

A guidebook intended for use by first responders  
during the initial phase of a transportation incident  
involving hazardous materials/dangerous goods

Exhibit C, Kippley Testimony

# 2020

## EMERGENCY RESPONSE GUIDEBOOK



## SHIPPING PAPERS (DOCUMENTS)

For the purpose of this guidebook, shipping documents and shipping papers are synonymous. Shipping papers provide vital information regarding the hazardous materials/dangerous goods to initiate protective actions. A consolidated version of the information found on shipping papers may be found as follows:

- Road – kept in the cab of a motor vehicle
- Rail – kept in possession of a crew member
- Aviation – kept in possession of the pilot or aircraft employees
- Marine – kept in a holder on the bridge of a vessel

Information provided:

- 4-digit identification number, UN or NA (go to yellow pages)
- Proper shipping name (go to blue pages)
- Hazard class or division number of material
- Packing group
- Emergency response telephone number
- Information describing the hazards of the material (entered on or attached to the shipping paper)\*

|  |  |
|--|--|
| <b>EMERGENCY CONTACT</b><br>1-000-000-0000 | <b>EXAMPLE OF EMERGENCY CONTACT TELEPHONE NUMBER</b> |
| <b>CONTRACT #:</b> XX-XXXX-X **            | <b>HAZARD CLASS OR DIVISION NO.</b>                  |
| <b>UN1219</b>                              | <b>ISOPROPANOL</b>                                   |
| <b>3</b>                                   | <b>II</b>  |
| <b>12 000 LITERS</b>                       | <b>1 TANKTRUCK</b>                                   |
| <b>ID NUMBER</b>                           | <b>SHIPPING NAME</b>                                 |
|  | <b>PACKING GROUP</b>                                 |

### EXAMPLE OF PLACARD AND PANEL WITH ID NUMBER

The 4-digit ID Number may be shown on the diamond-shaped placard or on an adjacent orange panel displayed on the ends and sides of a cargo tank, vehicle or rail car.



A Numbered Placard

OR

A Placard and an Orange Panel



**1219**

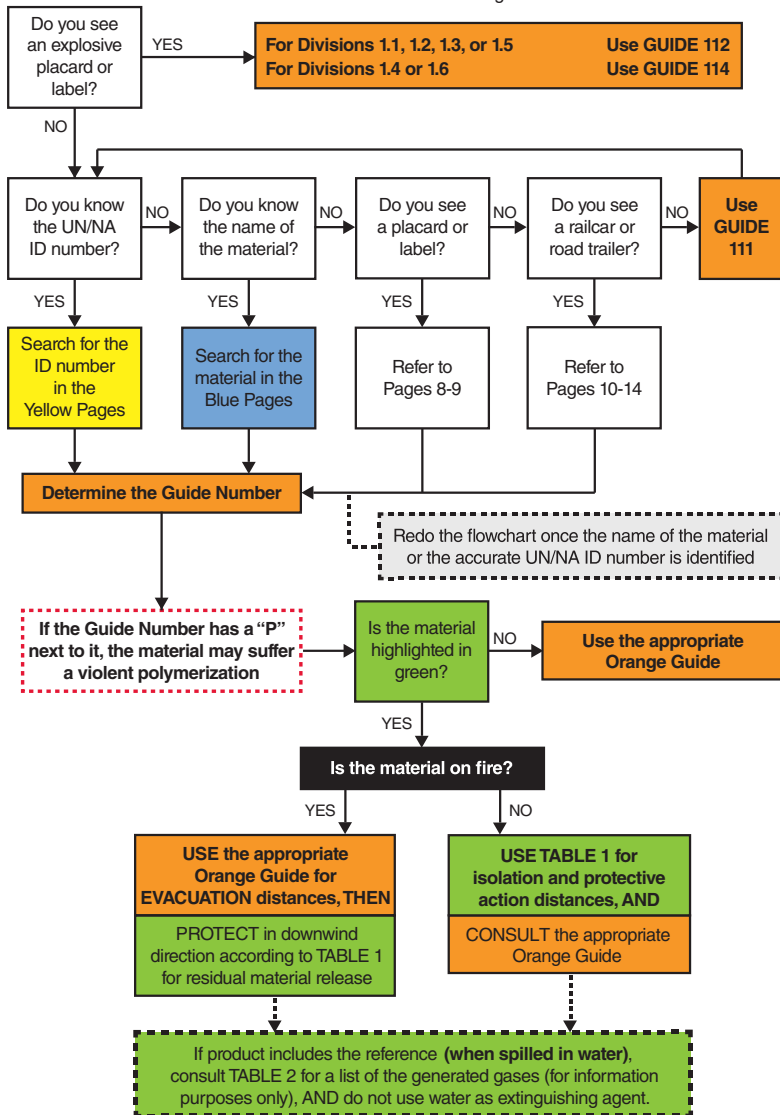
\* In the United States, this requirement may be satisfied by attaching a guide from the ERG2020 to the shipping paper, or by having the entire guidebook available for reference.

\*\* In the United States, a registration or contract number may be required on a shipping paper.

# HOW TO USE THIS GUIDEBOOK

**RESIST RUSHING IN!  
APPROACH INCIDENT FROM UPWIND, AND UPHILL AND/OR UPSTREAM  
STAY CLEAR OF ALL SPILLS, VAPORS, FUMES, SMOKE, AND POTENTIAL HAZARDS**

**WARNING:** DO NOT USE THIS FLOWCHART if more than one hazardous material/dangerous good is involved. Immediately call the appropriate emergency response agency telephone number listed on the inside back cover of this guidebook.



**BEFORE AN EMERGENCY - BECOME FAMILIAR WITH THIS GUIDEBOOK!**

First responders must be trained in the use of this guidebook.

**LOCAL EMERGENCY TELEPHONE NUMBERS**

Please populate this page with emergency telephone numbers  
for local assistance:

**HAZMAT CONTRACTORS**

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**RAIL COMPANIES**

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**FEDERAL/STATE/PROVINCIAL AGENCIES**

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**OTHERS**

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## SAFETY PRECAUTIONS

### RESIST RUSHING IN!

#### **APPROACH CAUTIOUSLY FROM *UPWIND, UPHILL AND/OR UPSTREAM*:**

- Stay clear of ***Vapor, Fumes, Smoke and Spills***.
- Keep vehicle at a safe distance from the scene.

#### **SECURE THE SCENE:**

- Isolate the area and protect yourself and others.

#### **IDENTIFY THE HAZARDS USING ANY OF THE FOLLOWING:**

- Placards
- Container labels
- Shipping papers
- Rail Car and Road Trailer Identification Chart
- Safety Data Sheets (SDS)
- Knowledge of persons on scene
- Consult applicable guide page

#### **ASSESS THE SITUATION:**

- Is there a fire, a spill or a leak?
- What are the weather conditions?
- What is the terrain like?
- Who/what is at risk: people, property or the environment?
- What actions should be taken – evacuation, shelter-in-place or dike?
- What resources (human and equipment) are required?
- What can be done immediately?

#### **OBTAIN HELP:**

- Advise your headquarters to notify responsible agencies and call for assistance from qualified personnel.

#### **RESPOND:**

- Enter only when wearing appropriate protective gear.
- Rescue attempts and protecting property must be weighed against you becoming part of the problem.
- Establish a command post and lines of communication.
- Continually reassess the situation and modify response accordingly.
- Consider safety of people in the immediate area first, including your own safety.

**ABOVE ALL:** Do not assume that gases or vapors are harmless because of lack of a smell – odorless gases or vapors may be harmful. Use **CAUTION** when handling empty containers because they may still present hazards until they are cleaned and purged of all residues.

## **NOTIFICATION AND REQUEST FOR TECHNICAL INFORMATION**

Follow the steps outlined in your organization's standard operating procedures and/or local emergency response plan for obtaining qualified assistance. Generally, the notification sequence and requests for technical information beyond what is available in this guidebook should occur in the following order:

### **1. NOTIFY YOUR ORGANIZATION/AGENCY:**

- Based on information provided, this will set in motion a series of events. Actions may range from dispatching additional trained personnel to the scene, to activating the local emergency response plan.
- Ensure that local fire and police departments have been notified.

### **2. CALL THE EMERGENCY RESPONSE TELEPHONE NUMBER ON THE SHIPPING PAPER**

- If shipping paper is not available, use guidance under next section "**NATIONAL ASSISTANCE**".

### **3. NATIONAL ASSISTANCE**

- Contact the appropriate emergency response agency listed on the inside back cover of this guidebook.
- Provide as much information about the hazardous material/dangerous good and the nature of the incident.
- The agency will provide immediate advice on handling the early stages of the incident.
- The agency will also contact the shipper or manufacturer of the material for more detailed information if necessary.
- The agency will request on-scene assistance when necessary.

### **4. PROVIDE AS MUCH OF THE FOLLOWING INFORMATION AS POSSIBLE:**

- Your name, call-back telephone number, fax number
- Location and nature of problem (spill, fire, etc.)
- Name and identification number of material(s) involved
- Shipper/consignee/point-of-origin
- Carrier name, rail car or truck number
- Container type and size
- Quantity of material transported/released
- Local conditions (weather, terrain)
- Proximity to schools, hospitals, waterways, etc.
- Injuries and exposures
- Local emergency services that have been notified

## HAZARD CLASSIFICATION SYSTEM

The hazard class of hazardous materials/dangerous goods is indicated either by its class (or division) number or name. Placards are used to identify the class or division of a material. The hazard class or division number must be displayed in the lower corner of a placard and is required for both primary and subsidiary hazard classes and divisions, if applicable. For other than Class 7 placards, text indicating a hazard (for example, "CORROSIVE") is not required. Text is shown only in the U.S. The hazard class or division number and subsidiary hazard classes or division numbers placed in parentheses (when applicable), must appear on the shipping paper after each proper shipping name.

### **Class 1 - Explosives**

|              |   |
|--------------|---|
| Division 1.1 | Explosives which have a mass explosion hazard   |
| Division 1.2 | Explosives which have a projection hazard but not a mass explosion hazard   |
| Division 1.3 | Explosives which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard |
| Division 1.4 | Explosives which present no significant hazard  |
| Division 1.5 | Very insensitive explosives with a mass explosion hazard  |
| Division 1.6 | Extremely insensitive articles which do not have a mass explosion hazard  |

### **Class 2 - Gases**

|              |                                 |
|--------------|---------------------------------|
| Division 2.1 | Flammable gases                 |
| Division 2.2 | Non-flammable, non-toxic* gases |
| Division 2.3 | Toxic* gases                    |

### **Class 3 - Flammable liquids (and Combustible liquids [U.S.]**

### **Class 4 - Flammable solids; Substances liable to spontaneous combustion; Substances which, on contact with water, emit flammable gases**

|              |  |
|--------------|--|
| Division 4.1 | Flammable solids, self-reactive substances and solid desensitized explosives |
| Division 4.2 | Substances liable to spontaneous combustion                                  |
| Division 4.3 | Substances which in contact with water emit flammable gases                  |

### **Class 5 - Oxidizing substances and Organic peroxides**

|              |                      |
|--------------|----------------------|
| Division 5.1 | Oxidizing substances |
| Division 5.2 | Organic peroxides    |

### **Class 6 - Toxic\* substances and Infectious substances**

|              |                       |
|--------------|-----------------------|
| Division 6.1 | Toxic* substances     |
| Division 6.2 | Infectious substances |

### **Class 7 - Radioactive materials**

### **Class 8 - Corrosive substances**

### **Class 9 - Miscellaneous hazardous materials/dangerous goods and articles**

\* The words "poison" or "poisonous" are synonymous with the word "toxic".



## INTRODUCTION TO THE TABLE OF MARKINGS, LABELS AND PLACARDS

**USE THIS TABLE ONLY WHEN THE ID NUMBER OR PROPER SHIPPING NAME IS NOT AVAILABLE.**

The next two pages display the placards used on transport vehicles carrying hazardous materials/dangerous goods with the applicable reference GUIDE circled. Follow these steps:

- 1. Approach scene from upwind, uphill and/or upstream at a safe distance to safely identify and/or read the placard or orange panel. Use binoculars if available.**
- 2. Match the vehicle placard(s) with one of the placards displayed on the next two pages.**
- 3. Consult the circled guide number associated with the placard. Use that guide information for now. For example:**

- Use GUIDE **127** for a FLAMMABLE (Class 3) placard



- Use GUIDE **153** for a CORROSIVE (Class 8) placard

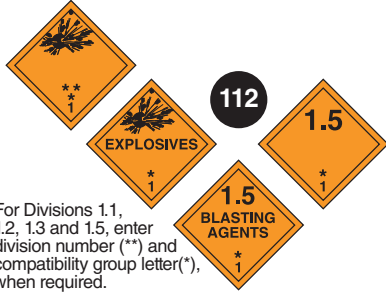
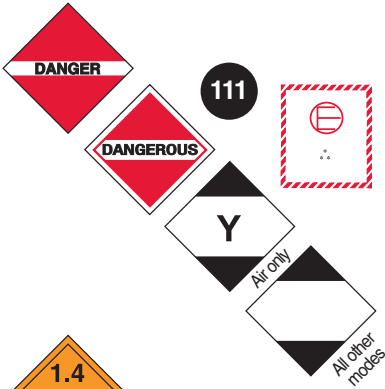


- Use GUIDE **111** when the DANGER or DANGEROUS placard is displayed or the nature of the spilled, leaking or burning material is not known. Also use this GUIDE when the presence of hazardous materials/dangerous goods is suspected but no placards can be seen.

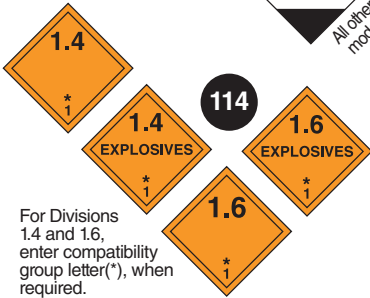
If multiple placards point to more than one guide, initially use the most conservative guide (i.e., the guide requiring the greatest degree of protective actions).

- 4. Guides associated with the placards provide the most significant risk and/or hazard information.**
- 5. When specific information, such as ID number or proper shipping name, becomes available, the more specific Guide recommended for that material must be consulted.**
- 6. A single asterisk (\*) on orange placards represents an explosive's compatibility group letter. The asterisk must be replaced with the appropriate compatibility group letter. Refer to the Glossary (page 375).**
- 7. Double asterisks (\*\*) on orange placards represent the division of the explosive. The double asterisks must be replaced with the appropriate division number.**

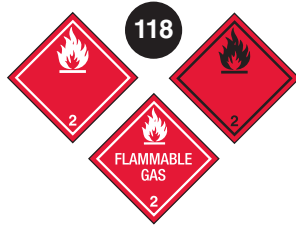
**TABLE OF MARKINGS, LABELS, AND PLACARDS**  
 USE THIS TABLE ONLY IF MATERIALS CANNOT BE SPECIFICALLY IDENTIFIED BY



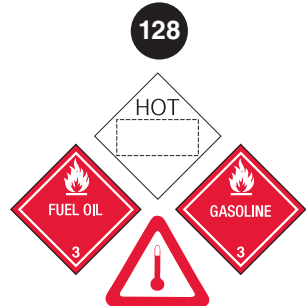
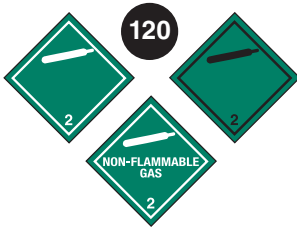
For Divisions 1.1, 1.2, 1.3 and 1.5, enter division number (\*\*) and compatibility group letter(\*), when required.



For Divisions 1.4 and 1.6, enter compatibility group letter(\*), when required.

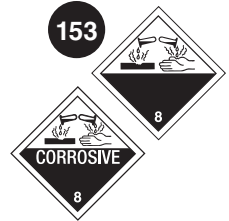
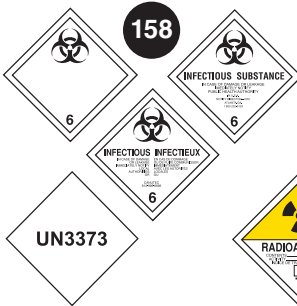
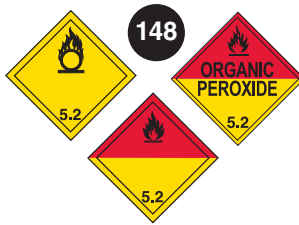
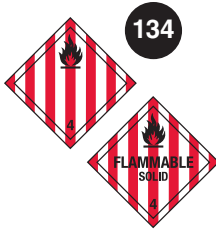


**INHALATION HAZARD**



# AND INITIAL RESPONSE GUIDE TO USE ON-SCENE

USING THE SHIPPING PAPER, NUMBERED PLACARD, OR ORANGE PANEL NUMBER



**138** Lithium metal batteries (UN3090, UN3091)

**147** Lithium ion batteries (UN3480, UN3481)



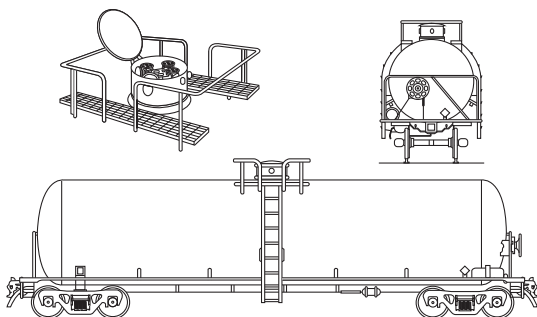
## RAIL CAR IDENTIFICATION CHART

**CAUTION:** Emergency response personnel must be aware that rail tank cars vary widely in construction, fittings and purpose. Tank cars could transport products that may be solids, liquids or gases. The products may be under pressure. It is essential that products be identified by consulting shipping papers or train consist or contacting dispatch centers before emergency response is initiated. The information stenciled on the sides or ends of tank cars, as illustrated below, may be used to identify the product utilizing:

- a. the commodity name shown;
- b. the other information shown, especially reporting marks and car number which, when supplied to a dispatch center, will facilitate the identification of the product.

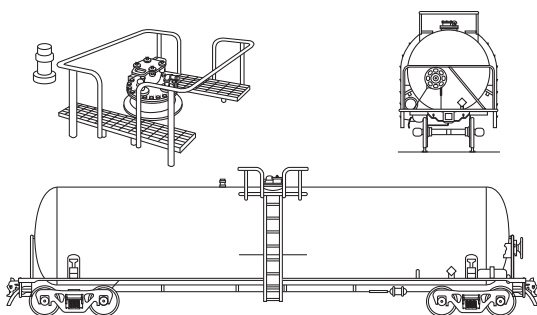
**The recommended guides should be considered as last resort if the material cannot be identified by any other means.**

### 117 Pressure tank car



- For flammable, non-flammable, toxic and/or liquefied compressed gases
- Protective housing
- No bottom fittings
- Pressures usually above 40 psi

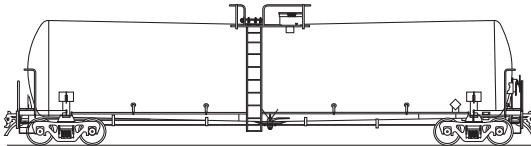
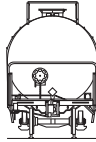
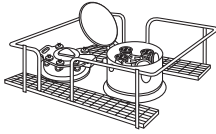
### 131 Non-pressure / low pressure tank car



- Known as **general service tank car**
- For variety of hazardous and non-hazardous materials
- Fittings and valves normally visible at the top of the tank
- Some may have bottom outlet valve
- Pressures usually below 25 psi

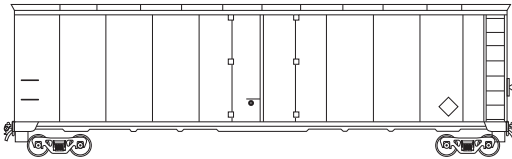
## RAIL CAR IDENTIFICATION CHART

**128 Non-pressure / low pressure tank car (TC117, DOT117)**



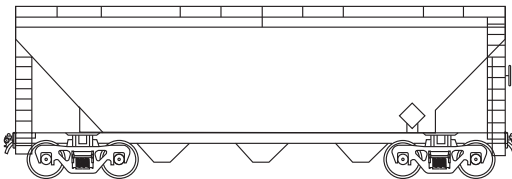
- For flammable liquids (e.g.,
- Petroleum crude oil, ethanol)
- Protective housing separate from manway
- Bottom outlet valve
- Pressures usually below 25 psi

**111 Box car**



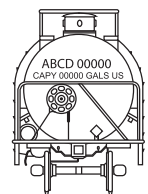
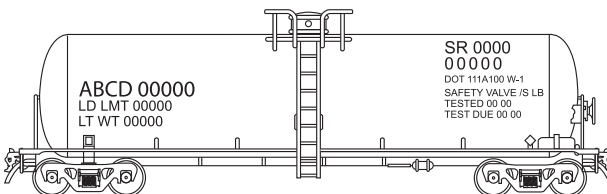
- For general freight that carry bulk or non-bulk packages
- May transport hazardous materials/dangerous goods in small packages or "tote bins"
- Single or double sliding door

**140 Hopper car**



- For bulk commodities and bulk cargo (e.g., coal, ore, cement and solid granular materials)
- Bulk lading discharged by gravity through the hopper bottom doors when doors opened

**COMMON MARKINGS ON RAIL CARS:** reporting marks and car number, load limit (pounds or kilograms), empty weight of car, placard, tank qualification and pressure relief device information, car specification, and commodity name.



## ROAD TRAILER IDENTIFICATION CHART

**CAUTION:** This chart depicts only the most general shapes of road trailers and cargo transport units. Emergency response personnel must be aware that there are many variations of road trailers, not illustrated below, that are used for shipping chemical products. Many intermodal tanks that transport liquids, solids, liquefied compressed gases, and refrigerated liquefied gases have similar silhouettes. The suggested guides are for the most hazardous products that may be transported in these trailer types.

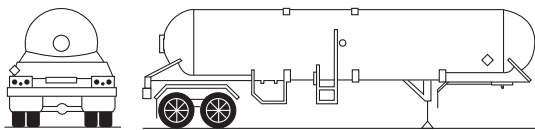
**WARNING:** Road trailers may be jacketed, the cross-section may look different than shown and external ring stiffeners would be invisible.

**NOTE:** An emergency shut-off valve is commonly found at the front of the tank, near the driver door.

**The recommended guides should be considered as last resort if the material cannot be identified by any other means.**

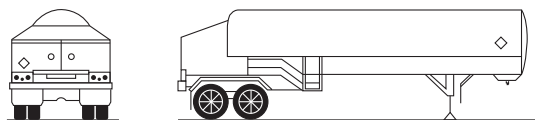
**MAWP: Maximum Allowable Working Pressure.**

### 117 MC331, TC331, SCT331



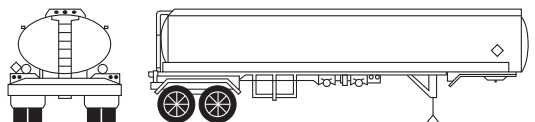
- For liquefied compressed gases (e.g., LPG, ammonia)
- Rounded heads
- Design pressure between 100-500 psi

### 117 MC338, TC338, SCT338, TC341, CGA341



- For refrigerated liquefied gases (cryogenic liquids)
- Similar to a "giant thermo-bottle"
- Fitting compartments located in a cabinet at the rear of the tank
- MAWP between 25-500 psi

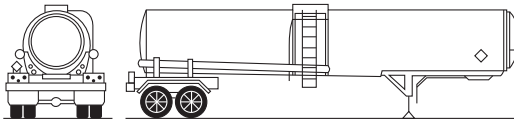
### 131 DOT406, TC406, SCT306, MC306, TC306



- For flammable liquids (e.g., gasoline, diesel)
- Elliptical cross-section
- Rollover protection at the top
- Bottom outlet valves
- MAWP between 3-15 psi

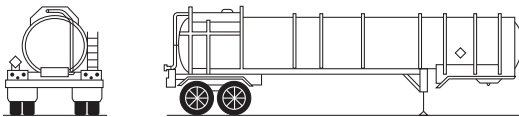
## ROAD TRAILER IDENTIFICATION CHART

### 137 DOT407, TC407, SCT307, MC307, TC307



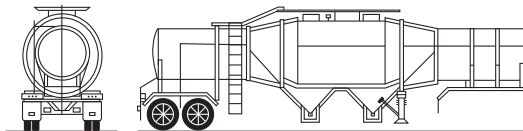
- For toxic, corrosive, and flammable liquids
- Circular cross-section
- May have external ring stiffeners
- MAWP of at least 25 psi

### 137 DOT412, TC412, SCT312, MC312, TC312



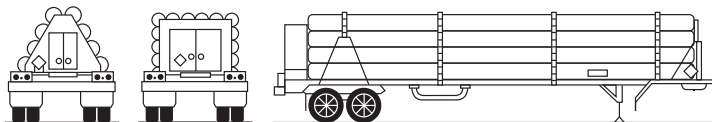
- Usually for corrosive liquids
- Circular cross-section
- External ring stiffeners
- Tank diameter is relatively small
- MAWP of at least 15 psi

### 112 TC423



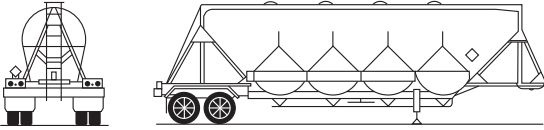
- For emulsion and water-gel explosives
- Hopper-style configuration
- MAWP between 5-15 psi

### 117 Compressed Gas/Tube Trailer

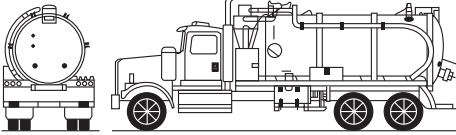


# ROAD TRAILER IDENTIFICATION CHART

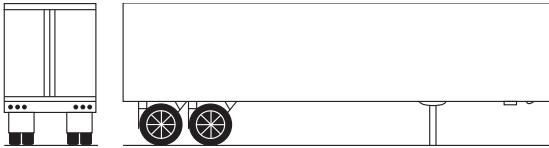
## 134 Dry Bulk Cargo Trailer



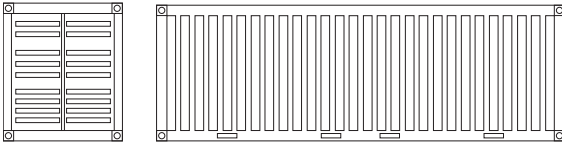
## 137 Vacuum Tanker



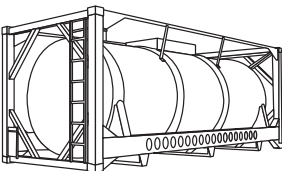
## 111 Mixed Cargo



## 111 Intermodal Freight Container



## 117 Intermodal Tank





NOTES

# GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELING OF CHEMICALS (GHS)

(May be found on means of containment during transport)

The Globally Harmonized System of Classification and Labeling of Chemicals (GHS) is an international guideline published by the United Nations. The GHS aims to harmonize the classification and labeling systems for all sectors involved in the life cycle of a chemical (production, storage, transport, workplace use, consumer use and presence in the environment).

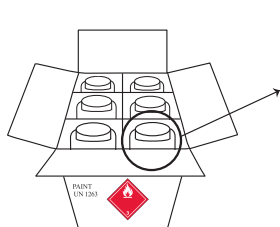
The GHS has nine symbols used to convey specific physical, health and environmental hazard information. These symbols are part of a pictogram that is diamond shaped and includes the GHS symbol in black on a white background with a red frame. The pictogram is part of the GHS label, which also includes the following information:

- **Signal word**
- **Hazard statement**
- **Precautionary statements**
- **Product identifier**
- **Supplier identification**

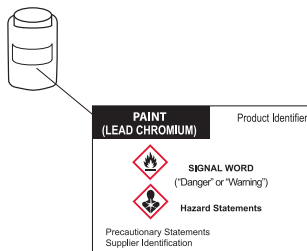
GHS pictograms are similar in shape to transport labels; however, transport labels have backgrounds of different colors.

The elements of the GHS that address signal words and hazard statements are not expected to be adopted in the transport sector. For substances and mixtures covered by the UN Recommendations on the Transport of Dangerous Goods, Model Regulations, the transport labels for physical hazards will have precedence. In transport, a GHS pictogram for the same (or lesser) hazard as the one reflected by the transport label or placard should not be present, but it could exist on the package.

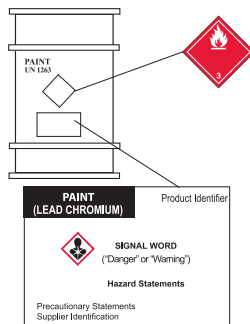
## Examples of GHS labeling:



**Outer Packaging:** Box with flammable liquid transport label













**Inner Packaging:** Plastic bottle with GHS hazard warning label



**Single Packaging:** 200 L (55 US gallons) drum with a flammable liquid transport label combined with GHS hazard warning label

In some cases, such as on drums or international bulk containers (IBCs), which must address information for all sectors, the GHS label may be found in addition to the required transport labels and placards. Both types of labels (GHS and transport) will differ in a way that will make them easy to identify during an emergency.

| <b>GHS Pictograms</b>   | <b>Physical hazards</b>   | <b>GHS Pictograms</b>   | <b>Health and Environmental hazards</b>  |
|---|---|---|--|
|    | Explosive;<br>Self-reactive;<br>Organic peroxide  |    | Skin corrosion;<br>Serious eye damage  |
|    | Flammable;<br>Pyrophoric;<br>Self-reactive;<br>Organic peroxide;<br>Self-heating;<br>Emits flammable gases when in contact with water |    | Acute toxicity (harmful);<br>Skin sensitizer;<br>Irritant (skin and eye);<br>Narcotic effect;<br>Respiratory tract irritant;<br>Hazardous to ozone layer (environment) |
|    | Oxidizer  |    | Respiratory sensitizer;<br>Mutagen;<br>Carcinogen;<br>Reproductive toxicity;<br>Target organ toxicity;<br>Aspiration hazard  |
|   | Gas under pressure  |   | Hazardous to aquatic environment   |
|  | Corrosive to metals   |  | Acute toxicity (fatal or toxic)  |

## HAZARD IDENTIFICATION NUMBERS DISPLAYED ON SOME INTERMODAL CONTAINERS

Hazard identification numbers, utilized under European and some South American regulations, may be found in the top half of an orange panel on some intermodal bulk containers. The 4-digit ID number is in the bottom half of the orange panel.



The hazard identification number in the top half of the orange panel consists of two or three digits. In general, the digits indicate the following hazards:

- 2 - Emission of gas due to pressure or chemical reaction
- 3 - Flammability of liquids (vapors) and gases or self-heating liquid
- 4 - Flammability of solids or self-heating solid
- 5 - Oxidizing (fire-intensifying) effect
- 6 - Toxicity or risk of infection
- 7 - Radioactivity
- 8 - Corrosivity
- 9 - Risk of spontaneous violent reaction

**NOTE:** The risk of spontaneous violent reaction within the meaning of digit 9 includes the possibility, due to the nature of a substance, of a risk of explosion, disintegration and polymerization reaction followed by the release of considerable heat or flammable and/or toxic gases.

- Doubling of a digit indicates an intensification of that particular hazard (i.e., 33, 66, 88).
- Where the hazard associated with a substance can be adequately indicated by a single digit, the digit is followed by a zero (i.e., 30, 40, 50).
- A hazard identification number prefixed by the letter "X" indicates that the substance will react dangerously with water (i.e., X88).

**HAZARD IDENTIFICATION NUMBERS**  
**DISPLAYED ON SOME INTERMODAL CONTAINERS**

The hazard identification numbers listed below have the following meanings:

|       |  |
|-------|--|
| 20    | Asphyxiant gas or gas with no subsidiary hazard  |
| 22    | Refrigerated liquefied gas, asphyxiant   |
| 223   | Refrigerated liquefied gas, flammable  |
| 225   | Refrigerated liquefied gas, oxidizing (fire-intensifying)  |
| 23    | Flammable gas  |
| 238   | Gas, flammable corrosive   |
| 239   | Flammable gas which can spontaneously lead to violent reaction   |
| 25    | Oxidizing (fire-intensifying) gas  |
| 26    | Toxic gas  |
| 263   | Toxic gas, flammable   |
| 265   | Toxic gas, oxidizing (fire-intensifying)   |
| 268   | Toxic gas, corrosive   |
| 28    | Gas, corrosive   |
| <hr/> |  |
| 30    | Flammable liquid (flash-point between 23°C and 60°C, inclusive), or flammable liquid or solid in the molten state with a flash-point above 60°C, heated to a temperature equal to or above its flash point, or self-heating liquid |
| 323   | Flammable liquid which reacts with water, emitting flammable gases   |
| X323  | Flammable liquid which reacts dangerously with water, emitting flammable gases   |
| 33    | Highly flammable liquid (flash-point below 23°C)   |
| 333   | Pyrophoric liquid  |
| X333  | Pyrophoric liquid which reacts dangerously with water  |
| 336   | Highly flammable liquid, toxic   |
| 338   | Highly flammable liquid, corrosive   |
| X338  | Highly flammable liquid, corrosive, which reacts dangerously with water  |
| 339   | Highly flammable liquid which can spontaneously lead to violent reaction   |
| 36    | Flammable liquid (flash-point between 23°C and 60°C, inclusive), slightly toxic, or self-heating liquid, toxic   |
| 362   | Flammable liquid, toxic, which reacts with water, emitting flammable gas   |
| X362  | Flammable liquid, toxic, which reacts dangerously with water, emitting flammable gases   |
| 368   | Flammable liquid, toxic, corrosive   |
| 38    | Flammable liquid (flash-point between 23°C and 60°C, inclusive), slightly corrosive or self-heating liquid, corrosive  |
| 382   | Flammable liquid, corrosive, which reacts with water, emitting flammable gases   |
| X382  | Flammable liquid, corrosive, which reacts dangerously with water, emitting flammable gases   |
| 39    | Flammable liquid, which can spontaneously lead to violent reaction   |
| <hr/> |  |
| 40    | Flammable solid, or self-reactive substance, or self-heating substance, or polymerizing substance  |

**HAZARD IDENTIFICATION NUMBERS**  
**DISPLAYED ON SOME INTERMODAL CONTAINERS**

|       |  |
|-------|--|
| 423   | Solid which reacts with water, emitting flammable gases, or flammable solid which reacts with water, emitting flammable gases, or self-heating solid which reacts with water, emitting flammable gases                                     |
| X423  | Solid which reacts dangerously with water, emitting flammable gases, or flammable solid which reacts dangerously with water, emitting flammable gases, or self-heating solid which reacts dangerously with water, emitting flammable gases |
| 43    | Spontaneously flammable (pyrophoric) solid   |
| X432  | Spontaneously flammable (pyrophoric) solid which reacts dangerously with water, emitting flammable gases   |
| 44    | Flammable solid, in the molten state at an elevated temperature  |
| 446   | Flammable solid, toxic, in the molten state at an elevated temperature   |
| 46    | Flammable or self-heating solid, toxic   |
| 462   | Toxic solid which reacts with water, emitting flammable gases  |
| X462  | Solid which reacts dangerously with water, emitting toxic gases  |
| 48    | Flammable or self-heating solid, corrosive   |
| 482   | Corrosive solid which reacts with water, emitting flammable gases  |
| X482  | Solid which reacts dangerously with water, emitting corrosive gases  |
| <hr/> |  |
| 50    | Oxidizing (fire-intensifying) substance  |
| 539   | Flammable organic peroxide   |
| 55    | Strongly oxidizing (fire-intensifying) substance   |
| 556   | Strongly oxidizing (fire-intensifying) substance, toxic  |
| 558   | Strongly oxidizing (fire-intensifying) substance, corrosive  |
| 559   | Strongly oxidizing (fire-intensifying) substance which can spontaneously lead to violent reaction  |
| 56    | Oxidizing substance (fire-intensifying), toxic   |
| 568   | Oxidizing substance (fire-intensifying), toxic, corrosive  |
| 58    | Oxidizing substance (fire-intensifying), corrosive   |
| 59    | Oxidizing substance (fire-intensifying), which can spontaneously lead to violent reaction  |
| <hr/> |  |
| 60    | Toxic or slightly toxic substance  |
| 606   | Infectious substance   |
| 623   | Toxic liquid, which reacts with water, emitting flammable gases  |
| 63    | Toxic substance, flammable (flash-point between 23°C and 60°C, inclusive)  |
| 638   | Toxic substance, flammable, (flash-point between 23°C and 60°C, inclusive), corrosive  |
| 639   | Toxic substance, flammable, (flash-point not above 60°C) which can spontaneously lead to violent reaction  |
| 64    | Toxic solid, flammable or self-heating   |
| 642   | Toxic solid which reacts with water, emitting flammable gases  |
| 65    | Toxic substance, oxidizing (fire-intensifying)   |
| 66    | Highly toxic substance   |

**HAZARD IDENTIFICATION NUMBERS**  
**DISPLAYED ON SOME INTERMODAL CONTAINERS**

|       |   |
|-------|---|
| 663   | Highly toxic substance, flammable (flash-point not above 60°C)  |
| 664   | Highly toxic solid, flammable or self-heating   |
| 665   | Highly toxic substance, oxidizing (fire-intensifying)   |
| 668   | Highly toxic substance, corrosive   |
| X668  | Highly toxic substance, corrosive, which reacts dangerously with water  |
| 669   | Highly toxic substance which can spontaneously lead to violent reaction   |
| 68    | Toxic substance, corrosive  |
| 69    | Toxic or slightly toxic substance which can spontaneously lead to violent reaction  |
| <hr/> |   |
| 70    | Radioactive material  |
| 768   | Radioactive material, toxic, corrosive  |
| 78    | Radioactive material, corrosive   |
| <hr/> |   |
| 80    | Corrosive or slightly corrosive substance   |
| X80   | Corrosive or slightly corrosive substance which reacts dangerously with water   |
| 823   | Corrosive liquid which reacts with water, emitting flammable gases  |
| 83    | Corrosive or slightly corrosive substance, flammable (flash-point between 23°C and 60°C, inclusive)   |
| X83   | Corrosive or slightly corrosive substance, flammable (flash-point between 23°C and 60°C, inclusive), which reacts dangerously with water  |
| 839   | Corrosive or slightly corrosive substance, flammable (flash-point between 23°C and 60°C, inclusive), which can spontaneously lead to violent reaction   |
| X839  | Corrosive or slightly corrosive substance, flammable (flash-point between 23°C and 60°C, inclusive), which can spontaneously lead to violent reaction and which reacts dangerously with water |
| 84    | Corrosive solid, flammable or self-heating  |
| 842   | Corrosive solid which reacts with water, emitting flammable gases   |
| 85    | Corrosive or slightly corrosive substance, oxidizing (fire-intensifying)  |
| 856   | Corrosive or slightly corrosive substance, oxidizing (fire-intensifying) and toxic  |
| 86    | Corrosive or slightly corrosive substance, toxic  |
| 88    | Highly corrosive substance  |
| X88   | Highly corrosive substance which reacts dangerously with water  |
| 883   | Highly corrosive substance, flammable (flash-point between 23°C and 60°C, inclusive)  |
| 884   | Highly corrosive solid, flammable or self-heating   |
| 885   | Highly corrosive substance, oxidizing (fire-intensifying)   |
| 886   | Highly corrosive substance, toxic   |
| X886  | Highly corrosive substance, toxic, which reacts dangerously with water  |
| 89    | Corrosive or slightly corrosive substance which can spontaneously lead to violent reaction  |
| <hr/> |   |
| 90    | Environmentally hazardous substance; miscellaneous dangerous substances   |
| 99    | Miscellaneous dangerous substance carried at an elevated temperature  |

## **PIPELINE TRANSPORTATION**

In North America, hazardous materials/dangerous goods are commonly transported through millions of miles of pipelines and related structures. Products transported include natural gas, natural gas liquids, crude oil, gasoline, diesel fuel, anhydrous ammonia, carbon dioxide, jet fuel, and other commodities. Although most pipelines are buried, often there are aboveground structures and markers indicating the presence of pipelines. First responders should be aware of the pipelines in their jurisdictions, the products they transport, and the operators responsible for those pipelines. Proactive relationships can be beneficial in the safe and effective management of pipeline emergencies.

### **Types of Pipelines**

#### **Natural Gas Pipelines**

##### **Natural Gas Transmission Pipelines**

Large-diameter, steel pipelines transport flammable natural gas (toxic and non-toxic) at very high pressures ranging from 200 to 1,500 psi\*. Natural gas in transmission pipelines is odorless — generally *not odorized* with mercaptan (the “rotten egg” smell); however, natural gas containing hydrogen sulfide (H<sub>2</sub>S) will have a distinct “rotten egg” odor.

##### **Natural Gas Distribution Pipelines**

Natural gas is delivered directly to customers via distribution pipelines. These pipelines are typically smaller-diameter, lower-pressure pipelines constructed of steel, plastic, or cast iron. Natural gas in distribution pipelines *is odorized* with mercaptan (the “rotten egg” smell).

##### **Natural Gas-Gathering and Natural Gas Well Production Pipelines**

Natural gas-gathering/well production pipelines collect “raw” natural gas from wellheads and transport the product to gas-processing and/or gas-treating plants. These gathering pipelines carry natural gas mixed with some quantity of natural gas liquids, water, and, in some areas, contaminants such as toxic hydrogen sulfide (H<sub>2</sub>S). Natural gas in these pipelines is *not odorized* with mercaptan (the “rotten egg” smell); however, natural gas that contains hydrogen sulfide (H<sub>2</sub>S) will have a distinct “rotten egg” odor.

#### **Hazardous Liquid and Highly Volatile Liquid Pipelines**

##### **Hazardous Liquid Pipelines**

Crude oil, refined petroleum products (e.g. gasoline, kerosene, jet fuel or diesel) and hazardous liquids (e.g. anhydrous ammonia or ethanol) are often transported by pipelines.

Many liquid petroleum pipelines transport different types of liquid petroleum in the same pipeline. To do so, the pipeline operator sends different products in “batches.” For example, an operator could send gasoline for several hours, and then switch to jet fuels, before switching to diesel fuel.

\* Data from <http://naturalgas.org/naturalgas/transport/>



## Highly Volatile Liquid (HVL) Pipelines

HVL pipelines transport hazardous liquids which will form a vapor cloud when released to the atmosphere and which have a vapor pressure exceeding 276 KPa (40 psia) at 37.8°C (100°F). An example of an HVL is liquid propane.

### Pipeline Markers

Since pipelines are usually buried underground, pipeline markers are used to indicate their presence in an area along the pipeline route. Of the three types of pipelines typically buried underground — distribution, gathering, and transmission — only transmission pipelines are marked with the following above-ground markers used to indicate their route.



Markers warn that a transmission pipeline is located in the area, identify the product transported in the line, and provide the name and telephone number of the pipeline operator to call. Markers and warning signs are located at frequent intervals along natural gas and liquid transmission pipeline rights-of-way, and are located at prominent points such as where pipelines intersect streets, highways, railways, or waterways.

*Pipeline markers only indicate the presence of a pipeline—they do not indicate the exact location of the pipeline.* Pipeline locations within a right-of-way may vary along its length and there may be multiple pipelines located in the same right-of-way.

### NOTE:

- Markers for pipelines transporting materials containing dangerous levels of hydrogen sulfide (H<sub>2</sub>S) may have markers that say: “Sour” or “Poison.”
- Natural gas distribution pipelines are not marked with above-ground signs.
- Gathering/production pipelines are often not marked with above-ground signs.

## Pipeline Structures (Above Ground)

|   |   |
|---|---|
| <b>Natural Gas Transmission Pipelines:</b>              | Compressor stations, valves, metering stations.                               |
| <b>Natural Gas Distribution Pipelines:</b>              | Regulator stations, customer meters and regulators, valve box covers.         |
| <b>Natural Gas Gathering/Well Production Pipelines:</b> | Compressor stations, valves, metering stations, wellheads, piping, manifolds. |
| <b>Petroleum and Hazardous Liquids Pipelines:</b>       | Storage tanks, valves, pump stations, loading racks.                          |

## Indications of Pipeline Leaks and Ruptures

Pipeline releases can range from relatively minor leaks to catastrophic ruptures. It is important to remember that gases and liquids behave differently once they are released from a pipeline. Generally, the following could be indications of a pipeline leak or rupture:

- Hissing, roaring, or explosive sound
- Flames appearing from the ground or water (perhaps very large flames)
- Vapor cloud/fog/mist
- Dirt/debris/water blowing out of the ground
- Liquids bubbling up from the ground or bubbling in water
- Distinctive, unusually strong odor of rotten eggs, mercaptan (an odorant in some natural gas pipelines), skunk, or petroleum
- Discolored/dead vegetation or discolored snow above a pipeline right-of-way
- Oil slick or sheen on flowing/standing water
- An area of frozen ground in the summer
- An unusual area of melted snow in the winter

## General Considerations for Responding to a Pipeline Emergency

- **Safety First!** Your safety and the safety of the community you protect is top priority. Remember to approach a pipeline incident from upwind, uphill, and upstream while using air monitoring equipment to detect for the presence of explosive and/or toxic levels of hazardous materials/dangerous goods.
  - Always wear proper personal protective equipment. Be prepared for a flash fire. Use shielding to protect first responders in the event of an explosion. Use respiratory protection.
  - Never operate pipeline valves (except in coordination with the pipeline operator); this could make the incident worse and put you and others in danger.
  - Never attempt to extinguish a pipeline fire before supply is shut off; this could result in the accumulation of a large flammable/explosive vapor cloud or liquid pool that could make the incident worse and put you and others in danger.
  - Do not walk or drive into a vapor cloud in an attempt to identify the product(s) involved.
  - Do not park over manholes or storm drains.
  - Do not approach the scene with vehicles or mechanical equipment until the isolation zones have been established (vehicles are a potential ignition source).
- **Secure the site** and determine a plan to evacuate or shelter-in-place. Work with other responders to deny entry to an area.
- **Identify the product and the operator.** If safe to do so, you may be able to identify the product based on its characteristics or other external clues. Look for pipeline markers indicating the product, operator of the pipeline, and their emergency contact information. Pipelines transport many different types of products, including gases, liquids, and highly volatile liquids that are in a liquid state inside the pipeline but in a gaseous state if released from the pipeline. The vapor density of gases determines if they rise or sink in air. Viscosity and specific gravity also are important characteristics of hazardous liquids to consider. Identification of the product also will help you determine the appropriate distance for isolation of the affected area.
- **Notify the pipeline operator** using the emergency contact information on the pipeline marker or other contact information you may have received from the pipeline operator. The pipeline operator will be a resource to you in the response.
- **Establish a command post.** Implement the Incident Command Structure, as needed, and be prepared to implement a Unified Command as additional stakeholders and resources arrive.

## **Other Important Considerations**

- If no flames are present, do not introduce ignition sources such as open flames, running vehicles, or electrical equipment (cell phones, pagers, two-way radios, lights, garage door openers, fans, door bells, etc.).
- Abandon any equipment used in or near the area of the pipeline release.
- If there is no risk to your safety or the safety of others, move far enough away from any noise coming from the pipeline to allow for normal conversation.
- Pipelines often are close to other public utilities, railroads, and highways; these can be impacted by pipeline releases or may be potential ignition sources.
- Natural gas can migrate underground from the source of a release to other areas via the path of least resistance (including through sewers, water lines, and geologic formations).

## **Considerations for Establishing Protective Action Distances**

- Type of product
  - If you know the material involved, identify the three-digit guide number by looking up the name in the alphabetical list (blue-bordered pages), then using the three-digit guide number, consult the recommendations in the assigned guide.
- Pressure and diameter of pipe (the pipeline operator can tell you this if you don't already know it)
- Timing of valve closure by the pipeline operator (quickly for automated valves; longer for manually operated valves)
- Dissipation time of the product in the pipeline once valves are closed
- Ability to conduct atmospheric monitoring and/or air sampling
- Weather (wind direction, etc.)
- Local variables such as topography, population density, demographics, and fire suppression methods available
- Nearby building construction material/density
- Natural and man-made barriers (such as highways, railroads, rivers, etc.)

## **U.S. Pipeline Resources**

**U.S. Pipeline Locations:** The National Pipeline Mapping System (NPMS) <https://www.npms.phmsa.dot.gov> indicates the general locations of hazardous liquids and natural gas transmission pipelines found within the U.S. The pipelines depicted in the NPMS are within 500 feet of their actual locations. Emergency responders may apply for an NPMS web viewer account that will allow access to more detailed information than is available to the general public. The NPMS does not contain gathering/production or natural gas distribution pipelines.

**U.S. Pipeline Emergency Response Training:** Where appropriate, reference pipeline emergencies training materials produced by the Pipeline and Hazardous Materials Safety Administration. Your state or jurisdiction also may provide training on how to handle the response to a pipeline incident.

### **Other Resources:**

Pipeline Association for Public Awareness  
<https://www.pipelineawareness.org/>

U.S. DOT, Pipeline and Hazardous Materials Safety Administration  
<https://www.phmsa.dot.gov/safety-awareness/pipeline/safety-awareness-overview>

Pipeline Emergency Responders Initiative (PERI)  
<https://www.phmsa.dot.gov/pipeline/peri/pipeline-emergency-responders-initiative-peri>

## **Canadian Pipeline Resources**

**Canadian Pipeline Locations:** The Canadian Energy Pipeline Association (CEPA) provides the general locations of natural gas and liquid pipelines found within Canada.

<https://www.cepa.com>

## INTRODUCTION TO YELLOW PAGES

For entries highlighted in green follow these steps:

- **IF THERE IS NO FIRE:**

- Go directly to **Table 1** (green-bordered pages)
- Look up the ID number and name of material
- Identify initial isolation and protective action distances
- Also consult the appropriate Orange Guide

- **IF A FIRE IS INVOLVED:**

- Use the appropriate Orange Guide for **EVACUATION** distances
- Also protect in downwind direction according to Table 1 for residual material release

**Note 1:** If the name in **Table 1** is shown with **(when spilled in water)**, these materials produce large amounts of Toxic Inhalation Hazard (TIH) (PIH in the US) gases when spilled in water. Some Water Reactive materials are also TIH materials themselves (e.g., UN1746 (Bromine trifluoride), UN1836 (Thionyl chloride)). In these instances, two entries are provided in **Table 1** for land-based and water-based spills. If a water-reactive material only has one entry in Table 1 for **(when spilled in water)** and the product is NOT spilled in water, Table 1 and Table 2 do not apply. You will find safe distances in the appropriate orange-bordered guide.

**Note 2: Explosives** are not individually listed by their ID number because in an emergency situation, the response will be based only on the division of the explosive, not on the individual explosive.

**For divisions 1.1, 1.2, 1.3 and 1.5, refer to GUIDE 112.**

**For divisions 1.4 and 1.6, refer to GUIDE 114.**

**Note 3:** Chemical warfare agents do not have an assigned ID number because they are not commercially transported. In an emergency situation, the assigned orange guide will provide guidance for the initial response. Also consult "Criminal or Terrorist Use of Chemical, Biological and Radiological Agents", pp. 368 to 372.

**ID Guide Name of Material**  
**No. No.**

|   |     |   |
|---|-----|---|
| — | 117 | AC  |
| — | 154 | Adamsite                                  |
| — | 112 | Ammonium nitrate-fuel oil mixtures        |
| — | 158 | Biological agents                         |
| — | 112 | Blasting agent, n.o.s.                    |
| — | 153 | Buzz                                      |
| — | 153 | BZ  |
| — | 159 | CA  |
| — | 125 | CG  |
| — | 125 | CK  |
| — | 153 | CN  |
| — | 153 | CS  |
| — | 154 | CX  |
| — | 151 | DA  |
| — | 153 | DC  |
| — | 154 | DM  |
| — | 125 | DP  |
| — | 151 | ED  |
| — | 112 | Explosives, division 1.1, 1.2, 1.3 or 1.5 |
| — | 114 | Explosives, division 1.4 or 1.6           |
| — | 153 | GA  |
| — | 153 | GB  |
| — | 153 | GD  |
| — | 153 | GF  |
| — | 153 | H   |
| — | 153 | HD  |
| — | 153 | HL  |
| — | 153 | HN-1                                      |
| — | 153 | HN-2                                      |
| — | 153 | HN-3                                      |

**ID Guide Name of Material**  
**No. No.**

|      |      |  |
|------|------|--|
| —    | 153  | L (Lewisite)                                   |
| —    | 153  | Lewisite                                       |
| —    | 152  | MD   |
| —    | 153  | Mustard  |
| —    | 153  | Mustard Lewisite                               |
| —    | 152  | PD   |
| —    | 119  | SA   |
| —    | 153  | Sarin  |
| —    | 153  | Soman  |
| —    | 153  | Tabun  |
| —    | 153  | Thickened GD                                   |
| —    | 153  | Toxins   |
| —    | 153  | VX   |
| 1001 | 116  | Acetylene, dissolved                           |
| 1002 | 122  | Air, compressed                                |
| 1003 | 122  | Air, refrigerated liquid (cryogenic liquid)    |
| 1005 | 125  | Ammonia, anhydrous                             |
| 1005 | 125  | Anhydrous ammonia                              |
| 1006 | 120  | Argon  |
| 1006 | 120  | Argon, compressed                              |
| 1008 | 125  | Boron trifluoride                              |
| 1008 | 125  | Boron trifluoride, compressed                  |
| 1009 | 126  | Bromotrifluoromethane                          |
| 1009 | 126  | Refrigerant gas R-13B1                         |
| 1010 | 116P | Butadienes, stabilized                         |
| 1010 | 116P | Butadienes and hydrocarbon mixture, stabilized |
| 1010 | 116P | Hydrocarbon and butadienes mixture, stabilized |
| 1011 | 115  | Butane   |
| 1012 | 115  | Butylene                                       |

**ID Guide Name of Material**  
**No. No.**

**ID Guide Name of Material**  
**No. No.**

|      |     |   |
|------|-----|---|
| 1013 | 120 | Carbon dioxide                                |
| 1013 | 120 | Carbon dioxide, compressed                    |
| 1014 | 122 | Carbon dioxide and Oxygen mixture, compressed |
| 1014 | 122 | Oxygen and Carbon dioxide mixture, compressed |
| 1015 | 126 | Carbon dioxide and Nitrous oxide mixture      |
| 1015 | 126 | Nitrous oxide and Carbon dioxide mixture      |
| 1016 | 119 | Carbon monoxide                               |
| 1016 | 119 | Carbon monoxide, compressed                   |
| 1017 | 124 | Chlorine                                      |
| 1018 | 126 | Chlorodifluoromethane                         |
| 1018 | 126 | Refrigerant gas R-22                          |
| 1020 | 126 | Chloropentafluoroethane                       |
| 1020 | 126 | Refrigerant gas R-115                         |
| 1021 | 126 | 1-Chloro-1,2,2,2-tetrafluoroethane            |
| 1021 | 126 | Refrigerant gas R-124                         |
| 1022 | 126 | Chlorotrifluoromethane                        |
| 1022 | 126 | Refrigerant gas R-13                          |
| 1023 | 119 | Coal gas                                      |
| 1023 | 119 | Coal gas, compressed                          |
| 1026 | 119 | Cyanogen                                      |
| 1027 | 115 | Cyclopropane                                  |
| 1028 | 126 | Dichlorodifluoromethane                       |
| 1028 | 126 | Refrigerant gas R-12                          |
| 1029 | 126 | Dichlorofluoromethane                         |
| 1029 | 126 | Refrigerant gas R-21                          |
| 1030 | 115 | 1,1-Difluoroethane                            |
| 1030 | 115 | Refrigerant gas R-152a                        |
| 1032 | 118 | Dimethylamine, anhydrous                      |

|      |      |   |
|------|------|---|
| 1033 | 115  | Dimethyl ether  |
| 1035 | 115  | Ethane  |
| 1035 | 115  | Ethane, compressed  |
| 1036 | 118  | Ethylamine  |
| 1037 | 115  | Ethyl chloride  |
| 1038 | 115  | Ethylene, refrigerated liquid (cryogenic liquid)  |
| 1039 | 115  | Ethyl methyl ether  |
| 1039 | 115  | Methyl ethyl ether  |
| 1040 | 119P | Ethylene oxide  |
| 1040 | 119P | Ethylene oxide with Nitrogen  |
| 1041 | 115  | Carbon dioxide and Ethylene oxide mixture, with more than 9% but not more than 87% Ethylene oxide |
| 1041 | 115  | Ethylene oxide and Carbon dioxide mixture, with more than 9% but not more than 87% Ethylene oxide |
| 1043 | 125  | Fertilizer, ammoniating solution, with free Ammonia   |
| 1044 | 126  | Fire extinguishers with compressed or liquefied gas   |
| 1045 | 124  | Fluorine  |
| 1045 | 124  | Fluorine, compressed  |
| 1046 | 120  | Helium  |
| 1046 | 120  | Helium, compressed  |
| 1048 | 125  | Hydrogen bromide, anhydrous   |
| 1049 | 115  | Hydrogen  |
| 1049 | 115  | Hydrogen, compressed  |
| 1050 | 125  | Hydrogen chloride, anhydrous  |
| 1051 | 117P | Hydrogen cyanide, anhydrous, stabilized   |
| 1051 | 117P | Hydrogen cyanide, stabilized  |
| 1052 | 125  | Hydrogen fluoride, anhydrous  |



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|      |      |  |
|------|------|--|
| 1053 | 117  | Hydrogen sulfide   |
| 1053 | 117  | Hydrogen sulphide  |
| 1055 | 115  | Isobutylene  |
| 1056 | 120  | Krypton  |
| 1056 | 120  | Krypton, compressed  |
| 1057 | 115  | Lighter refills containing flammable gas                                     |
| 1057 | 115  | Lighters containing flammable gas  |
| 1057 | 128  | Lighters, non-pressurized, containing flammable liquid                       |
| 1058 | 120  | Liquefied gases, non-flammable, charged with Nitrogen, Carbon dioxide or Air |
| 1060 | 116P | Methylacetylene and Propadiene mixture, stabilized                           |
| 1060 | 116P | Propadiene and Methylacetylene mixture, stabilized                           |
| 1061 | 118  | Methylamine, anhydrous   |
| 1062 | 123  | Methyl bromide   |
| 1063 | 115  | Methyl chloride  |
| 1063 | 115  | Refrigerant gas R-40   |
| 1064 | 117  | Methyl mercaptan   |
| 1065 | 120  | Neon   |
| 1065 | 120  | Neon, compressed   |
| 1066 | 120  | Nitrogen   |
| 1066 | 120  | Nitrogen, compressed   |
| 1067 | 124  | Dinitrogen tetroxide   |
| 1067 | 124  | Nitrogen dioxide   |
| 1069 | 125  | Nitrosyl chloride  |
| 1070 | 122  | Nitrous oxide  |
| 1070 | 122  | Nitrous oxide, compressed  |

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|      |      |  |
|------|------|--|
| 1071 | 119  | Oil gas  |
| 1071 | 119  | Oil gas, compressed                            |
| 1072 | 122  | Oxygen   |
| 1072 | 122  | Oxygen, compressed                             |
| 1073 | 122  | Oxygen, refrigerated liquid (cryogenic liquid) |
| 1075 | 115  | Butane   |
| 1075 | 115  | Butylene                                       |
| 1075 | 115  | Isobutane                                      |
| 1075 | 115  | Isobutylene                                    |
| 1075 | 115  | Liquefied petroleum gas                        |
| 1075 | 115  | LPG  |
| 1075 | 115  | Petroleum gases, liquefied                     |
| 1075 | 115  | Propane  |
| 1075 | 115  | Propylene                                      |
| 1076 | 125  | Phosgene                                       |
| 1077 | 115  | Propylene                                      |
| 1078 | 126  | Dispersant gas, n.o.s.                         |
| 1078 | 126  | Refrigerant gas, n.o.s.                        |
| 1079 | 125  | Sulfur dioxide                                 |
| 1079 | 125  | Sulphur dioxide                                |
| 1080 | 126  | Sulfur hexafluoride                            |
| 1080 | 126  | Sulphur hexafluoride                           |
| 1081 | 116P | Tetrafluoroethylene, stabilized                |
| 1082 | 119P | Refrigerant gas R-1113                         |
| 1082 | 119P | Trifluorochloroethylene, stabilized            |
| 1083 | 118  | Trimethylamine, anhydrous                      |
| 1085 | 116P | Vinyl bromide, stabilized                      |
| 1086 | 116P | Vinyl chloride, stabilized                     |
| 1087 | 116P | Vinyl methyl ether, stabilized                 |
| 1088 | 127  | Acetal   |

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1089 **129P** Acetaldehyde  
1090 **127** Acetone  
1091 **127** Acetone oils  
1092 **131P** Acrolein, stabilized  
1093 **131P** Acrylonitrile, stabilized  
1098 **131** Allyl alcohol  
1099 **131P** Allyl bromide  
1100 **131P** Allyl chloride  
1104 **129** Amyl acetates  
1105 **129** Pentanols  
1106 **132** Amylamine  
1107 **129** Amyl chloride  
1108 **128** n-Amylene  
1108 **128** 1-Pentene  
1109 **129** Amyl formates  
1110 **127** n-Amyl methyl ketone  
1110 **127** Methyl amyl ketone  
1111 **130** Amyl mercaptan  
1112 **128** Amyl nitrate  
1113 **129** Amyl nitrite  
1114 **130** Benzene  
1120 **129** Butanols  
1123 **129** Butyl acetates  
1125 **132** n-Butylamine  
1126 **130** 1-Bromobutane  
1126 **130** n-Butyl bromide  
1127 **130** n-Butyl chloride  
1127 **130** Chlorobutanes  
1128 **129** n-Butyl formate  
1129 **129P** Butyraldehyde  
1130 **128** Camphor oil

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1131 **131** Carbon bisulfide  
1131 **131** Carbon bisulphide  
1131 **131** Carbon disulfide  
1131 **131** Carbon disulphide  
1133 **128** Adhesives (flammable)  
1134 **130** Chlorobenzene  
1135 **131** Ethylene chlorohydrin  
1136 **128** Coal tar distillates, flammable  
1139 **127** Coating solution  
1143 **131P** Crotonaldehyde  
1143 **131P** Crotonaldehyde, stabilized  
1144 **128** Crotonylene  
1145 **128** Cyclohexane  
1146 **128** Cyclopentane  
1147 **130** Decahydronaphthalene  
1148 **129** Diacetone alcohol  
1149 **128** Butyl ethers  
1149 **128** Dibutyl ethers  
1150 **130P** 1,2-Dichloroethylene  
1152 **130** Dichloropentanes  
1153 **127** Ethylene glycol diethyl ether  
1154 **132** Diethylamine  
1155 **127** Diethyl ether  
1155 **127** Ethyl ether  
1156 **127** Diethyl ketone  
1157 **128** Diisobutyl ketone  
1158 **132** Diisopropylamine  
1159 **127** Diisopropyl ether  
1160 **132** Dimethylamine, aqueous solution  
1160 **132** Dimethylamine, solution  
1161 **129** Dimethyl carbonate

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|      |      |  |
|------|------|--|
| 1162 | 155  | Dimethyldichlorosilane                   |
| 1163 | 131  | Dimethylhydrazine, unsymmetrical         |
| 1164 | 130  | Dimethyl sulfide                         |
| 1164 | 130  | Dimethyl sulphide                        |
| 1165 | 127  | Dioxane                                  |
| 1166 | 127  | Dioxolane                                |
| 1167 | 128P | Divinyl ether, stabilized                |
| 1169 | 127  | Extracts, aromatic, liquid               |
| 1170 | 127  | Ethanol                                  |
| 1170 | 127  | Ethanol, solution                        |
| 1170 | 127  | Ethyl alcohol                            |
| 1170 | 127  | Ethyl alcohol, solution                  |
| 1171 | 127  | Ethylene glycol monoethyl ether          |
| 1172 | 129  | Ethylene glycol monoethyl ether acetate  |
| 1173 | 129  | Ethyl acetate                            |
| 1175 | 130  | Ethylbenzene                             |
| 1176 | 129  | Ethyl borate                             |
| 1177 | 130  | 2-Ethylbutyl acetate                     |
| 1178 | 130  | 2-Ethylbutylaldehyde                     |
| 1179 | 127  | Ethyl butyl ether                        |
| 1180 | 130  | Ethyl butyrate                           |
| 1181 | 155  | Ethyl chloroacetate                      |
| 1182 | 155  | Ethyl chloroformate                      |
| 1183 | 139  | Ethyldichlorosilane                      |
| 1184 | 131  | Ethylene dichloride                      |
| 1185 | 131P | Ethyleneimine, stabilized                |
| 1188 | 127  | Ethylene glycol monomethyl ether         |
| 1189 | 129  | Ethylene glycol monomethyl ether acetate |
| 1190 | 129  | Ethyl formate                            |

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|      |      |   |
|------|------|---|
| 1191 | 129  | Ethylhexaldehydes   |
| 1191 | 129  | Octyl aldehydes   |
| 1192 | 129  | Ethyl lactate   |
| 1193 | 127  | Ethyl methyl ketone   |
| 1193 | 127  | Methyl ethyl ketone   |
| 1194 | 131  | Ethyl nitrite, solution   |
| 1195 | 129  | Ethyl propionate  |
| 1196 | 155  | Ethyltrichlorosilane  |
| 1197 | 127  | Extracts, flavoring, liquid   |
| 1197 | 127  | Extracts, flavouring, liquid  |
| 1198 | 132  | Formaldehyde, solution, flammable                                       |
| 1198 | 132  | Formalin (flammable)  |
| 1199 | 153P | Furaldehydes  |
| 1201 | 127  | Fusel oil   |
| 1202 | 128  | Diesel fuel   |
| 1202 | 128  | Fuel oil  |
| 1202 | 128  | Gas oil   |
| 1202 | 128  | Heating oil, light  |
| 1203 | 128  | Gasohol   |
| 1203 | 128  | Gasoline  |
| 1203 | 128  | Motor spirit  |
| 1203 | 128  | Petrol  |
| 1204 | 127  | Nitroglycerin, solution in alcohol, with not more than 1% Nitroglycerin |
| 1206 | 128  | Heptanes  |
| 1207 | 130  | Hexaldehyde   |
| 1208 | 128  | Hexanes   |
| 1208 | 128  | Neohexane   |
| 1210 | 129  | Ink, printer's, flammable   |
| 1210 | 129  | Printing ink, flammable   |

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|      |             |   |
|------|-------------|---|
| 1210 | <b>129</b>  | Printing ink related material, flammable                |
| 1212 | <b>129</b>  | Isobutanol  |
| 1212 | <b>129</b>  | Isobutyl alcohol  |
| 1213 | <b>129</b>  | Isobutyl acetate  |
| 1214 | <b>132</b>  | Isobutylamine   |
| 1216 | <b>128</b>  | Isooctenes  |
| 1218 | <b>130P</b> | Isoprene, stabilized                                    |
| 1219 | <b>129</b>  | Isopropanol   |
| 1219 | <b>129</b>  | Isopropyl alcohol                                       |
| 1220 | <b>129</b>  | Isopropyl acetate                                       |
| 1221 | <b>132</b>  | Isopropylamine  |
| 1222 | <b>130</b>  | Isopropyl nitrate                                       |
| 1223 | <b>128</b>  | Kerosene  |
| 1224 | <b>127</b>  | Ketones, liquid, n.o.s.                                 |
| 1228 | <b>131</b>  | Mercaptan mixture, liquid, flammable, poisonous, n.o.s. |
| 1228 | <b>131</b>  | Mercaptan mixture, liquid, flammable, toxic, n.o.s.     |
| 1228 | <b>131</b>  | Mercaptans, liquid, flammable, poisonous, n.o.s.        |
| 1228 | <b>131</b>  | Mercaptans, liquid, flammable, toxic, n.o.s.            |
| 1229 | <b>129</b>  | Mesityl oxide   |
| 1230 | <b>131</b>  | Methanol  |
| 1230 | <b>131</b>  | Methyl alcohol  |
| 1231 | <b>129</b>  | Methyl acetate  |
| 1233 | <b>130</b>  | Methylamyl acetate                                      |
| 1234 | <b>127</b>  | Methylal  |
| 1235 | <b>132</b>  | Methylamine, aqueous solution                           |
| 1237 | <b>129</b>  | Methyl butyrate   |
| 1238 | <b>155</b>  | Methyl chloroformate                                    |
| 1239 | <b>131</b>  | Methyl chloromethyl ether                               |

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|      |             |   |
|------|-------------|---|
| 1242 | <b>139</b>  | Methyldichlorosilane                        |
| 1243 | <b>129</b>  | Methyl formate                              |
| 1244 | <b>131</b>  | Methylhydrazine                             |
| 1245 | <b>127</b>  | Methyl isobutyl ketone                      |
| 1246 | <b>127P</b> | Methyl isopropenyl ketone, stabilized       |
| 1247 | <b>129P</b> | Methyl methacrylate monomer, stabilized     |
| 1248 | <b>129</b>  | Methyl propionate                           |
| 1249 | <b>127</b>  | Methyl propyl ketone                        |
| 1250 | <b>155</b>  | Methyltrichlorosilane                       |
| 1251 | <b>131P</b> | Methyl vinyl ketone, stabilized             |
| 1259 | <b>131</b>  | Nickel carbonyl                             |
| 1261 | <b>129</b>  | Nitromethane                                |
| 1262 | <b>128</b>  | Isooctane                                   |
| 1262 | <b>128</b>  | Octanes                                     |
| 1263 | <b>128</b>  | Paint (flammable)                           |
| 1263 | <b>128</b>  | Paint related material (flammable)          |
| 1264 | <b>129</b>  | Paraldehyde                                 |
| 1265 | <b>128</b>  | Isopentane                                  |
| 1265 | <b>128</b>  | Pentanes                                    |
| 1266 | <b>127</b>  | Perfumery products, with flammable solvents |
| 1267 | <b>128</b>  | Petroleum crude oil                         |
| 1268 | <b>128</b>  | Petroleum distillates, n.o.s.               |
| 1268 | <b>128</b>  | Petroleum products, n.o.s.                  |
| 1270 | <b>128</b>  | Oil, petroleum                              |
| 1270 | <b>128</b>  | Petroleum oil                               |
| 1272 | <b>129</b>  | Pine oil                                    |
| 1274 | <b>129</b>  | n-Propanol                                  |
| 1274 | <b>129</b>  | Propyl alcohol, normal                      |
| 1275 | <b>129P</b> | Propionaldehyde                             |

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|      |      |                                       |
|------|------|---------------------------------------|
| 1276 | 129  | n-Propyl acetate                      |
| 1277 | 132  | Propylamine                           |
| 1278 | 129  | 1-Chloropropane                       |
| 1278 | 129  | Propyl chloride                       |
| 1279 | 130  | 1,2-Dichloropropane                   |
| 1280 | 127P | Propylene oxide                       |
| 1281 | 129  | Propyl formates                       |
| 1282 | 129  | Pyridine                              |
| 1286 | 127  | Rosin oil                             |
| 1287 | 127  | Rubber solution                       |
| 1288 | 128  | Shale oil                             |
| 1289 | 132  | Sodium methylate, solution in alcohol |
| 1292 | 129  | Ethyl silicate                        |
| 1292 | 129  | Tetraethyl silicate                   |
| 1293 | 127  | Tinctures, medicinal                  |
| 1294 | 130  | Toluene                               |
| 1295 | 139  | Trichlorosilane                       |
| 1296 | 132  | Triethylamine                         |
| 1297 | 132  | Trimethylamine, aqueous solution      |
| 1298 | 155  | Trimethylchlorosilane                 |
| 1299 | 128  | Turpentine                            |
| 1300 | 128  | Turpentine substitute                 |
| 1301 | 129P | Vinyl acetate, stabilized             |
| 1302 | 127P | Vinyl ethyl ether, stabilized         |
| 1303 | 130P | Vinylidene chloride, stabilized       |
| 1304 | 127P | Vinyl isobutyl ether, stabilized      |
| 1305 | 155P | Vinyltrichlorosilane                  |
| 1305 | 155P | Vinyltrichlorosilane, stabilized      |
| 1306 | 129  | Wood preservatives, liquid            |
| 1307 | 130  | Xylenes                               |

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|      |     |  |
|------|-----|--|
| 1308 | 170 | Zirconium suspended in a flammable liquid              |
| 1308 | 170 | Zirconium suspended in a liquid (flammable)            |
| 1309 | 170 | Aluminum powder, coated                                |
| 1310 | 113 | Ammonium picrate, wetted with not less than 10% water  |
| 1312 | 133 | Borneol  |
| 1313 | 133 | Calcium resinate                                       |
| 1314 | 133 | Calcium resinate, fused                                |
| 1318 | 133 | Cobalt resinate, precipitated                          |
| 1320 | 113 | Dinitrophenol, wetted with not less than 15% water     |
| 1321 | 113 | Dinitrophenolates, wetted with not less than 15% water |
| 1322 | 113 | Dinitroresorcinol, wetted with not less than 15% water |
| 1323 | 170 | Ferrocium  |
| 1324 | 133 | Films, nitrocellulose base                             |
| 1325 | 133 | Flammable solid, organic, n.o.s.                       |
| 1325 | 133 | Fusee (railway or highway)                             |
| 1326 | 170 | Hafnium powder, wetted with not less than 25% water    |
| 1327 | 133 | Bhusa, wet, damp or contaminated with oil              |
| 1327 | 133 | Hay, wet, damp or contaminated with oil                |
| 1327 | 133 | Straw, wet, damp or contaminated with oil              |
| 1328 | 133 | Hexamethylenetetramine                                 |
| 1330 | 133 | Manganese resinate                                     |
| 1331 | 133 | Matches, "strike anywhere"                             |
| 1332 | 133 | Metaldehyde  |
| 1333 | 170 | Cerium, slabs, ingots or rods                          |
| 1334 | 133 | Naphthalene, crude                                     |

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1334 **133** Naphthalene, refined

1336 **113** Nitroguanidine, wetted with not less than 20% water

1336 **113** Picrite, wetted with not less than 20% water

1337 **113** Nitrostarch, wetted with not less than 20% water

1338 **133** Phosphorus, amorphous

1338 **133** Red phosphorus

1339 **139** Phosphorus heptasulfide, free from yellow and white Phosphorus

1339 **139** Phosphorus heptasulphide, free from yellow and white Phosphorus

1340 **139** Phosphorus pentasulfide, free from yellow and white Phosphorus

1340 **139** Phosphorus pentasulphide, free from yellow and white Phosphorus

1341 **139** Phosphorus sesquisulfide, free from yellow and white Phosphorus

1341 **139** Phosphorus sesquisulphide, free from yellow and white Phosphorus

1343 **139** Phosphorus trisulfide, free from yellow and white Phosphorus

1343 **139** Phosphorus trisulphide, free from yellow and white Phosphorus

1344 **113** Picric acid, wetted with not less than 30% water

1344 **113** Trinitrophenol, wetted with not less than 30% water

1345 **133** Rubber scrap, powdered or granulated

1345 **133** Rubber shoddy, powdered or granulated

1346 **170** Silicon powder, amorphous

1347 **113** Silver picrate, wetted with not less than 30% water

1348 **113** Sodium dinitro-o-cresolate, wetted with not less than 15% water

1349 **113** Sodium picramate, wetted with not less than 20% water

1350 **133** Sulfur

1350 **133** Sulphur

1352 **170** Titanium powder, wetted with not less than 25% water

1353 **133** Fabrics impregnated with weakly nitrated Nitrocellulose, n.o.s.

1353 **133** Fibers impregnated with weakly nitrated Nitrocellulose, n.o.s.

1353 **133** Fibres impregnated with weakly nitrated Nitrocellulose, n.o.s.

1354 **113** Trinitrobenzene, wetted with not less than 30% water

1355 **113** Trinitrobenzoic acid, wetted with not less than 30% water

1356 **113** TNT, wetted with not less than 30% water

1356 **113** Trinitrotoluene, wetted with not less than 30% water

1357 **113** Urea nitrate, wetted with not less than 20% water

1358 **170** Zirconium powder, wetted with not less than 25% water

1360 **139** Calcium phosphide

1361 **133** Carbon, animal or vegetable origin

1361 **133** Charcoal

1362 **133** Carbon, activated

1363 **135** Copra

1364 **133** Cotton waste, oily

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|      |     |  |
|------|-----|--|
| 1365 | 133 | Cotton   |
| 1365 | 133 | Cotton, wet  |
| 1366 | 135 | Diethylzinc  |
| 1369 | 135 | p-Nitrosodimethylaniline                                       |
| 1370 | 135 | Dimethylzinc   |
| 1372 | 133 | Fibers, animal or vegetable, burnt, wet or damp                |
| 1372 | 133 | Fibres, animal or vegetable, burnt, wet or damp                |
| 1373 | 133 | Fabrics, animal or vegetable or synthetic, n.o.s. with oil     |
| 1373 | 133 | Fibers, animal or vegetable or synthetic, n.o.s. with oil      |
| 1373 | 133 | Fibres, animal or vegetable or synthetic, n.o.s. with oil      |
| 1374 | 133 | Fish meal, unstabilized  |
| 1374 | 133 | Fish scrap, unstabilized                                       |
| 1376 | 135 | Iron oxide, spent  |
| 1376 | 135 | Iron sponge, spent   |
| 1378 | 170 | Metal catalyst, wetted   |
| 1379 | 133 | Paper, unsaturated oil treated                                 |
| 1380 | 135 | Pentaborane  |
| 1381 | 136 | Phosphorus, white, dry or under water or in solution           |
| 1381 | 136 | Phosphorus, yellow, dry or under water or in solution          |
| 1381 | 136 | White phosphorus, dry or under water or in solution            |
| 1381 | 136 | Yellow phosphorus, dry or under water or in solution           |
| 1382 | 135 | Potassium sulfide, anhydrous                                   |
| 1382 | 135 | Potassium sulfide, with less than 30% water of crystallization |
| 1382 | 135 | Potassium sulphide, anhydrous                                  |

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|      |     |   |
|------|-----|---|
| 1382 | 135 | Potassium sulphide, with less than 30% water of crystallization   |
| 1383 | 135 | Aluminum powder, pyrophoric                                       |
| 1383 | 135 | Pyrophoric alloy, n.o.s.  |
| 1383 | 135 | Pyrophoric metal, n.o.s.  |
| 1384 | 135 | Sodium dithionite   |
| 1384 | 135 | Sodium hydrosulfite   |
| 1384 | 135 | Sodium hydrosulphite  |
| 1385 | 135 | Sodium sulfide, anhydrous   |
| 1385 | 135 | Sodium sulfide, with less than 30% water of crystallization       |
| 1385 | 135 | Sodium sulphide, anhydrous  |
| 1385 | 135 | Sodium sulphide, with less than 30% water of crystallization      |
| 1386 | 135 | Seed cake, with more than 1.5% oil and not more than 11% moisture |
| 1387 | 133 | Wool waste, wet   |
| 1389 | 138 | Alkali metal amalgam, liquid                                      |
| 1390 | 139 | Alkali metal amides   |
| 1391 | 138 | Alkali metal dispersion   |
| 1391 | 138 | Alkaline earth metal dispersion                                   |
| 1392 | 138 | Alkaline earth metal amalgam, liquid                              |
| 1393 | 138 | Alkaline earth metal alloy, n.o.s.                                |
| 1394 | 138 | Aluminum carbide  |
| 1395 | 139 | Aluminum ferrosilicon powder                                      |
| 1396 | 138 | Aluminum powder, uncoated   |
| 1397 | 139 | Aluminum phosphide  |
| 1398 | 138 | Aluminum silicon powder, uncoated                                 |
| 1400 | 138 | Barium  |
| 1401 | 138 | Calcium   |

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|      |            |  |
|------|------------|--|
| 1402 | <b>138</b> | Calcium carbide  |
| 1403 | <b>138</b> | Calcium cyanamide, with more than 0.1% Calcium carbide |
| 1404 | <b>138</b> | Calcium hydride  |
| 1405 | <b>138</b> | Calcium silicide                                       |
| 1407 | <b>138</b> | Caesium  |
| 1407 | <b>138</b> | Cesium   |
| 1408 | <b>139</b> | Ferrosilicon   |
| 1409 | <b>138</b> | Metal hydrides, water-reactive, n.o.s.                 |
| 1410 | <b>138</b> | Lithium aluminum hydride                               |
| 1411 | <b>138</b> | Lithium aluminum hydride, ethereal                     |
| 1413 | <b>138</b> | Lithium borohydride                                    |
| 1414 | <b>138</b> | Lithium hydride  |
| 1415 | <b>138</b> | Lithium  |
| 1417 | <b>138</b> | Lithium silicon  |
| 1418 | <b>138</b> | Magnesium alloys powder                                |
| 1418 | <b>138</b> | Magnesium powder                                       |
| 1419 | <b>139</b> | Magnesium aluminum phosphide                           |
| 1420 | <b>138</b> | Potassium, metal alloys, liquid                        |
| 1421 | <b>138</b> | Alkali metal alloy, liquid, n.o.s.                     |
| 1422 | <b>138</b> | Potassium sodium alloys, liquid                        |
| 1422 | <b>138</b> | Sodium potassium alloys, liquid                        |
| 1423 | <b>138</b> | Rubidium   |
| 1426 | <b>138</b> | Sodium borohydride                                     |
| 1427 | <b>138</b> | Sodium hydride   |
| 1428 | <b>138</b> | Sodium   |
| 1431 | <b>138</b> | Sodium methylate, dry                                  |
| 1432 | <b>139</b> | Sodium phosphide                                       |
| 1433 | <b>139</b> | Stannic phosphides                                     |
| 1435 | <b>138</b> | Zinc ashes   |

|      |            |  |
|------|------------|--|
| 1435 | <b>138</b> | Zinc dross                                     |
| 1435 | <b>138</b> | Zinc residue                                   |
| 1435 | <b>138</b> | Zinc skimmings                                 |
| 1436 | <b>138</b> | Zinc dust                                      |
| 1436 | <b>138</b> | Zinc powder                                    |
| 1437 | <b>138</b> | Zirconium hydride                              |
| 1438 | <b>140</b> | Aluminum nitrate                               |
| 1439 | <b>141</b> | Ammonium dichromate                            |
| 1442 | <b>143</b> | Ammonium perchlorate                           |
| 1444 | <b>140</b> | Ammonium persulfate                            |
| 1444 | <b>140</b> | Ammonium persulphate                           |
| 1445 | <b>141</b> | Barium chlorate, solid                         |
| 1446 | <b>141</b> | Barium nitrate                                 |
| 1447 | <b>141</b> | Barium perchlorate, solid                      |
| 1448 | <b>141</b> | Barium permanganate                            |
| 1449 | <b>141</b> | Barium peroxide                                |
| 1450 | <b>140</b> | Bromates, inorganic, n.o.s.                    |
| 1451 | <b>140</b> | Caesium nitrate                                |
| 1451 | <b>140</b> | Cesium nitrate                                 |
| 1452 | <b>140</b> | Calcium chlorate                               |
| 1453 | <b>140</b> | Calcium chlorite                               |
| 1454 | <b>140</b> | Calcium nitrate                                |
| 1455 | <b>140</b> | Calcium perchlorate                            |
| 1456 | <b>140</b> | Calcium permanganate                           |
| 1457 | <b>140</b> | Calcium peroxide                               |
| 1458 | <b>140</b> | Borate and Chlorate mixture                    |
| 1458 | <b>140</b> | Chlorate and Borate mixture                    |
| 1459 | <b>140</b> | Chlorate and Magnesium chloride mixture, solid |
| 1459 | <b>140</b> | Magnesium chloride and Chlorate mixture, solid |
| 1461 | <b>140</b> | Chlorates, inorganic, n.o.s.                   |



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|      |     |  |
|------|-----|--|
| 1462 | 143 | Chlorites, inorganic, n.o.s.                 |
| 1463 | 141 | Chromium trioxide, anhydrous                 |
| 1465 | 140 | Didymium nitrate                             |
| 1466 | 140 | Ferric nitrate                               |
| 1467 | 143 | Guanidine nitrate                            |
| 1469 | 141 | Lead nitrate                                 |
| 1470 | 141 | Lead perchlorate, solid                      |
| 1471 | 140 | Lithium hypochlorite, dry                    |
| 1471 | 140 | Lithium hypochlorite mixture                 |
| 1471 | 140 | Lithium hypochlorite mixtures, dry           |
| 1472 | 143 | Lithium peroxide                             |
| 1473 | 140 | Magnesium bromate                            |
| 1474 | 140 | Magnesium nitrate                            |
| 1475 | 140 | Magnesium perchlorate                        |
| 1476 | 140 | Magnesium peroxide                           |
| 1477 | 140 | Nitrates, inorganic, n.o.s.                  |
| 1479 | 140 | Oxidizing solid, n.o.s.                      |
| 1481 | 140 | Perchlorates, inorganic, n.o.s.              |
| 1482 | 140 | Permanganates, inorganic, n.o.s.             |
| 1483 | 140 | Peroxides, inorganic, n.o.s.                 |
| 1484 | 140 | Potassium bromate                            |
| 1485 | 140 | Potassium chlorate                           |
| 1486 | 140 | Potassium nitrate                            |
| 1487 | 140 | Potassium nitrate and Sodium nitrite mixture |
| 1487 | 140 | Sodium nitrite and Potassium nitrate mixture |
| 1488 | 140 | Potassium nitrite                            |
| 1489 | 140 | Potassium perchlorate                        |
| 1490 | 140 | Potassium permanganate                       |
| 1491 | 144 | Potassium peroxide                           |

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|      |     |  |
|------|-----|--|
| 1492 | 140 | Potassium persulfate                                     |
| 1492 | 140 | Potassium persulphate                                    |
| 1493 | 140 | Silver nitrate   |
| 1494 | 140 | Sodium bromate   |
| 1495 | 140 | Sodium chlorate  |
| 1496 | 143 | Sodium chlorite  |
| 1498 | 140 | Sodium nitrate   |
| 1499 | 140 | Potassium nitrate and Sodium nitrate mixture             |
| 1499 | 140 | Sodium nitrate and Potassium nitrate mixture             |
| 1500 | 141 | Sodium nitrite   |
| 1502 | 140 | Sodium perchlorate                                       |
| 1503 | 140 | Sodium permanganate                                      |
| 1504 | 144 | Sodium peroxide  |
| 1505 | 140 | Sodium persulfate  |
| 1505 | 140 | Sodium persulphate                                       |
| 1506 | 143 | Strontium chlorate                                       |
| 1507 | 140 | Strontium nitrate  |
| 1508 | 140 | Strontium perchlorate                                    |
| 1509 | 143 | Strontium peroxide                                       |
| 1510 | 143 | Tetranitromethane  |
| 1511 | 140 | Urea hydrogen peroxide                                   |
| 1512 | 140 | Zinc ammonium nitrite                                    |
| 1513 | 140 | Zinc chlorate  |
| 1514 | 140 | Zinc nitrate   |
| 1515 | 140 | Zinc permanganate  |
| 1516 | 143 | Zinc peroxide  |
| 1517 | 113 | Zirconium picramate, wetted with not less than 20% water |
| 1541 | 155 | Acetone cyanohydrin, stabilized                          |
| 1544 | 151 | Alkaloids, solid, n.o.s. (poisonous)                     |

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|      |     |  |
|------|-----|--|
| 1544 | 151 | Alkaloid salts, solid, n.o.s.<br>(poisonous)         |
| 1545 | 155 | Allyl isothiocyanate, stabilized                     |
| 1546 | 151 | Ammonium arsenate                                    |
| 1547 | 153 | Aniline  |
| 1548 | 153 | Aniline hydrochloride                                |
| 1549 | 157 | Antimony compound, inorganic,<br>solid, n.o.s.       |
| 1550 | 151 | Antimony lactate                                     |
| 1551 | 151 | Antimony potassium tartrate                          |
| 1553 | 154 | Arsenic acid, liquid                                 |
| 1554 | 154 | Arsenic acid, solid                                  |
| 1555 | 151 | Arsenic bromide                                      |
| 1556 | 152 | Arsenic compound, liquid, n.o.s.                     |
| 1556 | 152 | Methyldichloroarsine                                 |
| 1557 | 152 | Arsenic compound, solid, n.o.s.                      |
| 1558 | 152 | Arsenic  |
| 1559 | 151 | Arsenic pentoxide                                    |
| 1560 | 157 | Arsenic chloride                                     |
| 1560 | 157 | Arsenic trichloride                                  |
| 1561 | 151 | Arsenic trioxide                                     |
| 1562 | 152 | Arsenical dust                                       |
| 1564 | 154 | Barium compound, n.o.s.                              |
| 1565 | 157 | Barium cyanide                                       |
| 1566 | 154 | Beryllium compound, n.o.s.                           |
| 1567 | 134 | Beryllium powder                                     |
| 1569 | 131 | Bromoacetone   |
| 1570 | 152 | Brucine  |
| 1571 | 113 | Barium azide, wetted with not<br>less than 50% water |
| 1572 | 151 | Cacodylic acid                                       |
| 1573 | 151 | Calcium arsenate                                     |

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|      |     |   |
|------|-----|---|
| 1574 | 151 | Calcium arsenate and Calcium<br>arsenite mixture, solid |
| 1574 | 151 | Calcium arsenite and Calcium<br>arsenate mixture, solid |
| 1575 | 157 | Calcium cyanide   |
| 1577 | 153 | Chlorodinitrobenzenes, liquid                           |
| 1578 | 152 | Chloronitrobenzenes, solid                              |
| 1579 | 153 | 4-Chloro-o-toluidine<br>hydrochloride, solid            |
| 1580 | 154 | Chloropicrin  |
| 1581 | 123 | Chloropicrin and Methyl bromide<br>mixture              |
| 1581 | 123 | Methyl bromide and Chloropicrin<br>mixture              |
| 1582 | 119 | Chloropicrin and Methyl chloride<br>mixture             |
| 1582 | 119 | Methyl chloride and Chloropicrin<br>mixture             |
| 1583 | 154 | Chloropicrin mixture, n.o.s.                            |
| 1585 | 151 | Copper acetoarsenite                                    |
| 1586 | 151 | Copper arsenite   |
| 1587 | 151 | Copper cyanide  |
| 1588 | 157 | Cyanides, inorganic, solid,<br>n.o.s.                   |
| 1589 | 125 | Cyanogen chloride, stabilized                           |
| 1590 | 153 | Dichloroanilines, liquid                                |
| 1591 | 152 | o-Dichlorobenzene                                       |
| 1593 | 160 | Dichloromethane   |
| 1593 | 160 | Methylene chloride                                      |
| 1594 | 152 | Diethyl sulfate   |
| 1594 | 152 | Diethyl sulphate  |
| 1595 | 156 | Dimethyl sulfate  |
| 1595 | 156 | Dimethyl sulphate                                       |
| 1596 | 153 | Dinitroanilines   |

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1597 **152** Dinitrobenzenes, liquid  
1598 **153** Dinitro-o-cresol  
1599 **153** Dinitrophenol, solution  
1600 **152** Dinitrotoluenes, molten  
1601 **151** Disinfectant, solid, poisonous,  
n.o.s.  
1601 **151** Disinfectant, solid, toxic, n.o.s.  
1602 **151** Dye, liquid, poisonous, n.o.s.  
1602 **151** Dye, liquid, toxic, n.o.s.  
1602 **151** Dye intermediate, liquid,  
poisonous, n.o.s.  
1602 **151** Dye intermediate, liquid, toxic,  
n.o.s.  
1603 **155** Ethyl bromoacetate  
1604 **132** Ethylenediamine  
1605 **154** Ethylene dibromide  
1606 **151** Ferric arsenate  
1607 **151** Ferric arsenite  
1608 **151** Ferrous arsenate  
1611 **151** Hexaethyl tetraphosphate  
1612 **123** Compressed gas and hexaethyl  
tetraphosphate mixture  
1612 **123** Hexaethyl tetraphosphate and  
compressed gas mixture  
1613 **154** Hydrocyanic acid, aqueous  
solution, with less than 5%  
Hydrogen cyanide  
1613 **154** Hydrocyanic acid, aqueous  
solution, with not more than  
20% Hydrogen cyanide  
1613 **154** Hydrogen cyanide, aqueous  
solution, with not more than  
20% Hydrogen cyanide  
1614 **152** Hydrogen cyanide, stabilized  
(absorbed)  
1616 **151** Lead acetate

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1617 **151** Lead arsenates  
1618 **151** Lead arsenites  
1620 **151** Lead cyanide  
1621 **151** London purple  
1622 **151** Magnesium arsenate  
1623 **151** Mercuric arsenate  
1624 **154** Mercuric chloride  
1625 **141** Mercuric nitrate  
1626 **157** Mercuric potassium cyanide  
1627 **141** Mercurous nitrate  
1629 **151** Mercury acetate  
1630 **151** Mercury ammonium chloride  
1631 **154** Mercury benzoate  
1634 **154** Mercury bromides  
1636 **154** Mercury cyanide  
1637 **151** Mercury gluconate  
1638 **151** Mercury iodide  
1639 **151** Mercury nucleate  
1640 **151** Mercury oleate  
1641 **151** Mercury oxide  
1642 **151** Mercury oxycyanide,  
desensitized  
1643 **151** Mercury potassium iodide  
1644 **151** Mercury salicylate  
1645 **151** Mercury sulfate  
1645 **151** Mercury sulphate  
1646 **151** Mercury thiocyanate  
1647 **151** Ethylene dibromide and Methyl  
bromide mixture, liquid  
1647 **151** Methyl bromide and Ethylene  
dibromide mixture, liquid  
1648 **127** Acetonitrile

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|      |            |  |
|------|------------|--|
| 1649 | <b>152</b> | Motor fuel anti-knock mixture          |
| 1650 | <b>153</b> | beta-Naphthylamine, solid              |
| 1650 | <b>153</b> | Naphthylamine (beta), solid            |
| 1651 | <b>153</b> | Naphthylthiourea                       |
| 1652 | <b>153</b> | Naphthylurea                           |
| 1653 | <b>151</b> | Nickel cyanide                         |
| 1654 | <b>151</b> | Nicotine                               |
| 1655 | <b>151</b> | Nicotine compound, solid, n.o.s.       |
| 1655 | <b>151</b> | Nicotine preparation, solid,<br>n.o.s. |
| 1656 | <b>151</b> | Nicotine hydrochloride, liquid         |
| 1656 | <b>151</b> | Nicotine hydrochloride, solution       |
| 1657 | <b>151</b> | Nicotine salicylate                    |
| 1658 | <b>151</b> | Nicotine sulfate, solution             |
| 1658 | <b>151</b> | Nicotine sulphate, solution            |
| 1659 | <b>151</b> | Nicotine tartrate                      |
| 1660 | <b>124</b> | Nitric oxide                           |
| 1660 | <b>124</b> | Nitric oxide, compressed               |
| 1661 | <b>153</b> | Nitroanilines                          |
| 1662 | <b>152</b> | Nitrobenzene                           |
| 1663 | <b>153</b> | Nitrophenols                           |
| 1664 | <b>152</b> | Nitrotoluenes, liquid                  |
| 1665 | <b>152</b> | Nitroxylens, liquid                    |
| 1669 | <b>151</b> | Pentachloroethane                      |
| 1670 | <b>157</b> | Perchloromethyl mercaptan              |
| 1671 | <b>153</b> | Phenol, solid                          |
| 1672 | <b>151</b> | Phenylcarbylamine chloride             |
| 1673 | <b>153</b> | Phenylenediamines                      |
| 1674 | <b>151</b> | Phenylmercuric acetate                 |
| 1677 | <b>151</b> | Potassium arsenate                     |
| 1678 | <b>154</b> | Potassium arsenite                     |
| 1679 | <b>157</b> | Potassium cuprocyanide                 |

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|      |            |                                       |
|------|------------|---------------------------------------|
| 1680 | <b>157</b> | Potassium cyanide, solid              |
| 1683 | <b>151</b> | Silver arsenite                       |
| 1684 | <b>151</b> | Silver cyanide                        |
| 1685 | <b>151</b> | Sodium arsenate                       |
| 1686 | <b>154</b> | Sodium arsenite, aqueous<br>solution  |
| 1687 | <b>153</b> | Sodium azide                          |
| 1688 | <b>152</b> | Sodium cacodylate                     |
| 1689 | <b>157</b> | Sodium cyanide, solid                 |
| 1690 | <b>154</b> | Sodium fluoride, solid                |
| 1691 | <b>151</b> | Strontium arsenite                    |
| 1692 | <b>151</b> | Strychnine                            |
| 1692 | <b>151</b> | Strychnine salts                      |
| 1693 | <b>159</b> | Tear gas devices                      |
| 1693 | <b>159</b> | Tear gas substance, liquid,<br>n.o.s. |
| 1694 | <b>159</b> | Bromobenzyl cyanides, liquid          |
| 1695 | <b>131</b> | Chloroacetone, stabilized             |
| 1697 | <b>153</b> | Chloroacetophenone, solid             |
| 1698 | <b>154</b> | Diphenylamine chloroarsine            |
| 1699 | <b>151</b> | Diphenylchloroarsine, liquid          |
| 1700 | <b>159</b> | Tear gas candles                      |
| 1700 | <b>159</b> | Tear gas grenades                     |
| 1701 | <b>152</b> | Xylyl bromide, liquid                 |
| 1702 | <b>151</b> | 1,1,2,2-Tetrachloroethane             |
| 1704 | <b>153</b> | Tetraethyl dithiopyrophosphate        |
| 1707 | <b>151</b> | Thallium compound, n.o.s.             |
| 1708 | <b>153</b> | Toluidines, liquid                    |
| 1709 | <b>151</b> | 2,4-Toluenediamine, solid             |
| 1709 | <b>151</b> | 2,4-Toluylenediamine, solid           |
| 1710 | <b>160</b> | Trichloroethylene                     |
| 1711 | <b>153</b> | Xylidines, liquid                     |

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|      |     |   |
|------|-----|---|
| 1712 | 151 | Zinc arsenate                           |
| 1712 | 151 | Zinc arsenate and Zinc arsenite mixture |
| 1712 | 151 | Zinc arsenite                           |
| 1712 | 151 | Zinc arsenite and Zinc arsenate mixture |
| 1713 | 151 | Zinc cyanide                            |
| 1714 | 139 | Zinc phosphide                          |
| 1715 | 137 | Acetic anhydride                        |
| 1716 | 156 | Acetyl bromide                          |
| 1717 | 155 | Acetyl chloride                         |
| 1718 | 153 | Acid butyl phosphate                    |
| 1718 | 153 | Butyl acid phosphate                    |
| 1719 | 154 | Caustic alkali liquid, n.o.s.           |
| 1722 | 155 | Allyl chlorocarbonate                   |
| 1722 | 155 | Allyl chloroformate                     |
| 1723 | 132 | Allyl iodide                            |
| 1724 | 155 | Allyltrichlorosilane, stabilized        |
| 1725 | 137 | Aluminum bromide, anhydrous             |
| 1726 | 137 | Aluminum chloride, anhydrous            |
| 1727 | 154 | Ammonium bifluoride, solid              |
| 1727 | 154 | Ammonium hydrogendifluoride, solid      |
| 1728 | 155 | Amyltrichlorosilane                     |
| 1729 | 156 | Anisoyl chloride                        |
| 1730 | 157 | Antimony pentachloride, liquid          |
| 1731 | 157 | Antimony pentachloride, solution        |
| 1732 | 157 | Antimony pentafluoride                  |
| 1733 | 157 | Antimony trichloride                    |
| 1733 | 157 | Antimony trichloride, liquid            |
| 1733 | 157 | Antimony trichloride, solid             |
| 1736 | 137 | Benzoyl chloride                        |

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|      |     |  |
|------|-----|--|
| 1737 | 156 | Benzyl bromide   |
| 1738 | 156 | Benzyl chloride  |
| 1739 | 137 | Benzyl chloroformate   |
| 1740 | 154 | Hydrogendifluorides, solid, n.o.s.   |
| 1741 | 125 | Boron trichloride  |
| 1742 | 157 | Boron trifluoride acetic acid complex, liquid  |
| 1743 | 157 | Boron trifluoride propionic acid complex, liquid   |
| 1744 | 154 | Bromine  |
| 1744 | 154 | Bromine, solution  |
| 1744 | 154 | Bromine, solution (Inhalation Hazard Zone A)   |
| 1744 | 154 | Bromine, solution (Inhalation Hazard Zone B)   |
| 1745 | 144 | Bromine pentafluoride  |
| 1746 | 144 | Bromine trifluoride  |
| 1747 | 155 | Butyltrichlorosilane   |
| 1748 | 140 | Calcium hypochlorite, dry  |
| 1748 | 140 | Calcium hypochlorite mixture, dry, with more than 39% available Chlorine (8.8% available Oxygen) |
| 1749 | 124 | Chlorine trifluoride   |
| 1750 | 153 | Chloroacetic acid, solution  |
| 1751 | 153 | Chloroacetic acid, solid   |
| 1752 | 156 | Chloroacetyl chloride  |
| 1753 | 156 | Chlorophenyltrichlorosilane  |
| 1754 | 137 | Chlorosulfonic acid (with or without sulfur trioxide)  |
| 1754 | 137 | Chlorosulphonic acid (with or without sulphur trioxide)  |
| 1755 | 154 | Chromic acid, solution   |
| 1756 | 154 | Chromic fluoride, solid  |

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| 1757 | <b>154</b> | Chromic fluoride, solution                          |
| 1758 | <b>137</b> | Chromium oxychloride                                |
| 1759 | <b>154</b> | Corrosive solid, n.o.s.                             |
| 1759 | <b>154</b> | Ferrous chloride, solid                             |
| 1760 | <b>154</b> | Chemical kit  |
| 1760 | <b>154</b> | Compounds, cleaning liquid (corrosive)              |
| 1760 | <b>154</b> | Compounds, tree or weed killing, liquid (corrosive) |
| 1760 | <b>154</b> | Corrosive liquid, n.o.s.                            |
| 1760 | <b>154</b> | Ferrous chloride, solution                          |
| 1761 | <b>154</b> | Cupriethylenediamine, solution                      |
| 1762 | <b>156</b> | Cyclohexenyltrichlorosilane                         |
| 1763 | <b>156</b> | Cyclohexyltrichlorosilane                           |
| 1764 | <b>153</b> | Dichloroacetic acid                                 |
| 1765 | <b>156</b> | Dichloroacetyl chloride                             |
| 1766 | <b>156</b> | Dichlorophenyltrichlorosilane                       |
| 1767 | <b>155</b> | Diethyldichlorosilane                               |
| 1768 | <b>154</b> | Difluorophosphoric acid, anhydrous                  |
| 1769 | <b>156</b> | Diphenyldichlorosilane                              |
| 1770 | <b>153</b> | Diphenylmethyl bromide                              |
| 1771 | <b>156</b> | Dodecyltrichlorosilane                              |
| 1773 | <b>157</b> | Ferric chloride, anhydrous                          |
| 1774 | <b>154</b> | Fire extinguisher charges, corrosive liquid         |
| 1775 | <b>154</b> | Fluoroboric acid                                    |
| 1776 | <b>154</b> | Fluorophosphoric acid, anhydrous                    |
| 1777 | <b>137</b> | Fluorosulfonic acid                                 |
| 1777 | <b>137</b> | Fluorosulphonic acid                                |
| 1778 | <b>154</b> | Fluorosilicic acid                                  |
| 1778 | <b>154</b> | Hydrofluorosilicic acid                             |

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|      |            |   |
|------|------------|---|
| 1779 | <b>153</b> | Formic acid   |
| 1779 | <b>153</b> | Formic acid, with more than 85% acid                      |
| 1780 | <b>156</b> | Fumaryl chloride  |
| 1781 | <b>156</b> | Hexadecyltrichlorosilane                                  |
| 1782 | <b>154</b> | Hexafluorophosphoric acid                                 |
| 1783 | <b>153</b> | Hexamethylenediamine, solution                            |
| 1784 | <b>156</b> | Hexyltrichlorosilane                                      |
| 1786 | <b>157</b> | Hydrofluoric acid and Sulfuric acid mixture               |
| 1786 | <b>157</b> | Hydrofluoric acid and Sulphuric acid mixture              |
| 1786 | <b>157</b> | Sulfuric acid and Hydrofluoric acid mixture               |
| 1786 | <b>157</b> | Sulphuric acid and Hydrofluoric acid mixture              |
| 1787 | <b>154</b> | Hydriodic acid  |
| 1788 | <b>154</b> | Hydrobromic acid  |
| 1789 | <b>157</b> | Hydrochloric acid   |
| 1789 | <b>157</b> | Muriatic acid   |
| 1790 | <b>157</b> | Hydrofluoric acid   |
| 1791 | <b>154</b> | Hypochlorite solution                                     |
| 1791 | <b>154</b> | Sodium hypochlorite                                       |
| 1792 | <b>157</b> | Iodine monochloride, solid                                |
| 1793 | <b>153</b> | Isopropyl acid phosphate                                  |
| 1794 | <b>154</b> | Lead sulfate, with more than 3% free acid                 |
| 1794 | <b>154</b> | Lead sulphate, with more than 3% free acid                |
| 1796 | <b>157</b> | Nitrating acid mixture with more than 50% nitric acid     |
| 1796 | <b>157</b> | Nitrating acid mixture with not more than 50% nitric acid |
| 1798 | <b>157</b> | Aqua regia  |
| 1798 | <b>157</b> | Nitrohydrochloric acid                                    |

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|      |     |  |
|------|-----|--|
| 1799 | 156 | Nonyltrichlorosilane                         |
| 1800 | 156 | Octadecyltrichlorosilane                     |
| 1801 | 156 | Octyltrichlorosilane                         |
| 1802 | 157 | Perchloric acid, with not more than 50% acid |
| 1803 | 153 | Phenolsulfonic acid, liquid                  |
| 1803 | 153 | Phenolsulphonic acid, liquid                 |
| 1804 | 156 | Phenyltrichlorosilane                        |
| 1805 | 154 | Phosphoric acid, solution                    |
| 1806 | 137 | Phosphorus pentachloride                     |
| 1807 | 137 | Phosphorus pentoxide                         |
| 1808 | 137 | Phosphorus tribromide                        |
| 1809 | 137 | Phosphorus trichloride                       |
| 1810 | 137 | Phosphorus oxychloride                       |
| 1811 | 154 | Potassium hydrogen difluoride, solid         |
| 1812 | 154 | Potassium fluoride, solid                    |
| 1813 | 154 | Caustic potash, solid                        |
| 1813 | 154 | Potassium hydroxide, solid                   |
| 1814 | 154 | Caustic potash, solution                     |
| 1814 | 154 | Potassium hydroxide, solution                |
| 1815 | 132 | Propionyl chloride                           |
| 1816 | 155 | Propyltrichlorosilane                        |
| 1817 | 137 | Pyrosulfuryl chloride                        |
| 1817 | 137 | Pyrosulphuryl chloride                       |
| 1818 | 157 | Silicon tetrachloride                        |
| 1819 | 154 | Sodium aluminate, solution                   |
| 1823 | 154 | Caustic soda, solid                          |
| 1823 | 154 | Sodium hydroxide, solid                      |
| 1824 | 154 | Caustic soda, solution                       |
| 1824 | 154 | Sodium hydroxide, solution                   |
| 1825 | 157 | Sodium monoxide                              |

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|      |     |   |
|------|-----|---|
| 1826 | 157 | Nitrating acid mixture, spent, with more than 50% nitric acid     |
| 1826 | 157 | Nitrating acid mixture, spent, with not more than 50% nitric acid |
| 1827 | 137 | Stannic chloride, anhydrous                                       |
| 1827 | 137 | Tin tetrachloride   |
| 1828 | 137 | Sulfur chlorides  |
| 1828 | 137 | Sulphur chlorides   |
| 1829 | 137 | Sulfur trioxide, stabilized                                       |
| 1829 | 137 | Sulphur trioxide, stabilized                                      |
| 1830 | 137 | Sulfuric acid   |
| 1830 | 137 | Sulfuric acid, with more than 51% acid                            |
| 1830 | 137 | Sulphuric acid  |
| 1830 | 137 | Sulphuric acid, with more than 51% acid                           |
| 1831 | 137 | Sulfuric acid, fuming   |
| 1831 | 137 | Sulphuric acid, fuming  |
| 1832 | 137 | Sulfuric acid, spent  |
| 1832 | 137 | Sulphuric acid, spent   |
| 1833 | 154 | Sulfurous acid  |
| 1833 | 154 | Sulphurous acid   |
| 1834 | 137 | Sulfuryl chloride   |
| 1834 | 137 | Sulphuryl chloride  |
| 1835 | 153 | Tetramethylammonium hydroxide, solution                           |
| 1836 | 137 | Thionyl chloride  |
| 1837 | 157 | Thiophosphoryl chloride   |
| 1838 | 137 | Titanium tetrachloride  |
| 1839 | 153 | Trichloroacetic acid  |
| 1840 | 154 | Zinc chloride, solution   |
| 1841 | 171 | Acetaldehyde ammonia  |

**ID Guide Name of Material  
No. No.**

|      |             |   |
|------|-------------|---|
| 1843 | <b>141</b>  | Ammonium dinitro-o-cresolate, solid   |
| 1845 | <b>120</b>  | Carbon dioxide, solid   |
| 1845 | <b>120</b>  | Dry ice   |
| 1846 | <b>151</b>  | Carbon tetrachloride  |
| 1847 | <b>153</b>  | Potassium sulfide, hydrated, with not less than 30% water of crystallization  |
| 1847 | <b>153</b>  | Potassium sulphide, hydrated, with not less than 30% water of crystallization |
| 1848 | <b>153</b>  | Propionic acid  |
| 1848 | <b>153</b>  | Propionic acid, with not less than 10% and less than 90% acid                 |
| 1849 | <b>153</b>  | Sodium sulfide, hydrated, with not less than 30% water                        |
| 1849 | <b>153</b>  | Sodium sulphide, hydrated, with not less than 30% water                       |
| 1851 | <b>151</b>  | Medicine, liquid, poisonous, n.o.s.   |
| 1851 | <b>151</b>  | Medicine, liquid, toxic, n.o.s.   |
| 1854 | <b>135</b>  | Barium alloys, pyrophoric   |
| 1855 | <b>135</b>  | Calcium, pyrophoric   |
| 1855 | <b>135</b>  | Calcium alloys, pyrophoric  |
| 1856 | <b>133</b>  | Rags, oily  |
| 1857 | <b>133</b>  | Textile waste, wet  |
| 1858 | <b>126</b>  | Hexafluoropropylene   |
| 1858 | <b>126</b>  | Hexafluoropropylene, compressed   |
| 1858 | <b>126</b>  | Refrigerant gas R-1216  |
| 1859 | <b>125</b>  | Silicon tetrafluoride   |
| 1859 | <b>125</b>  | Silicon tetrafluoride, compressed   |
| 1860 | <b>116P</b> | Vinyl fluoride, stabilized  |
| 1862 | <b>130</b>  | Ethyl crotonate   |

**ID Guide Name of Material  
No. No.**

|      |            |   |
|------|------------|---|
| 1863 | <b>128</b> | Fuel, aviation, turbine engine  |
| 1865 | <b>128</b> | n-Propyl nitrate  |
| 1866 | <b>127</b> | Resin solution  |
| 1868 | <b>134</b> | Decaborane  |
| 1869 | <b>138</b> | Magnesium   |
| 1869 | <b>138</b> | Magnesium, in pellets, turnings or ribbons                                      |
| 1869 | <b>138</b> | Magnesium alloys, with more than 50% Magnesium, in pellets, turnings or ribbons |
| 1870 | <b>138</b> | Potassium borohydride   |
| 1871 | <b>170</b> | Titanium hydride  |
| 1872 | <b>140</b> | Lead dioxide  |
| 1873 | <b>143</b> | Perchloric acid, with more than 50% but not more than 72% acid                  |
| 1884 | <b>157</b> | Barium oxide  |
| 1885 | <b>153</b> | Benzidine   |
| 1886 | <b>156</b> | Benzylidene chloride  |
| 1887 | <b>160</b> | Bromochloromethane  |
| 1888 | <b>151</b> | Chloroform  |
| 1889 | <b>157</b> | Cyanogen bromide  |
| 1891 | <b>131</b> | Ethyl bromide   |
| 1892 | <b>151</b> | Ethylidichloroarsine  |
| 1894 | <b>151</b> | Phenylmercuric hydroxide  |
| 1895 | <b>151</b> | Phenylmercuric nitrate  |
| 1897 | <b>160</b> | Perchloroethylene   |
| 1897 | <b>160</b> | Tetrachloroethylene   |
| 1898 | <b>156</b> | Acetyl iodide   |
| 1902 | <b>153</b> | Diisooctyl acid phosphate   |
| 1903 | <b>153</b> | Disinfectant, liquid, corrosive, n.o.s.   |
| 1905 | <b>154</b> | Selenic acid  |
| 1906 | <b>153</b> | Acid, sludge  |



**ID Guide Name of Material  
No. No.**

|      |      |  |
|------|------|--|
| 1906 | 153  | Sludge acid                                    |
| 1907 | 154  | Soda lime, with more than 4% Sodium hydroxide  |
| 1908 | 154  | Chlorite solution                              |
| 1910 | 157  | Calcium oxide                                  |
| 1911 | 119  | Diborane                                       |
| 1911 | 119  | Diborane, compressed                           |
| 1911 | 119  | Diborane mixtures                              |
| 1912 | 115  | Methyl chloride and Methylene chloride mixture |
| 1912 | 115  | Methylene chloride and Methyl chloride mixture |
| 1913 | 120  | Neon, refrigerated liquid (cryogenic liquid)   |
| 1914 | 130  | Butyl propionates                              |
| 1915 | 127  | Cyclohexanone                                  |
| 1916 | 152  | 2,2'-Dichlorodiethyl ether                     |
| 1916 | 152  | Dichloroethyl ether                            |
| 1917 | 129P | Ethyl acrylate, stabilized                     |
| 1918 | 130  | Cumene   |
| 1918 | 130  | Isopropylbenzene                               |
| 1919 | 129P | Methyl acrylate, stabilized                    |
| 1920 | 128  | Nonanes  |
| 1921 | 131P | Propyleneimine, stabilized                     |
| 1922 | 132  | Pyrrolidine                                    |
| 1923 | 135  | Calcium dithionite                             |
| 1923 | 135  | Calcium hydrosulfite                           |
| 1923 | 135  | Calcium hydrosulphite                          |
| 1928 | 138  | Methyl magnesium bromide in Ethyl ether        |
| 1929 | 135  | Potassium dithionite                           |
| 1929 | 135  | Potassium hydrosulfite                         |
| 1929 | 135  | Potassium hydrosulphite                        |

**ID Guide Name of Material  
No. No.**

|      |     |  |
|------|-----|--|
| 1931 | 171 | Zinc dithionite  |
| 1931 | 171 | Zinc hydrosulfite  |
| 1931 | 171 | Zinc hydrosulphite   |
| 1932 | 135 | Zirconium scrap  |
| 1935 | 157 | Cyanide solution, n.o.s.   |
| 1938 | 156 | Bromoacetic acid, solution   |
| 1939 | 137 | Phosphorus oxybromide, solid   |
| 1940 | 153 | Thioglycolic acid  |
| 1941 | 171 | Dibromodifluoromethane   |
| 1941 | 171 | Refrigerant gas R-12B2   |
| 1942 | 140 | Ammonium nitrate, with not more than 0.2% combustible substances                 |
| 1944 | 133 | Matches, safety  |
| 1945 | 133 | Matches, wax "vesta"   |
| 1950 | 126 | Aerosols   |
| 1951 | 120 | Argon, refrigerated liquid (cryogenic liquid)                                    |
| 1952 | 126 | Carbon dioxide and Ethylene oxide mixtures, with not more than 9% Ethylene oxide |
| 1952 | 126 | Ethylene oxide and Carbon dioxide mixtures, with not more than 9% Ethylene oxide |
| 1953 | 119 | Compressed gas, poisonous, flammable, n.o.s.                                     |
| 1953 | 119 | Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)          |
| 1953 | 119 | Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)          |
| 1953 | 119 | Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)          |
| 1953 | 119 | Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D)          |

**ID Guide Name of Material  
No. No.**

|      |     |   |
|------|-----|---|
| 1953 | 119 | Compressed gas, toxic, flammable, n.o.s.                            |
| 1953 | 119 | Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A) |
| 1953 | 119 | Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B) |
| 1953 | 119 | Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C) |
| 1953 | 119 | Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D) |
| 1954 | 115 | Compressed gas, flammable, n.o.s.                                   |
| 1954 | 115 | Dispersant gases, n.o.s. (flammable)                                |
| 1954 | 115 | Refrigerant gases, n.o.s. (flammable)                               |
| 1955 | 123 | Compressed gas, poisonous, n.o.s.                                   |
| 1955 | 123 | Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone A)        |
| 1955 | 123 | Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone B)        |
| 1955 | 123 | Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone C)        |
| 1955 | 123 | Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone D)        |
| 1955 | 123 | Compressed gas, toxic, n.o.s.                                       |
| 1955 | 123 | Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone A)            |
| 1955 | 123 | Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone B)            |
| 1955 | 123 | Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone C)            |

**ID Guide Name of Material  
No. No.**

|      |      |  |
|------|------|--|
| 1955 | 123  | Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone D) |
| 1955 | 123  | Organic phosphate compound mixed with compressed gas     |
| 1955 | 123  | Organic phosphate mixed with compressed gas              |
| 1955 | 123  | Organic phosphorus compound mixed with compressed gas    |
| 1956 | 126  | Compressed gas, n.o.s.                                   |
| 1957 | 115  | Deuterium  |
| 1957 | 115  | Deuterium, compressed                                    |
| 1958 | 126  | 1,2-Dichloro-1,1,2,2-tetrafluoroethane                   |
| 1958 | 126  | Refrigerant gas R-114                                    |
| 1959 | 116P | 1,1-Difluoroethylene                                     |
| 1959 | 116P | Refrigerant gas R-1132a                                  |
| 1961 | 115  | Ethane, refrigerated liquid                              |
| 1961 | 115  | Ethane-Propane mixture, refrigerated liquid              |
| 1961 | 115  | Propane-Ethane mixture, refrigerated liquid              |
| 1962 | 116P | Ethylene   |
| 1962 | 116P | Ethylene, compressed                                     |
| 1963 | 120  | Helium, refrigerated liquid (cryogenic liquid)           |
| 1964 | 115  | Hydrocarbon gas mixture, compressed, n.o.s.              |
| 1965 | 115  | Hydrocarbon gas mixture, liquefied, n.o.s.               |
| 1966 | 115  | Hydrogen, refrigerated liquid (cryogenic liquid)         |
| 1967 | 123  | Insecticide gas, poisonous, n.o.s.                       |
| 1967 | 123  | Insecticide gas, toxic, n.o.s.                           |
| 1967 | 123  | Parathion and compressed gas mixture                     |

**ID Guide Name of Material  
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|      |     |   |
|------|-----|---|
| 1968 | 126 | Insecticide gas, n.o.s.                                   |
| 1969 | 115 | Isobutane   |
| 1970 | 120 | Krypton, refrigerated liquid (cryogenic liquid)           |
| 1971 | 115 | Methane   |
| 1971 | 115 | Methane, compressed                                       |
| 1971 | 115 | Natural gas, compressed                                   |
| 1972 | 115 | Liquefied natural gas (cryogenic liquid)                  |
| 1972 | 115 | LNG (cryogenic liquid)                                    |
| 1972 | 115 | Methane, refrigerated liquid (cryogenic liquid)           |
| 1972 | 115 | Natural gas, refrigerated liquid (cryogenic liquid)       |
| 1973 | 126 | Chlorodifluoromethane and Chloropentafluoroethane mixture |
| 1973 | 126 | Chloropentafluoroethane and Chlorodifluoromethane mixture |
| 1973 | 126 | Refrigerant gas R-502                                     |
| 1974 | 126 | Chlorodifluorobromomethane                                |
| 1974 | 126 | Refrigerant gas R-12B1                                    |
| 1975 | 124 | Dinitrogen tetroxide and Nitric oxide mixture             |
| 1975 | 124 | Nitric oxide and Dinitrogen tetroxide mixture             |
| 1975 | 124 | Nitric oxide and Nitrogen dioxide mixture                 |
| 1975 | 124 | Nitrogen dioxide and Nitric oxide mixture                 |
| 1976 | 126 | Octafluorocyclobutane                                     |
| 1976 | 126 | Refrigerant gas RC-318                                    |
| 1977 | 120 | Nitrogen, refrigerated liquid (cryogenic liquid)          |
| 1978 | 115 | Propane   |

**ID Guide Name of Material  
No. No.**

|      |      |   |
|------|------|---|
| 1982 | 126  | Refrigerant gas R-14                                |
| 1982 | 126  | Refrigerant gas R-14, compressed                    |
| 1982 | 126  | Tetrafluoromethane                                  |
| 1982 | 126  | Tetrafluoromethane, compressed                      |
| 1983 | 126  | 1-Chloro-2,2,2-trifluoroethane                      |
| 1983 | 126  | Refrigerant gas R-133a                              |
| 1984 | 126  | Refrigerant gas R-23                                |
| 1984 | 126  | Trifluoromethane                                    |
| 1986 | 131  | Alcohols, flammable, poisonous, n.o.s.              |
| 1986 | 131  | Alcohols, flammable, toxic, n.o.s.                  |
| 1987 | 127  | Alcohols, n.o.s.                                    |
| 1987 | 127  | Denatured alcohol                                   |
| 1988 | 131P | Aldehydes, flammable, poisonous, n.o.s.             |
| 1988 | 131P | Aldehydes, flammable, toxic, n.o.s.                 |
| 1989 | 129P | Aldehydes, n.o.s.                                   |
| 1990 | 171  | Benzaldehyde  |
| 1991 | 131P | Chloroprene, stabilized                             |
| 1992 | 131  | Flammable liquid, poisonous, n.o.s.                 |
| 1992 | 131  | Flammable liquid, toxic, n.o.s.                     |
| 1993 | 128  | Combustible liquid, n.o.s.                          |
| 1993 | 128  | Compounds, cleaning liquid (flammable)              |
| 1993 | 128  | Compounds, tree or weed killing, liquid (flammable) |
| 1993 | 128  | Diesel fuel   |
| 1993 | 128  | Flammable liquid, n.o.s.                            |
| 1993 | 128  | Fuel oil  |
| 1994 | 136  | Iron pentacarbonyl                                  |

**ID Guide Name of Material  
No. No.**

**ID Guide Name of Material  
No. No.**

|      |     |   |
|------|-----|---|
| 1999 | 130 | Asphalt   |
| 1999 | 130 | Asphalt, cut back   |
| 1999 | 130 | Tars, liquid  |
| 2000 | 133 | Celluloid, in blocks, rods, rolls, sheets, tubes, etc., except scrap  |
| 2001 | 133 | Cobalt naphthenates, powder   |
| 2002 | 135 | Celluloid, scrap  |
| 2004 | 135 | Magnesium diamide   |
| 2005 | 135 | Magnesium diphenyl  |
| 2006 | 135 | Plastics, nitrocellulose-based, self-heating, n.o.s.  |
| 2008 | 135 | Zirconium powder, dry   |
| 2009 | 135 | Zirconium, dry, finished sheets, strips or coiled wire  |
| 2010 | 138 | Magnesium hydride   |
| 2011 | 139 | Magnesium phosphide   |
| 2012 | 139 | Potassium phosphide   |
| 2013 | 139 | Strontium phosphide   |
| 2014 | 140 | Hydrogen peroxide, aqueous solution, with not less than 20% but not more than 60% Hydrogen peroxide (stabilized as necessary) |
| 2015 | 143 | Hydrogen peroxide, aqueous solution, stabilized, with more than 60% Hydrogen peroxide   |
| 2015 | 143 | Hydrogen peroxide, stabilized   |
| 2016 | 151 | Ammunition, poisonous, non-explosive  |
| 2016 | 151 | Ammunition, toxic, non-explosive  |
| 2017 | 159 | Ammunition, tear-producing, non-explosive   |
| 2018 | 152 | Chloroanilines, solid   |
| 2019 | 152 | Chloroanilines, liquid  |

|      |      |   |
|------|------|---|
| 2020 | 153  | Chlorophenols, solid  |
| 2021 | 153  | Chlorophenols, liquid   |
| 2022 | 153  | Cresylic acid   |
| 2023 | 131P | Epichlorohydrin   |
| 2024 | 151  | Mercury compound, liquid, n.o.s.  |
| 2025 | 151  | Mercury compound, solid, n.o.s.   |
| 2026 | 151  | Phenylmercuric compound, n.o.s.   |
| 2027 | 151  | Sodium arsenite, solid  |
| 2028 | 153  | Bombs, smoke, non-explosive, with corrosive liquid, without initiating device |
| 2029 | 132  | Hydrazine, anhydrous  |
| 2030 | 153  | Hydrazine, aqueous solution, with more than 37% Hydrazine                     |
| 2031 | 157  | Nitric acid, other than red fuming, with more than 65% nitric acid            |
| 2031 | 157  | Nitric acid, other than red fuming, with not more than 65% nitric acid        |
| 2032 | 157  | Nitric acid, red fuming   |
| 2033 | 154  | Potassium monoxide  |
| 2034 | 115  | Hydrogen and Methane mixture, compressed                                      |
| 2034 | 115  | Methane and Hydrogen mixture, compressed                                      |
| 2035 | 115  | Refrigerant gas R-143a  |
| 2035 | 115  | 1,1,1-Trifluoroethane   |
| 2036 | 120  | Xenon   |
| 2036 | 120  | Xenon, compressed   |
| 2037 | 115  | Gas cartridges  |
| 2037 | 115  | Receptacles, small, containing gas  |

**ID Guide Name of Material**  
**No. No.**

|      |      |   |
|------|------|---|
| 2038 | 152  | Dinitrotoluenes, liquid   |
| 2044 | 115  | 2,2-Dimethylpropane   |
| 2045 | 130  | Isobutyl aldehyde   |
| 2045 | 130  | Isobutyraldehyde  |
| 2046 | 130  | Cymenes   |
| 2047 | 129  | Dichloropropenes  |
| 2048 | 130P | Dicyclopentadiene   |
| 2049 | 130  | Diethylbenzene  |
| 2050 | 128  | Diisobutylene, isomeric compounds                                   |
| 2051 | 132  | 2-Dimethylaminoethanol  |
| 2052 | 128  | Dipentene   |
| 2053 | 129  | Methylamyl alcohol  |
| 2053 | 129  | Methyl isobutyl carbinol  |
| 2054 | 132  | Morpholine  |
| 2055 | 128P | Styrene monomer, stabilized   |
| 2056 | 127  | Tetrahydrofuran   |
| 2057 | 128  | Tripropylene  |
| 2058 | 129  | Valeraldehyde   |
| 2059 | 127  | Nitrocellulose, solution, flammable                                 |
| 2067 | 140  | Ammonium nitrate based fertilizer                                   |
| 2071 | 140  | Ammonium nitrate based fertilizer                                   |
| 2073 | 125  | Ammonia, solution, with more than 35% but not more than 50% Ammonia |
| 2074 | 153P | Acrylamide, solid   |
| 2075 | 153  | Chloral, anhydrous, stabilized                                      |
| 2076 | 153  | Cresols, liquid   |
| 2077 | 153  | alpha-Naphthylamine   |
| 2077 | 153  | Naphthylamine (alpha)   |
| 2078 | 156  | Toluene diisocyanate  |

**ID Guide Name of Material**  
**No. No.**

|      |      |  |
|------|------|--|
| 2079 | 154  | Diethylenetriamine                     |
| 2186 | 125  | Hydrogen chloride, refrigerated liquid |
| 2187 | 120  | Carbon dioxide, refrigerated liquid    |
| 2188 | 119  | Arsine                                 |
| 2189 | 119  | Dichlorosilane                         |
| 2190 | 124  | Oxygen difluoride                      |
| 2190 | 124  | Oxygen difluoride, compressed          |
| 2191 | 123  | Sulfuryl fluoride                      |
| 2191 | 123  | Sulphuryl fluoride                     |
| 2192 | 119  | Germane                                |
| 2193 | 126  | Hexafluoroethane                       |
| 2193 | 126  | Hexafluoroethane, compressed           |
| 2193 | 126  | Refrigerant gas R-116                  |
| 2193 | 126  | Refrigerant gas R-116, compressed      |
| 2194 | 125  | Selenium hexafluoride                  |
| 2195 | 125  | Tellurium hexafluoride                 |
| 2196 | 125  | Tungsten hexafluoride                  |
| 2197 | 125  | Hydrogen iodide, anhydrous             |
| 2198 | 125  | Phosphorus pentafluoride               |
| 2198 | 125  | Phosphorus pentafluoride, compressed   |
| 2199 | 119  | Phosphine                              |
| 2200 | 116P | Propadiene, stabilized                 |
| 2201 | 122  | Nitrous oxide, refrigerated liquid     |
| 2202 | 117  | Hydrogen selenide, anhydrous           |
| 2203 | 116  | Silane                                 |
| 2203 | 116  | Silane, compressed                     |
| 2204 | 119  | Carbonyl sulfide                       |
| 2204 | 119  | Carbonyl sulphide                      |
| 2205 | 153  | Adiponitrile                           |

**ID Guide Name of Material**  
**No. No.**

2206 **155** Isocyanate solution, poisonous, n.o.s.  
2206 **155** Isocyanate solution, toxic, n.o.s.  
2206 **155** Isocyanates, poisonous, n.o.s.  
2206 **155** Isocyanates, toxic, n.o.s.  
2208 **140** Bleaching powder  
2208 **140** Calcium hypochlorite mixture, dry, with more than 10% but not more than 39% available Chlorine  
2209 **153** Formaldehyde, solution (corrosive)  
2209 **153** Formalin (corrosive)  
2210 **135** Maneb  
2210 **135** Maneb preparation, with not less than 60% Maneb  
2211 **171** Polymeric beads, expandable  
2212 **171** Asbestos  
2212 **171** Asbestos, amphibole  
2212 **171** Asbestos, blue  
2212 **171** Asbestos, brown  
2212 **171** Blue asbestos  
2212 **171** Brown asbestos  
2213 **133** Paraformaldehyde  
2214 **156** Phthalic anhydride  
2215 **156** Maleic anhydride  
2215 **156** Maleic anhydride, molten  
2216 **171** Fish meal, stabilized  
2216 **171** Fish scrap, stabilized  
2217 **135** Seed cake, with not more than 1.5% oil and not more than 11% moisture  
2218 **132P** Acrylic acid, stabilized  
2219 **129** Allyl glycidyl ether

**ID Guide Name of Material**  
**No. No.**

2222 **128** Anisole  
2224 **152** Benzonitrile  
2225 **156** Benzenesulfonyl chloride  
2225 **156** Benzenesulphonyl chloride  
2226 **156** Benzotrichloride  
2227 **130P** n-Butyl methacrylate, stabilized  
2232 **153** Chloroacetaldehyde  
2232 **153** 2-Chloroethanal  
2233 **152** Chloroanisidines  
2234 **130** Chlorobenzotrifluorides  
2235 **153** Chlorobenzyl chlorides, liquid  
2236 **156** 3-Chloro-4-methylphenyl isocyanate, liquid  
2237 **153** Chloronitroanilines  
2238 **129** Chlorotoluenes  
2239 **153** Chlorotoluidines, solid  
2240 **154** Chromosulfuric acid  
2240 **154** Chromosulphuric acid  
2241 **128** Cycloheptane  
2242 **128** Cycloheptene  
2243 **130** Cyclohexyl acetate  
2244 **129** Cyclopentanol  
2245 **128** Cyclopentanone  
2246 **128** Cyclopentene  
2247 **128** n-Decane  
2248 **132** Di-n-butylamine  
2249 **131** Dichlorodimethyl ether, symmetrical  
2250 **156** Dichlorophenyl isocyanates  
2251 **128P** Bicyclo[2.2.1]hepta-2,5-diene, stabilized  
2251 **128P** 2,5-Norbornadiene, stabilized

**ID Guide Name of Material**  
**No. No.**

|      |      |   |
|------|------|---|
| 2252 | 127  | 1,2-Dimethoxyethane   |
| 2253 | 153  | N,N-Dimethylaniline   |
| 2254 | 133  | Matches, fusee  |
| 2256 | 130  | Cyclohexene   |
| 2257 | 138  | Potassium   |
| 2258 | 132  | 1,2-Propylenediamine  |
| 2259 | 153  | Triethylenetetramine  |
| 2260 | 132  | Tripropylamine  |
| 2261 | 153  | Xylenols, solid   |
| 2262 | 156  | Dimethylcarbamoyl chloride  |
| 2263 | 128  | Dimethylcyclohexanes  |
| 2264 | 132  | N,N-Dimethylcyclohexylamine   |
| 2264 | 132  | Dimethylcyclohexylamine   |
| 2265 | 129  | N,N-Dimethylformamide   |
| 2266 | 132  | Dimethyl-N-propylamine  |
| 2267 | 156  | Dimethyl thiophosphoryl chloride  |
| 2269 | 153  | 3,3'-Iminodipropylamine   |
| 2270 | 132  | Ethylamine, aqueous solution, with not less than 50% but not more than 70% Ethylamine |
| 2271 | 128  | Ethyl amyl ketone   |
| 2272 | 153  | N-Ethylaniline  |
| 2273 | 153  | 2-Ethylaniline  |
| 2274 | 153  | N-Ethyl-N-benzylaniline   |
| 2275 | 129  | 2-Ethylbutanol  |
| 2276 | 132  | 2-Ethylhexylamine   |
| 2277 | 130P | Ethyl methacrylate, stabilized  |
| 2278 | 128  | n-Heptene   |
| 2279 | 151  | Hexachlorobutadiene   |
| 2280 | 153  | Hexamethylenediamine, solid   |
| 2281 | 156  | Hexamethylene diisocyanate  |

**ID Guide Name of Material**  
**No. No.**

|      |      |                                   |
|------|------|-----------------------------------|
| 2282 | 129  | Hexanols                          |
| 2283 | 130P | Isobutyl methacrylate, stabilized |
| 2284 | 131  | Isobutyronitrile                  |
| 2285 | 156  | Isocyanatobenzotrifluorides       |
| 2286 | 128  | Pentamethylheptane                |
| 2287 | 128  | Isoheptenes                       |
| 2288 | 128  | Isohexenes                        |
| 2289 | 153  | Isophoronediamine                 |
| 2290 | 156  | Isophorone diisocyanate           |
| 2291 | 151  | Lead compound, soluble, n.o.s.    |
| 2293 | 128  | 4-Methoxy-4-methylpentan-2-one    |
| 2294 | 153  | N-Methylaniline                   |
| 2295 | 155  | Methyl chloroacetate              |
| 2296 | 128  | Methylcyclohexane                 |
| 2297 | 128  | Methylcyclohexanone               |
| 2298 | 128  | Methylcyclopentane                |
| 2299 | 155  | Methyl dichloroacetate            |
| 2300 | 153  | 2-Methyl-5-ethylpyridine          |
| 2301 | 128  | 2-Methylfuran                     |
| 2302 | 127  | 5-Methylhexan-2-one               |
| 2303 | 128  | Isopropenylbenzene                |
| 2304 | 133  | Naphthalene, molten               |
| 2305 | 153  | Nitrobenzenesulfonic acid         |
| 2305 | 153  | Nitrobenzenesulphonic acid        |
| 2306 | 152  | Nitrobenzotrifluorides, liquid    |
| 2307 | 152  | 3-Nitro-4-chlorobenzotrifluoride  |
| 2308 | 157  | Nitrosylsulfuric acid, liquid     |
| 2308 | 157  | Nitrosylsulphuric acid, liquid    |
| 2309 | 128P | Octadiene                         |
| 2310 | 131  | Pentane-2,4-dione                 |
| 2311 | 153  | Phenetidines                      |

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|      |            |   |
|------|------------|---|
| 2312 | <b>153</b> | Phenol, molten  |
| 2313 | <b>129</b> | Picolines   |
| 2315 | <b>171</b> | Articles containing<br>Polychlorinated biphenyls<br>(PCB)               |
| 2315 | <b>171</b> | PCB   |
| 2315 | <b>171</b> | Polychlorinated biphenyls, liquid                                       |
| 2316 | <b>157</b> | Sodium cuprocyanide, solid  |
| 2317 | <b>157</b> | Sodium cuprocyanide, solution   |
| 2318 | <b>135</b> | Sodium hydrosulfide, with<br>less than 25% water of<br>crystallization  |
| 2318 | <b>135</b> | Sodium hydrosulphide, with<br>less than 25% water of<br>crystallization |
| 2319 | <b>128</b> | Terpene hydrocarbons, n.o.s.  |
| 2320 | <b>153</b> | Tetraethylenepentamine  |
| 2321 | <b>153</b> | Trichlorobenzenes, liquid   |
| 2322 | <b>152</b> | Trichlorobutene   |
| 2323 | <b>130</b> | Triethyl phosphite  |
| 2324 | <b>128</b> | Triisobutylene  |
| 2325 | <b>129</b> | 1,3,5-Trimethylbenzene  |
| 2326 | <b>153</b> | Trimethylcyclohexylamine  |
| 2327 | <b>153</b> | Trimethylhexamethylenediamines  |
| 2328 | <b>156</b> | Trimethylhexamethylene<br>diisocyanate                                  |
| 2329 | <b>130</b> | Trimethyl phosphite   |
| 2330 | <b>128</b> | Undecane  |
| 2331 | <b>154</b> | Zinc chloride, anhydrous  |
| 2332 | <b>129</b> | Acetaldehyde oxime  |
| 2333 | <b>131</b> | Allyl acetate   |
| 2334 | <b>131</b> | Allylamine  |
| 2335 | <b>131</b> | Allyl ethyl ether   |
| 2336 | <b>131</b> | Allyl formate   |

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|      |             |                               |
|------|-------------|-------------------------------|
| 2337 | <b>131</b>  | Phenyl mercaptan              |
| 2338 | <b>127</b>  | Benzotrifluoride              |
| 2339 | <b>130</b>  | 2-Bromobutane                 |
| 2340 | <b>130</b>  | 2-Bromoethyl ethyl ether      |
| 2341 | <b>130</b>  | 1-Bromo-3-methylbutane        |
| 2342 | <b>130</b>  | Bromomethylpropanes           |
| 2343 | <b>130</b>  | 2-Bromopentane                |
| 2344 | <b>129</b>  | Bromopropanes                 |
| 2345 | <b>130</b>  | 3-Bromopropyne                |
| 2346 | <b>127</b>  | Butanedione                   |
| 2346 | <b>127</b>  | Diacetyl                      |
| 2347 | <b>130</b>  | Butyl mercaptan               |
| 2348 | <b>129P</b> | Butyl acrylates, stabilized   |
| 2350 | <b>127</b>  | Butyl methyl ether            |
| 2351 | <b>129</b>  | Butyl nitrites                |
| 2352 | <b>127P</b> | Butyl vinyl ether, stabilized |
| 2353 | <b>132</b>  | Butyryl chloride              |
| 2354 | <b>131</b>  | Chloromethyl ethyl ether      |
| 2356 | <b>129</b>  | 2-Chloropropane               |
| 2357 | <b>132</b>  | Cyclohexylamine               |
| 2358 | <b>128P</b> | Cyclooctatetraene             |
| 2359 | <b>132</b>  | Diallylamine                  |
| 2360 | <b>131P</b> | Diallyl ether                 |
| 2361 | <b>132</b>  | Diisobutylamine               |
| 2362 | <b>130</b>  | 1,1-Dichloroethane            |
| 2363 | <b>129</b>  | Ethyl mercaptan               |
| 2364 | <b>128</b>  | n-Propyl benzene              |
| 2366 | <b>128</b>  | Diethyl carbonate             |
| 2367 | <b>130</b>  | alpha-Methylvaleraldehyde     |
| 2367 | <b>130</b>  | Methyl valeraldehyde (alpha)  |
| 2368 | <b>128</b>  | alpha-Pinene                  |



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|      |      |                                |
|------|------|--------------------------------|
| 2368 | 128  | Pinene (alpha)                 |
| 2370 | 128  | 1-Hexene                       |
| 2371 | 128  | Isopentenes                    |
| 2372 | 129  | 1,2-Di-(dimethylamino)ethane   |
| 2373 | 127  | Diethoxymethane                |
| 2374 | 127  | 3,3-Diethoxypropene            |
| 2375 | 129  | Diethyl sulfide                |
| 2375 | 129  | Diethyl sulphide               |
| 2376 | 127  | 2,3-Dihydropyran               |
| 2377 | 127  | 1,1-Dimethoxyethane            |
| 2378 | 131  | 2-Dimethylaminoacetonitrile    |
| 2379 | 132  | 1,3-Dimethylbutylamine         |
| 2380 | 127  | Dimethyldiethoxysilane         |
| 2381 | 131  | Dimethyl disulfide             |
| 2381 | 131  | Dimethyl disulphide            |
| 2382 | 131  | Dimethylhydrazine, symmetrical |
| 2383 | 132  | Dipropylamine                  |
| 2384 | 127  | Di-n-propyl ether              |
| 2385 | 129  | Ethyl isobutyrate              |
| 2386 | 132  | 1-Ethylpiperidine              |
| 2387 | 130  | Fluorobenzene                  |
| 2388 | 130  | Fluorotoluenes                 |
| 2389 | 128  | Furan                          |
| 2390 | 129  | 2-Iodobutane                   |
| 2391 | 129  | Iodomethylpropanes             |
| 2392 | 129  | Iodopropanes                   |
| 2393 | 129  | Isobutyl formate               |
| 2394 | 129  | Isobutyl propionate            |
| 2395 | 132  | Isobutyryl chloride            |
| 2396 | 131P | Methacrylaldehyde, stabilized  |
| 2397 | 127  | 3-Methylbutan-2-one            |

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|      |      |  |
|------|------|--|
| 2398 | 127  | Methyl tert-butyl ether                              |
| 2399 | 132  | 1-Methylpiperidine                                   |
| 2400 | 130  | Methyl isovalerate                                   |
| 2401 | 132  | Piperidine   |
| 2402 | 130  | Propanethiols  |
| 2403 | 129P | Isopropenyl acetate                                  |
| 2404 | 131  | Propionitrile  |
| 2405 | 129  | Isopropyl butyrate                                   |
| 2406 | 127  | Isopropyl isobutyrate                                |
| 2407 | 155  | Isopropyl chloroformate                              |
| 2409 | 129  | Isopropyl propionate                                 |
| 2410 | 129  | 1,2,3,6-Tetrahydropyridine                           |
| 2411 | 131  | Butyronitrile  |
| 2412 | 130  | Tetrahydrothiophene                                  |
| 2413 | 128  | Tetrapropyl orthotitanate                            |
| 2414 | 130  | Thiophene  |
| 2416 | 129  | Trimethyl borate                                     |
| 2417 | 125  | Carbonyl fluoride                                    |
| 2417 | 125  | Carbonyl fluoride, compressed                        |
| 2418 | 125  | Sulfur tetrafluoride                                 |
| 2418 | 125  | Sulphur tetrafluoride                                |
| 2419 | 116  | Bromotrifluoroethylene                               |
| 2420 | 125  | Hexafluoroacetone                                    |
| 2421 | 124  | Nitrogen trioxide                                    |
| 2422 | 126  | Octafluorobut-2-ene                                  |
| 2422 | 126  | Refrigerant gas R-1318                               |
| 2424 | 126  | Octafluoropropane                                    |
| 2424 | 126  | Refrigerant gas R-218                                |
| 2426 | 140  | Ammonium nitrate, liquid (hot concentrated solution) |
| 2427 | 140  | Potassium chlorate, aqueous solution                 |

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|      |      |   |
|------|------|---|
| 2428 | 140  | Sodium chlorate, aqueous solution                         |
| 2429 | 140  | Calcium chlorate, aqueous solution                        |
| 2430 | 153  | Alkylphenols, solid, n.o.s. (including C2-C12 homologues) |
| 2431 | 153  | Anisidines  |
| 2432 | 153  | N,N-Diethylaniline  |
| 2433 | 152  | Chloronitrotoluenes, liquid                               |
| 2434 | 156  | Dibenzylidichlorosilane                                   |
| 2435 | 156  | Ethylphenyldichlorosilane                                 |
| 2436 | 129  | Thioacetic acid   |
| 2437 | 156  | Methylphenyldichlorosilane                                |
| 2438 | 131  | Trimethylacetyl chloride                                  |
| 2439 | 154  | Sodium hydrogendifluoride                                 |
| 2440 | 154  | Stannic chloride, pentahydrate                            |
| 2441 | 135  | Titanium trichloride, pyrophoric                          |
| 2441 | 135  | Titanium trichloride mixture, pyrophoric                  |
| 2442 | 156  | Trichloroacetyl chloride                                  |
| 2443 | 137  | Vanadium oxytrichloride                                   |
| 2444 | 137  | Vanadium tetrachloride                                    |
| 2446 | 153  | Nitrocresols, solid                                       |
| 2447 | 136  | Phosphorus, white, molten                                 |
| 2447 | 136  | White phosphorus, molten                                  |
| 2448 | 133  | Molten sulfur   |
| 2448 | 133  | Molten sulphur  |
| 2448 | 133  | Sulfur, molten  |
| 2448 | 133  | Sulphur, molten   |
| 2451 | 122  | Nitrogen trifluoride                                      |
| 2451 | 122  | Nitrogen trifluoride, compressed                          |
| 2452 | 116P | Ethylacetylene, stabilized                                |

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|      |      |   |
|------|------|---|
| 2453 | 115  | Ethyl fluoride                                    |
| 2453 | 115  | Refrigerant gas R-161                             |
| 2454 | 115  | Methyl fluoride                                   |
| 2454 | 115  | Refrigerant gas R-41                              |
| 2455 | 116  | Methyl nitrite                                    |
| 2456 | 130P | 2-Chloropropene                                   |
| 2457 | 128  | 2,3-Dimethylbutane                                |
| 2458 | 130  | Hexadiene   |
| 2459 | 128  | 2-Methyl-1-butene                                 |
| 2460 | 128  | 2-Methyl-2-butene                                 |
| 2461 | 128  | Methylpentadiene                                  |
| 2463 | 138  | Aluminum hydride                                  |
| 2464 | 141  | Beryllium nitrate                                 |
| 2465 | 140  | Dichloroisocyanuric acid, dry                     |
| 2465 | 140  | Dichloroisocyanuric acid salts                    |
| 2465 | 140  | Sodium dichloroisocyanurate                       |
| 2465 | 140  | Sodium dichloro-s-triazinetrione                  |
| 2466 | 143  | Potassium superoxide                              |
| 2468 | 140  | Trichloroisocyanuric acid, dry                    |
| 2469 | 140  | Zinc bromate                                      |
| 2470 | 152  | Phenylacetoneitrile, liquid                       |
| 2471 | 154  | Osmium tetroxide                                  |
| 2473 | 154  | Sodium arsenilate                                 |
| 2474 | 157  | Thiophosgene                                      |
| 2475 | 157  | Vanadium trichloride                              |
| 2477 | 131  | Methyl isothiocyanate                             |
| 2478 | 155  | Isocyanate solution, flammable, poisonous, n.o.s. |
| 2478 | 155  | Isocyanate solution, flammable, toxic, n.o.s.     |
| 2478 | 155  | Isocyanates, flammable, poisonous, n.o.s.         |

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|      |      |  |
|------|------|--|
| 2478 | 155  | Isocyanates, flammable, toxic, n.o.s.        |
| 2480 | 155P | Methyl isocyanate                            |
| 2481 | 155  | Ethyl isocyanate                             |
| 2482 | 155P | n-Propyl isocyanate                          |
| 2483 | 155P | Isopropyl isocyanate                         |
| 2484 | 155  | tert-Butyl isocyanate                        |
| 2485 | 155P | n-Butyl isocyanate                           |
| 2486 | 155P | Isobutyl isocyanate                          |
| 2487 | 155  | Phenyl isocyanate                            |
| 2488 | 155  | Cyclohexyl isocyanate                        |
| 2490 | 153  | Dichloroisopropyl ether                      |
| 2491 | 153  | Ethanolamine                                 |
| 2491 | 153  | Ethanolamine, solution                       |
| 2491 | 153  | Monoethanolamine                             |
| 2493 | 132  | Hexamethyleneimine                           |
| 2495 | 144  | Iodine pentafluoride                         |
| 2496 | 156  | Propionic anhydride                          |
| 2498 | 129  | 1,2,3,6-Tetrahydrobenzaldehyde               |
| 2501 | 152  | Tris-(1-aziridinyl)phosphine oxide, solution |
| 2502 | 132  | Valeryl chloride                             |
| 2503 | 137  | Zirconium tetrachloride                      |
| 2504 | 159  | Acetylene tetrabromide                       |
| 2504 | 159  | Tetrabromoethane                             |
| 2505 | 154  | Ammonium fluoride                            |
| 2506 | 154  | Ammonium hydrogen sulfate                    |
| 2506 | 154  | Ammonium hydrogen sulphate                   |
| 2507 | 154  | Chloroplatinic acid, solid                   |
| 2508 | 156  | Molybdenum pentachloride                     |
| 2509 | 154  | Potassium hydrogen sulfate                   |
| 2509 | 154  | Potassium hydrogen sulphate                  |

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|      |      |                                   |
|------|------|-----------------------------------|
| 2511 | 153  | 2-Chloropropionic acid            |
| 2512 | 152  | Aminophenols                      |
| 2513 | 156  | Bromoacetyl bromide               |
| 2514 | 130  | Bromobenzene                      |
| 2515 | 159  | Bromoform                         |
| 2516 | 151  | Carbon tetrabromide               |
| 2517 | 115  | 1-Chloro-1,1-difluoroethane       |
| 2517 | 115  | Difluorochloroethanes             |
| 2517 | 115  | Refrigerant gas R-142b            |
| 2518 | 153  | 1,5,9-Cyclododecatiene            |
| 2520 | 130P | Cyclooctadienes                   |
| 2521 | 131P | Diketene, stabilized              |
| 2522 | 153P | 2-Dimethylaminoethyl methacrylate |
| 2524 | 129  | Ethyl orthoformate                |
| 2525 | 156  | Ethyl oxalate                     |
| 2526 | 132  | Furfurylamine                     |
| 2527 | 129P | Isobutyl acrylate, stabilized     |
| 2528 | 130  | Isobutyl isobutyrate              |
| 2529 | 132  | Isobutyric acid                   |
| 2531 | 153P | Methacrylic acid, stabilized      |
| 2533 | 156  | Methyl trichloroacetate           |
| 2534 | 119  | Methylchlorosilane                |
| 2535 | 132  | 4-Methylmorpholine                |
| 2535 | 132  | N-Methylmorpholine                |
| 2536 | 127  | Methyltetrahydrofuran             |
| 2538 | 133  | Nitronaphthalene                  |
| 2541 | 128  | Terpinolene                       |
| 2542 | 153  | Tributylamine                     |
| 2545 | 135  | Hafnium powder, dry               |
| 2546 | 135  | Titanium powder, dry              |
| 2547 | 143  | Sodium superoxide                 |

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|      |      |  |
|------|------|--|
| 2548 | 124  | Chlorine pentafluoride                                 |
| 2552 | 151  | Hexafluoroacetone hydrate, liquid                      |
| 2554 | 130P | Methylallyl chloride                                   |
| 2555 | 113  | Nitrocellulose with water, not less than 25% water     |
| 2556 | 113  | Nitrocellulose with alcohol, not less than 25% alcohol |
| 2557 | 133  | Nitrocellulose mixture, without pigment                |
| 2557 | 133  | Nitrocellulose mixture, without plasticizer            |
| 2557 | 133  | Nitrocellulose mixture, with pigment                   |
| 2557 | 133  | Nitrocellulose mixture, with plasticizer               |
| 2558 | 131  | Epibromohydrin   |
| 2560 | 129  | 2-Methylpentan-2-ol                                    |
| 2561 | 128  | 3-Methyl-1-butene                                      |
| 2564 | 153  | Trichloroacetic acid, solution                         |
| 2565 | 153  | Dicyclohexylamine                                      |
| 2567 | 154  | Sodium pentachlorophenate                              |
| 2570 | 154  | Cadmium compound                                       |
| 2571 | 156  | Alkylsulfuric acids                                    |
| 2571 | 156  | Alkylsulphuric acids                                   |
| 2572 | 153  | Phenylhydrazine  |
| 2573 | 141  | Thallium chlorate                                      |
| 2574 | 151  | Tricresyl phosphate                                    |
| 2576 | 137  | Phosphorus oxybromide, molten                          |
| 2577 | 156  | Phenylacetyl chloride                                  |
| 2578 | 157  | Phosphorus trioxide                                    |
| 2579 | 153  | Piperazine   |
| 2580 | 154  | Aluminum bromide, solution                             |
| 2581 | 154  | Aluminum chloride, solution                            |

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|      |     |  |
|------|-----|--|
| 2582 | 154 | Ferric chloride, solution  |
| 2583 | 153 | Alkyl sulfonic acids, solid, with more than 5% free Sulfuric acid        |
| 2583 | 153 | Alkyl sulphonic acids, solid, with more than 5% free Sulphuric acid      |
| 2583 | 153 | Aryl sulfonic acids, solid, with more than 5% free Sulfuric acid         |
| 2583 | 153 | Aryl sulphonic acids, solid, with more than 5% free Sulphuric acid       |
| 2584 | 153 | Alkyl sulfonic acids, liquid, with more than 5% free Sulfuric acid       |
| 2584 | 153 | Alkyl sulphonic acids, liquid, with more than 5% free Sulphuric acid     |
| 2584 | 153 | Aryl sulfonic acids, liquid, with more than 5% free Sulfuric acid        |
| 2584 | 153 | Aryl sulphonic acids, liquid, with more than 5% free Sulphuric acid      |
| 2585 | 153 | Alkyl sulfonic acids, solid, with not more than 5% free Sulfuric acid    |
| 2585 | 153 | Alkyl sulphonic acids, solid, with not more than 5% free Sulphuric acid  |
| 2585 | 153 | Aryl sulfonic acids, solid, with not more than 5% free Sulfuric acid     |
| 2585 | 153 | Aryl sulphonic acids, solid, with not more than 5% free Sulphuric acid   |
| 2586 | 153 | Alkyl sulfonic acids, liquid, with not more than 5% free Sulfuric acid   |
| 2586 | 153 | Alkyl sulphonic acids, liquid, with not more than 5% free Sulphuric acid |

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|      |     |  |
|------|-----|--|
| 2586 | 153 | Aryl sulfonic acids, liquid, with not more than 5% free Sulfuric acid  |
| 2586 | 153 | Aryl sulphonic acids, liquid, with not more than 5% free Sulphuric acid                                      |
| 2587 | 153 | Benzoquinone   |
| 2588 | 151 | Pesticide, solid, poisonous, n.o.s.  |
| 2588 | 151 | Pesticide, solid, toxic, n.o.s.  |
| 2589 | 155 | Vinyl chloroacetate  |
| 2590 | 171 | Asbestos, chrysotile   |
| 2590 | 171 | Asbestos, white  |
| 2590 | 171 | White asbestos   |
| 2591 | 120 | Xenon, refrigerated liquid (cryogenic liquid)  |
| 2599 | 126 | Chlorotrifluoromethane and Trifluoromethane azeotropic mixture with approximately 60% Chlorotrifluoromethane |
| 2599 | 126 | Refrigerant gas R-503  |
| 2599 | 126 | Trifluoromethane and Chlorotrifluoromethane azeotropic mixture with approximately 60% Chlorotrifluoromethane |
| 2601 | 115 | Cyclobutane  |
| 2602 | 126 | Dichlorodifluoromethane and Difluoroethane azeotropic mixture with approximately 74% Dichlorodifluoromethane |
| 2602 | 126 | Difluoroethane and Dichlorodifluoromethane azeotropic mixture with approximately 74% Dichlorodifluoromethane |
| 2602 | 126 | Refrigerant gas R-500  |
| 2603 | 131 | Cycloheptatriene   |
| 2604 | 132 | Boron trifluoride diethyl etherate   |

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|      |      |   |
|------|------|---|
| 2605 | 155  | Methoxymethyl isocyanate  |
| 2606 | 155  | Methyl orthosilicate  |
| 2607 | 129P | Acrolein dimer, stabilized  |
| 2608 | 129  | Nitropropanes   |
| 2609 | 156  | Triallyl borate   |
| 2610 | 132  | Triallylamine   |
| 2611 | 131  | Propylene chlorohydrin  |
| 2612 | 127  | Methyl propyl ether   |
| 2614 | 129  | Methallyl alcohol   |
| 2615 | 127  | Ethyl propyl ether  |
| 2616 | 129  | Triisopropyl borate   |
| 2617 | 129  | Methylcyclohexanols   |
| 2618 | 130P | Vinyltoluenes, stabilized   |
| 2619 | 132  | Benzyl dimethylamine  |
| 2620 | 130  | Amyl butyrates  |
| 2621 | 127  | Acetyl methyl carbinol  |
| 2622 | 131P | Glycidaldehyde  |
| 2623 | 133  | Firelighters, solid, with flammable liquid                          |
| 2624 | 138  | Magnesium silicide  |
| 2626 | 140  | Chloric acid, aqueous solution, with not more than 10% Chloric acid |
| 2627 | 140  | Nitrites, inorganic, n.o.s.   |
| 2628 | 151  | Potassium fluoroacetate   |
| 2629 | 151  | Sodium fluoroacetate  |
| 2630 | 151  | Selenates   |
| 2630 | 151  | Selenites   |
| 2642 | 154  | Fluoroacetic acid   |
| 2643 | 155  | Methyl bromoacetate   |
| 2644 | 151  | Methyl iodide   |
| 2645 | 153  | Phenacyl bromide  |

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2646 **151** Hexachlorocyclopentadiene  
2647 **153** Malononitrile  
2648 **154** 1,2-Dibromobutan-3-one  
2649 **153** 1,3-Dichloroacetone  
2650 **153** 1,1-Dichloro-1-nitroethane  
2651 **153** 4,4'-Diaminodiphenylmethane  
2653 **156** Benzyl iodide  
2655 **151** Potassium fluorosilicate  
2656 **154** Quinoline  
2657 **153** Selenium disulfide  
2657 **153** Selenium disulphide  
2659 **151** Sodium chloroacetate  
2660 **153** Mononitrotoluidines  
2660 **153** Nitrotoluidines (mono)  
2661 **153** Hexachloroacetone  
2664 **160** Dibromomethane  
2667 **152** Butyltoluenes  
2668 **131** Chloroacetonitrile  
2669 **152** Chlorocresols, solution  
2670 **157** Cyanuric chloride  
2671 **153** Aminopyridines  
2672 **154** Ammonia, solution, with more than 10% but not more than 35% Ammonia  
2672 **154** Ammonium hydroxide  
2672 **154** Ammonium hydroxide, with more than 10% but not more than 35% Ammonia  
2673 **151** 2-Amino-4-chlorophenol  
2674 **154** Sodium fluorosilicate  
2676 **119** Stibine  
2677 **154** Rubidium hydroxide, solution  
2678 **154** Rubidium hydroxide, solid

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2679 **154** Lithium hydroxide, solution  
2680 **154** Lithium hydroxide  
2681 **154** Caesium hydroxide, solution  
2681 **154** Cesium hydroxide, solution  
2682 **157** Caesium hydroxide  
2682 **157** Cesium hydroxide  
2683 **132** Ammonium sulfide, solution  
2683 **132** Ammonium sulphide, solution  
2684 **132** 3-Diethylaminopropylamine  
2685 **132** N,N-Diethylethylenediamine  
2686 **132** 2-Diethylaminoethanol  
2687 **133** Dicyclohexylammonium nitrite  
2688 **159** 1-Bromo-3-chloropropane  
2689 **153** Glycerol alpha-monochlorohydrin  
2690 **152** N,n-Butylimidazole  
2691 **137** Phosphorus pentabromide  
2692 **157** Boron tribromide  
2693 **154** Bisulfites, aqueous solution, n.o.s.  
2693 **154** Bisulphites, aqueous solution, n.o.s.  
2698 **156** Tetrahydrophthalic anhydrides  
2699 **154** Trifluoroacetic acid  
2705 **153P** 1-Pentol  
2707 **127** Dimethyldioxanes  
2709 **128** Butylbenzenes  
2710 **128** Dipropyl ketone  
2713 **153** Acridine  
2714 **133** Zinc resinate  
2715 **133** Aluminum resinate  
2716 **153** 1,4-Butynediol

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|      |     |  |
|------|-----|--|
| 2717 | 133 | Camphor, synthetic   |
| 2719 | 141 | Barium bromate   |
| 2720 | 141 | Chromium nitrate   |
| 2721 | 140 | Copper chlorate  |
| 2722 | 140 | Lithium nitrate  |
| 2723 | 140 | Magnesium chlorate   |
| 2724 | 140 | Manganese nitrate  |
| 2725 | 140 | Nickel nitrate   |
| 2726 | 140 | Nickel nitrite   |
| 2727 | 141 | Thallium nitrate   |
| 2728 | 140 | Zirconium nitrate  |
| 2729 | 152 | Hexachlorobenzene  |
| 2730 | 152 | Nitroanisoles, liquid                                      |
| 2732 | 152 | Nitrobromobenzenes, liquid                                 |
| 2733 | 132 | Amines, flammable, corrosive, n.o.s.                       |
| 2733 | 132 | Polyamines, flammable, corrosive, n.o.s.                   |
| 2734 | 132 | Amines, liquid, corrosive, flammable, n.o.s.               |
| 2734 | 132 | Polyamines, liquid, corrosive, flammable, n.o.s.           |
| 2735 | 153 | Amines, liquid, corrosive, n.o.s.                          |
| 2735 | 153 | Polyamines, liquid, corrosive, n.o.s.                      |
| 2738 | 153 | N-Butylaniline   |
| 2739 | 156 | Butyric anhydride  |
| 2740 | 155 | n-Propyl chloroformate                                     |
| 2741 | 141 | Barium hypochlorite, with more than 22% available Chlorine |
| 2742 | 155 | sec-Butyl chloroformate                                    |
| 2742 | 155 | Chloroformates, poisonous, corrosive, flammable, n.o.s.    |

**ID Guide Name of Material  
No. No.**

|      |     |   |
|------|-----|---|
| 2742 | 155 | Chloroformates, toxic, corrosive, flammable, n.o.s. |
| 2742 | 155 | Isobutyl chloroformate                              |
| 2743 | 155 | n-Butyl chloroformate                               |
| 2744 | 155 | Cyclobutyl chloroformate                            |
| 2745 | 157 | Chloromethyl chloroformate                          |
| 2746 | 156 | Phenyl chloroformate                                |
| 2747 | 156 | tert-Butylcyclohexyl chloroformate                  |
| 2748 | 156 | 2-Ethylhexyl chloroformate                          |
| 2749 | 130 | Tetramethylsilane                                   |
| 2750 | 153 | 1,3-Dichloropropanol-2                              |
| 2751 | 155 | Diethylthiophosphoryl chloride                      |
| 2752 | 127 | 1,2-Epoxy-3-ethoxypropane                           |
| 2753 | 153 | N-Ethylbenzyltoluidines, liquid                     |
| 2754 | 153 | N-Ethyltoluidines                                   |
| 2757 | 151 | Carbamate pesticide, solid, poisonous               |
| 2757 | 151 | Carbamate pesticide, solid, toxic                   |
| 2758 | 131 | Carbamate pesticide, liquid, flammable, poisonous   |
| 2758 | 131 | Carbamate pesticide, liquid, flammable, toxic       |
| 2759 | 151 | Arsenical pesticide, solid, poisonous               |
| 2759 | 151 | Arsenical pesticide, solid, toxic                   |
| 2760 | 131 | Arsenical pesticide, liquid, flammable, poisonous   |
| 2760 | 131 | Arsenical pesticide, liquid, flammable, toxic       |
| 2761 | 151 | Organochlorine pesticide, solid, poisonous          |
| 2761 | 151 | Organochlorine pesticide, solid, toxic              |

**ID Guide Name of Material  
No. No.**

|      |     |  |
|------|-----|--|
| 2762 | 131 | Organochlorine pesticide, liquid, flammable, poisonous |
| 2762 | 131 | Organochlorine pesticide, liquid, flammable, toxic     |
| 2763 | 151 | Triazine pesticide, solid, poisonous                   |
| 2763 | 151 | Triazine pesticide, solid, toxic                       |
| 2764 | 131 | Triazine pesticide, liquid, flammable, poisonous       |
| 2764 | 131 | Triazine pesticide, liquid, flammable, toxic           |
| 2771 | 151 | Thiocarbamate pesticide, solid, poisonous              |
| 2771 | 151 | Thiocarbamate pesticide, solid, toxic                  |
| 2772 | 131 | Thiocarbamate pesticide, liquid, flammable, poisonous  |
| 2772 | 131 | Thiocarbamate pesticide, liquid, flammable, toxic      |
| 2775 | 151 | Copper based pesticide, solid, poisonous               |
| 2775 | 151 | Copper based pesticide, solid, toxic                   |
| 2776 | 131 | Copper based pesticide, liquid, flammable, poisonous   |
| 2776 | 131 | Copper based pesticide, liquid, flammable, toxic       |
| 2777 | 151 | Mercury based pesticide, solid, poisonous              |
| 2777 | 151 | Mercury based pesticide, solid, toxic                  |
| 2778 | 131 | Mercury based pesticide, liquid, flammable, poisonous  |
| 2778 | 131 | Mercury based pesticide, liquid, flammable, toxic      |
| 2779 | 153 | Substituted nitrophenol pesticide, solid, poisonous    |
| 2779 | 153 | Substituted nitrophenol pesticide, solid, toxic        |

**ID Guide Name of Material  
No. No.**

|      |     |   |
|------|-----|---|
| 2780 | 131 | Substituted nitrophenol pesticide, liquid, flammable, poisonous |
| 2780 | 131 | Substituted nitrophenol pesticide, liquid, flammable, toxic     |
| 2781 | 151 | Bipyridilium pesticide, solid, poisonous                        |
| 2781 | 151 | Bipyridilium pesticide, solid, toxic                            |
| 2782 | 131 | Bipyridilium pesticide, liquid, flammable, poisonous            |
| 2782 | 131 | Bipyridilium pesticide, liquid, flammable, toxic                |
| 2783 | 152 | Organophosphorus pesticide, solid, poisonous                    |
| 2783 | 152 | Organophosphorus pesticide, solid, toxic                        |
| 2784 | 131 | Organophosphorus pesticide, liquid, flammable, poisonous        |
| 2784 | 131 | Organophosphorus pesticide, liquid, flammable, toxic            |
| 2785 | 152 | 4-Thiapentanal  |
| 2786 | 153 | Organotin pesticide, solid, poisonous                           |
| 2786 | 153 | Organotin pesticide, solid, toxic                               |
| 2787 | 131 | Organotin pesticide, liquid, flammable, poisonous               |
| 2787 | 131 | Organotin pesticide, liquid, flammable, toxic                   |
| 2788 | 153 | Organotin compound, liquid, n.o.s.                              |
| 2789 | 132 | Acetic acid, glacial  |
| 2789 | 132 | Acetic acid, solution, more than 80% acid                       |
| 2790 | 153 | Acetic acid, solution, more than 10% but not more than 80% acid |



**ID Guide Name of Material  
No. No.**

|      |     |   |
|------|-----|---|
| 2793 | 170 | Ferrous metal borings, shavings, turnings or cuttings |
| 2794 | 154 | Batteries, wet, filled with acid                      |
| 2795 | 154 | Batteries, wet, filled with alkali                    |
| 2796 | 157 | Battery fluid, acid                                   |
| 2796 | 157 | Sulfuric acid, with not more than 51% acid            |
| 2796 | 157 | Sulphuric acid, with not more than 51% acid           |
| 2797 | 154 | Battery fluid, alkali                                 |
| 2798 | 137 | Benzene phosphorus dichloride                         |
| 2798 | 137 | Phenylphosphorus dichloride                           |
| 2799 | 137 | Benzene phosphorus thiodichloride                     |
| 2799 | 137 | Phenylphosphorus thiodichloride                       |
| 2800 | 154 | Batteries, wet, non-spillable                         |
| 2801 | 154 | Dye, liquid, corrosive, n.o.s.                        |
| 2801 | 154 | Dye intermediate, liquid, corrosive, n.o.s.           |
| 2802 | 154 | Copper chloride                                       |
| 2803 | 172 | Gallium   |
| 2805 | 138 | Lithium hydride, fused solid                          |
| 2806 | 139 | Lithium nitride                                       |
| 2807 | 171 | Magnetized material                                   |
| 2809 | 172 | Mercury   |
| 2810 | 153 | Compounds, tree or weed killing, liquid (toxic)       |
| 2810 | 153 | Poisonous liquid, organic, n.o.s.                     |
| 2810 | 153 | Toxic liquid, organic, n.o.s.                         |
| 2811 | 154 | Poisonous solid, organic, n.o.s.                      |
| 2811 | 154 | Toxic solid, organic, n.o.s.                          |
| 2812 | 154 | Sodium aluminate, solid                               |
| 2813 | 138 | Water-reactive solid, n.o.s.                          |

**ID Guide Name of Material  
No. No.**

|      |      |   |
|------|------|---|
| 2814 | 158  | Infectious substance, affecting humans  |
| 2815 | 153  | N-Aminoethylpiperazine                  |
| 2817 | 154  | Ammonium bifluoride, solution           |
| 2817 | 154  | Ammonium hydrogendifluoride, solution   |
| 2818 | 154  | Ammonium polysulfide, solution          |
| 2818 | 154  | Ammonium polysulphide, solution         |
| 2819 | 153  | Amyl acid phosphate                     |
| 2820 | 153  | Butyric acid                            |
| 2821 | 153  | Phenol solution                         |
| 2822 | 153  | 2-Chloropyridine                        |
| 2823 | 153  | Crotonic acid, solid                    |
| 2826 | 155  | Ethyl chlorothioformate                 |
| 2829 | 153  | Caproic acid                            |
| 2829 | 153  | Hexanoic acid                           |
| 2830 | 139  | Lithium ferrosilicon                    |
| 2831 | 160  | 1,1,1-Trichloroethane                   |
| 2834 | 154  | Phosphorous acid                        |
| 2835 | 138  | Sodium aluminum hydride                 |
| 2837 | 154  | Bisulfates, aqueous solution            |
| 2837 | 154  | Bisulphates, aqueous solution           |
| 2837 | 154  | Sodium bisulfate, solution              |
| 2837 | 154  | Sodium bisulphate, solution             |
| 2838 | 129P | Vinyl butyrate, stabilized              |
| 2839 | 153  | Aldol                                   |
| 2840 | 129  | Butyraldoxime                           |
| 2841 | 131  | Di-n-amylamine                          |
| 2842 | 129  | Nitroethane                             |
| 2844 | 138  | Calcium manganese silicon               |
| 2845 | 135  | Ethyl phosphonous dichloride, anhydrous |

**ID Guide Name of Material**  
**No. No.**

2845 **135** Methyl phosphonous dichloride  
2845 **135** Pyrophoric liquid, organic,  
n.o.s.  
2846 **135** Pyrophoric solid, organic, n.o.s.  
2849 **153** 3-Chloropropanol-1  
2850 **128** Propylene tetramer  
2851 **157** Boron trifluoride, dihydrate  
2852 **113** Dipicryl sulfide, wetted with not  
less than 10% water  
2852 **113** Dipicryl sulphide, wetted with  
not less than 10% water  
2853 **151** Magnesium fluorosilicate  
2854 **151** Ammonium fluorosilicate  
2854 **151** Ammonium silicofluoride  
2855 **151** Zinc fluorosilicate  
2855 **151** Zinc silicofluoride  
2856 **151** Fluorosilicates, n.o.s.  
2857 **126** Refrigerating machines,  
containing Ammonia solutions  
(UN2672)  
2857 **126** Refrigerating machines,  
containing non-flammable,  
non-poisonous gases  
2857 **126** Refrigerating machines,  
containing non-flammable,  
non-toxic gases  
2858 **170** Zirconium, dry, coiled wire,  
finished metal sheets or strip  
2859 **154** Ammonium metavanadate  
2861 **151** Ammonium polyvanadate  
2862 **151** Vanadium pentoxide  
2863 **154** Sodium ammonium vanadate  
2864 **151** Potassium metavanadate  
2865 **154** Hydroxylamine sulfate  
2865 **154** Hydroxylamine sulphate

**ID Guide Name of Material**  
**No. No.**

2869 **157** Titanium trichloride mixture  
2870 **135** Aluminum borohydride  
2870 **135** Aluminum borohydride in  
devices  
2871 **170** Antimony powder  
2872 **159** Dibromochloropropanes  
2873 **153** Dibutylaminoethanol  
2874 **153** Furfuryl alcohol  
2875 **151** Hexachlorophene  
2876 **153** Resorcinol  
2878 **170** Titanium sponge granules  
2878 **170** Titanium sponge powders  
2879 **157** Selenium oxychloride  
2880 **140** Calcium hypochlorite, hydrated,  
with not less than 5.5% but  
not more than 16% water  
2880 **140** Calcium hypochlorite, hydrated  
mixture, with not less than  
5.5% but not more than 16%  
water  
2881 **135** Metal catalyst, dry  
2881 **135** Nickel catalyst, dry  
2900 **158** Infectious substance, affecting  
animals only  
2901 **124** Bromine chloride  
2902 **151** Pesticide, liquid, poisonous,  
n.o.s.  
2902 **151** Pesticide, liquid, toxic, n.o.s.  
2903 **131** Pesticide, liquid, poisonous,  
flammable, n.o.s.  
2903 **131** Pesticide, liquid, toxic,  
flammable, n.o.s.  
2904 **154** Chlorophenolates, liquid  
2904 **154** Phenolates, liquid  
2905 **154** Chlorophenolates, solid

**ID Guide Name of Material  
No. No.**

|      |     |  |
|------|-----|--|
| 2905 | 154 | Phenolates, solid  |
| 2907 | 133 | Isosorbide dinitrate mixture   |
| 2908 | 161 | Radioactive material, excepted package, empty packaging                                      |
| 2909 | 161 | Radioactive material, excepted package, articles manufactured from depleted Uranium          |
| 2909 | 161 | Radioactive material, excepted package, articles manufactured from natural Thorium           |
| 2909 | 161 | Radioactive material, excepted package, articles manufactured from natural Uranium           |
| 2910 | 161 | Radioactive material, excepted package, limited quantity of material                         |
| 2911 | 161 | Radioactive material, excepted package, articles   |
| 2911 | 161 | Radioactive material, excepted package, instruments  |
| 2912 | 162 | Radioactive material, low specific activity (LSA-I), non fissile or fissile-excepted         |
| 2913 | 162 | Radioactive material, surface contaminated objects (SCO-I), non fissile or fissile-excepted  |
| 2913 | 162 | Radioactive material, surface contaminated objects (SCO-II), non fissile or fissile-excepted |
| 2915 | 163 | Radioactive material, Type A package, non-special form, non fissile or fissile-excepted      |
| 2916 | 163 | Radioactive material, Type B(U) package, non fissile or fissile-excepted                     |
| 2917 | 163 | Radioactive material, Type B(M) package, non fissile or fissile-excepted                     |

**ID Guide Name of Material  
No. No.**

|      |     |  |
|------|-----|--|
| 2919 | 163 | Radioactive material, transported under special arrangement, non fissile or fissile-excepted |
| 2920 | 132 | Corrosive liquid, flammable, n.o.s.  |
| 2921 | 134 | Corrosive solid, flammable, n.o.s.   |
| 2922 | 154 | Corrosive liquid, poisonous, n.o.s.  |
| 2922 | 154 | Corrosive liquid, toxic, n.o.s.  |
| 2923 | 154 | Corrosive solid, poisonous, n.o.s.   |
| 2923 | 154 | Corrosive solid, toxic, n.o.s.   |
| 2924 | 132 | Flammable liquid, corrosive, n.o.s   |
| 2925 | 134 | Flammable solid, corrosive, organic, n.o.s.  |
| 2926 | 134 | Flammable solid, poisonous, organic, n.o.s.  |
| 2926 | 134 | Flammable solid, toxic, organic, n.o.s.  |
| 2927 | 154 | Ethyl phosphonothioic dichloride, anhydrous  |
| 2927 | 154 | Ethyl phosphorodichloridate  |
| 2927 | 154 | Poisonous liquid, corrosive, organic, n.o.s.   |
| 2927 | 154 | Toxic liquid, corrosive, organic, n.o.s.   |
| 2928 | 154 | Poisonous solid, corrosive, organic, n.o.s.  |
| 2928 | 154 | Toxic solid, corrosive, organic, n.o.s.  |
| 2929 | 131 | Poisonous liquid, flammable, organic, n.o.s.   |
| 2929 | 131 | Toxic liquid, flammable, organic, n.o.s.   |
| 2930 | 134 | Poisonous solid, flammable, organic, n.o.s.  |

**ID Guide Name of Material  
No. No.**

|      |            |   |
|------|------------|---|
| 2930 | <b>134</b> | Toxic solid, flammable, organic, n.o.s.   |
| 2931 | <b>151</b> | Vanadyl sulfate   |
| 2931 | <b>151</b> | Vanadyl sulphate  |
| 2933 | <b>129</b> | Methyl 2-chloropropionate   |
| 2934 | <b>129</b> | Isopropyl 2-chloropropionate  |
| 2935 | <b>129</b> | Ethyl 2-chloropropionate  |
| 2936 | <b>153</b> | Thiolactic acid   |
| 2937 | <b>153</b> | alpha-Methylbenzyl alcohol, liquid  |
| 2937 | <b>153</b> | Methylbenzyl (alpha) alcohol, liquid  |
| 2940 | <b>135</b> | Cyclooctadiene phosphines   |
| 2940 | <b>135</b> | 9-Phosphabicyclononanes   |
| 2941 | <b>153</b> | Fluoroanilines  |
| 2942 | <b>153</b> | 2-Trifluoromethylaniline  |
| 2943 | <b>129</b> | Tetrahydrofurfurylamine   |
| 2945 | <b>132</b> | N-Methylbutylamine  |
| 2946 | <b>153</b> | 2-Amino-5-diethylaminopentane   |
| 2947 | <b>155</b> | Isopropyl chloroacetate   |
| 2948 | <b>153</b> | 3-Trifluoromethylaniline  |
| 2949 | <b>154</b> | Sodium hydrosulfide, hydrated, with not less than 25% water of crystallization  |
| 2949 | <b>154</b> | Sodium hydrosulfide, with not less than 25% water of crystallization            |
| 2949 | <b>154</b> | Sodium hydrosulphide, hydrated, with not less than 25% water of crystallization |
| 2949 | <b>154</b> | Sodium hydrosulphide, with not less than 25% water of crystallization           |
| 2950 | <b>138</b> | Magnesium granules, coated  |
| 2956 | <b>149</b> | 5-tert-Butyl-2,4,6-trinitro-m-xylene  |

**ID Guide Name of Material  
No. No.**

|      |             |  |
|------|-------------|--|
| 2956 | <b>149</b>  | Musk xylene  |
| 2965 | <b>139</b>  | Boron trifluoride dimethyl etherate  |
| 2966 | <b>153</b>  | Thioglycol   |
| 2967 | <b>154</b>  | Sulfamic acid  |
| 2967 | <b>154</b>  | Sulphamic acid   |
| 2968 | <b>135</b>  | Maneb, stabilized  |
| 2968 | <b>135</b>  | Maneb preparation, stabilized  |
| 2969 | <b>171</b>  | Castor beans, meal, pomace or flake  |
| 2977 | <b>166</b>  | Radioactive material, Uranium hexafluoride, fissile  |
| 2977 | <b>166</b>  | Uranium hexafluoride, radioactive material, fissile  |
| 2978 | <b>166</b>  | Radioactive material, Uranium hexafluoride, non fissile or fissile-excepted                    |
| 2978 | <b>166</b>  | Uranium hexafluoride, radioactive material, non fissile or fissile-excepted                    |
| 2983 | <b>131P</b> | Ethylene oxide and Propylene oxide mixture, with not more than 30% Ethylene oxide              |
| 2983 | <b>131P</b> | Propylene oxide and Ethylene oxide mixture, with not more than 30% Ethylene oxide              |
| 2984 | <b>140</b>  | Hydrogen peroxide, aqueous solution, with not less than 8% but less than 20% Hydrogen peroxide |
| 2985 | <b>155</b>  | Chlorosilanes, flammable, corrosive, n.o.s.  |
| 2986 | <b>155</b>  | Chlorosilanes, corrosive, flammable, n.o.s.  |
| 2987 | <b>156</b>  | Chlorosilanes, corrosive, n.o.s.   |
| 2988 | <b>139</b>  | Chlorosilanes, water-reactive, flammable, corrosive, n.o.s.                                    |
| 2989 | <b>133</b>  | Lead phosphite, dibasic  |

**ID Guide Name of Material  
No. No.**

2990 **171** Life-saving appliances, self-inflating

2991 **131** Carbamate pesticide, liquid, poisonous, flammable

2991 **131** Carbamate pesticide, liquid, toxic, flammable

2992 **151** Carbamate pesticide, liquid, poisonous

2992 **151** Carbamate pesticide, liquid, toxic

2993 **131** Arsenical pesticide, liquid, poisonous, flammable

2993 **131** Arsenical pesticide, liquid, toxic, flammable

2994 **151** Arsenical pesticide, liquid, poisonous

2994 **151** Arsenical pesticide, liquid, toxic

2995 **131** Organochlorine pesticide, liquid, poisonous, flammable

2995 **131** Organochlorine pesticide, liquid, toxic, flammable

2996 **151** Organochlorine pesticide, liquid, poisonous

2996 **151** Organochlorine pesticide, liquid, toxic

2997 **131** Triazine pesticide, liquid, poisonous, flammable

2997 **131** Triazine pesticide, liquid, toxic, flammable

2998 **151** Triazine pesticide, liquid, poisonous

2998 **151** Triazine pesticide, liquid, toxic

3002 **151** Phenyl urea pesticide, liquid, poisonous

3002 **151** Phenyl urea pesticide, liquid, toxic

3005 **131** Thiocarbamate pesticide, liquid, poisonous, flammable

**ID Guide Name of Material  
No. No.**

3005 **131** Thiocarbamate pesticide, liquid, toxic, flammable

3006 **151** Thiocarbamate pesticide, liquid, poisonous

3006 **151** Thiocarbamate pesticide, liquid, toxic

3009 **131** Copper based pesticide, liquid, poisonous, flammable

3009 **131** Copper based pesticide, liquid, toxic, flammable

3010 **151** Copper based pesticide, liquid, poisonous

3010 **151** Copper based pesticide, liquid, toxic

3011 **131** Mercury based pesticide, liquid, poisonous, flammable

3011 **131** Mercury based pesticide, liquid, toxic, flammable

3012 **151** Mercury based pesticide, liquid, poisonous

3012 **151** Mercury based pesticide, liquid, toxic

3013 **131** Substituted nitrophenol pesticide, liquid, poisonous, flammable

3013 **131** Substituted nitrophenol pesticide, liquid, toxic, flammable

3014 **153** Substituted nitrophenol pesticide, liquid, poisonous

3014 **153** Substituted nitrophenol pesticide, liquid, toxic

3015 **131** Bipyridilium pesticide, liquid, poisonous, flammable

3015 **131** Bipyridilium pesticide, liquid, toxic, flammable

3016 **151** Bipyridilium pesticide, liquid, poisonous

3016 **151** Bipyridilium pesticide, liquid, toxic

**ID Guide Name of Material**  
**No. No.**

**ID Guide Name of Material**  
**No. No.**

3017 **131** Organophosphorus pesticide,  
liquid, poisonous, flammable

3017 **131** Organophosphorus pesticide,  
liquid, toxic, flammable

3018 **152** Organophosphorus pesticide,  
liquid, poisonous

3018 **152** Organophosphorus pesticide,  
liquid, toxic

3019 **131** Organotin pesticide, liquid,  
poisonous, flammable

3019 **131** Organotin pesticide, liquid,  
toxic, flammable

3020 **153** Organotin pesticide, liquid,  
poisonous

3020 **153** Organotin pesticide, liquid, toxic

3021 **131** Pesticide, liquid, flammable,  
poisonous, n.o.s.

3021 **131** Pesticide, liquid, flammable,  
toxic, n.o.s.

3022 **127P** 1,2-Butylene oxide, stabilized

**3023 131** 2-Methyl-2-heptanethiol

3024 **131** Coumarin derivative pesticide,  
liquid, flammable, poisonous

3024 **131** Coumarin derivative pesticide,  
liquid, flammable, toxic

3025 **131** Coumarin derivative pesticide,  
liquid, poisonous, flammable

3025 **131** Coumarin derivative pesticide,  
liquid, toxic, flammable

3026 **151** Coumarin derivative pesticide,  
liquid, poisonous

3026 **151** Coumarin derivative pesticide,  
liquid, toxic

3027 **151** Coumarin derivative pesticide,  
solid, poisonous

3027 **151** Coumarin derivative pesticide,  
solid, toxic

3028 **154** Batteries, dry, containing  
Potassium hydroxide solid

**3048 157** Aluminum phosphide pesticide

3051 **135** Aluminum alkyls

3053 **135** Magnesium alkyls

3054 **129** Cyclohexanethiol

3054 **129** Cyclohexyl mercaptan

3055 **154** 2-(2-Aminoethoxy)ethanol

3056 **129** n-Heptaldehyde

**3057 125** Trifluoroacetyl chloride

3064 **127** Nitroglycerin, solution in  
alcohol, with more than  
1% but not more than 5%  
Nitroglycerin

3065 **127** Alcoholic beverages

3066 **153** Paint (corrosive)

3066 **153** Paint related material  
(corrosive)

3070 **126** Dichlorodifluoromethane and  
Ethylene oxide mixture,  
with not more than 12.5%  
Ethylene oxide

3070 **126** Ethylene oxide and  
Dichlorodifluoromethane  
mixture, with not more than  
12.5% Ethylene oxide

3071 **131** Mercaptan mixture, liquid,  
poisonous, flammable, n.o.s.

3071 **131** Mercaptan mixture, liquid, toxic,  
flammable, n.o.s.

3071 **131** Mercaptans, liquid, poisonous,  
flammable, n.o.s.

3071 **131** Mercaptans, liquid, toxic,  
flammable, n.o.s.

3072 **171** Life-saving appliances, not self-  
inflating

3073 **131P** Vinylpyridines, stabilized

3076 **138** Aluminum alkyl hydrides

3077 **171** Environmentally hazardous  
substance, solid, n.o.s.

**ID Guide Name of Material  
No. No.**

|      |      |   |
|------|------|---|
| 3077 | 171  | Hazardous waste, solid, n.o.s.                              |
| 3077 | 171  | Other regulated substances, solid, n.o.s.                   |
| 3078 | 138  | Cerium, turnings or gritty powder                           |
| 3079 | 131P | Methacrylonitrile, stabilized                               |
| 3080 | 155  | Isocyanate solution, poisonous, flammable, n.o.s.           |
| 3080 | 155  | Isocyanate solution, toxic, flammable, n.o.s.               |
| 3080 | 155  | Isocyanates, poisonous, flammable, n.o.s.                   |
| 3080 | 155  | Isocyanates, toxic, flammable, n.o.s.                       |
| 3082 | 171  | Environmentally hazardous substance, liquid, n.o.s.         |
| 3082 | 171  | Hazardous waste, liquid, n.o.s.                             |
| 3082 | 171  | Other regulated substances, liquid, n.o.s.                  |
| 3083 | 124  | Perchloryl fluoride   |
| 3084 | 157  | Corrosive solid, oxidizing, n.o.s.                          |
| 3085 | 140  | Oxidizing solid, corrosive, n.o.s.                          |
| 3086 | 141  | Poisonous solid, oxidizing, n.o.s.                          |
| 3086 | 141  | Toxic solid, oxidizing, n.o.s.                              |
| 3087 | 141  | Oxidizing solid, poisonous, n.o.s.                          |
| 3087 | 141  | Oxidizing solid, toxic, n.o.s.                              |
| 3088 | 135  | Self-heating solid, organic, n.o.s.                         |
| 3089 | 170  | Metal powder, flammable, n.o.s.                             |
| 3090 | 138  | Lithium batteries   |
| 3090 | 138  | Lithium metal batteries (including lithium alloy batteries) |
| 3091 | 138  | Lithium batteries contained in equipment                    |

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|------|-----|--|
| 3091 | 138 | Lithium batteries packed with equipment  |
| 3091 | 138 | Lithium metal batteries contained in equipment (including lithium alloy batteries) |
| 3091 | 138 | Lithium metal batteries packed with equipment (including lithium alloy batteries)  |
| 3092 | 129 | 1-Methoxy-2-propanol   |
| 3093 | 157 | Corrosive liquid, oxidizing, n.o.s.  |
| 3094 | 138 | Corrosive liquid, water-reactive, n.o.s.   |
| 3095 | 136 | Corrosive solid, self-heating, n.o.s.  |
| 3096 | 138 | Corrosive solid, water-reactive, n.o.s.  |
| 3097 | 140 | Flammable solid, oxidizing, n.o.s.   |
| 3098 | 140 | Oxidizing liquid, corrosive, n.o.s.  |
| 3099 | 142 | Oxidizing liquid, poisonous, n.o.s.  |
| 3099 | 142 | Oxidizing liquid, toxic, n.o.s.  |
| 3100 | 135 | Oxidizing solid, self-heating, n.o.s.  |
| 3101 | 146 | Organic peroxide type B, liquid  |
| 3102 | 146 | Organic peroxide type B, solid   |
| 3103 | 146 | Organic peroxide type C, liquid  |
| 3104 | 146 | Organic peroxide type C, solid   |
| 3105 | 145 | Organic peroxide type D, liquid  |
| 3106 | 145 | Organic peroxide type D, solid   |
| 3107 | 145 | Organic peroxide type E, liquid  |
| 3108 | 145 | Organic peroxide type E, solid   |
| 3109 | 145 | Organic peroxide type F, liquid  |
| 3110 | 145 | Organic peroxide type F, solid   |

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| 3111 | <b>148</b> | Organic peroxide type B, liquid, temperature controlled |
| 3112 | <b>148</b> | Organic peroxide type B, solid, temperature controlled  |
| 3113 | <b>148</b> | Organic peroxide type C, liquid, temperature controlled |
| 3114 | <b>148</b> | Organic peroxide type C, solid, temperature controlled  |
| 3115 | <b>148</b> | Organic peroxide type D, liquid, temperature controlled |
| 3116 | <b>148</b> | Organic peroxide type D, solid, temperature controlled  |
| 3117 | <b>148</b> | Organic peroxide type E, liquid, temperature controlled |
| 3118 | <b>148</b> | Organic peroxide type E, solid, temperature controlled  |
| 3119 | <b>148</b> | Organic peroxide type F, liquid, temperature controlled |
| 3120 | <b>148</b> | Organic peroxide type F, solid, temperature controlled  |
| 3121 | <b>144</b> | Oxidizing solid, water-reactive, n.o.s.                 |
| 3122 | <b>142</b> | Poisonous liquid, oxidizing, n.o.s.                     |
| 3122 | <b>142</b> | Toxic liquid, oxidizing, n.o.s.                         |
| 3123 | <b>139</b> | Poisonous liquid, water-reactive, n.o.s.                |
| 3123 | <b>139</b> | Toxic liquid, water-reactive, n.o.s.                    |
| 3124 | <b>136</b> | Poisonous solid, self-heating, n.o.s.                   |
| 3124 | <b>136</b> | Toxic solid, self-heating, n.o.s.                       |
| 3125 | <b>139</b> | Poisonous solid, water-reactive, n.o.s.                 |
| 3125 | <b>139</b> | Toxic solid, water-reactive, n.o.s.                     |
| 3126 | <b>136</b> | Self-heating solid, corrosive, organic, n.o.s.          |

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|------|------------|--|
| 3127 | <b>135</b> | Self-heating solid, oxidizing, n.o.s.  |
| 3128 | <b>136</b> | Self-heating solid, poisonous, organic, n.o.s.   |
| 3128 | <b>136</b> | Self-heating solid, toxic, organic, n.o.s.   |
| 3129 | <b>138</b> | Water-reactive liquid, corrosive, n.o.s.   |
| 3130 | <b>139</b> | Water-reactive liquid, poisonous, n.o.s.   |
| 3130 | <b>139</b> | Water-reactive liquid, toxic, n.o.s.   |
| 3131 | <b>138</b> | Water-reactive solid, corrosive, n.o.s.  |
| 3132 | <b>138</b> | Water-reactive solid, flammable, n.o.s.  |
| 3133 | <b>138</b> | Water-reactive solid, oxidizing, n.o.s.  |
| 3134 | <b>139</b> | Water-reactive solid, poisonous, n.o.s.  |
| 3134 | <b>139</b> | Water-reactive solid, toxic, n.o.s.  |
| 3135 | <b>138</b> | Water-reactive solid, self-heating, n.o.s.   |
| 3136 | <b>120</b> | Trifluoromethane, refrigerated liquid  |
| 3137 | <b>140</b> | Oxidizing solid, flammable, n.o.s.   |
| 3138 | <b>115</b> | Acetylene, Ethylene and Propylene in mixture, refrigerated liquid containing at least 71.5% Ethylene with not more than 22.5% Acetylene and not more than 6% Propylene |
| 3138 | <b>115</b> | Ethylene, Acetylene and Propylene in mixture, refrigerated liquid containing at least 71.5% Ethylene with not more than 22.5% Acetylene and not more than 6% Propylene |



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- 3138 **115** Propylene, Ethylene and Acetylene in mixture, refrigerated liquid containing at least 71.5% Ethylene with not more than 22.5% Acetylene and not more than 6% Propylene
- 3139 **140** Oxidizing liquid, n.o.s.
- 3140 **151** Alkaloids, liquid, n.o.s. (poisonous)
- 3140 **151** Alkaloid salts, liquid, n.o.s. (poisonous)
- 3141 **157** Antimony compound, inorganic, liquid, n.o.s.
- 3142 **151** Disinfectant, liquid, poisonous, n.o.s.
- 3142 **151** Disinfectant, liquid, toxic, n.o.s.
- 3143 **151** Dye, solid, poisonous, n.o.s.
- 3143 **151** Dye, solid, toxic, n.o.s.
- 3143 **151** Dye intermediate, solid, poisonous, n.o.s.
- 3143 **151** Dye intermediate, solid, toxic, n.o.s.
- 3144 **151** Nicotine compound, liquid, n.o.s.
- 3144 **151** Nicotine preparation, liquid, n.o.s.
- 3145 **153** Alkylphenols, liquid, n.o.s. (including C2-C12 homologues)
- 3146 **153** Organotin compound, solid, n.o.s.
- 3147 **154** Dye, solid, corrosive, n.o.s.
- 3147 **154** Dye intermediate, solid, corrosive, n.o.s.
- 3148 **138** Water-reactive liquid, n.o.s.

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- 3149 **140** Hydrogen peroxide and Peroxyacetic acid mixture, with acid(s), water and not more than 5% Peroxyacetic acid, stabilized
- 3149 **140** Peroxyacetic acid and hydrogen peroxide mixture, with acid(s), water and not more than 5% Peroxyacetic acid, stabilized
- 3150 **115** Devices, small, hydrocarbon gas powered, with release device
- 3150 **115** Hydrocarbon gas refills for small devices, with release device
- 3151 **171** Halogenated monomethyldiphenylmethanes, liquid
- 3151 **171** Polyhalogenated biphenyls, liquid
- 3151 **171** Polyhalogenated terphenyls, liquid
- 3152 **171** Halogenated monomethyldiphenylmethanes, solid
- 3152 **171** Polyhalogenated biphenyls, solid
- 3152 **171** Polyhalogenated terphenyls, solid
- 3153 **115** Perfluoro(methyl vinyl ether)
- 3154 **115** Perfluoro(ethyl vinyl ether)
- 3155 **154** Pentachlorophenol
- 3156 **122** Compressed gas, oxidizing, n.o.s.
- 3157 **122** Liquefied gas, oxidizing, n.o.s.
- 3158 **120** Gas, refrigerated liquid, n.o.s.
- 3159 **126** Refrigerant gas R-134a
- 3159 **126** 1,1,1,2-Tetrafluoroethane
- 3160 **119** Liquefied gas, poisonous, flammable, n.o.s.

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|      |     |  |
|------|-----|--|
| 3160 | 119 | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A) |
| 3160 | 119 | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B) |
| 3160 | 119 | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C) |
| 3160 | 119 | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D) |
| 3160 | 119 | Liquefied gas, toxic, flammable, n.o.s.                                |
| 3160 | 119 | Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)     |
| 3160 | 119 | Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)     |
| 3160 | 119 | Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)     |
| 3160 | 119 | Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)     |
| 3161 | 115 | Liquefied gas, flammable, n.o.s.                                       |
| 3162 | 123 | Liquefied gas, poisonous, n.o.s.                                       |
| 3162 | 123 | Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone A)            |
| 3162 | 123 | Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone B)            |
| 3162 | 123 | Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone C)            |
| 3162 | 123 | Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone D)            |
| 3162 | 123 | Liquefied gas, toxic, n.o.s.   |
| 3162 | 123 | Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone A)                |
| 3162 | 123 | Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone B)                |

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|------|-----|--|
| 3162 | 123 | Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone C)                            |
| 3162 | 123 | Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone D)                            |
| 3163 | 126 | Liquefied gas, n.o.s.  |
| 3164 | 126 | Articles, pressurized, hydraulic (containing non-flammable gas)                    |
| 3164 | 126 | Articles, pressurized, pneumatic (containing non-flammable gas)                    |
| 3165 | 131 | Aircraft hydraulic power unit fuel tank  |
| 3166 | 115 | Engine, fuel cell, flammable gas powered   |
| 3166 | 128 | Engine, fuel cell, flammable liquid powered  |
| 3166 | 128 | Engine, internal combustion  |
| 3166 | 115 | Engines, internal combustion, flammable gas powered                                |
| 3166 | 128 | Engines, internal combustion, flammable liquid powered                             |
| 3166 | 115 | Vehicle, flammable gas powered   |
| 3166 | 128 | Vehicle, flammable liquid powered  |
| 3166 | 115 | Vehicle, fuel cell, flammable gas powered  |
| 3166 | 128 | Vehicle, fuel cell, flammable liquid powered                                       |
| 3167 | 115 | Gas sample, non-pressurized, flammable, n.o.s., not refrigerated liquid            |
| 3168 | 119 | Gas sample, non-pressurized, poisonous, flammable, n.o.s., not refrigerated liquid |
| 3168 | 119 | Gas sample, non-pressurized, toxic, flammable, n.o.s., not refrigerated liquid     |

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|------|-----|---|
| 3169 | 123 | Gas sample, non-pressurized, poisonous, n.o.s., not refrigerated liquid |
| 3169 | 123 | Gas sample, non-pressurized, toxic, n.o.s., not refrigerated liquid     |
| 3170 | 138 | Aluminum dross  |
| 3170 | 138 | Aluminum remelting by-products  |
| 3170 | 138 | Aluminum smelting by-products   |
| 3171 | 154 | Battery-powered equipment (wet battery)                                 |
| 3171 | 147 | Battery-powered equipment (with lithium ion batteries)                  |
| 3171 | 138 | Battery-powered equipment (with lithium metal batteries)                |
| 3171 | 138 | Battery-powered equipment (with sodium batteries)                       |
| 3171 | 154 | Battery-powered vehicle (wet battery)                                   |
| 3171 | 147 | Battery-powered vehicle (with lithium ion batteries)                    |
| 3171 | 138 | Battery-powered vehicle (with sodium batteries)                         |
| 3171 | 154 | Wheelchair, electric, with batteries                                    |
| 3172 | 153 | Toxins, extracted from living sources, liquid, n.o.s.                   |
| 3174 | 135 | Titanium disulfide  |
| 3174 | 135 | Titanium disulphide   |
| 3175 | 133 | Solids containing flammable liquid, n.o.s.                              |
| 3176 | 133 | Flammable solid, organic, molten, n.o.s.                                |
| 3178 | 133 | Flammable solid, inorganic, n.o.s.                                      |
| 3178 | 133 | Smokeless powder for small arms   |
| 3179 | 134 | Flammable solid, poisonous, inorganic, n.o.s.                           |

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| 3179 | 134 | Flammable solid, toxic, inorganic, n.o.s.           |
| 3180 | 134 | Flammable solid, corrosive, inorganic, n.o.s.       |
| 3181 | 133 | Metal salts of organic compounds, flammable, n.o.s. |
| 3182 | 170 | Metal hydrides, flammable, n.o.s.                   |
| 3183 | 135 | Self-heating liquid, organic, n.o.s.                |
| 3184 | 136 | Self-heating liquid, poisonous, organic, n.o.s.     |
| 3184 | 136 | Self-heating liquid, toxic, organic, n.o.s.         |
| 3185 | 136 | Self-heating liquid, corrosive, organic, n.o.s.     |
| 3186 | 135 | Self-heating liquid, inorganic, n.o.s.              |
| 3187 | 136 | Self-heating liquid, poisonous, inorganic, n.o.s.   |
| 3187 | 136 | Self-heating liquid, toxic, inorganic, n.o.s.       |
| 3188 | 136 | Self-heating liquid, corrosive, inorganic, n.o.s.   |
| 3189 | 135 | Metal powder, self-heating, n.o.s.                  |
| 3190 | 135 | Self-heating solid, inorganic, n.o.s.               |
| 3191 | 136 | Self-heating solid, poisonous, inorganic, n.o.s.    |
| 3191 | 136 | Self-heating solid, toxic, inorganic, n.o.s.        |
| 3192 | 136 | Self-heating solid, corrosive, inorganic, n.o.s.    |
| 3194 | 135 | Pyrophoric liquid, inorganic, n.o.s.                |
| 3200 | 135 | Pyrophoric solid, inorganic, n.o.s.                 |

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| 3205 | <b>135</b> | Alkaline earth metal alcoholates, n.o.s.                  |
| 3206 | <b>136</b> | Alkali metal alcoholates, self-heating, corrosive, n.o.s. |
| 3208 | <b>138</b> | Metallic substance, water-reactive, n.o.s.                |
| 3209 | <b>138</b> | Metallic substance, water-reactive, self-heating, n.o.s.  |
| 3210 | <b>140</b> | Chlorates, inorganic, aqueous solution, n.o.s.            |
| 3211 | <b>140</b> | Perchlorates, inorganic, aqueous solution, n.o.s.         |
| 3212 | <b>140</b> | Hypochlorites, inorganic, n.o.s.                          |
| 3213 | <b>140</b> | Bromates, inorganic, aqueous solution, n.o.s.             |
| 3214 | <b>140</b> | Permanganates, inorganic, aqueous solution, n.o.s.        |
| 3215 | <b>140</b> | Persulfates, inorganic, n.o.s.                            |
| 3215 | <b>140</b> | Persulphates, inorganic, n.o.s.                           |
| 3216 | <b>140</b> | Persulfates, inorganic, aqueous solution, n.o.s.          |
| 3216 | <b>140</b> | Persulphates, inorganic, aqueous solution, n.o.s.         |
| 3218 | <b>140</b> | Nitrates, inorganic, aqueous solution, n.o.s.             |
| 3219 | <b>140</b> | Nitrites, inorganic, aqueous solution, n.o.s.             |
| 3220 | <b>126</b> | Pentafluoroethane   |
| 3220 | <b>126</b> | Refrigerant gas R-125                                     |
| 3221 | <b>149</b> | Self-reactive liquid type B                               |
| 3222 | <b>149</b> | Self-reactive solid type B                                |
| 3223 | <b>149</b> | Self-reactive liquid type C                               |
| 3224 | <b>149</b> | Self-reactive solid type C                                |
| 3225 | <b>149</b> | Self-reactive liquid type D                               |
| 3226 | <b>149</b> | Self-reactive solid type D                                |
| 3227 | <b>149</b> | Self-reactive liquid type E                               |

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| 3228 | <b>149</b> | Self-reactive solid type E                          |
| 3229 | <b>149</b> | Self-reactive liquid type F                         |
| 3230 | <b>149</b> | Self-reactive solid type F                          |
| 3231 | <b>150</b> | Self-reactive liquid type B, temperature controlled |
| 3232 | <b>150</b> | Self-reactive solid type B, temperature controlled  |
| 3233 | <b>150</b> | Self-reactive liquid type C, temperature controlled |
| 3234 | <b>150</b> | Self-reactive solid type C, temperature controlled  |
| 3235 | <b>150</b> | Self-reactive liquid type D, temperature controlled |
| 3236 | <b>150</b> | Self-reactive solid type D, temperature controlled  |
| 3237 | <b>150</b> | Self-reactive liquid type E, temperature controlled |
| 3238 | <b>150</b> | Self-reactive solid type E, temperature controlled  |
| 3239 | <b>150</b> | Self-reactive liquid type F, temperature controlled |
| 3240 | <b>150</b> | Self-reactive solid type F, temperature controlled  |
| 3241 | <b>133</b> | 2-Bromo-2-nitropropane-1, 3-diol                    |
| 3242 | <b>149</b> | Azodicarbonamide                                    |
| 3243 | <b>151</b> | Solids containing poisonous liquid, n.o.s.          |
| 3243 | <b>151</b> | Solids containing toxic liquid, n.o.s.              |
| 3244 | <b>154</b> | Solids containing corrosive liquid, n.o.s.          |
| 3245 | <b>171</b> | Genetically modified micro-organisms                |
| 3245 | <b>171</b> | Genetically modified organisms                      |
| 3246 | <b>156</b> | Methanesulfonyl chloride                            |
| 3246 | <b>156</b> | Methanesulphonyl chloride                           |

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|      |     |  |
|------|-----|--|
| 3247 | 140 | Sodium peroxoborate, anhydrous   |
| 3248 | 131 | Medicine, liquid, flammable, poisonous, n.o.s.   |
| 3248 | 131 | Medicine, liquid, flammable, toxic, n.o.s.   |
| 3249 | 151 | Medicine, solid, poisonous, n.o.s.   |
| 3249 | 151 | Medicine, solid, toxic, n.o.s.   |
| 3250 | 153 | Chloroacetic acid, molten  |
| 3251 | 133 | Isosorbide-5-mononitrate   |
| 3252 | 115 | Difluoromethane  |
| 3252 | 115 | Refrigerant gas R-32   |
| 3253 | 154 | Disodium trioxosilicate  |
| 3254 | 135 | Tributylphosphane  |
| 3255 | 135 | tert-Butyl hypochlorite  |
| 3256 | 128 | Elevated temperature liquid, flammable, n.o.s., with flash point above 37.8°C (100°F), at or above its flash point |
| 3256 | 128 | Elevated temperature liquid, flammable, n.o.s., with flash point above 60°C (140°F), at or above its flash point   |
| 3257 | 171 | Elevated temperature liquid, n.o.s., at or above 100°C (212°F), and below its flash point                          |
| 3258 | 171 | Elevated temperature solid, n.o.s., at or above 240°C (464°F)  |
| 3259 | 154 | Amines, solid, corrosive, n.o.s.   |
| 3259 | 154 | Polyamines, solid, corrosive, n.o.s.   |
| 3260 | 154 | Corrosive solid, acidic, inorganic, n.o.s.   |
| 3261 | 154 | Corrosive solid, acidic, organic, n.o.s.   |

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|------|-----|--|
| 3262 | 154 | Corrosive solid, basic, inorganic, n.o.s.    |
| 3263 | 154 | Corrosive solid, basic, organic, n.o.s.      |
| 3264 | 154 | Corrosive liquid, acidic, inorganic, n.o.s.  |
| 3265 | 153 | Corrosive liquid, acidic, organic, n.o.s.    |
| 3266 | 154 | Corrosive liquid, basic, inorganic, n.o.s.   |
| 3267 | 153 | Corrosive liquid, basic, organic, n.o.s.     |
| 3268 | 171 | Air bag inflators                            |
| 3268 | 171 | Air bag modules                              |
| 3268 | 171 | Safety devices                               |
| 3268 | 171 | Seat-belt pre-tensioners                     |
| 3269 | 128 | Polyester resin kit, liquid base material    |
| 3270 | 133 | Nitrocellulose membrane filters              |
| 3271 | 127 | Ethers, n.o.s.                               |
| 3272 | 127 | Esters, n.o.s.                               |
| 3273 | 131 | Nitriles, flammable, poisonous, n.o.s.       |
| 3273 | 131 | Nitriles, flammable, toxic, n.o.s.           |
| 3274 | 132 | Alcoholates solution, n.o.s., in alcohol     |
| 3275 | 131 | Nitriles, poisonous, flammable, n.o.s.       |
| 3275 | 131 | Nitriles, toxic, flammable, n.o.s.           |
| 3276 | 151 | Nitriles, liquid, poisonous, n.o.s.          |
| 3276 | 151 | Nitriles, liquid, toxic, n.o.s.              |
| 3276 | 151 | Nitriles, poisonous, liquid, n.o.s.          |
| 3276 | 151 | Nitriles, toxic, liquid, n.o.s.              |
| 3277 | 154 | Chloroformates, poisonous, corrosive, n.o.s. |

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| 3277 | 154 | Chloroformates, toxic, corrosive, n.o.s.                |
| 3278 | 151 | Organophosphorus compound, liquid, poisonous, n.o.s.    |
| 3278 | 151 | Organophosphorus compound, liquid, toxic, n.o.s.        |
| 3278 | 151 | Organophosphorus compound, poisonous, liquid, n.o.s.    |
| 3278 | 151 | Organophosphorus compound, toxic, liquid, n.o.s.        |
| 3279 | 131 | Organophosphorus compound, poisonous, flammable, n.o.s. |
| 3279 | 131 | Organophosphorus compound, toxic, flammable, n.o.s.     |
| 3280 | 151 | Organoarsenic compound, liquid, n.o.s.                  |
| 3281 | 151 | Metal carbonyls, liquid, n.o.s.                         |
| 3282 | 151 | Organometallic compound, liquid, poisonous, n.o.s.      |
| 3282 | 151 | Organometallic compound, liquid, toxic, n.o.s.          |
| 3282 | 151 | Organometallic compound, poisonous, liquid, n.o.s.      |
| 3282 | 151 | Organometallic compound, toxic, liquid, n.o.s.          |
| 3283 | 151 | Selenium compound, solid, n.o.s.                        |
| 3284 | 151 | Tellurium compound, n.o.s.                              |
| 3285 | 151 | Vanadium compound, n.o.s.                               |
| 3286 | 131 | Flammable liquid, poisonous, corrosive, n.o.s.          |
| 3286 | 131 | Flammable liquid, toxic, corrosive, n.o.s.              |
| 3287 | 151 | Poisonous liquid, inorganic, n.o.s.                     |
| 3287 | 151 | Toxic liquid, inorganic, n.o.s.                         |
| 3288 | 151 | Poisonous solid, inorganic, n.o.s.                      |

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|------|-----|--|
| 3288 | 151 | Toxic solid, inorganic, n.o.s.   |
| 3289 | 154 | Poisonous liquid, corrosive, inorganic, n.o.s.   |
| 3289 | 154 | Toxic liquid, corrosive, inorganic, n.o.s.   |
| 3290 | 154 | Poisonous solid, corrosive, inorganic, n.o.s.  |
| 3290 | 154 | Toxic solid, corrosive, inorganic, n.o.s.  |
| 3291 | 158 | (Bio)Medical waste, n.o.s.   |
| 3291 | 158 | Clinical waste, unspecified, n.o.s.  |
| 3291 | 158 | Medical waste, n.o.s.  |
| 3291 | 158 | Regulated medical waste, n.o.s.  |
| 3292 | 138 | Batteries, containing Sodium   |
| 3292 | 138 | Cells, containing Sodium   |
| 3292 | 138 | Sodium, batteries containing   |
| 3293 | 152 | Hydrazine, aqueous solution, with not more than 37% Hydrazine                              |
| 3294 | 131 | Hydrogen cyanide, solution in alcohol, with not more than 45% Hydrogen cyanide             |
| 3295 | 128 | Hydrocarbons, liquid, n.o.s.   |
| 3296 | 126 | Heptafluoropropane   |
| 3296 | 126 | Refrigerant gas R-227  |
| 3297 | 126 | Chlorotetrafluoroethane and Ethylene oxide mixture, with not more than 8.8% Ethylene oxide |
| 3297 | 126 | Ethylene oxide and Chlorotetrafluoroethane mixture, with not more than 8.8% Ethylene oxide |
| 3298 | 126 | Ethylene oxide and Pentafluoroethane mixture, with not more than 7.9% Ethylene oxide       |

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|------|------|--|
| 3298 | 126  | Pentafluoroethane and Ethylene oxide mixture, with not more than 7.9% Ethylene oxide |
| 3299 | 126  | Ethylene oxide and Tetrafluoroethane mixture, with not more than 5.6% Ethylene oxide |
| 3299 | 126  | Tetrafluoroethane and Ethylene oxide mixture, with not more than 5.6% Ethylene oxide |
| 3300 | 119P | Carbon dioxide and Ethylene oxide mixture, with more than 87% Ethylene oxide         |
| 3300 | 119P | Ethylene oxide and Carbon dioxide mixture, with more than 87% Ethylene oxide         |
| 3301 | 136  | Corrosive liquid, self-heating, n.o.s.   |
| 3302 | 152  | 2-Dimethylaminoethyl acrylate  |
| 3303 | 124  | Compressed gas, poisonous, oxidizing, n.o.s.   |
| 3303 | 124  | Compressed gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone A)              |
| 3303 | 124  | Compressed gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone B)              |
| 3303 | 124  | Compressed gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone C)              |
| 3303 | 124  | Compressed gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone D)              |
| 3303 | 124  | Compressed gas, toxic, oxidizing, n.o.s.   |
| 3303 | 124  | Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone A)                  |
| 3303 | 124  | Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone B)                  |

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|------|-----|--|
| 3303 | 124 | Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone C)                |
| 3303 | 124 | Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone D)                |
| 3304 | 125 | Compressed gas, poisonous, corrosive, n.o.s.                                       |
| 3304 | 125 | Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone A)            |
| 3304 | 125 | Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone B)            |
| 3304 | 125 | Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone C)            |
| 3304 | 125 | Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone D)            |
| 3304 | 125 | Compressed gas, toxic, corrosive, n.o.s.   |
| 3304 | 125 | Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone A)                |
| 3304 | 125 | Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone B)                |
| 3304 | 125 | Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone C)                |
| 3304 | 125 | Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone D)                |
| 3305 | 119 | Compressed gas, poisonous, flammable, corrosive, n.o.s.                            |
| 3305 | 119 | Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A) |
| 3305 | 119 | Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B) |

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|      |     |  |
|------|-----|--|
| 3305 | 119 | Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C) |
| 3305 | 119 | Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D) |
| 3305 | 119 | Compressed gas, toxic, flammable, corrosive, n.o.s.                                |
| 3305 | 119 | Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)     |
| 3305 | 119 | Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)     |
| 3305 | 119 | Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)     |
| 3305 | 119 | Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)     |
| 3306 | 124 | Compressed gas, poisonous, oxidizing, corrosive, n.o.s.                            |
| 3306 | 124 | Compressed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A) |
| 3306 | 124 | Compressed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B) |
| 3306 | 124 | Compressed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C) |
| 3306 | 124 | Compressed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone D) |
| 3306 | 124 | Compressed gas, toxic, oxidizing, corrosive, n.o.s.                                |
| 3306 | 124 | Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A)     |
| 3306 | 124 | Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B)     |

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|      |     |  |
|------|-----|--|
| 3306 | 124 | Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C) |
| 3306 | 124 | Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone D) |
| 3307 | 124 | Liquefied gas, poisonous, oxidizing, n.o.s.                                    |
| 3307 | 124 | Liquefied gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone A)         |
| 3307 | 124 | Liquefied gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone B)         |
| 3307 | 124 | Liquefied gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone C)         |
| 3307 | 124 | Liquefied gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone D)         |
| 3307 | 124 | Liquefied gas, toxic, oxidizing, n.o.s.  |
| 3307 | 124 | Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone A)             |
| 3307 | 124 | Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone B)             |
| 3307 | 124 | Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone C)             |
| 3307 | 124 | Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone D)             |
| 3308 | 125 | Liquefied gas, poisonous, corrosive, n.o.s.                                    |
| 3308 | 125 | Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone A)         |
| 3308 | 125 | Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone B)         |



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|          |   |
|----------|---|
| 3308 125 | Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone C)            |
| 3308 125 | Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone D)            |
| 3308 125 | Liquefied gas, toxic, corrosive, n.o.s.   |
| 3308 125 | Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone A)                |
| 3308 125 | Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone B)                |
| 3308 125 | Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone C)                |
| 3308 125 | Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone D)                |
| 3309 119 | Liquefied gas, poisonous, flammable, corrosive, n.o.s.                            |
| 3309 119 | Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A) |
| 3309 119 | Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B) |
| 3309 119 | Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C) |
| 3309 119 | Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D) |
| 3309 119 | Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)     |
| 3309 119 | Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)     |

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|          |   |
|----------|---|
| 3309 119 | Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)     |
| 3309 119 | Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)     |
| 3310 124 | Liquefied gas, poisonous, oxidizing, corrosive, n.o.s.                            |
| 3310 124 | Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A) |
| 3310 124 | Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B) |
| 3310 124 | Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C) |
| 3310 124 | Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone D) |
| 3310 124 | Liquefied gas, toxic, oxidizing, corrosive, n.o.s.                                |
| 3310 124 | Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A)     |
| 3310 124 | Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B)     |
| 3310 124 | Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C)     |
| 3310 124 | Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone D)     |
| 3311 122 | Gas, refrigerated liquid, oxidizing, n.o.s.                                       |
| 3312 115 | Gas, refrigerated liquid, flammable, n.o.s.                                       |
| 3313 135 | Organic pigments, self-heating  |
| 3314 171 | Plastic molding compound  |
| 3314 171 | Plastics moulding compound  |

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|------|-----|--|
| 3315 | 151 | Chemical sample, poisonous   |
| 3315 | 151 | Chemical sample, toxic   |
| 3316 | 171 | Chemical kit   |
| 3316 | 171 | First aid kit  |
| 3317 | 113 | 2-Amino-4,6-dinitrophenol, wetted with not less than 20% water   |
| 3318 | 125 | Ammonia solution, with more than 50% Ammonia   |
| 3319 | 113 | Nitroglycerin mixture, desensitized, solid, n.o.s., with more than 2% but not more than 10% Nitroglycerin                          |
| 3320 | 157 | Sodium borohydride and Sodium hydroxide solution, with not more than 12% Sodium borohydride and not more than 40% Sodium hydroxide |
| 3321 | 162 | Radioactive material, low specific activity (LSA-II), non fissile or fissile-excepted  |
| 3322 | 162 | Radioactive material, low specific activity (LSA-III), non fissile or fissile-excepted   |
| 3323 | 163 | Radioactive material, Type C package, non fissile or fissile excepted  |
| 3324 | 165 | Radioactive material, low specific activity (LSA-II), fissile  |
| 3325 | 165 | Radioactive material, low specific activity (LSA-III), fissile   |
| 3326 | 165 | Radioactive material, surface contaminated objects (SCO-I), fissile  |
| 3326 | 165 | Radioactive material, surface contaminated objects (SCO-II), fissile   |
| 3327 | 165 | Radioactive material, Type A package, fissile, non-special form  |

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|      |     |   |
|------|-----|---|
| 3328 | 165 | Radioactive material, Type B(U) package, fissile  |
| 3329 | 165 | Radioactive material, Type B(M) package, fissile  |
| 3330 | 165 | Radioactive material, Type C package, fissile   |
| 3331 | 165 | Radioactive material, transported under special arrangement, fissile  |
| 3332 | 164 | Radioactive material, Type A package, special form, non fissile or fissile-excepted                             |
| 3333 | 165 | Radioactive material, Type A package, special form, fissile   |
| 3334 | 171 | Aviation regulated liquid, n.o.s.   |
| 3334 | 171 | Self-defense spray, non-pressurized   |
| 3335 | 171 | Aviation regulated solid, n.o.s.  |
| 3336 | 130 | Mercaptan mixture, liquid, flammable, n.o.s.  |
| 3336 | 130 | Mercaptans, liquid, flammable, n.o.s.   |
| 3337 | 126 | Refrigerant gas R-404A  |
| 3338 | 126 | Refrigerant gas R-407A  |
| 3339 | 126 | Refrigerant gas R-407B  |
| 3340 | 126 | Refrigerant gas R-407C  |
| 3341 | 135 | Thiourea dioxide  |
| 3342 | 135 | Xanthates   |
| 3343 | 113 | Nitroglycerin mixture, desensitized, liquid, flammable, n.o.s., with not more than 30% Nitroglycerin            |
| 3344 | 113 | Pentaerythrite tetranitrate mixture, desensitized, solid, n.o.s., with more than 10% but not more than 20% PETN |

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- 3344 113 Pentaerythritol tetranitrate mixture, desensitized, solid, n.o.s., with more than 10% but not more than 20% PETN
- 3344 113 PETN mixture, desensitized, solid, n.o.s., with more than 10% but not more than 20% PETN
- 3345 153 Phenoxyacetic acid derivative pesticide, solid, poisonous
- 3345 153 Phenoxyacetic acid derivative pesticide, solid, toxic
- 3346 131 Phenoxyacetic acid derivative pesticide, liquid, flammable, poisonous
- 3346 131 Phenoxyacetic acid derivative pesticide, liquid, flammable, toxic
- 3347 131 Phenoxyacetic acid derivative pesticide, liquid, poisonous, flammable
- 3347 131 Phenoxyacetic acid derivative pesticide, liquid, toxic, flammable
- 3348 153 Phenoxyacetic acid derivative pesticide, liquid, poisonous
- 3348 153 Phenoxyacetic acid derivative pesticide, liquid, toxic
- 3349 151 Pyrethroid pesticide, solid, poisonous
- 3349 151 Pyrethroid pesticide, solid, toxic
- 3350 131 Pyrethroid pesticide, liquid, flammable, poisonous
- 3350 131 Pyrethroid pesticide, liquid, flammable, toxic
- 3351 131 Pyrethroid pesticide, liquid, poisonous, flammable
- 3351 131 Pyrethroid pesticide, liquid, toxic, flammable
- 3352 151 Pyrethroid pesticide, liquid, poisonous

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- 3352 151 Pyrethroid pesticide, liquid, toxic
- 3354 115 Insecticide gas, flammable, n.o.s.
- 3355 119 Insecticide gas, poisonous, flammable, n.o.s.
- 3355 119 Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)
- 3355 119 Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)
- 3355 119 Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)
- 3355 119 Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D)
- 3355 119 Insecticide gas, toxic, flammable, n.o.s.
- 3355 119 Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)
- 3355 119 Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)
- 3355 119 Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)
- 3355 119 Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)
- 3356 140 Oxygen generator, chemical
- 3356 140 Oxygen generator, chemical, spent
- 3357 113 Nitroglycerin mixture, desensitized, liquid, n.o.s., with not more than 30% Nitroglycerin
- 3358 115 Refrigerating machines, containing flammable, non-poisonous, liquefied gas

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| 3358 | 115 | Refrigerating machines, containing flammable, non-toxic, liquefied gas |
| 3359 | 171 | Fumigated cargo transport unit   |
| 3360 | 133 | Fibers, vegetable, dry   |
| 3360 | 133 | Fibres, vegetable, dry   |
| 3361 | 156 | Chlorosilanes, poisonous, corrosive, n.o.s.                            |
| 3361 | 156 | Chlorosilanes, toxic, corrosive, n.o.s.                                |
| 3362 | 155 | Chlorosilanes, poisonous, corrosive, flammable, n.o.s.                 |
| 3362 | 155 | Chlorosilanes, toxic, corrosive, flammable, n.o.s.                     |
| 3363 | 171 | Dangerous goods in apparatus   |
| 3363 | 171 | Dangerous goods in articles  |
| 3363 | 171 | Dangerous goods in machinery   |
| 3364 | 113 | Picric acid, wetted with not less than 10% water                       |
| 3364 | 113 | Trinitrophenol, wetted with not less than 10% water                    |
| 3365 | 113 | Picryl chloride, wetted with not less than 10% water                   |
| 3365 | 113 | Trinitrochlorobenzene, wetted with not less than 10% water             |
| 3366 | 113 | TNT, wetted with not less than 10% water                               |
| 3366 | 113 | Trinitrotoluene, wetted with not less than 10% water                   |
| 3367 | 113 | Trinitrobenzene, wetted with not less than 10% water                   |
| 3368 | 113 | Trinitrobenzoic acid, wetted with not less than 10% water              |
| 3369 | 113 | Sodium dinitro-o-cresolate, wetted with not less than 10% water        |
| 3370 | 113 | Urea nitrate, wetted with not less than 10% water                      |
| 3371 | 129 | 2-Methylbutanal  |

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|------|-----|---|
| 3373 | 158 | Biological substance, category B  |
| 3374 | 116 | Acetylene, solvent free   |
| 3375 | 140 | Ammonium nitrate emulsion   |
| 3375 | 140 | Ammonium nitrate gel  |
| 3375 | 140 | Ammonium nitrate suspension   |
| 3376 | 113 | 4-Nitrophenylhydrazine, with not less than 30% water                              |
| 3377 | 140 | Sodium perborate monohydrate  |
| 3378 | 140 | Sodium carbonate peroxyhydrate  |
| 3379 | 113 | Desensitized explosive, liquid, n.o.s.  |
| 3380 | 113 | Desensitized explosive, solid, n.o.s.   |
| 3381 | 151 | Poisonous by inhalation liquid, n.o.s. (Inhalation Hazard Zone A)                 |
| 3381 | 151 | Toxic by inhalation liquid, n.o.s. (Inhalation Hazard Zone A)                     |
| 3382 | 151 | Poisonous by inhalation liquid, n.o.s. (Inhalation Hazard Zone B)                 |
| 3382 | 151 | Toxic by inhalation liquid, n.o.s. (Inhalation Hazard Zone B)                     |
| 3383 | 131 | Poisonous by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone A)      |
| 3383 | 131 | Toxic by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone A)          |
| 3384 | 131 | Poisonous by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone B)      |
| 3384 | 131 | Toxic by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone B)          |
| 3385 | 139 | Poisonous by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone A) |

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|------|-----|---|
| 3385 | 139 | Toxic by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone A)     |
| 3386 | 139 | Poisonous by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone B) |
| 3386 | 139 | Toxic by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone B)     |
| 3387 | 142 | Poisonous by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone A)      |
| 3387 | 142 | Toxic by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone A)          |
| 3388 | 142 | Poisonous by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone B)      |
| 3388 | 142 | Toxic by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone B)          |
| 3389 | 154 | Poisonous by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone A)      |
| 3389 | 154 | Toxic by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone A)          |
| 3390 | 154 | Poisonous by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone B)      |
| 3390 | 154 | Toxic by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone B)          |
| 3391 | 135 | Organometallic substance, solid, pyrophoric                                       |
| 3392 | 135 | Organometallic substance, liquid, pyrophoric                                      |
| 3393 | 135 | Organometallic substance, solid, pyrophoric, water-reactive                       |
| 3394 | 135 | Organometallic substance, liquid, pyrophoric, water-reactive                      |

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| 3395 | 135 | Organometallic substance, solid, water-reactive                |
| 3396 | 138 | Organometallic substance, solid, water-reactive, flammable     |
| 3397 | 138 | Organometallic substance, solid, water-reactive, self-heating  |
| 3398 | 135 | Organometallic substance, liquid, water-reactive               |
| 3399 | 138 | Organometallic substance, liquid, water-reactive, flammable    |
| 3400 | 138 | Organometallic substance, solid, self-heating                  |
| 3401 | 138 | Alkali metal amalgam, solid                                    |
| 3402 | 138 | Alkaline earth metal amalgam, solid                            |
| 3403 | 138 | Potassium, metal alloys, solid                                 |
| 3404 | 138 | Potassium sodium alloys, solid                                 |
| 3404 | 138 | Sodium potassium alloys, solid                                 |
| 3405 | 141 | Barium chlorate, solution                                      |
| 3406 | 141 | Barium perchlorate, solution                                   |
| 3407 | 140 | Chlorate and Magnesium chloride mixture, solution              |
| 3407 | 140 | Magnesium chloride and Chlorate mixture, solution              |
| 3408 | 141 | Lead perchlorate, solution                                     |
| 3409 | 152 | Chloronitrobenzenes, liquid                                    |
| 3410 | 153 | 4-Chloro-o-toluidine hydrochloride, solution                   |
| 3411 | 153 | beta-Naphthylamine, solution                                   |
| 3411 | 153 | Naphthylamine (beta), solution                                 |
| 3412 | 153 | Formic acid, with not less than 5% but less than 10% acid      |
| 3412 | 153 | Formic acid, with not less than 10% but not more than 85% acid |

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| 3413 | 157  | Potassium cyanide, solution                     |
| 3414 | 157  | Sodium cyanide, solution                        |
| 3415 | 154  | Sodium fluoride, solution                       |
| 3416 | 153  | Chloroacetophenone, liquid                      |
| 3417 | 152  | Xylyl bromide, solid                            |
| 3418 | 151  | 2,4-Toluenediamine, solution                    |
| 3418 | 151  | 2,4-Toluylenediamine, solution                  |
| 3419 | 157  | Boron trifluoride acetic acid complex, solid    |
| 3420 | 157  | Boron trifluoride propionic acid complex, solid |
| 3421 | 154  | Potassium hydrogen difluoride, solution         |
| 3422 | 154  | Potassium fluoride, solution                    |
| 3423 | 153  | Tetramethylammonium hydroxide, solid            |
| 3424 | 141  | Ammonium dinitro-o-cresolate, solution          |
| 3425 | 156  | Bromoacetic acid, solid                         |
| 3426 | 153P | Acrylamide, solution                            |
| 3427 | 153  | Chlorobenzyl chlorides, solid                   |
| 3428 | 156  | 3-Chloro-4-methylphenyl isocyanate, solid       |
| 3429 | 153  | Chlorotoluidines, liquid                        |
| 3430 | 153  | Xylenols, liquid                                |
| 3431 | 152  | Nitrobenzotrifluorides, solid                   |
| 3432 | 171  | Polychlorinated biphenyls, solid                |
| 3434 | 153  | Nitrocresols, liquid                            |
| 3436 | 151  | Hexafluoroacetone hydrate, solid                |
| 3437 | 152  | Chlorocresols, solid                            |
| 3438 | 153  | alpha-Methylbenzyl alcohol, solid               |
| 3438 | 153  | Methylbenzyl (alpha) alcohol, solid             |

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| 3439 | 151 | Nitriles, poisonous, solid, n.o.s.                   |
| 3439 | 151 | Nitriles, solid, poisonous, n.o.s.                   |
| 3439 | 151 | Nitriles, solid, toxic, n.o.s.                       |
| 3439 | 151 | Nitriles, toxic, solid, n.o.s.                       |
| 3440 | 151 | Selenium compound, liquid, n.o.s.                    |
| 3441 | 153 | Chlorodinitrobenzenes, solid                         |
| 3442 | 153 | Dichloroanilines, solid                              |
| 3443 | 152 | Dinitrobenzenes, solid                               |
| 3444 | 151 | Nicotine hydrochloride, solid                        |
| 3445 | 151 | Nicotine sulfate, solid                              |
| 3445 | 151 | Nicotine sulphate, solid                             |
| 3446 | 152 | Nitrotoluenes, solid                                 |
| 3447 | 152 | Nitroxylenes, solid                                  |
| 3448 | 159 | Tear gas substance, solid, n.o.s.                    |
| 3449 | 159 | Bromobenzyl cyanides, solid                          |
| 3450 | 151 | Diphenylchloroarsine, solid                          |
| 3451 | 153 | Toluidines, solid                                    |
| 3452 | 153 | Xylidines, solid                                     |
| 3453 | 154 | Phosphoric acid, solid                               |
| 3454 | 152 | Dinitrotoluenes, solid                               |
| 3455 | 153 | Cresols, solid                                       |
| 3456 | 157 | Nitrosylsulfuric acid, solid                         |
| 3456 | 157 | Nitrosylsulphuric acid, solid                        |
| 3457 | 152 | Chloronitrotoluenes, solid                           |
| 3458 | 152 | Nitroanisoles, solid                                 |
| 3459 | 152 | Nitrobromobenzenes, solid                            |
| 3460 | 153 | N-Ethylbenzyltoluidines, solid                       |
| 3462 | 153 | Toxins, extracted from living sources, solid, n.o.s. |
| 3463 | 153 | Propionic acid, with not less than 90% acid          |

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No. No.**

3464 151 Organophosphorus compound, poisonous, solid, n.o.s.  
 3464 151 Organophosphorus compound, solid, poisonous, n.o.s.  
 3464 151 Organophosphorus compound, solid, toxic, n.o.s.  
 3464 151 Organophosphorus compound, toxic, solid, n.o.s.  
 3465 151 Organoarsenic compound, solid, n.o.s.  
 3466 151 Metal carbonyls, solid, n.o.s.  
 3467 151 Organometallic compound, poisonous, solid, n.o.s.  
 3467 151 Organometallic compound, solid, poisonous, n.o.s.  
 3467 151 Organometallic compound, solid, toxic, n.o.s.  
 3467 151 Organometallic compound, toxic, solid, n.o.s.  
 3468 115 Hydrogen in a metal hydride storage system  
 3468 115 Hydrogen in a metal hydride storage system contained in equipment  
 3468 115 Hydrogen in a metal hydride storage system packed with equipment  
 3469 132 Paint, flammable, corrosive  
 3469 132 Paint related material, flammable, corrosive  
 3470 132 Paint, corrosive, flammable  
 3470 132 Paint related material, corrosive, flammable  
 3471 154 Hydrogendifluorides, solution, n.o.s.  
 3472 153 Crotonic acid, liquid  
 3473 128 Fuel cell cartridges, containing flammable liquids

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3473 128 Fuel cell cartridges contained in equipment, containing flammable liquids  
 3473 128 Fuel cell cartridges packed with equipment, containing flammable liquids  
 3474 113 1-Hydroxybenzotriazole, anhydrous, wetted with not less than 20% water  
 3474 113 1-Hydroxybenzotriazole, monohydrate  
 3475 127 Ethanol and gasoline mixture, with more than 10% ethanol  
 3475 127 Ethanol and motor spirit mixture, with more than 10% ethanol  
 3475 127 Ethanol and petrol mixture, with more than 10% ethanol  
 3475 127 Gasoline and ethanol mixture, with more than 10% ethanol  
 3475 127 Motor spirit and ethanol mixture, with more than 10% ethanol  
 3475 127 Petrol and ethanol mixture, with more than 10% ethanol  
 3476 138 Fuel cell cartridges, containing water-reactive substances  
 3476 138 Fuel cell cartridges contained in equipment, containing water-reactive substances  
 3476 138 Fuel cell cartridges packed with equipment, containing water-reactive substances  
 3477 153 Fuel cell cartridges, containing corrosive substances  
 3477 153 Fuel cell cartridges contained in equipment, containing corrosive substances  
 3477 153 Fuel cell cartridges packed with equipment, containing corrosive substances

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|      |     |   |
|------|-----|---|
| 3478 | 115 | Fuel cell cartridges, containing liquefied flammable gas  |
| 3478 | 115 | Fuel cell cartridges contained in equipment, containing liquefied flammable gas                             |
| 3478 | 115 | Fuel cell cartridges packed with equipment, containing liquefied flammable gas                              |
| 3479 | 115 | Fuel cell cartridges, containing hydrogen in metal hydride  |
| 3479 | 115 | Fuel cell cartridges contained in equipment, containing hydrogen in metal hydride                           |
| 3479 | 115 | Fuel cell cartridges packed with equipment, containing hydrogen in metal hydride                            |
| 3480 | 147 | Lithium ion batteries (including lithium ion polymer batteries)   |
| 3481 | 147 | Lithium ion batteries contained in equipment (including lithium ion polymer batteries)                      |
| 3481 | 147 | Lithium ion batteries packed with equipment (including lithium ion polymer batteries)                       |
| 3482 | 138 | Alkali metal dispersion, flammable  |
| 3482 | 138 | Alkaline earth metal dispersion, flammable  |
| 3483 | 131 | Motor fuel anti-knock mixture, flammable  |
| 3484 | 132 | Hydrazine aqueous solution, flammable, with more than 37% hydrazine, by mass                                |
| 3485 | 140 | Calcium hypochlorite, dry, corrosive, with more than 39% available chlorine (8.8% available oxygen)         |
| 3485 | 140 | Calcium hypochlorite mixture, dry, corrosive, with more than 39% available chlorine (8.8% available oxygen) |

**ID Guide Name of Material**  
**No. No.**

|      |     |   |
|------|-----|---|
| 3486 | 140 | Calcium hypochlorite mixture, dry, corrosive, with more than 10% but not more than 39% available chlorine |
| 3487 | 140 | Calcium hypochlorite, hydrated, corrosive, with not less than 5.5% but not more than 16% water            |
| 3487 | 140 | Calcium hypochlorite, hydrated mixture, corrosive, with not less than 5.5% but not more than 16% water    |
| 3488 | 131 | Poisonous by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)                   |
| 3488 | 131 | Toxic by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)                       |
| 3489 | 131 | Poisonous by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)                   |
| 3489 | 131 | Toxic by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)                       |
| 3490 | 155 | Poisonous by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone A)              |
| 3490 | 155 | Toxic by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone A)                  |
| 3491 | 155 | Poisonous by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone B)              |
| 3491 | 155 | Toxic by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone B)                  |
| 3492 | 131 | Poisonous by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone A)                   |
| 3492 | 131 | Toxic by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone A)                       |



**ID Guide Name of Material  
No. No.**

|      |     |   |
|------|-----|---|
| 3493 | 131 | Poisonous by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone B)                                     |
| 3493 | 131 | Toxic by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone B)   |
| 3494 | 131 | Petroleum sour crude oil, flammable, poisonous  |
| 3494 | 131 | Petroleum sour crude oil, flammable, toxic  |
| 3495 | 154 | Iodine  |
| 3496 | 171 | Batteries, nickel-metal hydride   |
| 3497 | 133 | Krill meal  |
| 3498 | 157 | Iodine monochloride, liquid   |
| 3499 | 171 | Capacitor, electric double layer  |
| 3500 | 126 | Chemical under pressure, n.o.s.   |
| 3501 | 115 | Chemical under pressure, flammable, n.o.s.  |
| 3502 | 123 | Chemical under pressure, poisonous, n.o.s.  |
| 3502 | 123 | Chemical under pressure, toxic, n.o.s.  |
| 3503 | 125 | Chemical under pressure, corrosive, n.o.s.  |
| 3504 | 119 | Chemical under pressure, flammable, poisonous, n.o.s.   |
| 3504 | 119 | Chemical under pressure, flammable, toxic, n.o.s.   |
| 3505 | 118 | Chemical under pressure, flammable, corrosive, n.o.s.   |
| 3506 | 172 | Mercury contained in manufactured articles  |
| 3507 | 166 | Uranium hexafluoride, radioactive material, excepted package, less than 0.1 kg per package, non-fissile or fissile-excepted |
| 3508 | 171 | Capacitor, asymmetric   |

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No. No.**

|      |     |   |
|------|-----|---|
| 3509 | 171 | Packagings discarded, empty, uncleaned                                |
| 3510 | 174 | Adsorbed gas, flammable, n.o.s.                                       |
| 3511 | 174 | Adsorbed gas, n.o.s.  |
| 3512 | 173 | Adsorbed gas, poisonous, n.o.s.                                       |
| 3512 | 173 | Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone A)            |
| 3512 | 173 | Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone B)            |
| 3512 | 173 | Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone C)            |
| 3512 | 173 | Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone D)            |
| 3512 | 173 | Adsorbed gas, toxic, n.o.s.   |
| 3512 | 173 | Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone A)                |
| 3512 | 173 | Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone B)                |
| 3512 | 173 | Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone C)                |
| 3512 | 173 | Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone D)                |
| 3513 | 174 | Adsorbed gas, oxidizing, n.o.s.                                       |
| 3514 | 173 | Adsorbed gas, poisonous, flammable, n.o.s.                            |
| 3514 | 173 | Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone A) |
| 3514 | 173 | Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone B) |
| 3514 | 173 | Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone C) |
| 3514 | 173 | Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone D) |
| 3514 | 173 | Adsorbed gas, toxic, flammable, n.o.s.                                |

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**ID Guide No. No. Name of Material**

3514 173 Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone A)

3516 173 Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone A)

3514 173 Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone B)

3516 173 Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone B)

3514 173 Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone C)

3516 173 Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone C)

3514 173 Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone D)

3516 173 Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone D)

3515 173 Adsorbed gas, poisonous, oxidizing, n.o.s.

3516 173 Adsorbed gas, toxic, corrosive, n.o.s.

3515 173 Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone A)

3516 173 Adsorbed gas, toxic, corrosive, n.o.s. (Inhalation hazard zone A)

3515 173 Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone B)

3516 173 Adsorbed gas, toxic, corrosive, n.o.s. (Inhalation hazard zone B)

3515 173 Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone C)

3516 173 Adsorbed gas, toxic, corrosive, n.o.s. (Inhalation hazard zone C)

3515 173 Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone D)

3516 173 Adsorbed gas, toxic, corrosive, n.o.s. (Inhalation hazard zone D)

3515 173 Adsorbed gas, toxic, oxidizing, n.o.s.

3517 173 Adsorbed gas, poisonous, flammable, corrosive, n.o.s.

3515 173 Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone A)

3517 173 Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone A)

3515 173 Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone B)

3517 173 Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone B)

3515 173 Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone C)

3517 173 Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone C)

3515 173 Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone D)

3517 173 Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone D)

3516 173 Adsorbed gas, poisonous, corrosive, n.o.s.

3517 173 Adsorbed gas, toxic, flammable, corrosive, n.o.s.

**ID Guide Name of Material  
No. No.**

|      |     |  |
|------|-----|--|
| 3517 | 173 | Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone A)     |
| 3517 | 173 | Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone B)     |
| 3517 | 173 | Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone C)     |
| 3517 | 173 | Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone D)     |
| 3518 | 173 | Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s.                            |
| 3518 | 173 | Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone A) |
| 3518 | 173 | Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone B) |
| 3518 | 173 | Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone C) |
| 3518 | 173 | Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone D) |
| 3518 | 173 | Adsorbed gas, toxic, oxidizing, corrosive, n.o.s.                                |
| 3518 | 173 | Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone A)     |
| 3518 | 173 | Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone B)     |
| 3518 | 173 | Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone C)     |
| 3518 | 173 | Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone D)     |
| 3519 | 173 | Boron trifluoride, adsorbed  |
| 3520 | 173 | Chlorine, adsorbed   |

**ID Guide Name of Material  
No. No.**

|      |      |  |
|------|------|--|
| 3521 | 173  | Silicon tetrafluoride, adsorbed                                |
| 3522 | 173  | Arsine, adsorbed   |
| 3523 | 173  | Germane, adsorbed  |
| 3524 | 173  | Phosphorus pentafluoride, adsorbed                             |
| 3525 | 173  | Phosphine, adsorbed  |
| 3526 | 173  | Hydrogen selenide, adsorbed                                    |
| 3527 | 128P | Polyester resin kit, solid base material                       |
| 3528 | 128  | Engine, fuel cell, flammable liquid powered                    |
| 3528 | 128  | Engine, internal combustion, flammable liquid powered          |
| 3528 | 128  | Machinery, fuel cell, flammable liquid powered                 |
| 3528 | 128  | Machinery, internal combustion, flammable liquid powered       |
| 3529 | 115  | Engine, fuel cell, flammable gas powered                       |
| 3529 | 115  | Engine, internal combustion, flammable gas powered             |
| 3529 | 115  | Machinery, fuel cell, flammable gas powered                    |
| 3529 | 115  | Machinery, internal combustion, flammable gas powered          |
| 3530 | 171  | Engine, internal combustion                                    |
| 3530 | 171  | Machinery, internal combustion                                 |
| 3531 | 149P | Polymerizing substance, solid, stabilized, n.o.s.              |
| 3532 | 149P | Polymerizing substance, liquid, stabilized, n.o.s.             |
| 3533 | 150P | Polymerizing substance, solid, temperature controlled, n.o.s.  |
| 3534 | 150P | Polymerizing substance, liquid, temperature controlled, n.o.s. |
| 3535 | 134  | Toxic solid, flammable, inorganic, n.o.s.                      |

**ID Guide Name of Material  
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|      |            |   |
|------|------------|---|
| 3536 | <b>147</b> | Lithium batteries installed in cargo transport unit (lithium ion batteries)             |
| 3536 | <b>138</b> | Lithium batteries installed in cargo transport unit (lithium metal batteries)           |
| 3537 | <b>115</b> | Articles containing flammable gas, n.o.s.   |
| 3538 | <b>120</b> | Articles containing non-flammable, non-toxic gas, n.o.s.                                |
| 3539 | <b>123</b> | Articles containing toxic gas, n.o.s.   |
| 3540 | <b>127</b> | Articles containing flammable liquid, n.o.s.  |
| 3541 | <b>133</b> | Articles containing flammable solid, n.o.s.   |
| 3542 | <b>135</b> | Articles containing a substance liable to spontaneous combustion, n.o.s.                |
| 3543 | <b>138</b> | Articles containing a substance which emits flammable gas in contact with water, n.o.s. |
| 3544 | <b>140</b> | Articles containing oxidizing substance, n.o.s.   |
| 3545 | <b>145</b> | Articles containing organic peroxide, n.o.s.  |
| 3546 | <b>151</b> | Articles containing toxic substance, n.o.s.   |
| 3547 | <b>154</b> | Articles containing corrosive substance, n.o.s.   |
| 3548 | <b>171</b> | Articles containing miscellaneous dangerous goods, n.o.s.                               |
| 3549 | <b>158</b> | Medical waste, category A, affecting humans, solid                                      |
| 3549 | <b>158</b> | Medical waste, category A, affecting animals only, solid                                |
| 8000 | <b>171</b> | Consumer commodity  |
| 9035 | <b>123</b> | Gas identification set  |

**ID Guide Name of Material  
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|      |            |   |
|------|------------|---|
| 9191 | <b>143</b> | Chlorine dioxide, hydrate, frozen                       |
| 9202 | <b>168</b> | Carbon monoxide, refrigerated liquid (cryogenic liquid) |
| 9206 | <b>137</b> | Methyl phosphonic dichloride                            |
| 9260 | <b>169</b> | Aluminum, molten  |
| 9263 | <b>156</b> | Chloropivaloyl chloride                                 |
| 9264 | <b>151</b> | 3,5-Dichloro-2,4,6-trifluoropyridine                    |
| 9269 | <b>132</b> | Trimethoxysilane  |

NOTES

## INTRODUCTION TO BLUE PAGES

For entries **highlighted in green** follow these steps:

- **IF THERE IS NO FIRE:**

- Go directly to **Table 1** (**green-bordered pages**)
- Look up the ID number and name of material
- Identify initial isolation and protective action distances
- Also consult the appropriate Orange Guide

- **IF A FIRE IS INVOLVED:**

- Use the appropriate Orange Guide for **EVACUATION** distances
- Also protect in downwind direction according to Table 1 for residual material release

**Note 1:** If the name in **Table 1** is shown with **(when spilled in water)**, these materials produce large amounts of Toxic Inhalation Hazard (TIH) (PIH in the US) gases when spilled in water. Some Water Reactive materials are also TIH materials themselves (e.g., UN1746 (Bromine trifluoride), UN1836 (Thionyl chloride)). In these instances, two entries are provided in **Table 1** for land-based and water-based spills. If a water-reactive material only has one entry in Table 1 for **(when spilled in water)** and the product is NOT spilled in water, Table 1 and Table 2 do not apply. You will find safe distances in the appropriate orange-bordered guide.

**Note 2: Explosives** are not individually listed by their name because in an emergency situation, the response will be based only on the division of the explosive, not on the individual explosive.

**For divisions 1.1, 1.2, 1.3 and 1.5, refer to GUIDE 112.**

**For divisions 1.4 and 1.6, refer to GUIDE 114.**

**Note 3:** Chemical warfare agents do not have an assigned ID number because they are not commercially transported. In an emergency situation, the assigned orange guide will provide guidance for the initial response. Also consult "Criminal or Terrorist Use of Chemical, Biological and Radiological Agents", pp. 368 to 372.

**Name of Material**      **Guide ID**  
**No.**      **No.**

**Name of Material**      **Guide ID**  
**No.**      **No.**

|  |      |      |
|--|------|------|
| AC   | 117  | —    |
| Acetal   | 127  | 1088 |
| Acetaldehyde   | 129P | 1089 |
| Acetaldehyde ammonia   | 171  | 1841 |
| Acetaldehyde oxime   | 129  | 2332 |
| Acetic acid, glacial   | 132  | 2789 |
| Acetic acid, solution, more than 10% but not more than 80% acid  | 153  | 2790 |
| Acetic acid, solution, more than 80% acid  | 132  | 2789 |
| Acetic anhydride   | 137  | 1715 |
| Acetone  | 127  | 1090 |
| Acetone cyanohydrin, stabilized  | 155  | 1541 |
| Acetone oils   | 127  | 1091 |
| Acetonitrile   | 127  | 1648 |
| Acetyl bromide   | 156  | 1716 |
| Acetyl chloride  | 155  | 1717 |
| Acetylene, dissolved   | 116  | 1001 |
| Acetylene, Ethylene and Propylene in mixture, refrigerated liquid containing at least 71.5% Ethylene with not more than 22.5% Acetylene and not more than 6% Propylene | 115  | 3138 |
| Acetylene, solvent free  | 116  | 3374 |
| Acetylene tetrabromide   | 159  | 2504 |
| Acetyl iodide  | 156  | 1898 |
| Acetyl methyl carbinol   | 127  | 2621 |
| Acid, sludge   | 153  | 1906 |
| Acid butyl phosphate   | 153  | 1718 |
| Acridine   | 153  | 2713 |
| Acrolein, stabilized   | 131P | 1092 |
| Acrolein dimer, stabilized   | 129P | 2607 |

|  |      |      |
|--|------|------|
| Acrylamide, solid  | 153P | 2074 |
| Acrylamide, solution   | 153P | 3426 |
| Acrylic acid, stabilized   | 132P | 2218 |
| Acrylonitrile, stabilized  | 131P | 1093 |
| Adamsite   | 154  | —    |
| Adhesives (flammable)  | 128  | 1133 |
| Adiponitrile   | 153  | 2205 |
| Adsorbed gas, flammable, n.o.s.  | 174  | 3510 |
| Adsorbed gas, n.o.s.   | 174  | 3511 |
| Adsorbed gas, oxidizing, n.o.s.  | 174  | 3513 |
| Adsorbed gas, poisonous, corrosive, n.o.s.                                       | 173  | 3516 |
| Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone A)            | 173  | 3516 |
| Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone B)            | 173  | 3516 |
| Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone C)            | 173  | 3516 |
| Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone D)            | 173  | 3516 |
| Adsorbed gas, poisonous, flammable, corrosive, n.o.s.                            | 173  | 3517 |
| Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone A) | 173  | 3517 |
| Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone B) | 173  | 3517 |
| Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone C) | 173  | 3517 |
| Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone D) | 173  | 3517 |

**Name of Material**      **Guide ID**  
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|  |     |      |
|--|-----|------|
| Adsorbed gas, poisonous, flammable, n.o.s.                                       | 173 | 3514 |
| Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone A)            | 173 | 3514 |
| Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone B)            | 173 | 3514 |
| Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone C)            | 173 | 3514 |
| Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone D)            | 173 | 3514 |
| Adsorbed gas, poisonous, n.o.s.  | 173 | 3512 |
| Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone A)                       | 173 | 3512 |
| Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone B)                       | 173 | 3512 |
| Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone C)                       | 173 | 3512 |
| Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone D)                       | 173 | 3512 |
| Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s.                            | 173 | 3518 |
| Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone A) | 173 | 3518 |
| Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone B) | 173 | 3518 |
| Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone C) | 173 | 3518 |
| Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone D) | 173 | 3518 |

**Name of Material**      **Guide ID**  
**No.**      **No.**

|  |     |      |
|--|-----|------|
| Adsorbed gas, poisonous, oxidizing, n.o.s.                                   | 173 | 3515 |
| Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone A)        | 173 | 3515 |
| Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone B)        | 173 | 3515 |
| Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone C)        | 173 | 3515 |
| Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone D)        | 173 | 3515 |
| Adsorbed gas, toxic, corrosive, n.o.s.                                       | 173 | 3516 |
| Adsorbed gas, toxic, corrosive, n.o.s. (Inhalation hazard zone A)            | 173 | 3516 |
| Adsorbed gas, toxic, corrosive, n.o.s. (Inhalation hazard zone B)            | 173 | 3516 |
| Adsorbed gas, toxic, corrosive, n.o.s. (Inhalation hazard zone C)            | 173 | 3516 |
| Adsorbed gas, toxic, corrosive, n.o.s. (Inhalation hazard zone D)            | 173 | 3516 |
| Adsorbed gas, toxic, flammable, corrosive, n.o.s.                            | 173 | 3517 |
| Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone A) | 173 | 3517 |
| Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone B) | 173 | 3517 |
| Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone C) | 173 | 3517 |
| Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone D) | 173 | 3517 |



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| Adsorbed gas, toxic, flammable, n.o.s.                                       | 173 | 3514 |
| Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone A)            | 173 | 3514 |
| Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone B)            | 173 | 3514 |
| Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone C)            | 173 | 3514 |
| Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone D)            | 173 | 3514 |
| Adsorbed gas, toxic, n.o.s.  | 173 | 3512 |
| Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone A)                       | 173 | 3512 |
| Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone B)                       | 173 | 3512 |
| Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone C)                       | 173 | 3512 |
| Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone D)                       | 173 | 3512 |
| Adsorbed gas, toxic, oxidizing, corrosive, n.o.s.                            | 173 | 3518 |
| Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone A) | 173 | 3518 |
| Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone B) | 173 | 3518 |
| Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone C) | 173 | 3518 |
| Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone D) | 173 | 3518 |
| Adsorbed gas, toxic, oxidizing, n.o.s.                                       | 173 | 3515 |
| Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone A)            | 173 | 3515 |

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| Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone B) | 173  | 3515 |
| Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone C) | 173  | 3515 |
| Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone D) | 173  | 3515 |
| Aerosols  | 126  | 1950 |
| Air, compressed   | 122  | 1002 |
| Air, refrigerated liquid (cryogenic liquid)                       | 122  | 1003 |
| Air bag inflators   | 171  | 3268 |
| Air bag modules   | 171  | 3268 |
| Aircraft hydraulic power unit fuel tank                           | 131  | 3165 |
| Alcoholates solution, n.o.s., in alcohol                          | 132  | 3274 |
| Alcoholic beverages   | 127  | 3065 |
| Alcohols, flammable, poisonous, n.o.s.                            | 131  | 1986 |
| Alcohols, flammable, toxic, n.o.s.                                | 131  | 1986 |
| Alcohols, n.o.s.  | 127  | 1987 |
| Aldehydes, flammable, poisonous, n.o.s.                           | 131P | 1988 |
| Aldehydes, flammable, toxic, n.o.s.                               | 131P | 1988 |
| Aldehydes, n.o.s.   | 129P | 1989 |
| Aldol   | 153  | 2839 |
| Alkali metal alcoholates, self-heating, corrosive, n.o.s.         | 136  | 3206 |
| Alkali metal alloy, liquid, n.o.s.                                | 138  | 1421 |
| Alkali metal amalgam, liquid                                      | 138  | 1389 |
| Alkali metal amalgam, solid                                       | 138  | 3401 |
| Alkali metal amides   | 139  | 1390 |

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| Alkali metal dispersion  | 138      | 1391 | Alkyl sulphonic acids, liquid, with more than 5% free Sulphuric acid     | 153      | 2584 |
| Alkali metal dispersion, flammable                                     | 138      | 3482 | Alkyl sulphonic acids, liquid, with not more than 5% free Sulphuric acid | 153      | 2586 |
| Alkaline earth metal alcoholates, n.o.s.                               | 135      | 3205 | Alkyl sulphonic acids, solid, with more than 5% free Sulphuric acid      | 153      | 2583 |
| Alkaline earth metal alloy, n.o.s.                                     | 138      | 1393 | Alkyl sulphonic acids, solid, with not more than 5% free Sulphuric acid  | 153      | 2585 |
| Alkaline earth metal amalgam, liquid                                   | 138      | 1392 | Alkylsulphuric acids   | 156      | 2571 |
| Alkaline earth metal amalgam, solid                                    | 138      | 3402 | Allyl acetate  | 131      | 2333 |
| Alkaline earth metal dispersion  | 138      | 1391 | Allyl alcohol  | 131      | 1098 |
| Alkaline earth metal dispersion, flammable                             | 138      | 3482 | Allylamine   | 131      | 2334 |
| Alkaloids, liquid, n.o.s. (poisonous)                                  | 151      | 3140 | Allyl bromide  | 131P     | 1099 |
| Alkaloids, solid, n.o.s. (poisonous)                                   | 151      | 1544 | Allyl chloride   | 131P     | 1100 |
| Alkaloid salts, liquid, n.o.s. (poisonous)                             | 151      | 3140 | Allyl chlorocarbonate  | 155      | 1722 |
| Alkaloid salts, solid, n.o.s. (poisonous)                              | 151      | 1544 | Allyl chloroformate  | 155      | 1722 |
| Alkylphenols, liquid, n.o.s. (including C2-C12 homologues)             | 153      | 3145 | Allyl ethyl ether  | 131      | 2335 |
| Alkylphenols, solid, n.o.s. (including C2-C12 homologues)              | 153      | 2430 | Allyl formate  | 131      | 2336 |
| Alkyl sulfonic acids, liquid, with more than 5% free Sulfuric acid     | 153      | 2584 | Allyl glycidyl ether   | 129      | 2219 |
| Alkyl sulfonic acids, liquid, with not more than 5% free Sulfuric acid | 153      | 2586 | Allyl iodide   | 132      | 1723 |
| Alkyl sulfonic acids, solid, with more than 5% free Sulfuric acid      | 153      | 2583 | Allyl isothiocyanate, stabilized   | 155      | 1545 |
| Alkyl sulfonic acids, solid, with not more than 5% free Sulfuric acid  | 153      | 2585 | Allyltrichlorosilane, stabilized   | 155      | 1724 |
| Alkylsulfuric acids  | 156      | 2571 | alpha-Methylbenzyl alcohol, liquid                                       | 153      | 2937 |
|  |          |      | alpha-Methylbenzyl alcohol, solid  | 153      | 3438 |
|  |          |      | alpha-Methylvaleraldehyde  | 130      | 2367 |
|  |          |      | alpha-Naphthylamine  | 153      | 2077 |
|  |          |      | alpha-Pinene   | 128      | 2368 |
|  |          |      | Aluminum, molten   | 169      | 9260 |
|  |          |      | Aluminum alkyl hydrides  | 138      | 3076 |
|  |          |      | Aluminum alkyls  | 135      | 3051 |

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| Aluminum borohydride   | 135       | 2870   | 2-(2-Aminoethoxy)ethanol   | 154       | 3055   |
| Aluminum borohydride in devices                                | 135       | 2870   | N-Aminoethylpiperazine   | 153       | 2815   |
| Aluminum bromide, anhydrous                                    | 137       | 1725   | Aminophenols   | 152       | 2512   |
| Aluminum bromide, solution                                     | 154       | 2580   | Aminopyridines   | 153       | 2671   |
| Aluminum carbide   | 138       | 1394   | Ammonia, anhydrous   | 125       | 1005   |
| Aluminum chloride, anhydrous                                   | 137       | 1726   | Ammonia, solution, with more than 10% but not more than 35% Ammonia  | 154       | 2672   |
| Aluminum chloride, solution                                    | 154       | 2581   | Ammonia, solution, with more than 35% but not more than 50% Ammonia  | 125       | 2073   |
| Aluminum dross   | 138       | 3170   | Ammonia solution, with more than 50% Ammonia                         | 125       | 3318   |
| Aluminum ferrosilicon powder                                   | 139       | 1395   | Ammonium arsenate  | 151       | 1546   |
| Aluminum hydride   | 138       | 2463   | Ammonium bifluoride, solid   | 154       | 1727   |
| Aluminum nitrate   | 140       | 1438   | Ammonium bifluoride, solution  | 154       | 2817   |
| Aluminum phosphide   | 139       | 1397   | Ammonium dichromate  | 141       | 1439   |
| Aluminum phosphide pesticide                                   | 157       | 3048   | Ammonium dinitro-o-cresolate, solid                                  | 141       | 1843   |
| Aluminum powder, coated  | 170       | 1309   | Ammonium dinitro-o-cresolate, solution                               | 141       | 3424   |
| Aluminum powder, pyrophoric                                    | 135       | 1383   | Ammonium fluoride  | 154       | 2505   |
| Aluminum powder, uncoated                                      | 138       | 1396   | Ammonium fluorosilicate  | 151       | 2854   |
| Aluminum remelting by-products                                 | 138       | 3170   | Ammonium hydrogendifluoride, solid                                   | 154       | 1727   |
| Aluminum resinate  | 133       | 2715   | Ammonium hydrogendifluoride, solution                                | 154       | 2817   |
| Aluminum silicon powder, uncoated                              | 138       | 1398   | Ammonium hydrogen sulfate  | 154       | 2506   |
| Aluminum smelting by-products                                  | 138       | 3170   | Ammonium hydrogen sulphate   | 154       | 2506   |
| Amines, flammable, corrosive, n.o.s.                           | 132       | 2733   | Ammonium hydroxide   | 154       | 2672   |
| Amines, liquid, corrosive, flammable, n.o.s.                   | 132       | 2734   | Ammonium hydroxide, with more than 10% but not more than 35% Ammonia | 154       | 2672   |
| Amines, liquid, corrosive, n.o.s.                              | 153       | 2735   | Ammonium metavanadate  | 154       | 2859   |
| Amines, solid, corrosive, n.o.s.                               | 154       | 3259   | Ammonium nitrate, liquid (hot concentrated solution)                 | 140       | 2426   |
| 2-Amino-4-chlorophenol   | 151       | 2673   |  |           |        |
| 2-Amino-5-diethylaminopentane                                  | 153       | 2946   |  |           |        |
| 2-Amino-4,6-dinitrophenol, wetted with not less than 20% water | 113       | 3317   |  |           |        |

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| Ammonium nitrate, with not more than 0.2% combustible substances | 140              | 1942          | n-Amylene                                     | 128              | 1108          |
| Ammonium nitrate based fertilizer                                | 140              | 2067          | Amyl formates                                 | 129              | 1109          |
| Ammonium nitrate based fertilizer                                | 140              | 2071          | Amyl mercaptan                                | 130              | 1111          |
| Ammonium nitrate emulsion  | 140              | 3375          | n-Amyl methyl ketone                          | 127              | 1110          |
| Ammonium nitrate-fuel oil mixtures                               | 112              | ---           | Amyl nitrate                                  | 128              | 1112          |
| Ammonium nitrate gel   | 140              | 3375          | Amyl nitrite                                  | 129              | 1113          |
| Ammonium nitrate suspension                                      | 140              | 3375          | Amyltrichlorosilane                           | 155              | 1728          |
| Ammonium perchlorate   | 143              | 1442          | Anhydrous ammonia                             | 125              | 1005          |
| Ammonium persulfate  | 140              | 1444          | Aniline                                       | 153              | 1547          |
| Ammonium persulphate   | 140              | 1444          | Aniline hydrochloride                         | 153              | 1548          |
| Ammonium picrate, wetted with not less than 10% water            | 113              | 1310          | Anisidines                                    | 153              | 2431          |
| Ammonium polysulfide, solution                                   | 154              | 2818          | Anisole                                       | 128              | 2222          |
| Ammonium polysulphide, solution                                  | 154              | 2818          | Anisoyl chloride                              | 156              | 1729          |
| Ammonium polyvanadate  | 151              | 2861          | Antimony compound, inorganic, liquid, n.o.s.  | 157              | 3141          |
| Ammonium silicofluoride  | 151              | 2854          | Antimony compound, inorganic, solid, n.o.s.   | 157              | 1549          |
| Ammonium sulfide, solution                                       | 132              | 2683          | Antimony lactate                              | 151              | 1550          |
| Ammonium sulphide, solution                                      | 132              | 2683          | Antimony pentachloride, liquid                | 157              | 1730          |
| Ammunition, poisonous, non-explosive                             | 151              | 2016          | Antimony pentachloride, solution              | 157              | 1731          |
| Ammunition, tear-producing, non-explosive                        | 159              | 2017          | Antimony pentafluoride                        | 157              | 1732          |
| Ammunition, toxic, non-explosive                                 | 151              | 2016          | Antimony potassium tartrate                   | 151              | 1551          |
| Amyl acetates  | 129              | 1104          | Antimony powder                               | 170              | 2871          |
| Amyl acid phosphate  | 153              | 2819          | Antimony trichloride                          | 157              | 1733          |
| Amylamine  | 132              | 1106          | Antimony trichloride, liquid                  | 157              | 1733          |
| Amyl butyrates   | 130              | 2620          | Antimony trichloride, solid                   | 157              | 1733          |
| Amyl chloride  | 129              | 1107          | Aqua regia                                    | 157              | 1798          |
|  |                  |               | Argon   | 120              | 1006          |
|  |                  |               | Argon, compressed                             | 120              | 1006          |
|  |                  |               | Argon, refrigerated liquid (cryogenic liquid) | 120              | 1951          |
|  |                  |               | Arsenic                                       | 152              | 1558          |

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| Arsenic acid, liquid  | 154       | 1553   | Articles containing flammable gas, n.o.s.                             | 115       | 3537   |
| Arsenic acid, solid   | 154       | 1554   | Articles containing flammable liquid, n.o.s.                          | 127       | 3540   |
| Arsenical dust  | 152       | 1562   | Articles containing flammable solid, n.o.s.                           | 133       | 3541   |
| Arsenical pesticide, liquid, flammable, poisonous                                       | 131       | 2760   | Articles containing miscellaneous dangerous goods, n.o.s.             | 171       | 3548   |
| Arsenical pesticide, liquid, flammable, toxic   | 131       | 2760   | Articles containing non-flammable, non-toxic gas, n.o.s.              | 120       | 3538   |
| Arsenical pesticide, liquid, poisonous  | 151       | 2994   | Articles containing oxidizing substance, n.o.s.                       | 140       | 3544   |
| Arsenical pesticide, liquid, poisonous, flammable                                       | 131       | 2993   | Articles containing organic peroxide, n.o.s.                          | 145       | 3545   |
| Arsenical pesticide, liquid, toxic  | 151       | 2994   | Articles containing Polychlorinated biphenyls (PCB)                   | 171       | 2315   |
| Arsenical pesticide, liquid, toxic, flammable   | 131       | 2993   | Articles containing toxic gas, n.o.s.                                 | 123       | 3539   |
| Arsenical pesticide, solid, poisonous   | 151       | 2759   | Articles containing toxic substance, n.o.s.                           | 151       | 3546   |
| Arsenical pesticide, solid, toxic   | 151       | 2759   | Articles, pressurized, hydraulic (containing non-flammable gas)       | 126       | 3164   |
| Arsenic bromide   | 151       | 1555   | Articles, pressurized, pneumatic (containing non-flammable gas)       | 126       | 3164   |
| Arsenic chloride  | 157       | 1560   | Aryl sulfonic acids, liquid, with more than 5% free Sulfuric acid     | 153       | 2584   |
| Arsenic compound, liquid, n.o.s.  | 152       | 1556   | Aryl sulfonic acids, liquid, with not more than 5% free Sulfuric acid | 153       | 2586   |
| Arsenic compound, solid, n.o.s.   | 152       | 1557   | Aryl sulfonic acids, solid, with more than 5% free Sulfuric acid      | 153       | 2583   |
| Arsenic pentoxide   | 151       | 1559   | Aryl sulfonic acids, solid, with not more than 5% free Sulfuric acid  | 153       | 2585   |
| Arsenic trichloride   | 157       | 1560   |   |           |        |
| Arsenic trioxide  | 151       | 1561   |   |           |        |
| Arsine  | 119       | 2188   |   |           |        |
| Arsine, adsorbed  | 173       | 3522   |   |           |        |
| Articles containing a substance liable to spontaneous combustion, n.o.s.                | 135       | 3542   |   |           |        |
| Articles containing a substance which emits flammable gas in contact with water, n.o.s. | 138       | 3543   |   |           |        |
| Articles containing corrosive substance, n.o.s.   | 154       | 3547   |   |           |        |

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| Aryl sulphonic acids, liquid, with more than 5% free Sulphuric acid     | 153      | 2584 | Barium perchlorate, solid                                | 141      | 1447 |
| Aryl sulphonic acids, liquid, with not more than 5% free Sulphuric acid | 153      | 2586 | Barium perchlorate, solution                             | 141      | 3406 |
| Aryl sulphonic acids, solid, with more than 5% free Sulphuric acid      | 153      | 2583 | Barium permanganate                                      | 141      | 1448 |
| Aryl sulphonic acids, solid, with not more than 5% free Sulphuric acid  | 153      | 2585 | Barium peroxide  | 141      | 1449 |
| Asbestos  | 171      | 2212 | Batteries, containing Sodium                             | 138      | 3292 |
| Asbestos, amphibole   | 171      | 2212 | Batteries, dry, containing Potassium hydroxide solid     | 154      | 3028 |
| Asbestos, blue  | 171      | 2212 | Batteries, nickel-metal hydride                          | 171      | 3496 |
| Asbestos, brown   | 171      | 2212 | Batteries, wet, filled with acid                         | 154      | 2794 |
| Asbestos, chrysotile  | 171      | 2590 | Batteries, wet, filled with alkali                       | 154      | 2795 |
| Asbestos, white   | 171      | 2590 | Batteries, wet, non-spillable                            | 154      | 2800 |
| Asphalt   | 130      | 1999 | Battery fluid, acid                                      | 157      | 2796 |
| Asphalt, cut back   | 130      | 1999 | Battery fluid, alkali                                    | 154      | 2797 |
| Aviation regulated liquid, n.o.s.                                       | 171      | 3334 | Battery-powered equipment (wet battery)                  | 154      | 3171 |
| Aviation regulated solid, n.o.s.  | 171      | 3335 | Battery-powered equipment (with lithium ion batteries)   | 147      | 3171 |
| Azodicarbonamide  | 149      | 3242 | Battery-powered equipment (with lithium metal batteries) | 138      | 3171 |
| Barium  | 138      | 1400 | Battery-powered equipment (with sodium batteries)        | 138      | 3171 |
| Barium alloys, pyrophoric   | 135      | 1854 | Battery-powered vehicle (wet battery)                    | 154      | 3171 |
| Barium azide, wetted with not less than 50% water                       | 113      | 1571 | Battery-powered vehicle (with lithium ion batteries)     | 147      | 3171 |
| Barium bromate  | 141      | 2719 | Battery-powered vehicle (with sodium batteries)          | 138      | 3171 |
| Barium chlorate, solid  | 141      | 1445 | Benzaldehyde   | 171      | 1990 |
| Barium chlorate, solution   | 141      | 3405 | Benzene  | 130      | 1114 |
| Barium compound, n.o.s.   | 154      | 1564 | Benzene phosphorus dichloride                            | 137      | 2798 |
| Barium cyanide  | 157      | 1565 | Benzene phosphorus thiodichloride                        | 137      | 2799 |
| Barium hypochlorite, with more than 22% available Chlorine              | 141      | 2741 | Benzenesulfonyl chloride                                 | 156      | 2225 |
| Barium nitrate  | 141      | 1446 | Benzenesulphonyl chloride                                | 156      | 2225 |
| Barium oxide  | 157      | 1884 | Benzidine  | 153      | 1885 |
|   |          |      | Benzonitrile   | 152      | 2224 |

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| Benzoquinone   | 153       | 2587   | Bipyridilium pesticide, solid, poisonous                                      | 151       | 2781   |
| Benzotrichloride                                     | 156       | 2226   | Bipyridilium pesticide, solid, toxic  | 151       | 2781   |
| Benzotrifluoride                                     | 127       | 2338   | Bisulfates, aqueous solution  | 154       | 2837   |
| Benzoyl chloride                                     | 137       | 1736   | Bisulfites, aqueous solution, n.o.s.  | 154       | 2693   |
| Benzyl bromide                                       | 156       | 1737   | Bisulphates, aqueous solution   | 154       | 2837   |
| Benzyl chloride                                      | 156       | 1738   | Bisulphites, aqueous solution, n.o.s.   | 154       | 2693   |
| Benzyl chloroformate                                 | 137       | 1739   | Blasting agent, n.o.s.  | 112       | —      |
| Benzylidimethylamine                                 | 132       | 2619   | Bleaching powder  | 140       | 2208   |
| Benzylidene chloride                                 | 156       | 1886   | Blue asbestos   | 171       | 2212   |
| Benzyl iodide  | 156       | 2653   | Bombs, smoke, non-explosive, with corrosive liquid, without initiating device | 153       | 2028   |
| Beryllium compound, n.o.s.                           | 154       | 1566   | Borate and Chlorate mixture   | 140       | 1458   |
| Beryllium nitrate                                    | 141       | 2464   | Borneol   | 133       | 1312   |
| Beryllium powder                                     | 134       | 1567   | Boron tribromide  | 157       | 2692   |
| beta-Naphthylamine, solid                            | 153       | 1650   | Boron trichloride   | 125       | 1741   |
| beta-Naphthylamine, solution                         | 153       | 3411   | Boron trifluoride   | 125       | 1008   |
| Bhusa, wet, damp or contaminated with oil            | 133       | 1327   | Boron trifluoride, adsorbed   | 173       | 3519   |
| Bicyclo[2.2.1]hepta-2,5-diene, stabilized            | 128P      | 2251   | Boron trifluoride, compressed   | 125       | 1008   |
| Biological agents                                    | 158       | —      | Boron trifluoride, dihydrate  | 157       | 2851   |
| Biological substance, category B                     | 158       | 3373   | Boron trifluoride acetic acid complex, liquid                                 | 157       | 1742   |
| (Bio)Medical waste, n.o.s.                           | 158       | 3291   | Boron trifluoride acetic acid complex, solid                                  | 157       | 3419   |
| Bipyridilium pesticide, liquid, flammable, poisonous | 131       | 2782   | Boron trifluoride diethyl etherate  | 132       | 2604   |
| Bipyridilium pesticide, liquid, flammable, toxic     | 131       | 2782   | Boron trifluoride dimethyl etherate   | 139       | 2965   |
| Bipyridilium pesticide, liquid, poisonous            | 151       | 3016   | Boron trifluoride propionic acid complex, liquid                              | 157       | 1743   |
| Bipyridilium pesticide, liquid, poisonous, flammable | 131       | 3015   | Boron trifluoride propionic acid complex, solid                               | 157       | 3420   |
| Bipyridilium pesticide, liquid, toxic                | 151       | 3016   |   |           |        |
| Bipyridilium pesticide, liquid, toxic, flammable     | 131       | 3015   |   |           |        |

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| Bromates, inorganic, aqueous solution, n.o.s.       | <b>140</b> | 3213        |
| Bromates, inorganic, n.o.s.                         | <b>140</b> | 1450        |
| <b>Bromine</b>                                      | <b>154</b> | <b>1744</b> |
| <b>Bromine, solution</b>                            | <b>154</b> | <b>1744</b> |
| <b>Bromine, solution (Inhalation Hazard Zone A)</b> | <b>154</b> | <b>1744</b> |
| <b>Bromine, solution (Inhalation Hazard Zone B)</b> | <b>154</b> | <b>1744</b> |
| <b>Bromine chloride</b>                             | <b>124</b> | <b>2901</b> |
| <b>Bromine pentafluoride</b>                        | <b>144</b> | <b>1745</b> |
| <b>Bromine trifluoride</b>                          | <b>144</b> | <b>1746</b> |
| Bromoacetic acid, solid                             | <b>156</b> | 3425        |
| Bromoacetic acid, solution                          | <b>156</b> | 1938        |
| <b>Bromoacetone</b>                                 | <b>131</b> | <b>1569</b> |
| Bromoacetyl bromide                                 | <b>156</b> | 2513        |
| Bromobenzene  | <b>130</b> | 2514        |
| Bromobenzyl cyanides, liquid                        | <b>159</b> | 1694        |
| Bromobenzyl cyanides, solid                         | <b>159</b> | 3449        |
| 1-Bromobutane                                       | <b>130</b> | 1126        |
| 2-Bromobutane                                       | <b>130</b> | 2339        |
| Bromochloromethane                                  | <b>160</b> | 1887        |
| 1-Bromo-3-chloropropane                             | <b>159</b> | 2688        |
| 2-Bromoethyl ethyl ether                            | <b>130</b> | 2340        |
| Bromoform   | <b>159</b> | 2515        |
| 1-Bromo-3-methylbutane                              | <b>130</b> | 2341        |
| Bromomethylpropanes                                 | <b>130</b> | 2342        |
| 2-Bromo-2-nitropropane-1,3-diol                     | <b>133</b> | 3241        |
| 2-Bromopentane                                      | <b>130</b> | 2343        |
| Bromopropanes                                       | <b>129</b> | 2344        |
| 3-Bromopropyne                                      | <b>130</b> | 2345        |
| Bromotrifluoroethylene                              | <b>116</b> | 2419        |

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| Bromotrifluoromethane                          | <b>126</b>  | 1009        |
| Brown asbestos                                 | <b>171</b>  | 2212        |
| Brucine  | <b>152</b>  | 1570        |
| Butadienes, stabilized                         | <b>116P</b> | 1010        |
| Butadienes and hydrocarbon mixture, stabilized | <b>116P</b> | 1010        |
| Butane   | <b>115</b>  | 1011        |
| Butane   | <b>115</b>  | 1075        |
| Butanedione                                    | <b>127</b>  | 2346        |
| Butanols                                       | <b>129</b>  | 1120        |
| Butyl acetates                                 | <b>129</b>  | 1123        |
| Butyl acid phosphate                           | <b>153</b>  | 1718        |
| Butyl acrylates, stabilized                    | <b>129P</b> | 2348        |
| n-Butylamine                                   | <b>132</b>  | 1125        |
| N-Butylaniline                                 | <b>153</b>  | 2738        |
| Butylbenzenes                                  | <b>128</b>  | 2709        |
| n-Butyl bromide                                | <b>130</b>  | 1126        |
| n-Butyl chloride                               | <b>130</b>  | 1127        |
| <b>n-Butyl chloroformate</b>                   | <b>155</b>  | <b>2743</b> |
| <b>sec-Butyl chloroformate</b>                 | <b>155</b>  | <b>2742</b> |
| tert-Butylcyclohexyl chloroformate             | <b>156</b>  | 2747        |
| Butylene                                       | <b>115</b>  | 1012        |
| Butylene                                       | <b>115</b>  | 1075        |
| 1,2-Butylene oxide, stabilized                 | <b>127P</b> | 3022        |
| Butyl ethers                                   | <b>128</b>  | 1149        |
| n-Butyl formate                                | <b>129</b>  | 1128        |
| tert-Butyl hypochlorite                        | <b>135</b>  | 3255        |
| N,n-Butylimidazole                             | <b>152</b>  | 2690        |
| <b>n-Butyl isocyanate</b>                      | <b>155P</b> | <b>2485</b> |
| <b>tert-Butyl isocyanate</b>                   | <b>155</b>  | <b>2484</b> |
| Butyl mercaptan                                | <b>130</b>  | 2347        |



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| n-Butyl methacrylate, stabilized                     | 130P      | 2227   | Calcium arsenite and Calcium arsenate mixture, solid  | 151       | 1574   |
| Butyl methyl ether                                   | 127       | 2350   | Calcium carbide   | 138       | 1402   |
| Butyl nitrites                                       | 129       | 2351   | Calcium chlorate  | 140       | 1452   |
| Butyl propionates                                    | 130       | 1914   | Calcium chlorate, aqueous solution  | 140       | 2429   |
| Butyltoluenes  | 152       | 2667   | Calcium chlorite  | 140       | 1453   |
| Butyltrichlorosilane                                 | 155       | 1747   | Calcium cyanamide, with more than 0.1% Calcium carbide  | 138       | 1403   |
| 5-tert-Butyl-2,4,6-trinitro-m-xylene                 | 149       | 2956   | Calcium cyanide   | 157       | 1575   |
| Butyl vinyl ether, stabilized                        | 127P      | 2352   | Calcium dithionite  | 135       | 1923   |
| 1,4-Butynediol                                       | 153       | 2716   | Calcium hydride   | 138       | 1404   |
| Butyraldehyde  | 129P      | 1129   | Calcium hydrosulfite  | 135       | 1923   |
| Butyraldoxime  | 129       | 2840   | Calcium hydrosulphite   | 135       | 1923   |
| Butyric acid   | 153       | 2820   | Calcium hypochlorite, dry   | 140       | 1748   |
| Butyric anhydride                                    | 156       | 2739   | Calcium hypochlorite, dry, corrosive, with more than 39% available chlorine (8.8% available oxygen)       | 140       | 3485   |
| Butyronitrile  | 131       | 2411   | Calcium hypochlorite, hydrated, corrosive, with not less than 5.5% but not more than 16% water            | 140       | 3487   |
| Butyryl chloride                                     | 132       | 2353   | Calcium hypochlorite, hydrated, with not less than 5.5% but not more than 16% water                       | 140       | 2880   |
| Buzz   | 153       | —      | Calcium hypochlorite, hydrated mixture, corrosive, with not less than 5.5% but not more than 16% water    | 140       | 3487   |
| BZ   | 153       | —      | Calcium hypochlorite, hydrated mixture, with not less than 5.5% but not more than 16% water               | 140       | 2880   |
| CA   | 159       | —      | Calcium hypochlorite mixture, dry, corrosive, with more than 10% but not more than 39% available chlorine | 140       | 3486   |
| Cacodylic acid                                       | 151       | 1572   |   |           |        |
| Cadmium compound                                     | 154       | 2570   |   |           |        |
| Caesium  | 138       | 1407   |   |           |        |
| Caesium hydroxide                                    | 157       | 2682   |   |           |        |
| Caesium hydroxide, solution                          | 154       | 2681   |   |           |        |
| Caesium nitrate                                      | 140       | 1451   |   |           |        |
| Calcium  | 138       | 1401   |   |           |        |
| Calcium, pyrophoric                                  | 135       | 1855   |   |           |        |
| Calcium alloys, pyrophoric                           | 135       | 1855   |   |           |        |
| Calcium arsenate                                     | 151       | 1573   |   |           |        |
| Calcium arsenate and Calcium arsenite mixture, solid | 151       | 1574   |   |           |        |

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| Calcium hypochlorite mixture, dry, corrosive, with more than 39% available chlorine (8.8% available oxygen) | 140      | 3485 | Carbamate pesticide, liquid, toxic, flammable   | 131      | 2991 |
| Calcium hypochlorite mixture, dry, with more than 10% but not more than 39% available Chlorine              | 140      | 2208 | Carbamate pesticide, solid, poisonous   | 151      | 2757 |
| Calcium hypochlorite mixture, dry, with more than 39% available Chlorine (8.8% available Oxygen)            | 140      | 1748 | Carbamate pesticide, solid, toxic   | 151      | 2757 |
| Calcium manganese silicon   | 138      | 2844 | Carbon, activated   | 133      | 1362 |
| Calcium nitrate   | 140      | 1454 | Carbon, animal or vegetable origin  | 133      | 1361 |
| Calcium oxide   | 157      | 1910 | Carbon bisulfide  | 131      | 1131 |
| Calcium perchlorate   | 140      | 1455 | Carbon bisulphide   | 131      | 1131 |
| Calcium permanganate  | 140      | 1456 | Carbon dioxide  | 120      | 1013 |
| Calcium peroxide  | 140      | 1457 | Carbon dioxide, compressed  | 120      | 1013 |
| Calcium phosphide   | 139      | 1360 | Carbon dioxide, refrigerated liquid   | 120      | 2187 |
| Calcium resinate  | 133      | 1313 | Carbon dioxide, solid   | 120      | 1845 |
| Calcium resinate, fused   | 133      | 1314 | Carbon dioxide and Ethylene oxide mixture, with more than 9% but not more than 87% Ethylene oxide | 115      | 1041 |
| Calcium silicide  | 138      | 1405 | Carbon dioxide and Ethylene oxide mixture, with more than 87% Ethylene oxide                      | 119P     | 3300 |
| Camphor, synthetic  | 133      | 2717 | Carbon dioxide and Ethylene oxide mixtures, with not more than 9% Ethylene oxide                  | 126      | 1952 |
| Camphor oil   | 128      | 1130 | Carbon dioxide and Nitrous oxide mixture  | 126      | 1015 |
| Capacitor, asymmetric   | 171      | 3508 | Carbon dioxide and Oxygen mixture, compressed   | 122      | 1014 |
| Capacitor, electric double layer  | 171      | 3499 | Carbon disulfide  | 131      | 1131 |
| Caproic acid  | 153      | 2829 | Carbon disulphide   | 131      | 1131 |
| Carbamate pesticide, liquid, flammable, poisonous   | 131      | 2758 | Carbon monoxide   | 119      | 1016 |
| Carbamate pesticide, liquid, flammable, toxic   | 131      | 2758 | Carbon monoxide, compressed   | 119      | 1016 |
| Carbamate pesticide, liquid, poisonous  | 151      | 2992 | Carbon monoxide, refrigerated liquid (cryogenic liquid)   | 168      | 9202 |
| Carbamate pesticide, liquid, poisonous, flammable   | 131      | 2991 | Carbon tetrabromide   | 151      | 2516 |
| Carbamate pesticide, liquid, toxic  | 151      | 2992 | Carbon tetrachloride  | 151      | 1846 |

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| Carbonyl fluoride  | 125       | 2417   | Chemical under pressure, flammable, poisonous, n.o.s.               | 119       | 3504   |
| Carbonyl fluoride, compressed  | 125       | 2417   | Chemical under pressure, flammable, toxic, n.o.s.                   | 119       | 3504   |
| Carbonyl sulfide   | 119       | 2204   | Chemical under pressure, n.o.s.                                     | 126       | 3500   |
| Carbonyl sulphide  | 119       | 2204   | Chemical under pressure, poisonous, n.o.s.                          | 123       | 3502   |
| Castor beans, meal, pomace or flake                                  | 171       | 2969   | Chemical under pressure, toxic, n.o.s.                              | 123       | 3502   |
| Caustic alkali liquid, n.o.s.  | 154       | 1719   | Chloral, anhydrous, stabilized                                      | 153       | 2075   |
| Caustic potash, solid  | 154       | 1813   | Chlorate and Borate mixture   | 140       | 1458   |
| Caustic potash, solution   | 154       | 1814   | Chlorate and Magnesium chloride mixture, solid                      | 140       | 1459   |
| Caustic soda, solid  | 154       | 1823   | Chlorate and Magnesium chloride mixture, solution                   | 140       | 3407   |
| Caustic soda, solution   | 154       | 1824   | Chlorates, inorganic, aqueous solution, n.o.s.                      | 140       | 3210   |
| Cells, containing Sodium   | 138       | 3292   | Chlorates, inorganic, n.o.s.  | 140       | 1461   |
| Celluloid, in blocks, rods, rolls, sheets, tubes, etc., except scrap | 133       | 2000   | Chloric acid, aqueous solution, with not more than 10% Chloric acid | 140       | 2626   |
| Celluloid, scrap   | 135       | 2002   | Chlorine  | 124       | 1017   |
| Cerium, slabs, ingots or rods  | 170       | 1333   | Chlorine, adsorbed  | 173       | 3520   |
| Cerium, turnings or gritty powder                                    | 138       | 3078   | Chlorine dioxide, hydrate, frozen                                   | 143       | 9191   |
| Cesium   | 138       | 1407   | Chlorine pentafluoride  | 124       | 2548   |
| Cesium hydroxide   | 157       | 2682   | Chlorine trifluoride  | 124       | 1749   |
| Cesium hydroxide, solution   | 154       | 2681   | Chlorite solution   | 154       | 1908   |
| Cesium nitrate   | 140       | 1451   | Chlorites, inorganic, n.o.s.  | 143       | 1462   |
| CG   | 125       | —      | Chloroacetaldehyde  | 153       | 2232   |
| Charcoal   | 133       | 1361   | Chloroacetic acid, molten   | 153       | 3250   |
| Chemical kit   | 154       | 1760   | Chloroacetic acid, solid  | 153       | 1751   |
| Chemical kit   | 171       | 3316   | Chloroacetic acid, solution   | 153       | 1750   |
| Chemical sample, poisonous   | 151       | 3315   | Chloroacetone, stabilized   | 131       | 1695   |
| Chemical sample, toxic   | 151       | 3315   | Chloroacetonitrile  | 131       | 2668   |
| Chemical under pressure, corrosive, n.o.s.                           | 125       | 3503   |   |           |        |
| Chemical under pressure, flammable, corrosive, n.o.s.                | 118       | 3505   |   |           |        |
| Chemical under pressure, flammable, n.o.s.                           | 115       | 3501   |   |           |        |

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| Chloroacetophenone, liquid                                | 153       | 3416   | 3-Chloro-4-methylphenyl isocyanate, solid                 | 156       | 3428   |
| Chloroacetophenone, solid                                 | 153       | 1697   | Chloronitroanilines                                       | 153       | 2237   |
| Chloroacetyl chloride                                     | 156       | 1752   | Chloronitrobenzenes, liquid                               | 152       | 3409   |
| Chloroanilines, liquid                                    | 152       | 2019   | Chloronitrobenzenes, solid                                | 152       | 1578   |
| Chloroanilines, solid                                     | 152       | 2018   | Chloronitrotoluenes, liquid                               | 152       | 2433   |
| Chloroanisidines  | 152       | 2233   | Chloronitrotoluenes, solid                                | 152       | 3457   |
| Chlorobenzene   | 130       | 1134   | Chloropentafluoroethane                                   | 126       | 1020   |
| Chlorobenzotrifluorides                                   | 130       | 2234   | Chloropentafluoroethane and Chlorodifluoromethane mixture | 126       | 1973   |
| Chlorobenzyl chlorides, liquid                            | 153       | 2235   | Chlorophenolates, liquid                                  | 154       | 2904   |
| Chlorobenzyl chlorides, solid                             | 153       | 3427   | Chlorophenolates, solid                                   | 154       | 2905   |
| Chlorobutanes   | 130       | 1127   | Chlorophenols, liquid                                     | 153       | 2021   |
| Chlorocresols, solid                                      | 152       | 3437   | Chlorophenols, solid                                      | 153       | 2020   |
| Chlorocresols, solution                                   | 152       | 2669   | Chlorophenyltrichlorosilane                               | 156       | 1753   |
| Chlorodifluorobromomethane                                | 126       | 1974   | Chloropicrin  | 154       | 1580   |
| 1-Chloro-1,1-difluoroethane                               | 115       | 2517   | Chloropicrin and Methyl bromide mixture                   | 123       | 1581   |
| Chlorodifluoromethane                                     | 126       | 1018   | Chloropicrin and Methyl chloride mixture                  | 119       | 1582   |
| Chlorodifluoromethane and Chloropentafluoroethane mixture | 126       | 1973   | Chloropicrin mixture, n.o.s.                              | 154       | 1583   |
| Chlorodinitrobenzenes, liquid                             | 153       | 1577   | Chloropivaloyl chloride                                   | 156       | 9263   |
| Chlorodinitrobenzenes, solid                              | 153       | 3441   | Chloroplatinic acid, solid                                | 154       | 2507   |
| 2-Chloroethanal   | 153       | 2232   | Chloroprene, stabilized                                   | 131P      | 1991   |
| Chloroform  | 151       | 1888   | 1-Chloropropane   | 129       | 1278   |
| Chloroformates, poisonous, corrosive, flammable, n.o.s.   | 155       | 2742   | 2-Chloropropane   | 129       | 2356   |
| Chloroformates, poisonous, corrosive, n.o.s.              | 154       | 3277   | 3-Chloropropanol-1  | 153       | 2849   |
| Chloroformates, toxic, corrosive, flammable, n.o.s.       | 155       | 2742   | 2-Chloropropene   | 130P      | 2456   |
| Chloroformates, toxic, corrosive, n.o.s.                  | 154       | 3277   | 2-Chloropropionic acid                                    | 153       | 2511   |
| Chloromethyl chloroformate                                | 157       | 2745   | 2-Chloropyridine  | 153       | 2822   |
| Chloromethyl ethyl ether                                  | 131       | 2354   | Chlorosilanes, corrosive, flammable, n.o.s.               | 155       | 2986   |
| 3-Chloro-4-methylphenyl isocyanate, liquid                | 156       | 2236   | Chlorosilanes, corrosive, n.o.s.                          | 156       | 2987   |

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Chlorosilanes, flammable, corrosive, n.o.s.      **155**      2985

Chlorosilanes, poisonous, corrosive, flammable, n.o.s.      **155**      3362

Chlorosilanes, poisonous, corrosive, n.o.s.      **156**      3361

Chlorosilanes, toxic, corrosive, flammable, n.o.s.      **155**      3362

Chlorosilanes, toxic, corrosive, n.o.s.      **156**      3361

Chlorosilanes, water-reactive, flammable, corrosive, n.o.s.      **139**      2988

Chlorosulfonic acid (with or without sulfur trioxide)      **137**      1754

Chlorosulphonic acid (with or without sulphur trioxide)      **137**      1754

1-Chloro-1,2,2,2-tetrafluoroethane      **126**      1021

Chlorotetrafluoroethane and Ethylene oxide mixture, with not more than 8.8% Ethylene oxide      **126**      3297

Chlorotoluenes      **129**      2238

4-Chloro-o-toluidine hydrochloride, solid      **153**      1579

4-Chloro-o-toluidine hydrochloride, solution      **153**      3410

Chlorotoluidines, liquid      **153**      3429

Chlorotoluidines, solid      **153**      2239

1-Chloro-2,2,2-trifluoroethane      **126**      1983

Chlorotrifluoromethane      **126**      1022

Chlorotrifluoromethane and Trifluoromethane azeotropic mixture with approximately 60% Chlorotrifluoromethane      **126**      2599

Chromic acid, solution      **154**      1755

Chromic fluoride, solid      **154**      1756

Chromic fluoride, solution      **154**      1757

Chromium nitrate      **141**      2720

Chromium oxychloride      **137**      1758

Chromium trioxide, anhydrous      **141**      1463

Chromosulfuric acid      **154**      2240

Chromosulphuric acid      **154**      2240

**CK**      **125**      —

Clinical waste, unspecified, n.o.s.      **158**      3291

**CN**      **153**      —

Coal gas      **119**      1023

Coal gas, compressed      **119**      1023

Coal tar distillates, flammable      **128**      1136

Coating solution      **127**      1139

Cobalt naphthenates, powder      **133**      2001

Cobalt resinate, precipitated      **133**      1318

Combustible liquid, n.o.s.      **128**      1993

Compounds, cleaning liquid (corrosive)      **154**      1760

Compounds, cleaning liquid (flammable)      **128**      1993

Compounds, tree or weed killing, liquid (corrosive)      **154**      1760

Compounds, tree or weed killing, liquid (flammable)      **128**      1993

Compounds, tree or weed killing, liquid (toxic)      **153**      2810

Compressed gas, flammable, n.o.s.      **115**      1954

Compressed gas, n.o.s.      **126**      1956

Compressed gas, oxidizing, n.o.s.      **122**      3156

**Compressed gas, poisonous, corrosive, n.o.s.**      **125**      3304

**Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone A)**      **125**      3304

| Name of Material   | Guide ID No. | Guide ID No. | Name of Material   | Guide ID No. | Guide ID No. |
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| Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone B)            | 125          | 3304         | Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone B)                       | 123          | 1955         |
| Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone C)            | 125          | 3304         | Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone C)                       | 123          | 1955         |
| Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone D)            | 125          | 3304         | Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone D)                       | 123          | 1955         |
| Compressed gas, poisonous, flammable, corrosive, n.o.s.                            | 119          | 3305         | Compressed gas, poisonous, oxidizing, corrosive, n.o.s.                            | 124          | 3306         |
| Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A) | 119          | 3305         | Compressed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A) | 124          | 3306         |
| Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B) | 119          | 3305         | Compressed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B) | 124          | 3306         |
| Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C) | 119          | 3305         | Compressed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C) | 124          | 3306         |
| Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D) | 119          | 3305         | Compressed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone D) | 124          | 3306         |
| Compressed gas, poisonous, flammable, n.o.s.                                       | 119          | 1953         | Compressed gas, poisonous, oxidizing, n.o.s.                                       | 124          | 3303         |
| Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)            | 119          | 1953         | Compressed gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone A)            | 124          | 3303         |
| Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)            | 119          | 1953         | Compressed gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone B)            | 124          | 3303         |
| Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)            | 119          | 1953         | Compressed gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone C)            | 124          | 3303         |
| Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D)            | 119          | 1953         | Compressed gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone D)            | 124          | 3303         |
| Compressed gas, poisonous, n.o.s.  | 123          | 1955         | Compressed gas, toxic, corrosive, n.o.s.   | 125          | 3304         |
| Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone A)                       | 123          | 1955         | Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone A)                | 125          | 3304         |

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| Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone B)            | 125 | 3304 |
| Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone C)            | 125 | 3304 |
| Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone D)            | 125 | 3304 |
| Compressed gas, toxic, flammable, corrosive, n.o.s.                            | 119 | 3305 |
| Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A) | 119 | 3305 |
| Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B) | 119 | 3305 |
| Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C) | 119 | 3305 |
| Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D) | 119 | 3305 |
| Compressed gas, toxic, flammable, n.o.s.                                       | 119 | 1953 |
| Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)            | 119 | 1953 |
| Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)            | 119 | 1953 |
| Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)            | 119 | 1953 |
| Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)            | 119 | 1953 |
| Compressed gas, toxic, n.o.s.  | 123 | 1955 |
| Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone A)                       | 123 | 1955 |
| Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone B)                       | 123 | 1955 |

|  |     |      |
|--|-----|------|
| Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone C)                       | 123 | 1955 |
| Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone D)                       | 123 | 1955 |
| Compressed gas, toxic, oxidizing, corrosive, n.o.s.                            | 124 | 3306 |
| Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A) | 124 | 3306 |
| Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B) | 124 | 3306 |
| Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C) | 124 | 3306 |
| Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone D) | 124 | 3306 |
| Compressed gas, toxic, oxidizing, n.o.s.                                       | 124 | 3303 |
| Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone A)            | 124 | 3303 |
| Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone B)            | 124 | 3303 |
| Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone C)            | 124 | 3303 |
| Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone D)            | 124 | 3303 |
| Compressed gas and hexaethyl tetraphosphate mixture                            | 123 | 1612 |
| Consumer commodity   | 171 | 8000 |
| Copper acetoarsenite   | 151 | 1585 |
| Copper arsenite  | 151 | 1586 |
| Copper based pesticide, liquid, flammable, poisonous                           | 131 | 2776 |
| Copper based pesticide, liquid, flammable, toxic                               | 131 | 2776 |

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| Copper based pesticide, liquid, poisonous            | <b>151</b>       | 3010          | Corrosive solid, acidic, organic, n.o.s.                    | <b>154</b>       | 3261          |
| Copper based pesticide, liquid, poisonous, flammable | <b>131</b>       | 3009          | Corrosive solid, basic, inorganic, n.o.s.                   | <b>154</b>       | 3262          |
| Copper based pesticide, liquid, toxic                | <b>151</b>       | 3010          | Corrosive solid, basic, organic, n.o.s.                     | <b>154</b>       | 3263          |
| Copper based pesticide, liquid, toxic, flammable     | <b>131</b>       | 3009          | Corrosive solid, flammable, n.o.s.                          | <b>134</b>       | 2921          |
| Copper based pesticide, solid, poisonous             | <b>151</b>       | 2775          | Corrosive solid, n.o.s.                                     | <b>154</b>       | 1759          |
| Copper based pesticide, solid, toxic                 | <b>151</b>       | 2775          | Corrosive solid, oxidizing, n.o.s.                          | <b>157</b>       | 3084          |
| Copper chlorate                                      | <b>140</b>       | 2721          | Corrosive solid, poisonous, n.o.s.                          | <b>154</b>       | 2923          |
| Copper chloride                                      | <b>154</b>       | 2802          | Corrosive solid, self-heating, n.o.s.                       | <b>136</b>       | 3095          |
| Copper cyanide                                       | <b>151</b>       | 1587          | Corrosive solid, toxic, n.o.s.                              | <b>154</b>       | 2923          |
| Copra  | <b>135</b>       | 1363          | Corrosive solid, water-reactive, n.o.s.                     | <b>138</b>       | 3096          |
| Corrosive liquid, acidic, inorganic, n.o.s.          | <b>154</b>       | 3264          | Cotton  | <b>133</b>       | 1365          |
| Corrosive liquid, acidic, organic, n.o.s.            | <b>153</b>       | 3265          | Cotton, wet   | <b>133</b>       | 1365          |
| Corrosive liquid, basic, inorganic, n.o.s.           | <b>154</b>       | 3266          | Cotton waste, oily  | <b>133</b>       | 1364          |
| Corrosive liquid, basic, organic, n.o.s.             | <b>153</b>       | 3267          | Coumarin derivative pesticide, liquid, flammable, poisonous | <b>131</b>       | 3024          |
| Corrosive liquid, flammable, n.o.s.                  | <b>132</b>       | 2920          | Coumarin derivative pesticide, liquid, flammable, toxic     | <b>131</b>       | 3024          |
| Corrosive liquid, n.o.s.                             | <b>154</b>       | 1760          | Coumarin derivative pesticide, liquid, poisonous            | <b>151</b>       | 3026          |
| Corrosive liquid, oxidizing, n.o.s.                  | <b>157</b>       | 3093          | Coumarin derivative pesticide, liquid, poisonous, flammable | <b>131</b>       | 3025          |
| Corrosive liquid, poisonous, n.o.s.                  | <b>154</b>       | 2922          | Coumarin derivative pesticide, liquid, toxic                | <b>151</b>       | 3026          |
| Corrosive liquid, self-heating, n.o.s.               | <b>136</b>       | 3301          | Coumarin derivative pesticide, liquid, toxic, flammable     | <b>131</b>       | 3025          |
| Corrosive liquid, toxic, n.o.s.                      | <b>154</b>       | 2922          | Coumarin derivative pesticide, solid, poisonous             | <b>151</b>       | 3027          |
| Corrosive liquid, water-reactive, n.o.s.             | <b>138</b>       | 3094          | Coumarin derivative pesticide, solid, toxic                 | <b>151</b>       | 3027          |
| Corrosive solid, acidic, inorganic, n.o.s.           | <b>154</b>       | 3260          | Cresols, liquid   | <b>153</b>       | 2076          |



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| Cresols, solid                     | 153  | 3455 |
| Cresylic acid                      | 153  | 2022 |
| Crotonaldehyde                     | 131P | 1143 |
| Crotonaldehyde, stabilized         | 131P | 1143 |
| Crotonic acid, liquid              | 153  | 3472 |
| Crotonic acid, solid               | 153  | 2823 |
| Crotonylene                        | 128  | 1144 |
| CS                                 | 153  | —    |
| Cumene                             | 130  | 1918 |
| Cupriethylenediamine, solution     | 154  | 1761 |
| CX                                 | 154  | —    |
| Cyanide solution, n.o.s.           | 157  | 1935 |
| Cyanides, inorganic, solid, n.o.s. | 157  | 1588 |
| Cyanogen                           | 119  | 1026 |
| Cyanogen bromide                   | 157  | 1889 |
| Cyanogen chloride, stabilized      | 125  | 1589 |
| Cyanuric chloride                  | 157  | 2670 |
| Cyclobutane                        | 115  | 2601 |
| Cyclobutyl chloroformate           | 155  | 2744 |
| 1,5,9-Cyclododecatriene            | 153  | 2518 |
| Cycloheptane                       | 128  | 2241 |
| Cycloheptatriene                   | 131  | 2603 |
| Cycloheptene                       | 128  | 2242 |
| Cyclohexane                        | 128  | 1145 |
| Cyclohexanethiol                   | 129  | 3054 |
| Cyclohexanone                      | 127  | 1915 |
| Cyclohexene                        | 130  | 2256 |
| Cyclohexenyltrichlorosilane        | 156  | 1762 |
| Cyclohexyl acetate                 | 130  | 2243 |
| Cyclohexylamine                    | 132  | 2357 |
| Cyclohexyl isocyanate              | 155  | 2488 |

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| Cyclohexyl mercaptan   | 129  | 3054 |
| Cyclohexyltrichlorosilane                                    | 156  | 1763 |
| Cyclooctadiene phosphines                                    | 135  | 2940 |
| Cyclooctadienes  | 130P | 2520 |
| Cyclooctatetraene  | 128P | 2358 |
| Cyclopentane   | 128  | 1146 |
| Cyclopentanol  | 129  | 2244 |
| Cyclopentanone   | 128  | 2245 |
| Cyclopentene   | 128  | 2246 |
| Cyclopropane   | 115  | 1027 |
| Cymenes  | 130  | 2046 |
| DA   | 151  | —    |
| Dangerous goods in apparatus                                 | 171  | 3363 |
| Dangerous goods in articles                                  | 171  | 3363 |
| Dangerous goods in machinery                                 | 171  | 3363 |
| DC   | 153  | —    |
| Decaborane   | 134  | 1868 |
| Decahydronaphthalene   | 130  | 1147 |
| n-Decane   | 128  | 2247 |
| Denatured alcohol  | 127  | 1987 |
| Desensitized explosive, liquid, n.o.s.                       | 113  | 3379 |
| Desensitized explosive, solid, n.o.s.                        | 113  | 3380 |
| Deuterium  | 115  | 1957 |
| Deuterium, compressed  | 115  | 1957 |
| Devices, small, hydrocarbon gas powered, with release device | 115  | 3150 |
| Diacetone alcohol  | 129  | 1148 |
| Diacetyl   | 127  | 2346 |
| Diallylamine   | 132  | 2359 |
| Diallyl ether  | 131P | 2360 |
| 4,4'-Diaminodiphenylmethane                                  | 153  | 2651 |

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| Di-n-amylamine   | 131       | 2841   | Dichloroisocyanuric acid, dry          | 140       | 2465   |
| Dibenzylchlorosilane   | 156       | 2434   | Dichloroisocyanuric acid salts         | 140       | 2465   |
| Diborane   | 119       | 1911   | Dichloroisopropyl ether                | 153       | 2490   |
| Diborane, compressed   | 119       | 1911   | Dichloromethane                        | 160       | 1593   |
| Diborane mixtures  | 119       | 1911   | 1,1-Dichloro-1-nitroethane             | 153       | 2650   |
| 1,2-Dibromobutan-3-one   | 154       | 2648   | Dichloropentanes                       | 130       | 1152   |
| Dibromochloropropanes  | 159       | 2872   | Dichlorophenyl isocyanates             | 156       | 2250   |
| Dibromodifluoromethane   | 171       | 1941   | Dichlorophenyltrichlorosilane          | 156       | 1766   |
| Dibromomethane   | 160       | 2664   | 1,2-Dichloropropane                    | 130       | 1279   |
| Di-n-butylamine  | 132       | 2248   | 1,3-Dichloropropanol-2                 | 153       | 2750   |
| Dibutylaminoethanol  | 153       | 2873   | Dichloropropenes                       | 129       | 2047   |
| Dibutyl ethers   | 128       | 1149   | Dichlorosilane                         | 119       | 2189   |
| Dichloroacetic acid  | 153       | 1764   | 1,2-Dichloro-1,1,2,2-tetrafluoroethane | 126       | 1958   |
| 1,3-Dichloroacetone  | 153       | 2649   | 3,5-Dichloro-2,4,6-trifluoropyridine   | 151       | 9264   |
| Dichloroanilines, liquid   | 153       | 1590   | Dicyclohexylamine                      | 153       | 2565   |
| Dichloroanilines, solid  | 153       | 3442   | Dicyclohexylammonium nitrite           | 133       | 2687   |
| o-Dichlorobenzene  | 152       | 1591   | Dicyclopentadiene                      | 130P      | 2048   |
| 2,2'-Dichlorodiethyl ether   | 152       | 1916   | 1,2-Di-(dimethylamino)ethane           | 129       | 2372   |
| Dichlorodifluoromethane  | 126       | 1028   | Didymium nitrate                       | 140       | 1465   |
| Dichlorodifluoromethane and Difluoroethane azeotropic mixture with approximately 74% Dichlorodifluoromethane | 126       | 2602   | Diesel fuel                            | 128       | 1202   |
| Dichlorodifluoromethane and Ethylene oxide mixture, with not more than 12.5% Ethylene oxide                  | 126       | 3070   | Diesel fuel                            | 128       | 1993   |
| Dichlorodimethyl ether, symmetrical  | 131       | 2249   | Diethoxymethane                        | 127       | 2373   |
| 1,1-Dichloroethane   | 130       | 2362   | 3,3-Diethoxypropene                    | 127       | 2374   |
| 1,2-Dichloroethylene   | 130P      | 1150   | Diethylamine                           | 132       | 1154   |
| Dichloroethyl ether  | 152       | 1916   | 2-Diethylaminoethanol                  | 132       | 2686   |
| Dichlorofluoromethane  | 126       | 1029   | 3-Diethylaminopropylamine              | 132       | 2684   |
|  |           |        | N,N-Diethylaniline                     | 153       | 2432   |
|  |           |        | Diethylbenzene                         | 130       | 2049   |
|  |           |        | Diethyl carbonate                      | 128       | 2366   |
|  |           |        | Diethylchlorosilane                    | 155       | 1767   |
|  |           |        | Diethylenetriamine                     | 154       | 2079   |

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| Diethyl ether  | 127       | 1155   | 2-Dimethylaminoacetonitrile       | 131       | 2378   |
| N,N-Diethylethylenediamine   | 132       | 2685   | 2-Dimethylaminoethanol            | 132       | 2051   |
| Diethyl ketone   | 127       | 1156   | 2-Dimethylaminoethyl acrylate     | 152       | 3302   |
| Diethyl sulfate  | 152       | 1594   | 2-Dimethylaminoethyl methacrylate | 153P      | 2522   |
| Diethyl sulfide  | 129       | 2375   | N,N-Dimethylaniline               | 153       | 2253   |
| Diethyl sulphate   | 152       | 1594   | 2,3-Dimethylbutane                | 128       | 2457   |
| Diethyl sulphide   | 129       | 2375   | 1,3-Dimethylbutylamine            | 132       | 2379   |
| Diethylthiophosphoryl chloride   | 155       | 2751   | Dimethylcarbamoyl chloride        | 156       | 2262   |
| Diethylzinc  | 135       | 1366   | Dimethyl carbonate                | 129       | 1161   |
| Difluorochloroethanes  | 115       | 2517   | Dimethylcyclohexanes              | 128       | 2263   |
| 1,1-Difluoroethane   | 115       | 1030   | N,N-Dimethylcyclohexylamine       | 132       | 2264   |
| Difluoroethane and Dichlorodifluoromethane azeotropic mixture with approximately 74% Dichlorodifluoromethane | 126       | 2602   | Dimethylcyclohexylamine           | 132       | 2264   |
| 1,1-Difluoroethylene   | 116P      | 1959   | Dimethyldichlorosilane            | 155       | 1162   |
| Difluoromethane  | 115       | 3252   | Dimethyldiethoxysilane            | 127       | 2380   |
| Difluorophosphoric acid, anhydrous   | 154       | 1768   | Dimethyldioxanes                  | 127       | 2707   |
| 2,3-Dihydropyran   | 127       | 2376   | Dimethyl disulfide                | 131       | 2381   |
| Diisobutylamine  | 132       | 2361   | Dimethyl disulphide               | 131       | 2381   |
| Diisobutylene, isomeric compounds  | 128       | 2050   | Dimethyl ether                    | 115       | 1033   |
| Diisobutyl ketone  | 128       | 1157   | N,N-Dimethylformamide             | 129       | 2265   |
| Diisooctyl acid phosphate  | 153       | 1902   | Dimethylhydrazine, symmetrical    | 131       | 2382   |
| Diisopropylamine   | 132       | 1158   | Dimethylhydrazine, unsymmetrical  | 131       | 1163   |
| Diisopropyl ether  | 127       | 1159   | 2,2-Dimethylpropane               | 115       | 2044   |
| Diketene, stabilized   | 131P      | 2521   | Dimethyl-N-propylamine            | 132       | 2266   |
| 1,1-Dimethoxyethane  | 127       | 2377   | Dimethyl sulfate                  | 156       | 1595   |
| 1,2-Dimethoxyethane  | 127       | 2252   | Dimethyl sulfide                  | 130       | 1164   |
| Dimethylamine, anhydrous   | 118       | 1032   | Dimethyl sulphate                 | 156       | 1595   |
| Dimethylamine, aqueous solution  | 132       | 1160   | Dimethyl sulphide                 | 130       | 1164   |
| Dimethylamine, solution  | 132       | 1160   | Dimethyl thiophosphoryl chloride  | 156       | 2267   |
|  |           |        | Dimethylzinc                      | 135       | 1370   |

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| Dinitroanilines  | 153       | 1596   | Disinfectant, liquid, poisonous, n.o.s.     | 151       | 3142   |
| Dinitrobenzenes, liquid                                | 152       | 1597   | Disinfectant, liquid, toxic, n.o.s.         | 151       | 3142   |
| Dinitrobenzenes, solid                                 | 152       | 3443   | Disinfectant, solid, poisonous, n.o.s.      | 151       | 1601   |
| Dinitro-o-cresol                                       | 153       | 1598   | Disinfectant, solid, toxic, n.o.s.          | 151       | 1601   |
| Dinitrogen tetroxide                                   | 124       | 1067   | Disodium trioxosilicate                     | 154       | 3253   |
| Dinitrogen tetroxide and Nitric oxide mixture          | 124       | 1975   | Dispersant gas, n.o.s.                      | 126       | 1078   |
| Dinitrophenol, solution                                | 153       | 1599   | Dispersant gases, n.o.s. (flammable)        | 115       | 1954   |
| Dinitrophenol, wetted with not less than 15% water     | 113       | 1320   | Divinyl ether, stabilized                   | 128P      | 1167   |
| Dinitrophenolates, wetted with not less than 15% water | 113       | 1321   | DM  | 154       | —      |
| Dinitroresorcinol, wetted with not less than 15% water | 113       | 1322   | Dodecyltrichlorosilane                      | 156       | 1771   |
| Dinitrotoluenes, liquid                                | 152       | 2038   | DP  | 125       | —      |
| Dinitrotoluenes, molten                                | 152       | 1600   | Dry ice                                     | 120       | 1845   |
| Dinitrotoluenes, solid                                 | 152       | 3454   | Dye, liquid, corrosive, n.o.s.              | 154       | 2801   |
| Dioxane  | 127       | 1165   | Dye, liquid, poisonous, n.o.s.              | 151       | 1602   |
| Dioxolane  | 127       | 1166   | Dye, liquid, toxic, n.o.s.                  | 151       | 1602   |
| Dipentene  | 128       | 2052   | Dye, solid, corrosive, n.o.s.               | 154       | 3147   |
| Diphenylamine chloroarsine                             | 154       | 1698   | Dye, solid, poisonous, n.o.s.               | 151       | 3143   |
| Diphenylchloroarsine, liquid                           | 151       | 1699   | Dye, solid, toxic, n.o.s.                   | 151       | 3143   |
| Diphenylchloroarsine, solid                            | 151       | 3450   | Dye intermediate, liquid, corrosive, n.o.s. | 154       | 2801   |
| Diphenyldichlorosilane                                 | 156       | 1769   | Dye intermediate, liquid, poisonous, n.o.s. | 151       | 1602   |
| Diphenylmethyl bromide                                 | 153       | 1770   | Dye intermediate, liquid, toxic, n.o.s.     | 151       | 1602   |
| Dipicryl sulfide, wetted with not less than 10% water  | 113       | 2852   | Dye intermediate, solid, corrosive, n.o.s.  | 154       | 3147   |
| Dipicryl sulphide, wetted with not less than 10% water | 113       | 2852   | Dye intermediate, solid, poisonous, n.o.s.  | 151       | 3143   |
| Dipropylamine  | 132       | 2383   | Dye intermediate, solid, toxic, n.o.s.      | 151       | 3143   |
| Di-n-propyl ether                                      | 127       | 2384   | ED  | 151       | —      |
| Dipropyl ketone  | 128       | 2710   |   |           |        |
| Disinfectant, liquid, corrosive, n.o.s.                | 153       | 1903   |   |           |        |

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| Elevated temperature liquid, flammable, n.o.s., with flash point above 37.8°C (100°F), at or above its flash point | 128       | 3256   | Esters, n.o.s.  | 127       | 3272   |
| Elevated temperature liquid, flammable, n.o.s., with flash point above 60°C (140°F), at or above its flash point   | 128       | 3256   | Ethane  | 115       | 1035   |
| Elevated temperature liquid, n.o.s., at or above 100°C (212°F), and below its flash point                          | 171       | 3257   | Ethane, compressed  | 115       | 1035   |
| Elevated temperature solid, n.o.s., at or above 240°C (464°F)  | 171       | 3258   | Ethane, refrigerated liquid   | 115       | 1961   |
| Engine, fuel cell, flammable gas powered   | 115       | 3166   | Ethane-Propane mixture, refrigerated liquid   | 115       | 1961   |
| Engine, fuel cell, flammable gas powered   | 115       | 3529   | Ethanol   | 127       | 1170   |
| Engine, fuel cell, flammable liquid powered  | 128       | 3166   | Ethanol and gasoline mixture, with more than 10% ethanol                              | 127       | 3475   |
| Engine, fuel cell, flammable liquid powered  | 128       | 3528   | Ethanol and motor spirit mixture, with more than 10% ethanol                          | 127       | 3475   |
| Engine, internal combustion  | 128       | 3166   | Ethanol and petrol mixture, with more than 10% ethanol                                | 127       | 3475   |
| Engine, internal combustion  | 171       | 3530   | Ethanol, solution   | 127       | 1170   |
| Engine, internal combustion, flammable gas powered   | 115       | 3529   | Ethanolamine  | 153       | 2491   |
| Engine, internal combustion, flammable liquid powered  | 128       | 3528   | Ethanolamine, solution  | 153       | 2491   |
| Engines, internal combustion, flammable gas powered  | 115       | 3166   | Ethers, n.o.s.  | 127       | 3271   |
| Engines, internal combustion, flammable liquid powered   | 128       | 3166   | Ethyl acetate   | 129       | 1173   |
| Environmentally hazardous substance, liquid, n.o.s.  | 171       | 3082   | Ethylacetylene, stabilized  | 116P      | 2452   |
| Environmentally hazardous substance, solid, n.o.s.   | 171       | 3077   | Ethyl acrylate, stabilized  | 129P      | 1917   |
| Epibromohydrin   | 131       | 2558   | Ethyl alcohol   | 127       | 1170   |
| Epichlorohydrin  | 131P      | 2023   | Ethyl alcohol, solution   | 127       | 1170   |
| 1,2-Epoxy-3-ethoxypropane  | 127       | 2752   | Ethylamine  | 118       | 1036   |
|  |           |        | Ethylamine, aqueous solution, with not less than 50% but not more than 70% Ethylamine | 132       | 2270   |
|  |           |        | Ethyl amyl ketone   | 128       | 2271   |
|  |           |        | 2-Ethylaniline  | 153       | 2273   |
|  |           |        | N-Ethylaniline  | 153       | 2272   |
|  |           |        | Ethylbenzene  | 130       | 1175   |
|  |           |        | N-Ethyl-N-benzylaniline   | 153       | 2274   |
|  |           |        | N-Ethylbenzyltoluidines, liquid   | 153       | 2753   |
|  |           |        | N-Ethylbenzyltoluidines, solid  | 153       | 3460   |

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| Ethyl borate   | 129       | 1176   | Ethylene glycol monoethyl ether   | 127       | 1171   |
| Ethyl bromide  | 131       | 1891   | Ethylene glycol monoethyl ether acetate   | 129       | 1172   |
| Ethyl bromoacetate   | 155       | 1603   | Ethylene glycol monomethyl ether  | 127       | 1188   |
| 2-Ethylbutanol   | 129       | 2275   | Ethylene glycol monomethyl ether acetate  | 129       | 1189   |
| 2-Ethylbutyl acetate   | 130       | 1177   | Ethyleneimine, stabilized   | 131P      | 1185   |
| Ethyl butyl ether  | 127       | 1179   | Ethylene oxide  | 119P      | 1040   |
| 2-Ethylbutyraldehyde   | 130       | 1178   | Ethylene oxide and Carbon dioxide mixture, with more than 9% but not more than 87% Ethylene oxide | 115       | 1041   |
| Ethyl butyrate   | 130       | 1180   | Ethylene oxide and Carbon dioxide mixture, with more than 87% Ethylene oxide                      | 119P      | 3300   |
| Ethyl chloride   | 115       | 1037   | Ethylene oxide and Carbon dioxide mixtures, with not more than 9% Ethylene oxide                  | 126       | 1952   |
| Ethyl chloroacetate  | 155       | 1181   | Ethylene oxide and Chlorotetrafluoroethane mixture, with not more than 8.8% Ethylene oxide        | 126       | 3297   |
| Ethyl chloroformate  | 155       | 1182   | Ethylene oxide and Dichlorodifluoromethane mixture, with not more than 12.5% Ethylene oxide       | 126       | 3070   |
| Ethyl 2-chloropropionate   | 129       | 2935   | Ethylene oxide and Pentafluoroethane mixture, with not more than 7.9% Ethylene oxide              | 126       | 3298   |
| Ethyl chlorothioformate  | 155       | 2826   | Ethylene oxide and Propylene oxide mixture, with not more than 30% Ethylene oxide                 | 131P      | 2983   |
| Ethyl crotonate  | 130       | 1862   | Ethylene oxide and Tetrafluoroethane mixture, with not more than 5.6% Ethylene oxide              | 126       | 3299   |
| Ethyl dichloroarsine   | 151       | 1892   | Ethylene oxide with Nitrogen  | 119P      | 1040   |
| Ethyl dichlorosilane   | 139       | 1183   | Ethyl ether   | 127       | 1155   |
| Ethylene   | 116P      | 1962   | Ethyl fluoride  | 115       | 2453   |
| Ethylene, Acetylene and Propylene in mixture, refrigerated liquid containing at least 71.5% Ethylene with not more than 22.5% Acetylene and not more than 6% Propylene | 115       | 3138   |   |           |        |
| Ethylene, compressed   | 116P      | 1962   |   |           |        |
| Ethylene, refrigerated liquid (cryogenic liquid)   | 115       | 1038   |   |           |        |
| Ethylene chlorohydrin  | 131       | 1135   |   |           |        |
| Ethylenediamine  | 132       | 1604   |   |           |        |
| Ethylene dibromide   | 154       | 1605   |   |           |        |
| Ethylene dibromide and Methyl bromide mixture, liquid  | 151       | 1647   |   |           |        |
| Ethylene dichloride  | 131       | 1184   |   |           |        |
| Ethylene glycol diethyl ether  | 127       | 1153   |   |           |        |

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| Ethyl formate                               | 129       | 1190   | Fabrics, animal or vegetable or synthetic, n.o.s. with oil      | 133       | 1373   |
| Ethylhexaldehydes                           | 129       | 1191   | Fabrics impregnated with weakly nitrated Nitrocellulose, n.o.s. | 133       | 1353   |
| 2-Ethylhexylamine                           | 132       | 2276   | Ferric arsenate   | 151       | 1606   |
| 2-Ethylhexyl chloroformate                  | 156       | 2748   | Ferric arsenite   | 151       | 1607   |
| Ethyl isobutyrate                           | 129       | 2385   | Ferric chloride, anhydrous                                      | 157       | 1773   |
| Ethyl isocyanate                            | 155       | 2481   | Ferric chloride, solution                                       | 154       | 2582   |
| Ethyl lactate                               | 129       | 1192   | Ferric nitrate  | 140       | 1466   |
| Ethyl mercaptan                             | 129       | 2363   | Ferrocerium   | 170       | 1323   |
| Ethyl methacrylate, stabilized              | 130P      | 2277   | Ferrosilicon  | 139       | 1408   |
| Ethyl methyl ether                          | 115       | 1039   | Ferrous arsenate  | 151       | 1608   |
| Ethyl methyl ketone                         | 127       | 1193   | Ferrous chloride, solid   | 154       | 1759   |
| Ethyl nitrite, solution                     | 131       | 1194   | Ferrous chloride, solution                                      | 154       | 1760   |
| Ethyl orthoformate                          | 129       | 2524   | Ferrous metal borings, shavings, turnings or cuttings           | 170       | 2793   |
| Ethyl oxalate                               | 156       | 2525   | Fertilizer, ammoniating solution, with free Ammonia             | 125       | 1043   |
| Ethylphenyldichlorosilane                   | 156       | 2435   | Fibers, animal or vegetable, burnt, wet or damp                 | 133       | 1372   |
| Ethyl phosphonothioic dichloride, anhydrous | 154       | 2927   | Fibers, animal or vegetable or synthetic, n.o.s. with oil       | 133       | 1373   |
| Ethyl phosphonous dichloride, anhydrous     | 135       | 2845   | Fibers, vegetable, dry  | 133       | 3360   |
| Ethyl phosphorodichloridate                 | 154       | 2927   | Fibers impregnated with weakly nitrated Nitrocellulose, n.o.s.  | 133       | 1353   |
| 1-Ethylpiperidine                           | 132       | 2386   | Fibres, animal or vegetable, burnt, wet or damp                 | 133       | 1372   |
| Ethyl propionate                            | 129       | 1195   | Fibres, animal or vegetable or synthetic, n.o.s. with oil       | 133       | 1373   |
| Ethyl propyl ether                          | 127       | 2615   | Fibres, vegetable, dry  | 133       | 3360   |
| Ethyl silicate                              | 129       | 1292   | Fibres impregnated with weakly nitrated Nitrocellulose, n.o.s.  | 133       | 1353   |
| N-Ethyltoluidines                           | 153       | 2754   | Fibres, animal or vegetable, burnt, wet or damp                 | 133       | 1372   |
| Ethyltrichlorosilane                        | 155       | 1196   | Fibres, animal or vegetable or synthetic, n.o.s. with oil       | 133       | 1373   |
| Explosives, division 1.1, 1.2, 1.3 or 1.5   | 112       | —      | Fibres, vegetable, dry  | 133       | 3360   |
| Explosives, division 1.4 or 1.6             | 114       | —      | Fibres impregnated with weakly nitrated Nitrocellulose, n.o.s.  | 133       | 1353   |
| Extracts, aromatic, liquid                  | 127       | 1169   | Films, nitrocellulose base                                      | 133       | 1324   |
| Extracts, flavoring, liquid                 | 127       | 1197   | Fire extinguisher charges, corrosive liquid                     | 154       | 1774   |
| Extracts, flavouring, liquid                | 127       | 1197   |   |           |        |

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| Fire extinguishers with compressed or liquefied gas | 126              | 1044          | Flammable solid, toxic, organic, n.o.s.                        | 134              | 2926          |
| Firelighters, solid, with flammable liquid          | 133              | 2623          | Fluorine   | 124              | 1045          |
| First aid kit                                       | 171              | 3316          | Fluorine, compressed   | 124              | 1045          |
| Fish meal, stabilized                               | 171              | 2216          | Fluoroacetic acid  | 154              | 2642          |
| Fish meal, unstabilized                             | 133              | 1374          | Fluoroanilines   | 153              | 2941          |
| Fish scrap, stabilized                              | 171              | 2216          | Fluorobenzene  | 130              | 2387          |
| Fish scrap, unstabilized                            | 133              | 1374          | Fluoroboric acid   | 154              | 1775          |
| Flammable liquid, corrosive, n.o.s.                 | 132              | 2924          | Fluorophosphoric acid, anhydrous                               | 154              | 1776          |
| Flammable liquid, n.o.s.                            | 128              | 1993          | Fluorosilicates, n.o.s.  | 151              | 2856          |
| Flammable liquid, poisonous, corrosive, n.o.s.      | 131              | 3286          | Fluorosilicic acid   | 154              | 1778          |
| Flammable liquid, poisonous, n.o.s.                 | 131              | 1992          | Fluorosulfonic acid  | 137              | 1777          |
| Flammable liquid, toxic, corrosive, n.o.s.          | 131              | 3286          | Fluorosulphonic acid   | 137              | 1777          |
| Flammable liquid, toxic, n.o.s.                     | 131              | 1992          | Fluorotoluenes   | 130              | 2388          |
| Flammable solid, corrosive, inorganic, n.o.s.       | 134              | 3180          | Formaldehyde, solution (corrosive)                             | 153              | 2209          |
| Flammable solid, corrosive, organic, n.o.s.         | 134              | 2925          | Formaldehyde, solution, flammable                              | 132              | 1198          |
| Flammable solid, inorganic, n.o.s.                  | 133              | 3178          | Formalin (corrosive)   | 153              | 2209          |
| Flammable solid, organic, molten, n.o.s.            | 133              | 3176          | Formalin (flammable)   | 132              | 1198          |
| Flammable solid, organic, n.o.s.                    | 133              | 1325          | Formic acid  | 153              | 1779          |
| Flammable solid, oxidizing, n.o.s.                  | 140              | 3097          | Formic acid, with more than 85% acid                           | 153              | 1779          |
| Flammable solid, poisonous, inorganic, n.o.s.       | 134              | 3179          | Formic acid, with not less than 5% but less than 10% acid      | 153              | 3412          |
| Flammable solid, poisonous, organic, n.o.s.         | 134              | 2926          | Formic acid, with not less than 10% but not more than 85% acid | 153              | 3412          |
| Flammable solid, toxic, inorganic, n.o.s.           | 134              | 3179          | Fuel, aviation, turbine engine                                 | 128              | 1863          |
|   |                  |               | Fuel cell cartridges, containing corrosive substances          | 153              | 3477          |
|   |                  |               | Fuel cell cartridges, containing flammable liquids             | 128              | 3473          |
|   |                  |               | Fuel cell cartridges, containing hydrogen in metal hydride     | 115              | 3479          |



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| Fuel cell cartridges, containing liquefied flammable gas                          | 115       | 3478   | Furfurylamine  | 132       | 2526   |
| Fuel cell cartridges, containing water-reactive substances                        | 138       | 3476   | Fusee (railway or highway)   | 133       | 1325   |
| Fuel cell cartridges contained in equipment, containing corrosive substances      | 153       | 3477   | Fusel oil  | 127       | 1201   |
| Fuel cell cartridges contained in equipment, containing flammable liquids         | 128       | 3473   | GA   | 153       | —      |
| Fuel cell cartridges contained in equipment, containing hydrogen in metal hydride | 115       | 3479   | Gallium  | 172       | 2803   |
| Fuel cell cartridges contained in equipment, containing liquefied flammable gas   | 115       | 3478   | Gas, refrigerated liquid, flammable, n.o.s.  | 115       | 3312   |
| Fuel cell cartridges contained in equipment, containing water-reactive substances | 138       | 3476   | Gas, refrigerated liquid, n.o.s.   | 120       | 3158   |
| Fuel cell cartridges packed with equipment, containing corrosive substances       | 153       | 3477   | Gas, refrigerated liquid, oxidizing, n.o.s.  | 122       | 3311   |
| Fuel cell cartridges packed with equipment, containing flammable liquids          | 128       | 3473   | Gas cartridges   | 115       | 2037   |
| Fuel cell cartridges packed with equipment, containing hydrogen in metal hydride  | 115       | 3479   | Gas identification set   | 123       | 9035   |
| Fuel cell cartridges packed with equipment, containing liquefied flammable gas    | 115       | 3478   | Gasohol  | 128       | 1203   |
| Fuel cell cartridges packed with equipment, containing water-reactive substances  | 138       | 3476   | Gas oil  | 128       | 1202   |
| Fuel cell cartridges packed with equipment, containing corrosive substances       | 153       | 3477   | Gasoline   | 128       | 1203   |
| Fuel cell cartridges packed with equipment, containing flammable liquids          | 128       | 3473   | Gasoline and ethanol mixture, with more than 10% ethanol                           | 127       | 3475   |
| Fuel cell cartridges packed with equipment, containing hydrogen in metal hydride  | 115       | 3479   | Gas sample, non-pressurized, flammable, n.o.s., not refrigerated liquid            | 115       | 3167   |
| Fuel cell cartridges packed with equipment, containing liquefied flammable gas    | 115       | 3478   | Gas sample, non-pressurized, poisonous, flammable, n.o.s., not refrigerated liquid | 119       | 3168   |
| Fuel cell cartridges packed with equipment, containing water-reactive substances  | 138       | 3476   | Gas sample, non-pressurized, poisonous, n.o.s., not refrigerated liquid            | 123       | 3169   |
| Fuel oil  | 128       | 1202   | Gas sample, non-pressurized, toxic, flammable, n.o.s., not refrigerated liquid     | 119       | 3168   |
| Fuel oil  | 128       | 1993   | Gas sample, non-pressurized, toxic, n.o.s., not refrigerated liquid                | 123       | 3169   |
| Fumaryl chloride  | 156       | 1780   | GB   | 153       | —      |
| Fumigated cargo transport unit  | 171       | 3359   | GD   | 153       | —      |
| Furaldehydes  | 153P      | 1199   | Genetically modified micro-organisms   | 171       | 3245   |
| Furan   | 128       | 2389   | Genetically modified organisms   | 171       | 3245   |
| Furfuryl alcohol  | 153       | 2874   |  |           |        |

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| Germane   | 119       | 2192   | Hexachlorophene                                     | 151       | 2875   |
| Germane, adsorbed                                   | 173       | 3523   | Hexadecyltrichlorosilane                            | 156       | 1781   |
| GF  | 153       | —      | Hexadiene   | 130       | 2458   |
| Glycerol alpha-monochlorohydrin                     | 153       | 2689   | Hexaethyl tetraphosphate                            | 151       | 1611   |
| Glycidaldehyde                                      | 131P      | 2622   | Hexaethyl tetraphosphate and compressed gas mixture | 123       | 1612   |
| Guanidine nitrate                                   | 143       | 1467   | Hexafluoroacetone                                   | 125       | 2420   |
| H   | 153       | —      | Hexafluoroacetone hydrate, liquid                   | 151       | 2552   |
| Hafnium powder, dry                                 | 135       | 2545   | Hexafluoroacetone hydrate, solid                    | 151       | 3436   |
| Hafnium powder, wetted with not less than 25% water | 170       | 1326   | Hexafluoroethane                                    | 126       | 2193   |
| Halogenated monomethyldiphenylmethanes, liquid      | 171       | 3151   | Hexafluoroethane, compressed                        | 126       | 2193   |
| Halogenated monomethyldiphenylmethanes, solid       | 171       | 3152   | Hexafluorophosphoric acid                           | 154       | 1782   |
| Hay, wet, damp or contaminated with oil             | 133       | 1327   | Hexafluoropropylene                                 | 126       | 1858   |
| Hazardous waste, liquid, n.o.s.                     | 171       | 3082   | Hexafluoropropylene, compressed                     | 126       | 1858   |
| Hazardous waste, solid, n.o.s.                      | 171       | 3077   | Hexaldehyde   | 130       | 1207   |
| HD  | 153       | —      | Hexamethylenediamine, solid                         | 153       | 2280   |
| Heating oil, light                                  | 128       | 1202   | Hexamethylenediamine, solution                      | 153       | 1783   |
| Helium  | 120       | 1046   | Hexamethylene diisocyanate                          | 156       | 2281   |
| Helium, compressed                                  | 120       | 1046   | Hexamethyleneimine                                  | 132       | 2493   |
| Helium, refrigerated liquid (cryogenic liquid)      | 120       | 1963   | Hexamethylenetetramine                              | 133       | 1328   |
| Heptafluoropropane                                  | 126       | 3296   | Hexanes   | 128       | 1208   |
| n-Heptaldehyde                                      | 129       | 3056   | Hexanoic acid                                       | 153       | 2829   |
| Heptanes  | 128       | 1206   | Hexanols  | 129       | 2282   |
| n-Heptene   | 128       | 2278   | 1-Hexene  | 128       | 2370   |
| Hexachloroacetone                                   | 153       | 2661   | Hexyltrichlorosilane                                | 156       | 1784   |
| Hexachlorobenzene                                   | 152       | 2729   | HL  | 153       | —      |
| Hexachlorobutadiene                                 | 151       | 2279   | HN-1  | 153       | —      |
| Hexachlorocyclopentadiene                           | 151       | 2646   | HN-2  | 153       | —      |
|   |           |        | HN-3  | 153       | —      |
|   |           |        | Hydrazine, anhydrous                                | 132       | 2029   |

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| Hydrazine aqueous solution, flammable, with more than 37% hydrazine, by mass | 132       | 3484   | Hydrogen in a metal hydride storage system contained in equipment                              | 115       | 3468   |
| Hydrazine, aqueous solution, with more than 37% Hydrazine                    | 153       | 2030   | Hydrogen in a metal hydride storage system packed with equipment                               | 115       | 3468   |
| Hydrazine, aqueous solution, with not more than 37% Hydrazine                | 152       | 3293   | Hydrogen, refrigerated liquid (cryogenic liquid)   | 115       | 1966   |
| Hydriodic acid   | 154       | 1787   | Hydrogen and Methane mixture, compressed   | 115       | 2034   |
| Hydrobromic acid   | 154       | 1788   | Hydrogen bromide, anhydrous  | 125       | 1048   |
| Hydrocarbon and butadienes mixture, stabilized                               | 116P      | 1010   | Hydrogen chloride, anhydrous   | 125       | 1050   |
| Hydrocarbon gas mixture, compressed, n.o.s.                                  | 115       | 1964   | Hydrogen chloride, refrigerated liquid   | 125       | 2186   |
| Hydrocarbon gas mixture, liquefied, n.o.s.                                   | 115       | 1965   | Hydrogen cyanide, anhydrous, stabilized  | 117P      | 1051   |
| Hydrocarbon gas refills for small devices, with release device               | 115       | 3150   | Hydrogen cyanide, aqueous solution, with not more than 20% Hydrogen cyanide                    | 154       | 1613   |
| Hydrocarbons, liquid, n.o.s.   | 128       | 3295   | Hydrogen cyanide, solution in alcohol, with not more than 45% Hydrogen cyanide                 | 131       | 3294   |
| Hydrochloric acid  | 157       | 1789   | Hydrogen cyanide, stabilized   | 117P      | 1051   |
| Hydrocyanic acid, aqueous solution, with less than 5% Hydrogen cyanide       | 154       | 1613   | Hydrogen cyanide, stabilized (absorbed)  | 152       | 1614   |
| Hydrocyanic acid, aqueous solution, with not more than 20% Hydrogen cyanide  | 154       | 1613   | Hydrogendifluorides, solid, n.o.s.   | 154       | 1740   |
| Hydrofluoric acid  | 157       | 1790   | Hydrogendifluorides, solution, n.o.s.  | 154       | 3471   |
| Hydrofluoric acid and Sulfuric acid mixture                                  | 157       | 1786   | Hydrogen fluoride, anhydrous   | 125       | 1052   |
| Hydrofluoric acid and Sulphuric acid mixture                                 | 157       | 1786   | Hydrogen iodide, anhydrous   | 125       | 2197   |
| Hydrofluorosilicic acid  | 154       | 1778   | Hydrogen peroxide, aqueous solution, stabilized, with more than 60% Hydrogen peroxide          | 143       | 2015   |
| Hydrogen   | 115       | 1049   | Hydrogen peroxide, aqueous solution, with not less than 8% but less than 20% Hydrogen peroxide | 140       | 2984   |
| Hydrogen, compressed   | 115       | 1049   |  |           |        |
| Hydrogen in a metal hydride storage system                                   | 115       | 3468   |  |           |        |

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| Hydrogen peroxide, aqueous solution, with not less than 20% but not more than 60% Hydrogen peroxide (stabilized as necessary) | 140          | 2014   | Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B) | 119          | 3355   |
| Hydrogen peroxide, stabilized   | 143          | 2015   | Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C) | 119          | 3355   |
| Hydrogen peroxide and Peroxyacetic acid mixture, with acid(s), water and not more than 5% Peroxyacetic acid, stabilized       | 140          | 3149   | Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D) | 119          | 3355   |
| Hydrogen selenide, adsorbed   | 173          | 3526   | Insecticide gas, poisonous, n.o.s.                                       | 123          | 1967   |
| Hydrogen selenide, anhydrous  | 117          | 2202   | Insecticide gas, toxic, flammable, n.o.s.                                | 119          | 3355   |
| Hydrogen sulfide  | 117          | 1053   | Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)     | 119          | 3355   |
| Hydrogen sulphide   | 117          | 1053   | Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)     | 119          | 3355   |
| 1-Hydroxybenzotriazole, anhydrous, wetted with not less than 20% water  | 113          | 3474   | Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)     | 119          | 3355   |
| 1-Hydroxybenzotriazole, monohydrate   | 113          | 3474   | Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)     | 119          | 3355   |
| Hydroxylamine sulfate   | 154          | 2865   | Insecticide gas, toxic, n.o.s.   | 123          | 1967   |
| Hydroxylamine sulphate  | 154          | 2865   | Iodine   | 154          | 3495   |
| Hypochlorite solution   | 154          | 1791   | Iodine monochloride, liquid  | 157          | 3498   |
| Hypochlorites, inorganic, n.o.s.  | 140          | 3212   | Iodine monochloride, solid   | 157          | 1792   |
| 3,3'-Iminodipropylamine   | 153          | 2269   | Iodine pentafluoride   | 144          | 2495   |
| Infectious substance, affecting animals only  | 158          | 2900   | 2-Iodobutane   | 129          | 2390   |
| Infectious substance, affecting humans  | 158          | 2814   | Iodomethylpropanes   | 129          | 2391   |
| Ink, printer's, flammable   | 129          | 1210   | Iodopropanes   | 129          | 2392   |
| Insecticide gas, flammable, n.o.s.  | 115          | 3354   | Iron oxide, spent  | 135          | 1376   |
| Insecticide gas, n.o.s.   | 126          | 1968   | Iron pentacarbonyl   | 136          | 1994   |
| Insecticide gas, poisonous, flammable, n.o.s.   | 119          | 3355   | Iron sponge, spent   | 135          | 1376   |
| Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)  | 119          | 3355   | Isobutane  | 115          | 1075   |
|   |              |        | Isobutane  | 115          | 1969   |

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| Isobutanol  | 129  | 1212 |
| Isobutyl acetate                                  | 129  | 1213 |
| Isobutyl acrylate, stabilized                     | 129P | 2527 |
| Isobutyl alcohol                                  | 129  | 1212 |
| Isobutyl aldehyde                                 | 130  | 2045 |
| Isobutylamine                                     | 132  | 1214 |
| Isobutyl chloroformate                            | 155  | 2742 |
| Isobutylene                                       | 115  | 1055 |
| Isobutylene                                       | 115  | 1075 |
| Isobutyl formate                                  | 129  | 2393 |
| Isobutyl isobutyrate                              | 130  | 2528 |
| Isobutyl isocyanate                               | 155P | 2486 |
| Isobutyl methacrylate, stabilized                 | 130P | 2283 |
| Isobutyl propionate                               | 129  | 2394 |
| Isobutyraldehyde                                  | 130  | 2045 |
| Isobutyric acid                                   | 132  | 2529 |
| Isobutyronitrile                                  | 131  | 2284 |
| Isobutyryl chloride                               | 132  | 2395 |
| Isocyanate solution, flammable, poisonous, n.o.s. | 155  | 2478 |
| Isocyanate solution, flammable, toxic, n.o.s.     | 155  | 2478 |
| Isocyanate solution, poisonous, flammable, n.o.s. | 155  | 3080 |
| Isocyanate solution, poisonous, n.o.s.            | 155  | 2206 |
| Isocyanate solution, toxic, flammable, n.o.s.     | 155  | 3080 |
| Isocyanate solution, toxic, n.o.s.                | 155  | 2206 |
| Isocyanates, flammable, poisonous, n.o.s.         | 155  | 2478 |
| Isocyanates, flammable, toxic, n.o.s.             | 155  | 2478 |

|   |      |      |
|---|------|------|
| Isocyanates, poisonous, flammable, n.o.s. | 155  | 3080 |
| Isocyanates, poisonous, n.o.s.            | 155  | 2206 |
| Isocyanates, toxic, flammable, n.o.s.     | 155  | 3080 |
| Isocyanates, toxic, n.o.s.                | 155  | 2206 |
| Isocyanatobenzotrifluorides               | 156  | 2285 |
| Isoheptenes                               | 128  | 2287 |
| Isohexenes                                | 128  | 2288 |
| Isooctane                                 | 128  | 1262 |
| Isooctenes                                | 128  | 1216 |
| Isopentane                                | 128  | 1265 |
| Isopentenes                               | 128  | 2371 |
| Isophoronediamine                         | 153  | 2289 |
| Isophorone diisocyanate                   | 156  | 2290 |
| Isoprene, stabilized                      | 130P | 1218 |
| Isopropanol                               | 129  | 1219 |
| Isopropenyl acetate                       | 129P | 2403 |
| Isopropenylbenzene                        | 128  | 2303 |
| Isopropyl acetate                         | 129  | 1220 |
| Isopropyl acid phosphate                  | 153  | 1793 |
| Isopropyl alcohol                         | 129  | 1219 |
| Isopropylamine                            | 132  | 1221 |
| Isopropylbenzene                          | 130  | 1918 |
| Isopropyl butyrate                        | 129  | 2405 |
| Isopropyl chloroacetate                   | 155  | 2947 |
| Isopropyl chloroformate                   | 155  | 2407 |
| Isopropyl 2-chloropropionate              | 129  | 2934 |
| Isopropyl isobutyrate                     | 127  | 2406 |
| Isopropyl isocyanate                      | 155P | 2483 |
| Isopropyl nitrate                         | 130  | 1222 |
| Isopropyl propionate                      | 129  | 2409 |
| Isosorbide dinitrate mixture              | 133  | 2907 |

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| Isosorbide-5-mononitrate                               | 133       | 3251   | Liquefied gas, flammable, n.o.s.  | 115       | 3161   |
| Kerosene   | 128       | 1223   | Liquefied gas, n.o.s.   | 126       | 3163   |
| Ketones, liquid, n.o.s.                                | 127       | 1224   | Liquefied gas, oxidizing, n.o.s.  | 122       | 3157   |
| Krill meal   | 133       | 3497   | Liquefied gas, poisonous, corrosive, n.o.s.                                       | 125       | 3308   |
| Krypton  | 120       | 1056   | Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone A)            | 125       | 3308   |
| Krypton, compressed                                    | 120       | 1056   | Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone B)            | 125       | 3308   |
| Krypton, refrigerated liquid (cryogenic liquid)        | 120       | 1970   | Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone C)            | 125       | 3308   |
| L (Lewisite)   | 153       | —      | Liquefied gas, poisonous, flammable, corrosive, n.o.s.                            | 119       | 3309   |
| Lead acetate   | 151       | 1616   | Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A) | 119       | 3309   |
| Lead arsenates   | 151       | 1617   | Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B) | 119       | 3309   |
| Lead arsenites   | 151       | 1618   | Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C) | 119       | 3309   |
| Lead compound, soluble, n.o.s.                         | 151       | 2291   | Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D) | 119       | 3309   |
| Lead cyanide   | 151       | 1620   | Liquefied gas, poisonous, n.o.s.  | 119       | 3160   |
| Lead dioxide   | 140       | 1872   | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)            | 119       | 3160   |
| Lead nitrate   | 141       | 1469   | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)            | 119       | 3160   |
| Lead perchlorate, solid                                | 141       | 1470   | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)            | 119       | 3160   |
| Lead perchlorate, solution                             | 141       | 3408   | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D)            | 119       | 3160   |
| Lead phosphite, dibasic                                | 133       | 2989   | Liquefied gas, poisonous, n.o.s.  | 119       | 3160   |
| Lead sulfate, with more than 3% free acid              | 154       | 1794   | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)            | 119       | 3160   |
| Lead sulphate, with more than 3% free acid             | 154       | 1794   | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)            | 119       | 3160   |
| Lewisite   | 153       | —      | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)            | 119       | 3160   |
| Life-saving appliances, not self-inflating             | 171       | 3072   | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D)            | 119       | 3160   |
| Life-saving appliances, self-inflating                 | 171       | 2990   | Liquefied gas, poisonous, n.o.s.  | 119       | 3160   |
| Lighter refills containing flammable gas               | 115       | 1057   | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)            | 119       | 3160   |
| Lighters containing flammable gas                      | 115       | 1057   | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)            | 119       | 3160   |
| Lighters, non-pressurized, containing flammable liquid | 128       | 1057   | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)            | 119       | 3160   |

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Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)      **119**      3160

Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D)      **119**      3160

Liquefied gas, poisonous, n.o.s.      **123**      3162

Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone A)      **123**      3162

Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone B)      **123**      3162

Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone C)      **123**      3162

Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone D)      **123**      3162

Liquefied gas, poisonous, oxidizing, corrosive, n.o.s.      **124**      3310

Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A)      **124**      3310

Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B)      **124**      3310

Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C)      **124**      3310

Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone D)      **124**      3310

Liquefied gas, poisonous, oxidizing, n.o.s.      **124**      3307

Liquefied gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone A)      **124**      3307

Liquefied gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone B)      **124**      3307

Liquefied gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone C)      **124**      3307

Liquefied gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone D)      **124**      3307

Liquefied gas, toxic, corrosive, n.o.s.      **125**      3308

Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone A)      **125**      3308

Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone B)      **125**      3308

Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone C)      **125**      3308

Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone D)      **125**      3308

Liquefied gas, toxic, flammable, corrosive, n.o.s.      **119**      3309

Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)      **119**      3309

Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)      **119**      3309

Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)      **119**      3309

Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)      **119**      3309

Liquefied gas, toxic, flammable, n.o.s.      **119**      3160

Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)      **119**      3160

Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)      **119**      3160

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| Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)            | 119 | 3160 |
| Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)            | 119 | 3160 |
| Liquefied gas, toxic, n.o.s.  | 123 | 3162 |
| Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone A)                       | 123 | 3162 |
| Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone B)                       | 123 | 3162 |
| Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone C)                       | 123 | 3162 |
| Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone D)                       | 123 | 3162 |
| Liquefied gas, toxic, oxidizing, corrosive, n.o.s.                            | 124 | 3310 |
| Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A) | 124 | 3310 |
| Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B) | 124 | 3310 |
| Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C) | 124 | 3310 |
| Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone D) | 124 | 3310 |
| Liquefied gas, toxic, oxidizing, n.o.s.                                       | 124 | 3307 |
| Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone A)            | 124 | 3307 |
| Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone B)            | 124 | 3307 |
| Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone C)            | 124 | 3307 |

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| Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone D)            | 124 | 3307 |
| Liquefied gases, non-flammable, charged with Nitrogen, Carbon dioxide or Air  | 120 | 1058 |
| Liquefied natural gas (cryogenic liquid)                                      | 115 | 1972 |
| Liquefied petroleum gas   | 115 | 1075 |
| Lithium   | 138 | 1415 |
| Lithium aluminum hydride  | 138 | 1410 |
| Lithium aluminum hydride, ethereal  | 138 | 1411 |
| Lithium batteries   | 138 | 3090 |
| Lithium batteries contained in equipment                                      | 138 | 3091 |
| Lithium batteries installed in cargo transport unit (lithium ion batteries)   | 147 | 3536 |
| Lithium batteries installed in cargo transport unit (lithium metal batteries) | 138 | 3536 |
| Lithium batteries packed with equipment                                       | 138 | 3091 |
| Lithium borohydride   | 138 | 1413 |
| Lithium ferrosilicon  | 139 | 2830 |
| Lithium hydride   | 138 | 1414 |
| Lithium hydride, fused solid  | 138 | 2805 |
| Lithium hydroxide   | 154 | 2680 |
| Lithium hydroxide, solution   | 154 | 2679 |
| Lithium hypochlorite, dry   | 140 | 1471 |
| Lithium hypochlorite mixture  | 140 | 1471 |
| Lithium hypochlorite mixtures, dry  | 140 | 1471 |
| Lithium ion batteries (including lithium ion polymer batteries)               | 147 | 3480 |



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| Lithium ion batteries contained in equipment (including lithium ion polymer batteries) | 147       | 3481   | Magnesium alloys, with more than 50% Magnesium, in pellets, turnings or ribbons | 138       | 1869   |
| Lithium ion batteries packed with equipment (including lithium ion polymer batteries)  | 147       | 3481   | Magnesium alloys powder   | 138       | 1418   |
| Lithium metal batteries (including lithium alloy batteries)                            | 138       | 3090   | Magnesium aluminum phosphide  | 139       | 1419   |
| Lithium metal batteries contained in equipment (including lithium alloy batteries)     | 138       | 3091   | Magnesium arsenate  | 151       | 1622   |
| Lithium metal batteries packed with equipment (including lithium alloy batteries)      | 138       | 3091   | Magnesium bromate   | 140       | 1473   |
| Lithium nitrate  | 140       | 2722   | Magnesium chlorate  | 140       | 2723   |
| Lithium nitride  | 139       | 2806   | Magnesium chloride and Chlorate mixture, solid                                  | 140       | 1459   |
| Lithium peroxide   | 143       | 1472   | Magnesium chloride and Chlorate mixture, solution                               | 140       | 3407   |
| Lithium silicon  | 138       | 1417   | Magnesium diamide   | 135       | 2004   |
| LNG (cryogenic liquid)   | 115       | 1972   | Magnesium diphenyl  | 135       | 2005   |
| London purple  | 151       | 1621   | Magnesium fluorosilicate  | 151       | 2853   |
| LPG  | 115       | 1075   | Magnesium granules, coated  | 138       | 2950   |
| Machinery, fuel cell, flammable gas powered  | 115       | 3529   | Magnesium hydride   | 138       | 2010   |
| Machinery, fuel cell, flammable liquid powered   | 128       | 3528   | Magnesium nitrate   | 140       | 1474   |
| Machinery, internal combustion   | 171       | 3530   | Magnesium perchlorate   | 140       | 1475   |
| Machinery, internal combustion, flammable gas powered                                  | 115       | 3529   | Magnesium peroxide  | 140       | 1476   |
| Machinery, internal combustion, flammable liquid powered                               | 128       | 3528   | Magnesium phosphide   | 139       | 2011   |
| Magnesium  | 138       | 1869   | Magnesium powder  | 138       | 1418   |
| Magnesium, in pellets, turnings or ribbons   | 138       | 1869   | Magnesium silicide  | 138       | 2624   |
| Magnesium alkyls   | 135       | 3053   | Magnetized material   | 171       | 2807   |
|  |           |        | Maleic anhydride  | 156       | 2215   |
|  |           |        | Maleic anhydride, molten  | 156       | 2215   |
|  |           |        | Malononitrile   | 153       | 2647   |
|  |           |        | Maneb   | 135       | 2210   |
|  |           |        | Maneb, stabilized   | 135       | 2968   |
|  |           |        | Maneb preparation, stabilized   | 135       | 2968   |
|  |           |        | Maneb preparation, with not less than 60% Maneb                                 | 135       | 2210   |
|  |           |        | Manganese nitrate   | 140       | 2724   |

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| Manganese resinate                                       | 133              | 1330          | Mercaptans, liquid, poisonous, flammable, n.o.s.      | 131              | 3071          |
| Matches, fusee   | 133              | 2254          | Mercaptans, liquid, toxic, flammable, n.o.s.          | 131              | 3071          |
| Matches, safety  | 133              | 1944          | Mercuric arsenate                                     | 151              | 1623          |
| Matches, "strike anywhere"                               | 133              | 1331          | Mercuric chloride                                     | 154              | 1624          |
| Matches, wax "vesta"                                     | 133              | 1945          | Mercuric nitrate                                      | 141              | 1625          |
| <b>MD</b>  | <b>152</b>       | <b>—</b>      | Mercuric potassium cyanide                            | 157              | 1626          |
| Medical waste, category A, affecting animals only, solid | 158              | 3549          | Mercurous nitrate                                     | 141              | 1627          |
| Medical waste, category A, affecting humans, solid       | 158              | 3549          | Mercury   | 172              | 2809          |
| Medical waste, n.o.s.                                    | 158              | 3291          | Mercury acetate                                       | 151              | 1629          |
| Medicine, liquid, flammable, poisonous, n.o.s.           | 131              | 3248          | Mercury ammonium chloride                             | 151              | 1630          |
| Medicine, liquid, flammable, toxic, n.o.s.               | 131              | 3248          | Mercury based pesticide, liquid, flammable, poisonous | 131              | 2778          |
| Medicine, liquid, poisonous, n.o.s.                      | 151              | 1851          | Mercury based pesticide, liquid, flammable, toxic     | 131              | 2778          |
| Medicine, liquid, toxic, n.o.s.                          | 151              | 1851          | Mercury based pesticide, liquid, poisonous            | 151              | 3012          |
| Medicine, solid, poisonous, n.o.s.                       | 151              | 3249          | Mercury based pesticide, liquid, poisonous, flammable | 131              | 3011          |
| Medicine, solid, toxic, n.o.s.                           | 151              | 3249          | Mercury based pesticide, liquid, toxic                | 151              | 3012          |
| Mercaptan mixture, liquid, flammable, n.o.s.             | 130              | 3336          | Mercury based pesticide, liquid, toxic, flammable     | 131              | 3011          |
| Mercaptan mixture, liquid, flammable, poisonous, n.o.s.  | 131              | 1228          | Mercury based pesticide, solid, poisonous             | 151              | 2777          |
| Mercaptan mixture, liquid, flammable, toxic, n.o.s.      | 131              | 1228          | Mercury based pesticide, solid, toxic                 | 151              | 2777          |
| Mercaptan mixture, liquid, poisonous, flammable, n.o.s.  | 131              | 3071          | Mercury benzoate                                      | 154              | 1631          |
| Mercaptan mixture, liquid, toxic, flammable, n.o.s.      | 131              | 3071          | Mercury bromides                                      | 154              | 1634          |
| Mercaptans, liquid, flammable, n.o.s.                    | 130              | 3336          | Mercury compound, liquid, n.o.s.                      | 151              | 2024          |
| Mercaptans, liquid, flammable, poisonous, n.o.s.         | 131              | 1228          | Mercury compound, solid, n.o.s.                       | 151              | 2025          |
| Mercaptans, liquid, flammable, toxic, n.o.s.             | 131              | 1228          | Mercury contained in manufactured articles            | 172              | 3506          |
|  |                  |               | Mercury cyanide                                       | 154              | 1636          |

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| Mercury gluconate  | 151       | 1637   | Methacrylonitrile, stabilized                      | 131P      | 3079   |
| Mercury iodide   | 151       | 1638   | Methallyl alcohol                                  | 129       | 2614   |
| Mercury nucleate   | 151       | 1639   | Methane  | 115       | 1971   |
| Mercury oleate   | 151       | 1640   | Methane, compressed                                | 115       | 1971   |
| Mercury oxide  | 151       | 1641   | Methane, refrigerated liquid (cryogenic liquid)    | 115       | 1972   |
| Mercury oxycyanide, desensitized                         | 151       | 1642   | Methane and Hydrogen mixture, compressed           | 115       | 2034   |
| Mercury potassium iodide                                 | 151       | 1643   | Methanesulfonyl chloride                           | 156       | 3246   |
| Mercury salicylate                                       | 151       | 1644   | Methanesulphonyl chloride                          | 156       | 3246   |
| Mercury sulfate  | 151       | 1645   | Methanol   | 131       | 1230   |
| Mercury sulphate   | 151       | 1645   | Methoxymethyl isocyanate                           | 155       | 2605   |
| Mercury thiocyanate                                      | 151       | 1646   | 4-Methoxy-4-methylpentan-2-one                     | 128       | 2293   |
| Mesityl oxide  | 129       | 1229   | 1-Methoxy-2-propanol                               | 129       | 3092   |
| Metal carbonyls, liquid, n.o.s.                          | 151       | 3281   | Methyl acetate                                     | 129       | 1231   |
| Metal carbonyls, solid, n.o.s.                           | 151       | 3466   | Methylacetylene and Propadiene mixture, stabilized | 116P      | 1060   |
| Metal catalyst, dry                                      | 135       | 2881   | Methyl acrylate, stabilized                        | 129P      | 1919   |
| Metal catalyst, wetted                                   | 170       | 1378   | Methylal   | 127       | 1234   |
| Metaldehyde  | 133       | 1332   | Methyl alcohol                                     | 131       | 1230   |
| Metal hydrides, flammable, n.o.s.                        | 170       | 3182   | Methylallyl chloride                               | 130P      | 2554   |
| Metal hydrides, water-reactive, n.o.s.                   | 138       | 1409   | Methylamine, anhydrous                             | 118       | 1061   |
| Metallic substance, water-reactive, n.o.s.               | 138       | 3208   | Methylamine, aqueous solution                      | 132       | 1235   |
| Metallic substance, water-reactive, self-heating, n.o.s. | 138       | 3209   | Methylamyl acetate                                 | 130       | 1233   |
| Metal powder, flammable, n.o.s.                          | 170       | 3089   | Methylamyl alcohol                                 | 129       | 2053   |
| Metal powder, self-heating, n.o.s.                       | 135       | 3189   | Methyl amyl ketone                                 | 127       | 1110   |
| Metal salts of organic compounds, flammable, n.o.s.      | 133       | 3181   | N-Methylaniline                                    | 153       | 2294   |
| Methacrylaldehyde, stabilized                            | 131P      | 2396   | Methylbenzyl (alpha) alcohol, liquid               | 153       | 2937   |
| Methacrylic acid, stabilized                             | 153P      | 2531   | Methylbenzyl (alpha) alcohol, solid                | 153       | 3438   |
|  |           |        | Methyl bromide                                     | 123       | 1062   |

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| Methyl bromide and Chloropicrin mixture               | 123       | 1581   | Methyl ethyl ketone                     | 127       | 1193   |
| Methyl bromide and Ethylene dibromide mixture, liquid | 151       | 1647   | 2-Methyl-5-ethylpyridine                | 153       | 2300   |
| Methyl bromoacetate                                   | 155       | 2643   | Methyl fluoride                         | 115       | 2454   |
| 2-Methylbutanal                                       | 129       | 3371   | Methyl formate                          | 129       | 1243   |
| 3-Methylbutan-2-one                                   | 127       | 2397   | 2-Methylfuran                           | 128       | 2301   |
| 2-Methyl-1-butene                                     | 128       | 2459   | 2-Methyl-2-heptanethiol                 | 131       | 3023   |
| 2-Methyl-2-butene                                     | 128       | 2460   | 5-Methylhexan-2-one                     | 127       | 2302   |
| 3-Methyl-1-butene                                     | 128       | 2561   | Methylhydrazine                         | 131       | 1244   |
| N-Methylbutylamine                                    | 132       | 2945   | Methyl iodide                           | 151       | 2644   |
| Methyl tert-butyl ether                               | 127       | 2398   | Methyl isobutyl carbinol                | 129       | 2053   |
| Methyl butyrate                                       | 129       | 1237   | Methyl isobutyl ketone                  | 127       | 1245   |
| Methyl chloride                                       | 115       | 1063   | Methyl isocyanate                       | 155P      | 2480   |
| Methyl chloride and Chloropicrin mixture              | 119       | 1582   | Methyl isopropenyl ketone, stabilized   | 127P      | 1246   |
| Methyl chloride and Methylene chloride mixture        | 115       | 1912   | Methyl isothiocyanate                   | 131       | 2477   |
| Methyl chloroacetate                                  | 155       | 2295   | Methyl isovalerate                      | 130       | 2400   |
| Methyl chloroformate                                  | 155       | 1238   | Methyl magnesium bromide in Ethyl ether | 138       | 1928   |
| Methyl chloromethyl ether                             | 131       | 1239   | Methyl mercaptan                        | 117       | 1064   |
| Methyl 2-chloropropionate                             | 129       | 2933   | Methyl methacrylate monomer, stabilized | 129P      | 1247   |
| Methylchlorosilane                                    | 119       | 2534   | 4-Methylmorpholine                      | 132       | 2535   |
| Methylcyclohexane                                     | 128       | 2296   | N-Methylmorpholine                      | 132       | 2535   |
| Methylcyclohexanols                                   | 129       | 2617   | Methyl nitrite                          | 116       | 2455   |
| Methylcyclohexanone                                   | 128       | 2297   | Methyl orthosilicate                    | 155       | 2606   |
| Methylcyclopentane                                    | 128       | 2298   | Methylpentadiene                        | 128       | 2461   |
| Methyl dichloroacetate                                | 155       | 2299   | 2-Methylpentan-2-ol                     | 129       | 2560   |
| Methyldichloroarsine                                  | 152       | 1556   | Methylphenyldichlorosilane              | 156       | 2437   |
| Methyldichlorosilane                                  | 139       | 1242   | Methyl phosphonic dichloride            | 137       | 9206   |
| Methylene chloride                                    | 160       | 1593   | Methyl phosphonous dichloride           | 135       | 2845   |
| Methylene chloride and Methyl chloride mixture        | 115       | 1912   | 1-Methylpiperidine                      | 132       | 2399   |
| Methyl ethyl ether                                    | 115       | 1039   | Methyl propionate                       | 129       | 1248   |
|   |           |        | Methyl propyl ether                     | 127       | 2612   |

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| Methyl propyl ketone   | 127  | 1249 |
| Methyltetrahydrofuran  | 127  | 2536 |
| Methyl trichloroacetate                                      | 156  | 2533 |
| Methyltrichlorosilane  | 155  | 1250 |
| Methyl valeraldehyde (alpha)                                 | 130  | 2367 |
| Methyl vinyl ketone, stabilized                              | 131P | 1251 |
| Molten sulfur  | 133  | 2448 |
| Molten sulphur   | 133  | 2448 |
| Molybdenum pentachloride                                     | 156  | 2508 |
| Monoethanolamine   | 153  | 2491 |
| Mononitrotoluidines  | 153  | 2660 |
| Morpholine   | 132  | 2054 |
| Motor fuel anti-knock mixture                                | 152  | 1649 |
| Motor fuel anti-knock mixture, flammable                     | 131  | 3483 |
| Motor spirit   | 128  | 1203 |
| Motor spirit and ethanol mixture, with more than 10% ethanol | 127  | 3475 |
| Muriatic acid  | 157  | 1789 |
| Musk xylene  | 149  | 2956 |
| Mustard  | 153  | —    |
| Mustard Lewisite   | 153  | —    |
| Naphthalene, crude   | 133  | 1334 |
| Naphthalene, molten  | 133  | 2304 |
| Naphthalene, refined   | 133  | 1334 |
| Naphthylamine (alpha)  | 153  | 2077 |
| Naphthylamine (beta), solid                                  | 153  | 1650 |
| Naphthylamine (beta), solution                               | 153  | 3411 |
| Naphthylthiourea   | 153  | 1651 |
| Naphthylurea   | 153  | 1652 |
| Natural gas, compressed                                      | 115  | 1971 |

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| Natural gas, refrigerated liquid (cryogenic liquid) | 115 | 1972 |
| Neohexane   | 128 | 1208 |
| Neon  | 120 | 1065 |
| Neon, compressed                                    | 120 | 1065 |
| Neon, refrigerated liquid (cryogenic liquid)        | 120 | 1913 |
| Nickel carbonyl                                     | 131 | 1259 |
| Nickel catalyst, dry                                | 135 | 2881 |
| Nickel cyanide                                      | 151 | 1653 |
| Nickel nitrate                                      | 140 | 2725 |
| Nickel nitrite                                      | 140 | 2726 |
| Nicotine  | 151 | 1654 |
| Nicotine compound, liquid, n.o.s.                   | 151 | 3144 |
| Nicotine compound, solid, n.o.s.                    | 151 | 1655 |
| Nicotine hydrochloride, liquid                      | 151 | 1656 |
| Nicotine hydrochloride, solid                       | 151 | 3444 |
| Nicotine hydrochloride, solution                    | 151 | 1656 |
| Nicotine preparation, liquid, n.o.s.                | 151 | 3144 |
| Nicotine preparation, solid, n.o.s.                 | 151 | 1655 |
| Nicotine salicylate                                 | 151 | 1657 |
| Nicotine sulfate, solid                             | 151 | 3445 |
| Nicotine sulfate, solution                          | 151 | 1658 |
| Nicotine sulphate, solid                            | 151 | 3445 |
| Nicotine sulphate, solution                         | 151 | 1658 |
| Nicotine tartrate                                   | 151 | 1659 |
| Nitrates, inorganic, aqueous solution, n.o.s.       | 140 | 3218 |
| Nitrates, inorganic, n.o.s.                         | 140 | 1477 |

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| Nitrating acid mixture with more than 50% nitric acid                  | 157              | 1796          | Nitriles, toxic, flammable, n.o.s.                     | 131              | 3275          |
| Nitrating acid mixture with not more than 50% nitric acid              | 157              | 1796          | Nitriles, toxic, liquid, n.o.s.                        | 151              | 3276          |
| Nitrating acid mixture, spent, with more than 50% nitric acid          | 157              | 1826          | Nitriles, toxic, solid, n.o.s.                         | 151              | 3439          |
| Nitrating acid mixture, spent, with not more than 50% nitric acid      | 157              | 1826          | Nitrites, inorganic, aqueous solution, n.o.s.          | 140              | 3219          |
| Nitric acid, other than red fuming, with more than 65% nitric acid     | 157              | 2031          | Nitrites, inorganic, n.o.s.                            | 140              | 2627          |
| Nitric acid, other than red fuming, with not more than 65% nitric acid | 157              | 2031          | Nitroanilines  | 153              | 1661          |
| Nitric acid, red fuming  | 157              | 2032          | Nitroanisoles, liquid                                  | 152              | 2730          |
| Nitric oxide   | 124              | 1660          | Nitroanisoles, solid                                   | 152              | 3458          |
| Nitric oxide, compressed   | 124              | 1660          | Nitrobenzene   | 152              | 1662          |
| Nitric oxide and Dinitrogen tetroxide mixture                          | 124              | 1975          | Nitrobenzenesulfonic acid                              | 153              | 2305          |
| Nitric oxide and Nitrogen dioxide mixture                              | 124              | 1975          | Nitrobenzenesulphonic acid                             | 153              | 2305          |
| Nitriles, flammable, poisonous, n.o.s.                                 | 131              | 3273          | Nitrobenzotrifluorides, liquid                         | 152              | 2306          |
| Nitriles, flammable, toxic, n.o.s.                                     | 131              | 3273          | Nitrobenzotrifluorides, solid                          | 152              | 3431          |
| Nitriles, liquid, poisonous, n.o.s.                                    | 151              | 3276          | Nitrobromobenzenes, liquid                             | 152              | 2732          |
| Nitriles, liquid, toxic, n.o.s.  | 151              | 3276          | Nitrobromobenzenes, solid                              | 152              | 3459          |
| Nitriles, poisonous, flammable, n.o.s.                                 | 131              | 3275          | Nitrocellulose membrane filters                        | 133              | 3270          |
| Nitriles, poisonous, liquid, n.o.s.                                    | 151              | 3276          | Nitrocellulose mixture, without pigment                | 133              | 2557          |
| Nitriles, poisonous, solid, n.o.s.                                     | 151              | 3439          | Nitrocellulose mixture, without plasticizer            | 133              | 2557          |
| Nitriles, solid, poisonous, n.o.s.                                     | 151              | 3439          | Nitrocellulose mixture, with pigment                   | 133              | 2557          |
| Nitriles, solid, toxic, n.o.s.   | 151              | 3439          | Nitrocellulose mixture, with plasticizer               | 133              | 2557          |
|  |                  |               | Nitrocellulose, solution, flammable                    | 127              | 2059          |
|  |                  |               | Nitrocellulose with alcohol, not less than 25% alcohol | 113              | 2556          |
|  |                  |               | Nitrocellulose with water, not less than 25% water     | 113              | 2555          |
|  |                  |               | 3-Nitro-4-chlorobenzotrifluoride                       | 152              | 2307          |
|  |                  |               | Nitrocresols, liquid                                   | 153              | 3434          |
|  |                  |               | Nitrocresols, solid                                    | 153              | 2446          |

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| Nitroethane   | 129 | 2842 |
| Nitrogen  | 120 | 1066 |
| Nitrogen, compressed  | 120 | 1066 |
| Nitrogen, refrigerated liquid (cryogenic liquid)  | 120 | 1977 |
| Nitrogen dioxide  | 124 | 1067 |
| Nitrogen dioxide and Nitric oxide mixture   | 124 | 1975 |
| Nitrogen trifluoride  | 122 | 2451 |
| Nitrogen trifluoride, compressed  | 122 | 2451 |
| Nitrogen trioxide   | 124 | 2421 |
| Nitroglycerin, solution in alcohol, with more than 1% but not more than 5% Nitroglycerin                  | 127 | 3064 |
| Nitroglycerin, solution in alcohol, with not more than 1% Nitroglycerin                                   | 127 | 1204 |
| Nitroglycerin mixture, desensitized, liquid, flammable, n.o.s., with not more than 30% Nitroglycerin      | 113 | 3343 |
| Nitroglycerin mixture, desensitized, liquid, n.o.s., with not more than 30% Nitroglycerin                 | 113 | 3357 |
| Nitroglycerin mixture, desensitized, solid, n.o.s., with more than 2% but not more than 10% Nitroglycerin | 113 | 3319 |
| Nitroguanidine, wetted with not less than 20% water   | 113 | 1336 |
| Nitrohydrochloric acid  | 157 | 1798 |
| Nitromethane  | 129 | 1261 |
| Nitronaphthalene  | 133 | 2538 |
| Nitrophenols  | 153 | 1663 |
| 4-Nitrophenylhydrazine, with not less than 30% water  | 113 | 3376 |

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| Nitropropanes                                    | 129  | 2608 |
| p-Nitrosodimethylaniline                         | 135  | 1369 |
| Nitrostarch, wetted with not less than 20% water | 113  | 1337 |
| Nitrosyl chloride                                | 125  | 1069 |
| Nitrosylsulfuric acid, liquid                    | 157  | 2308 |
| Nitrosylsulfuric acid, solid                     | 157  | 3456 |
| Nitrosylsulphuric acid, liquid                   | 157  | 2308 |
| Nitrosylsulphuric acid, solid                    | 157  | 3456 |
| Nitrotoluenes, liquid                            | 152  | 1664 |
| Nitrotoluenes, solid                             | 152  | 3446 |
| Nitrotoluidines (mono)                           | 153  | 2660 |
| Nitrous oxide                                    | 122  | 1070 |
| Nitrous oxide, compressed                        | 122  | 1070 |
| Nitrous oxide, refrigerated liquid               | 122  | 2201 |
| Nitrous oxide and Carbon dioxide mixture         | 126  | 1015 |
| Nitroxylenes, liquid                             | 152  | 1665 |
| Nitroxylenes, solid                              | 152  | 3447 |
| Nonanes  | 128  | 1920 |
| Nonyltrichlorosilane                             | 156  | 1799 |
| 2,5-Norbornadiene, stabilized                    | 128P | 2251 |
| Octadecyltrichlorosilane                         | 156  | 1800 |
| Octadiene  | 128P | 2309 |
| Octafluorobut-2-ene                              | 126  | 2422 |
| Octafluorocyclobutane                            | 126  | 1976 |
| Octafluoropropane                                | 126  | 2424 |
| Octanes  | 128  | 1262 |
| Octyl aldehydes                                  | 129  | 1191 |
| Octyltrichlorosilane                             | 156  | 1801 |
| Oil, petroleum                                   | 128  | 1270 |
| Oil gas  | 119  | 1071 |

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| Oil gas, compressed                                     | 119              | 1071          | Organic phosphate mixed with compressed gas            | 123              | 1955          |
| Organic peroxide type B, liquid                         | 146              | 3101          | Organic phosphorus compound mixed with compressed gas  | 123              | 1955          |
| Organic peroxide type B, liquid, temperature controlled | 148              | 3111          | Organic pigments, self-heating                         | 135              | 3313          |
| Organic peroxide type B, solid                          | 146              | 3102          | Organoarsenic compound, liquid, n.o.s.                 | 151              | 3280          |
| Organic peroxide type B, solid, temperature controlled  | 148              | 3112          | Organoarsenic compound, solid, n.o.s.                  | 151              | 3465          |
| Organic peroxide type C, liquid                         | 146              | 3103          | Organochlorine pesticide, liquid, flammable, poisonous | 131              | 2762          |
| Organic peroxide type C, liquid, temperature controlled | 148              | 3113          | Organochlorine pesticide, liquid, flammable, toxic     | 131              | 2762          |
| Organic peroxide type C, solid                          | 146              | 3104          | Organochlorine pesticide, liquid, poisonous            | 151              | 2996          |
| Organic peroxide type C, solid, temperature controlled  | 148              | 3114          | Organochlorine pesticide, liquid, poisonous, flammable | 131              | 2995          |
| Organic peroxide type D, liquid                         | 145              | 3105          | Organochlorine pesticide, liquid, toxic                | 151              | 2996          |
| Organic peroxide type D, liquid, temperature controlled | 148              | 3115          | Organochlorine pesticide, liquid, toxic, flammable     | 131              | 2995          |
| Organic peroxide type D, solid                          | 145              | 3106          | Organochlorine pesticide, solid, poisonous             | 151              | 2761          |
| Organic peroxide type D, solid, temperature controlled  | 148              | 3116          | Organochlorine pesticide, solid, toxic                 | 151              | 2761          |
| Organic peroxide type E, liquid                         | 145              | 3107          | Organometallic compound, liquid, poisonous, n.o.s.     | 151              | 3282          |
| Organic peroxide type E, liquid, temperature controlled | 148              | 3117          | Organometallic compound, liquid, toxic, n.o.s.         | 151              | 3282          |
| Organic peroxide type E, solid                          | 145              | 3108          | Organometallic compound, poisonous, liquid, n.o.s.     | 151              | 3282          |
| Organic peroxide type E, solid, temperature controlled  | 148              | 3118          | Organometallic compound, poisonous, solid, n.o.s.      | 151              | 3467          |
| Organic peroxide type F, liquid                         | 145              | 3109          | Organometallic compound, solid, poisonous, n.o.s.      | 151              | 3467          |
| Organic peroxide type F, liquid, temperature controlled | 148              | 3119          | Organometallic compound, solid, toxic, n.o.s.          | 151              | 3467          |
| Organic peroxide type F, solid                          | 145              | 3110          | Organometallic compound, toxic, liquid, n.o.s.         | 151              | 3282          |
| Organic peroxide type F, solid, temperature controlled  | 148              | 3120          |  |                  |               |
| Organic phosphate compound mixed with compressed gas    | 123              | 1955          |  |                  |               |



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| Organometallic compound, toxic, solid, n.o.s.                 | 151              | 3467          | Organophosphorus compound, toxic, flammable, n.o.s.      | 131              | 3279          |
| Organometallic substance, liquid, pyrophoric                  | 135              | 3392          | Organophosphorus compound, toxic, liquid, n.o.s.         | 151              | 3278          |
| Organometallic substance, liquid, pyrophoric, water-reactive  | 135              | 3394          | Organophosphorus compound, toxic, solid, n.o.s.          | 151              | 3464          |
| Organometallic substance, liquid, water-reactive              | 135              | 3398          | Organophosphorus pesticide, liquid, flammable, poisonous | 131              | 2784          |
| Organometallic substance, liquid, water-reactive, flammable   | 138              | 3399          | Organophosphorus pesticide, liquid, flammable, toxic     | 131              | 2784          |
| Organometallic substance, solid, pyrophoric                   | 135              | 3391          | Organophosphorus pesticide, liquid, poisonous            | 152              | 3018          |
| Organometallic substance, solid, pyrophoric, water-reactive   | 135              | 3393          | Organophosphorus pesticide, liquid, poisonous, flammable | 131              | 3017          |
| Organometallic substance, solid, self-heating                 | 138              | 3400          | Organophosphorus pesticide, liquid, toxic                | 152              | 3018          |
| Organometallic substance, solid, water-reactive               | 135              | 3395          | Organophosphorus pesticide, liquid, toxic, flammable     | 131              | 3017          |
| Organometallic substance, solid, water-reactive, flammable    | 138              | 3396          | Organophosphorus pesticide, solid, poisonous             | 152              | 2783          |
| Organometallic substance, solid, water-reactive, self-heating | 138              | 3397          | Organophosphorus pesticide, solid, toxic                 | 152              | 2783          |
| Organophosphorus compound, liquid, poisonous, n.o.s.          | 151              | 3278          | Organotin compound, liquid, n.o.s.                       | 153              | 2788          |
| Organophosphorus compound, liquid, toxic, n.o.s.              | 151              | 3278          | Organotin compound, solid, n.o.s.                        | 153              | 3146          |
| Organophosphorus compound, poisonous, flammable, n.o.s.       | 131              | 3279          | Organotin pesticide, liquid, flammable, poisonous        | 131              | 2787          |
| Organophosphorus compound, poisonous, liquid, n.o.s.          | 151              | 3278          | Organotin pesticide, liquid, flammable, toxic            | 131              | 2787          |
| Organophosphorus compound, poisonous, solid, n.o.s.           | 151              | 3464          | Organotin pesticide, liquid, poisonous                   | 153              | 3020          |
| Organophosphorus compound, solid, poisonous, n.o.s.           | 151              | 3464          | Organotin pesticide, liquid, poisonous, flammable        | 131              | 3019          |
| Organophosphorus compound, solid, toxic, n.o.s.               | 151              | 3464          | Organotin pesticide, liquid, toxic                       | 153              | 3020          |
|   |                  |               | Organotin pesticide, liquid, toxic, flammable            | 131              | 3019          |
|   |                  |               | Organotin pesticide, solid, poisonous                    | 153              | 2786          |

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| Organotin pesticide, solid, toxic              | 153      | 2786 | Packagings discarded, empty, uncleaned   | 171      | 3509 |
| Osmium tetroxide                               | 154      | 2471 | Paint (corrosive)  | 153      | 3066 |
| Other regulated substances, liquid, n.o.s.     | 171      | 3082 | Paint, corrosive, flammable  | 132      | 3470 |
| Other regulated substances, solid, n.o.s.      | 171      | 3077 | Paint (flammable)  | 128      | 1263 |
| Oxidizing liquid, corrosive, n.o.s.            | 140      | 3098 | Paint, flammable, corrosive  | 132      | 3469 |
| Oxidizing liquid, n.o.s.                       | 140      | 3139 | Paint related material (corrosive)   | 153      | 3066 |
| Oxidizing liquid, poisonous, n.o.s.            | 142      | 3099 | Paint related material, corrosive, flammable   | 132      | 3470 |
| Oxidizing liquid, toxic, n.o.s.                | 142      | 3099 | Paint related material (flammable)   | 128      | 1263 |
| Oxidizing solid, corrosive, n.o.s.             | 140      | 3085 | Paint related material, flammable, corrosive   | 132      | 3469 |
| Oxidizing solid, flammable, n.o.s.             | 140      | 3137 | Paper, unsaturated oil treated   | 133      | 1379 |
| Oxidizing solid, n.o.s.                        | 140      | 1479 | Paraformaldehyde   | 133      | 2213 |
| Oxidizing solid, poisonous, n.o.s.             | 141      | 3087 | Paraldehyde  | 129      | 1264 |
| Oxidizing solid, self-heating, n.o.s.          | 135      | 3100 | Parathion and compressed gas mixture   | 123      | 1967 |
| Oxidizing solid, toxic, n.o.s.                 | 141      | 3087 | PCB  | 171      | 2315 |
| Oxidizing solid, water-reactive, n.o.s.        | 144      | 3121 | PD   | 152      | —    |
| Oxygen   | 122      | 1072 | Pentaborane  | 135      | 1380 |
| Oxygen, compressed                             | 122      | 1072 | Pentachloroethane  | 151      | 1669 |
| Oxygen, refrigerated liquid (cryogenic liquid) | 122      | 1073 | Pentachlorophenol  | 154      | 3155 |
| Oxygen and Carbon dioxide mixture, compressed  | 122      | 1014 | Pentaerythrite tetranitrate mixture, desensitized, solid, n.o.s., with more than 10% but not more than 20% PETN  | 113      | 3344 |
| Oxygen difluoride                              | 124      | 2190 | Pentaerythritol tetranitrate mixture, desensitized, solid, n.o.s., with more than 10% but not more than 20% PETN | 113      | 3344 |
| Oxygen difluoride, compressed                  | 124      | 2190 | Pentafluoroethane  | 126      | 3220 |
| Oxygen generator, chemical                     | 140      | 3356 | Pentafluoroethane and Ethylene oxide mixture, with not more than 7.9% Ethylene oxide                             | 126      | 3298 |
| Oxygen generator, chemical, spent              | 140      | 3356 | Pentamethylheptane   | 128      | 2286 |

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| Pentane-2,4-dione   | 131       | 2310   | Pesticide, liquid, flammable, poisonous, n.o.s.  | 131       | 3021   |
| Pentanes  | 128       | 1265   | Pesticide, liquid, flammable, toxic, n.o.s.  | 131       | 3021   |
| Pentanol  | 129       | 1105   | Pesticide, liquid, poisonous, flammable, n.o.s.  | 131       | 2903   |
| 1-Pentene   | 128       | 1108   | Pesticide, liquid, poisonous, n.o.s.   | 151       | 2902   |
| 1-Pentol  | 153P      | 2705   | Pesticide, liquid, toxic, flammable, n.o.s.  | 131       | 2903   |
| Perchlorates, inorganic, aqueous solution, n.o.s.   | 140       | 3211   | Pesticide, liquid, toxic, n.o.s.   | 151       | 2902   |
| Perchlorates, inorganic, n.o.s.   | 140       | 1481   | Pesticide, solid, poisonous, n.o.s.  | 151       | 2588   |
| Perchloric acid, with more than 50% but not more than 72% acid  | 143       | 1873   | Pesticide, solid, toxic, n.o.s.  | 151       | 2588   |
| Perchloric acid, with not more than 50% acid  | 157       | 1802   | PETN mixture, desensitized, solid, n.o.s., with more than 10% but not more than 20% PETN | 113       | 3344   |
| Perchloroethylene   | 160       | 1897   | Petrol   | 128       | 1203   |
| Perchloromethyl mercaptan   | 157       | 1670   | Petrol and ethanol mixture, with more than 10% ethanol                                   | 127       | 3475   |
| Perchloryl fluoride   | 124       | 3083   | Petroleum crude oil  | 128       | 1267   |
| Perfluoro(ethyl vinyl ether)  | 115       | 3154   | Petroleum distillates, n.o.s.  | 128       | 1268   |
| Perfluoro(methyl vinyl ether)   | 115       | 3153   | Petroleum gases, liquefied   | 115       | 1075   |
| Perfumery products, with flammable solvents   | 127       | 1266   | Petroleum oil  | 128       | 1270   |
| Permanganates, inorganic, aqueous solution, n.o.s.  | 140       | 3214   | Petroleum products, n.o.s.   | 128       | 1268   |
| Permanganates, inorganic, n.o.s.  | 140       | 1482   | Petroleum sour crude oil, flammable, poisonous   | 131       | 3494   |
| Peroxides, inorganic, n.o.s.  | 140       | 1483   | Petroleum sour crude oil, flammable, toxic   | 131       | 3494   |
| Peroxyacetic acid and hydrogen peroxide mixture, with acid(s), water and not more than 5% Peroxyacetic acid, stabilized | 140       | 3149   | Phenacyl bromide   | 153       | 2645   |
| Persulfates, inorganic, aqueous solution, n.o.s.  | 140       | 3216   | Phenetidines   | 153       | 2311   |
| Persulfates, inorganic, n.o.s.  | 140       | 3215   | Phenol, molten   | 153       | 2312   |
| Persulphates, inorganic, aqueous solution, n.o.s.   | 140       | 3216   | Phenol, solid  | 153       | 1671   |
| Persulphates, inorganic, n.o.s.   | 140       | 3215   | Phenol solution  | 153       | 2821   |
|   |           |        | Phenolates, liquid   | 154       | 2904   |
|   |           |        | Phenolates, solid  | 154       | 2905   |

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| Phenolsulfonic acid, liquid   | 153      | 1803 | Phenylphosphorus thiodichloride                                 | 137      | 2799 |
| Phenolsulphonic acid, liquid  | 153      | 1803 | Phenyltrichlorosilane   | 156      | 1804 |
| Phenoxyacetic acid derivative pesticide, liquid, flammable, poisonous | 131      | 3346 | Phenyl urea pesticide, liquid, poisonous                        | 151      | 3002 |
| Phenoxyacetic acid derivative pesticide, liquid, flammable, toxic     | 131      | 3346 | Phenyl urea pesticide, liquid, toxic                            | 151      | 3002 |
| Phenoxyacetic acid derivative pesticide, liquid, poisonous            | 153      | 3348 | Phosgene  | 125      | 1076 |
| Phenoxyacetic acid derivative pesticide, liquid, poisonous, flammable | 131      | 3347 | 9-Phosphabicyclononanes   | 135      | 2940 |
| Phenoxyacetic acid derivative pesticide, liquid, toxic                | 153      | 3348 | Phosphine   | 119      | 2199 |
| Phenoxyacetic acid derivative pesticide, liquid, toxic, flammable     | 131      | 3347 | Phosphine, adsorbed   | 173      | 3525 |
| Phenoxyacetic acid derivative pesticide, solid, poisonous             | 153      | 3345 | Phosphoric acid, solid  | 154      | 3453 |
| Phenoxyacetic acid derivative pesticide, solid, toxic                 | 153      | 3345 | Phosphoric acid, solution                                       | 154      | 1805 |
| Phenylacetonitrile, liquid  | 152      | 2470 | Phosphorous acid  | 154      | 2834 |
| Phenylacetyl chloride   | 156      | 2577 | Phosphorus, amorphous   | 133      | 1338 |
| Phenylcarbylamine chloride  | 151      | 1672 | Phosphorus, white, dry or under water or in solution            | 136      | 1381 |
| Phenyl chloroformate  | 156      | 2746 | Phosphorus, white, molten                                       | 136      | 2447 |
| Phenylenediamines   | 153      | 1673 | Phosphorus, yellow, dry or under water or in solution           | 136      | 1381 |
| Phenylhydrazine   | 153      | 2572 | Phosphorus heptasulfide, free from yellow and white Phosphorus  | 139      | 1339 |
| Phenyl isocyanate   | 155      | 2487 | Phosphorus heptasulphide, free from yellow and white Phosphorus | 139      | 1339 |
| Phenyl mercaptan  | 131      | 2337 | Phosphorus oxybromide, molten                                   | 137      | 2576 |
| Phenylmercuric acetate  | 151      | 1674 | Phosphorus oxybromide, solid                                    | 137      | 1939 |
| Phenylmercuric compound, n.o.s.                                       | 151      | 2026 | Phosphorus oxychloride  | 137      | 1810 |
| Phenylmercuric hydroxide  | 151      | 1894 | Phosphorus pentabromide   | 137      | 2691 |
| Phenylmercuric nitrate  | 151      | 1895 | Phosphorus pentachloride  | 137      | 1806 |
| Phenylphosphorus dichloride   | 137      | 2798 | Phosphorus pentafluoride  | 125      | 2198 |
|   |          |      | Phosphorus pentafluoride, adsorbed                              | 173      | 3524 |
|   |          |      | Phosphorus pentafluoride, compressed                            | 125      | 2198 |

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Phosphorus pentasulfide, free from yellow and white Phosphorus      **139**      1340

Phosphorus pentasulphide, free from yellow and white Phosphorus      **139**      1340

Phosphorus pentoxide      **137**      1807

Phosphorus sesquisulfide, free from yellow and white Phosphorus      **139**      1341

Phosphorus sesquisulphide, free from yellow and white Phosphorus      **139**      1341

Phosphorus tribromide      **137**      1808

Phosphorus trichloride      **137**      1809

Phosphorus trioxide      **157**      2578

Phosphorus trisulfide, free from yellow and white Phosphorus      **139**      1343

Phosphorus trisulphide, free from yellow and white Phosphorus      **139**      1343

Phthalic anhydride      **156**      2214

Picolines      **129**      2313

Picric acid, wetted with not less than 10% water      **113**      3364

Picric acid, wetted with not less than 30% water      **113**      1344

Picrite, wetted with not less than 20% water      **113**      1336

Picryl chloride, wetted with not less than 10% water      **113**      3365

Pinene (alpha)      **128**      2368

Pine oil      **129**      1272

Piperazine      **153**      2579

Piperidine      **132**      2401

Plastic molding compound      **171**      3314

Plastics moulding compound      **171**      3314

Plastics, nitrocellulose-based, self-heating, n.o.s.      **135**      2006

Poisonous by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone A)      **131**      3492

Poisonous by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone B)      **131**      3493

Poisonous by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone A)      **154**      3389

Poisonous by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone B)      **154**      3390

Poisonous by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)      **131**      3488

Poisonous by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)      **131**      3489

Poisonous by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone A)      **131**      3383

Poisonous by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone B)      **131**      3384

Poisonous by inhalation liquid, n.o.s. (Inhalation Hazard Zone A)      **151**      3381

Poisonous by inhalation liquid, n.o.s. (Inhalation Hazard Zone B)      **151**      3382

Poisonous by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone A)      **142**      3387

Poisonous by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone B)      **142**      3388

Poisonous by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone A)      **155**      3490

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| Poisonous by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone B) | <b>155</b> | 3491 |
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| Polyamines, liquid, corrosive, flammable, n.o.s. | <b>132</b> | 2734 |
|--|------------|------|

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| Polyamines, liquid, corrosive, n.o.s. | <b>153</b> | 2735 |
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| Poisonous by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone A) | <b>139</b> | 3385 |
|---|------------|------|

|                                      |            |      |
|--------------------------------------|------------|------|
| Polyamines, solid, corrosive, n.o.s. | <b>154</b> | 3259 |
|--------------------------------------|------------|------|

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|---|------------|------|
| Poisonous by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone B) | <b>139</b> | 3386 |
|---|------------|------|

|                                   |            |      |
|-----------------------------------|------------|------|
| Polychlorinated biphenyls, liquid | <b>171</b> | 2315 |
|-----------------------------------|------------|------|

|                                  |            |      |
|----------------------------------|------------|------|
| Polychlorinated biphenyls, solid | <b>171</b> | 3432 |
|----------------------------------|------------|------|

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| Poisonous liquid, corrosive, inorganic, n.o.s. | <b>154</b> | 3289 |
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|   |            |      |
|---|------------|------|
| Polyester resin kit, liquid base material | <b>128</b> | 3269 |
|---|------------|------|

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| Poisonous liquid, corrosive, organic, n.o.s. | <b>154</b> | 2927 |
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| Polyester resin kit, solid base material | <b>128P</b> | 3527 |
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| Poisonous liquid, flammable, organic, n.o.s. | <b>131</b> | 2929 |
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| Polyhalogenated biphenyls, liquid | <b>171</b> | 3151 |
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| Poisonous liquid, inorganic, n.o.s. | <b>151</b> | 3287 |
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| Polyhalogenated biphenyls, solid | <b>171</b> | 3152 |
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|-----------------------------------|------------|------|
| Poisonous liquid, organic, n.o.s. | <b>153</b> | 2810 |
|-----------------------------------|------------|------|

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| Polyhalogenated terphenyls, liquid | <b>171</b> | 3151 |
|------------------------------------|------------|------|

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| Poisonous liquid, oxidizing, n.o.s. | <b>142</b> | 3122 |
|-------------------------------------|------------|------|

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| Polyhalogenated terphenyls, solid | <b>171</b> | 3152 |
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| Poisonous liquid, water-reactive, n.o.s. | <b>139</b> | 3123 |
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| Polymeric beads, expandable | <b>171</b> | 2211 |
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|   |            |      |
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| Poisonous solid, corrosive, inorganic, n.o.s. | <b>154</b> | 3290 |
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| Polymerizing substance, liquid, stabilized, n.o.s. | <b>149P</b> | 3532 |
|--|-------------|------|

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|---|------------|------|
| Poisonous solid, corrosive, organic, n.o.s. | <b>154</b> | 2928 |
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| Polymerizing substance, liquid, temperature controlled, n.o.s. | <b>150P</b> | 3534 |
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| Poisonous solid, flammable, organic, n.o.s. | <b>134</b> | 2930 |
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| Polymerizing substance, solid, stabilized, n.o.s. | <b>149P</b> | 3531 |
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| Poisonous solid, inorganic, n.o.s. | <b>151</b> | 3288 |
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|---|-------------|------|
| Polymerizing substance, solid, temperature controlled, n.o.s. | <b>150P</b> | 3533 |
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| Poisonous solid, organic, n.o.s. | <b>154</b> | 2811 |
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| Potassium | <b>138</b> | 2257 |
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|                                    |            |      |
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| Poisonous solid, oxidizing, n.o.s. | <b>141</b> | 3086 |
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|---------------------------------|------------|------|
| Potassium, metal alloys, liquid | <b>138</b> | 1420 |
|---------------------------------|------------|------|

|                                       |            |      |
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| Poisonous solid, self-heating, n.o.s. | <b>136</b> | 3124 |
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|                                |            |      |
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| Potassium, metal alloys, solid | <b>138</b> | 3403 |
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| Poisonous solid, water-reactive, n.o.s. | <b>139</b> | 3125 |
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| Potassium arsenate | <b>151</b> | 1677 |
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|  |            |      |
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| Polyamines, flammable, corrosive, n.o.s. | <b>132</b> | 2733 |
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| Potassium arsenite | <b>154</b> | 1678 |
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| Potassium borohydride | <b>138</b> | 1870 |
|-----------------------|------------|------|

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|--|-----------|--------|---|-----------|--------|
| Potassium bromate                            | 140       | 1484   | Potassium persulphate   | 140       | 1492   |
| Potassium chlorate                           | 140       | 1485   | Potassium phosphide   | 139       | 2012   |
| Potassium chlorate, aqueous solution         | 140       | 2427   | Potassium sodium alloys, liquid   | 138       | 1422   |
| Potassium cuprocyanide                       | 157       | 1679   | Potassium sodium alloys, solid  | 138       | 3404   |
| Potassium cyanide, solid                     | 157       | 1680   | Potassium sulfide, anhydrous  | 135       | 1382   |
| Potassium cyanide, solution                  | 157       | 3413   | Potassium sulfide, hydrated, with not less than 30% water of crystallization  | 153       | 1847   |
| Potassium dithionite                         | 135       | 1929   | Potassium sulfide, with less than 30% water of crystallization                | 135       | 1382   |
| Potassium fluoride, solid                    | 154       | 1812   | Potassium sulphide, anhydrous   | 135       | 1382   |
| Potassium fluoride, solution                 | 154       | 3422   | Potassium sulphide, hydrated, with not less than 30% water of crystallization | 153       | 1847   |
| Potassium fluoroacetate                      | 151       | 2628   | Potassium sulphide, with less than 30% water of crystallization               | 135       | 1382   |
| Potassium fluorosilicate                     | 151       | 2655   | Potassium superoxide  | 143       | 2466   |
| Potassium hydrogen difluoride, solid         | 154       | 1811   | Printing ink, flammable   | 129       | 1210   |
| Potassium hydrogen difluoride, solution      | 154       | 3421   | Printing ink related material, flammable                                      | 129       | 1210   |
| Potassium hydrogen sulfate                   | 154       | 2509   | Propadiene, stabilized  | 116P      | 2200   |
| Potassium hydrogen sulphate                  | 154       | 2509   | Propadiene and Methylacetylene mixture, stabilized                            | 116P      | 1060   |
| Potassium hydrosulfite                       | 135       | 1929   | Propane   | 115       | 1075   |
| Potassium hydrosulphite                      | 135       | 1929   | Propane   | 115       | 1978   |
| Potassium hydroxide, solid                   | 154       | 1813   | Propane-Ethane mixture, refrigerated liquid                                   | 115       | 1961   |
| Potassium hydroxide, solution                | 154       | 1814   | Propanethiols   | 130       | 2402   |
| Potassium metavanadate                       | 151       | 2864   | n-Propanol  | 129       | 1274   |
| Potassium monoxide                           | 154       | 2033   | Propionaldehyde   | 129P      | 1275   |
| Potassium nitrate                            | 140       | 1486   | Propionic acid  | 153       | 1848   |
| Potassium nitrate and Sodium nitrate mixture | 140       | 1499   | Propionic acid, with not less than 10% and less than 90% acid                 | 153       | 1848   |
| Potassium nitrate and Sodium nitrite mixture | 140       | 1487   |   |           |        |
| Potassium nitrite                            | 140       | 1488   |   |           |        |
| Potassium perchlorate                        | 140       | 1489   |   |           |        |
| Potassium permanganate                       | 140       | 1490   |   |           |        |
| Potassium peroxide                           | 144       | 1491   |   |           |        |
| Potassium persulfate                         | 140       | 1492   |   |           |        |

| Name of Material   | Guide No. | ID No. | Name of Material  | Guide No. | ID No. |
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| Propionic acid, with not less than 90% acid  | 153       | 3463   | Pyrethroid pesticide, liquid, poisonous   | 151       | 3352   |
| Propionic anhydride  | 156       | 2496   | Pyrethroid pesticide, liquid, poisonous, flammable                                  | 131       | 3351   |
| Propionitrile  | 131       | 2404   | Pyrethroid pesticide, liquid, toxic   | 151       | 3352   |
| Propionyl chloride   | 132       | 1815   | Pyrethroid pesticide, liquid, toxic, flammable                                      | 131       | 3351   |
| n-Propyl acetate   | 129       | 1276   | Pyrethroid pesticide, solid, poisonous  | 151       | 3349   |
| Propyl alcohol, normal   | 129       | 1274   | Pyrethroid pesticide, solid, toxic  | 151       | 3349   |
| Propylamine  | 132       | 1277   | Pyridine  | 129       | 1282   |
| n-Propyl benzene   | 128       | 2364   | Pyrophoric alloy, n.o.s.  | 135       | 1383   |
| Propyl chloride  | 129       | 1278   | Pyrophoric liquid, inorganic, n.o.s.  | 135       | 3194   |
| n-Propyl chloroformate   | 155       | 2740   | Pyrophoric liquid, organic, n.o.s.  | 135       | 2845   |
| Propylene  | 115       | 1075   | Pyrophoric metal, n.o.s.  | 135       | 1383   |
| Propylene  | 115       | 1077   | Pyrophoric solid, inorganic, n.o.s.   | 135       | 3200   |
| Propylene, Ethylene and Acetylene in mixture, refrigerated liquid containing at least 71.5% Ethylene with not more than 22.5% Acetylene and not more than 6% Propylene | 115       | 3138   | Pyrophoric solid, organic, n.o.s.   | 135       | 2846   |
| Propylene chlorohydrin   | 131       | 2611   | Pyrosulfuryl chloride   | 137       | 1817   |
| 1,2-Propylenediamine   | 132       | 2258   | Pyrosulphuryl chloride  | 137       | 1817   |
| Propyleneimine, stabilized   | 131P      | 1921   | Pyrrolidine   | 132       | 1922   |
| Propylene oxide  | 127P      | 1280   | Quinoline   | 154       | 2656   |
| Propylene oxide and Ethylene oxide mixture, with not more than 30% Ethylene oxide  | 131P      | 2983   | Radioactive material, excepted package, articles                                    | 161       | 2911   |
| Propylene tetramer   | 128       | 2850   | Radioactive material, excepted package, articles manufactured from depleted Uranium | 161       | 2909   |
| Propyl formates  | 129       | 1281   | Radioactive material, excepted package, articles manufactured from natural Thorium  | 161       | 2909   |
| n-Propyl isocyanate  | 155P      | 2482   |   |           |        |
| n-Propyl nitrate   | 128       | 1865   |   |           |        |
| Propyltrichlorosilane  | 155       | 1816   |   |           |        |
| Pyrethroid pesticide, liquid, flammable, poisonous   | 131       | 3350   |   |           |        |
| Pyrethroid pesticide, liquid, flammable, toxic   | 131       | 3350   |   |           |        |



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| Radioactive material, excepted package, articles manufactured from natural Uranium           | 161              | 2909          | Radioactive material, transported under special arrangement, non fissile or fissile-excepted | 163              | 2919          |
| Radioactive material, excepted package, empty packaging                                      | 161              | 2908          | Radioactive material, Type A package, fissile, non-special form                              | 165              | 3327          |
| Radioactive material, excepted package, instruments  | 161              | 2911          | Radioactive material, Type A package, non-special form, non fissile or fissile-excepted      | 163              | 2915          |
| Radioactive material, excepted package, limited quantity of material                         | 161              | 2910          | Radioactive material, Type A package, special form, fissile                                  | 165              | 3333          |
| Radioactive material, low specific activity (LSA-I), non fissile or fissile-excepted         | 162              | 2912          | Radioactive material, Type A package, special form, non fissile or fissile-excepted          | 164              | 3332          |
| Radioactive material, low specific activity (LSA-II), fissile                                | 165              | 3324          | Radioactive material, Type B(M) package, fissile   | 165              | 3329          |
| Radioactive material, low specific activity (LSA-II), non fissile or fissile-excepted        | 162              | 3321          | Radioactive material, Type B(M) package, non fissile or fissile-excepted                     | 163              | 2917          |
| Radioactive material, low specific activity (LSA-III), fissile                               | 165              | 3325          | Radioactive material, Type B(U) package, fissile   | 165              | 3328          |
| Radioactive material, low specific activity (LSA-III), non fissile or fissile-excepted       | 162              | 3322          | Radioactive material, Type B(U) package, non fissile or fissile-excepted                     | 163              | 2916          |
| Radioactive material, surface contaminated objects (SCO-I), fissile                          | 165              | 3326          | Radioactive material, Type C package, fissile  | 165              | 3330          |
| Radioactive material, surface contaminated objects (SCO-I), non fissile or fissile-excepted  | 162              | 2913          | Radioactive material, Type C package, non fissile or fissile excepted                        | 163              | 3323          |
| Radioactive material, surface contaminated objects (SCO-II), fissile                         | 165              | 3326          | Radioactive material, Uranium hexafluoride, fissile  | 166              | 2977          |
| Radioactive material, surface contaminated objects (SCO-II), non fissile or fissile-excepted | 162              | 2913          | Radioactive material, Uranium hexafluoride, non fissile or fissile-excepted                  | 166              | 2978          |
| Radioactive material, transported under special arrangement, fissile                         | 165              | 3331          | Rags, oily   | 133              | 1856          |

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|---------------------------------------|------------------|---------------|--|------------------|---------------|
| Receptacles, small, containing gas    | 115              | 2037          | Refrigerant gas R-218  | 126              | 2424          |
| Red phosphorus                        | 133              | 1338          | Refrigerant gas R-227  | 126              | 3296          |
| Refrigerant gas, n.o.s.               | 126              | 1078          | Refrigerant gas R-404A   | 126              | 3337          |
| Refrigerant gases, n.o.s. (flammable) | 115              | 1954          | Refrigerant gas R-407A   | 126              | 3338          |
| Refrigerant gas R-12                  | 126              | 1028          | Refrigerant gas R-407B   | 126              | 3339          |
| Refrigerant gas R-12B1                | 126              | 1974          | Refrigerant gas R-407C   | 126              | 3340          |
| Refrigerant gas R-12B2                | 171              | 1941          | Refrigerant gas R-500  | 126              | 2602          |
| Refrigerant gas R-13                  | 126              | 1022          | Refrigerant gas R-502  | 126              | 1973          |
| Refrigerant gas R-13B1                | 126              | 1009          | Refrigerant gas R-503  | 126              | 2599          |
| Refrigerant gas R-14                  | 126              | 1982          | Refrigerant gas R-1113   | 119P             | 1082          |
| Refrigerant gas R-14, compressed      | 126              | 1982          | Refrigerant gas R-1132a  | 116P             | 1959          |
| Refrigerant gas R-21                  | 126              | 1029          | Refrigerant gas R-1216   | 126              | 1858          |
| Refrigerant gas R-22                  | 126              | 1018          | Refrigerant gas R-1318   | 126              | 2422          |
| Refrigerant gas R-23                  | 126              | 1984          | Refrigerant gas RC-318   | 126              | 1976          |
| Refrigerant gas R-32                  | 115              | 3252          | Refrigerating machines, containing Ammonia solutions (UN2672)              | 126              | 2857          |
| Refrigerant gas R-40                  | 115              | 1063          | Refrigerating machines, containing flammable, non-poisonous, liquefied gas | 115              | 3358          |
| Refrigerant gas R-41                  | 115              | 2454          | Refrigerating machines, containing flammable, non-toxic, liquefied gas     | 115              | 3358          |
| Refrigerant gas R-114                 | 126              | 1958          | Refrigerating machines, containing non-flammable, non-poisonous gases      | 126              | 2857          |
| Refrigerant gas R-115                 | 126              | 1020          | Refrigerating machines, containing non-flammable, non-toxic gases          | 126              | 2857          |
| Refrigerant gas R-116                 | 126              | 2193          | Regulated medical waste, n.o.s.  | 158              | 3291          |
| Refrigerant gas R-116, compressed     | 126              | 2193          | Resin solution   | 127              | 1866          |
| Refrigerant gas R-124                 | 126              | 1021          | Resorcinol   | 153              | 2876          |
| Refrigerant gas R-125                 | 126              | 3220          | Rosin oil  | 127              | 1286          |
| Refrigerant gas R-133a                | 126              | 1983          | Rubber scrap, powdered or granulated                                       | 133              | 1345          |
| Refrigerant gas R-134a                | 126              | 3159          |  |                  |               |
| Refrigerant gas R-142b                | 115              | 2517          |  |                  |               |
| Refrigerant gas R-143a                | 115              | 2035          |  |                  |               |
| Refrigerant gas R-152a                | 115              | 1030          |  |                  |               |
| Refrigerant gas R-161                 | 115              | 2453          |  |                  |               |

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| Rubber shoddy, powdered or granulated                                 | 133       | 1345   | Self-heating liquid, poisonous, inorganic, n.o.s.   | 136       | 3187   |
| Rubber solution   | 127       | 1287   | Self-heating liquid, poisonous, organic, n.o.s.     | 136       | 3184   |
| Rubidium  | 138       | 1423   | Self-heating liquid, toxic, inorganic, n.o.s.       | 136       | 3187   |
| Rubidium hydroxide, solid   | 154       | 2678   | Self-heating liquid, toxic, organic, n.o.s.         | 136       | 3184   |
| Rubidium hydroxide, solution  | 154       | 2677   | Self-heating solid, corrosive, inorganic, n.o.s.    | 136       | 3192   |
| SA  | 119       | —      | Self-heating solid, corrosive, organic, n.o.s.      | 136       | 3126   |
| Safety devices  | 171       | 3268   | Self-heating solid, inorganic, n.o.s.               | 135       | 3190   |
| Sarin   | 153       | —      | Self-heating solid, organic, n.o.s.                 | 135       | 3088   |
| Seat-belt pre-tensioners  | 171       | 3268   | Self-heating solid, oxidizing, n.o.s.               | 135       | 3127   |
| Seed cake, with more than 1.5% oil and not more than 11% moisture     | 135       | 1386   | Self-heating solid, poisonous, inorganic, n.o.s.    | 136       | 3191   |
| Seed cake, with not more than 1.5% oil and not more than 11% moisture | 135       | 2217   | Self-heating solid, poisonous, organic, n.o.s.      | 136       | 3128   |
| Selenates   | 151       | 2630   | Self-heating solid, toxic, inorganic, n.o.s.        | 136       | 3191   |
| Selenic acid  | 154       | 1905   | Self-heating solid, toxic, organic, n.o.s.          | 136       | 3128   |
| Selenites   | 151       | 2630   | Self-heating solid, toxic, inorganic, n.o.s.        | 136       | 3128   |
| Selenium compound, liquid, n.o.s.                                     | 151       | 3440   | Self-reactive liquid type B                         | 149       | 3221   |
| Selenium compound, solid, n.o.s.                                      | 151       | 3283   | Self-reactive liquid type B, temperature controlled | 150       | 3231   |
| Selenium disulfide  | 153       | 2657   | Self-reactive liquid type C                         | 149       | 3223   |
| Selenium disulphide   | 153       | 2657   | Self-reactive liquid type C, temperature controlled | 150       | 3233   |
| Selenium hexafluoride   | 125       | 2194   | Self-reactive liquid type D                         | 149       | 3225   |
| Selenium oxychloride  | 157       | 2879   | Self-reactive liquid type D, temperature controlled | 150       | 3235   |
| Self-defense spray, non-pressurized                                   | 171       | 3334   | Self-reactive liquid type E                         | 149       | 3227   |
| Self-heating liquid, corrosive, inorganic, n.o.s.                     | 136       | 3188   | Self-reactive liquid type E, temperature controlled | 150       | 3237   |
| Self-heating liquid, corrosive, organic, n.o.s.                       | 136       | 3185   | Self-reactive liquid type F                         | 149       | 3229   |
| Self-heating liquid, inorganic, n.o.s.                                | 135       | 3186   |   |           |        |
| Self-heating liquid, organic, n.o.s.                                  | 135       | 3183   |   |           |        |

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| Self-reactive liquid type F, temperature controlled | 150      | 3239 | Sodium   | 138      | 1428 |
| Self-reactive solid type B                          | 149      | 3222 | Sodium aluminate, solid  | 154      | 2812 |
| Self-reactive solid type B, temperature controlled  | 150      | 3232 | Sodium aluminate, solution   | 154      | 1819 |
| Self-reactive solid type C                          | 149      | 3224 | Sodium aluminum hydride  | 138      | 2835 |
| Self-reactive solid type C, temperature controlled  | 150      | 3234 | Sodium ammonium vanadate   | 154      | 2863 |
| Self-reactive solid type D                          | 149      | 3226 | Sodium arsanilate  | 154      | 2473 |
| Self-reactive solid type D, temperature controlled  | 150      | 3236 | Sodium arsenate  | 151      | 1685 |
| Self-reactive solid type E                          | 149      | 3228 | Sodium arsenite, aqueous solution  | 154      | 1686 |
| Self-reactive solid type E, temperature controlled  | 150      | 3238 | Sodium arsenite, solid   | 151      | 2027 |
| Self-reactive solid type F                          | 149      | 3230 | Sodium azide   | 153      | 1687 |
| Self-reactive solid type F, temperature controlled  | 150      | 3240 | Sodium, batteries containing   | 138      | 3292 |
| Shale oil   | 128      | 1288 | Sodium bisulfate, solution   | 154      | 2837 |
| Silane  | 116      | 2203 | Sodium bisulphate, solution  | 154      | 2837 |
| Silane, compressed                                  | 116      | 2203 | Sodium borohydride   | 138      | 1426 |
| Silicon powder, amorphous                           | 170      | 1346 | Sodium borohydride and Sodium hydroxide solution, with not more than 12% Sodium borohydride and not more than 40% Sodium hydroxide | 157      | 3320 |
| Silicon tetrachloride                               | 157      | 1818 | Sodium bromate   | 140      | 1494 |
| Silicon tetrafluoride                               | 125      | 1859 | Sodium cacodylate  | 152      | 1688 |
| Silicon tetrafluoride, adsorbed                     | 173      | 3521 | Sodium carbonate peroxyhydrate   | 140      | 3378 |
| Silicon tetrafluoride, compressed                   | 125      | 1859 | Sodium chlorate  | 140      | 1495 |
| Silver arsenite                                     | 151      | 1683 | Sodium chlorate, aqueous solution  | 140      | 2428 |
| Silver cyanide                                      | 151      | 1684 | Sodium chlorite  | 143      | 1496 |
| Silver nitrate                                      | 140      | 1493 | Sodium chloroacetate   | 151      | 2659 |
| Silver picrate, wetted with not less than 30% water | 113      | 1347 | Sodium cuprocyanide, solid   | 157      | 2316 |
| Sludge acid   | 153      | 1906 | Sodium cuprocyanide, solution  | 157      | 2317 |
| Smokeless powder for small arms                     | 133      | 3178 | Sodium cyanide, solid  | 157      | 1689 |
| Soda lime, with more than 4% Sodium hydroxide       | 154      | 1907 | Sodium cyanide, solution   | 157      | 3414 |
|   |          |      | Sodium dichloroisocyanurate  | 140      | 2465 |

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| Sodium dichloro-s-triazinetriene  | 140       | 2465   | Sodium methylate, solution in alcohol                        | 132       | 1289   |
| Sodium dinitro-o-cresolate, wetted with not less than 10% water                 | 113       | 3369   | Sodium monoxide  | 157       | 1825   |
| Sodium dinitro-o-cresolate, wetted with not less than 15% water                 | 113       | 1348   | Sodium nitrate   | 140       | 1498   |
| Sodium dithionite   | 135       | 1384   | Sodium nitrate and Potassium nitrate mixture                 | 140       | 1499   |
| Sodium fluoride, solid  | 154       | 1690   | Sodium nitrite   | 141       | 1500   |
| Sodium fluoride, solution   | 154       | 3415   | Sodium nitrite and Potassium nitrate mixture                 | 140       | 1487   |
| Sodium fluoroacetate  | 151       | 2629   | Sodium pentachlorophenate                                    | 154       | 2567   |
| Sodium fluorosilicate   | 154       | 2674   | Sodium perborate monohydrate                                 | 140       | 3377   |
| Sodium hydride  | 138       | 1427   | Sodium perchlorate   | 140       | 1502   |
| Sodium hydrogendifluoride   | 154       | 2439   | Sodium permanganate  | 140       | 1503   |
| Sodium hydrosulfide, hydrated, with not less than 25% water of crystallization  | 154       | 2949   | Sodium peroxide  | 144       | 1504   |
| Sodium hydrosulfide, with less than 25% water of crystallization                | 135       | 2318   | Sodium peroxoborate, anhydrous                               | 140       | 3247   |
| Sodium hydrosulfide, with not less than 25% water of crystallization            | 154       | 2949   | Sodium persulfate  | 140       | 1505   |
| Sodium hydrosulfite   | 135       | 1384   | Sodium persulphate   | 140       | 1505   |
| Sodium hydrosulphide, hydrated, with not less than 25% water of crystallization | 154       | 2949   | Sodium phosphide   | 139       | 1432   |
| Sodium hydrosulphide, with less than 25% water of crystallization               | 135       | 2318   | Sodium picramate, wetted with not less than 20% water        | 113       | 1349   |
| Sodium hydrosulphide, with not less than 25% water of crystallization           | 154       | 2949   | Sodium potassium alloys, liquid                              | 138       | 1422   |
| Sodium hydrosulphite  | 135       | 1384   | Sodium potassium alloys, solid                               | 138       | 3404   |
| Sodium hydroxide, solid   | 154       | 1823   | Sodium sulfide, anhydrous                                    | 135       | 1385   |
| Sodium hydroxide, solution  | 154       | 1824   | Sodium sulfide, hydrated, with not less than 30% water       | 153       | 1849   |
| Sodium hypochlorite   | 154       | 1791   | Sodium sulfide, with less than 30% water of crystallization  | 135       | 1385   |
| Sodium methylate, dry   | 138       | 1431   | Sodium sulphide, anhydrous                                   | 135       | 1385   |
|   |           |        | Sodium sulphide, hydrated, with not less than 30% water      | 153       | 1849   |
|   |           |        | Sodium sulphide, with less than 30% water of crystallization | 135       | 1385   |
|   |           |        | Sodium superoxide  | 143       | 2547   |

| Name of Material  | Guide No.  | ID No.      | Name of Material  | Guide No.  | ID No.      |
|---|------------|-------------|---|------------|-------------|
| Solids containing corrosive liquid, n.o.s.                      | 154        | 3244        | Substituted nitrophenol pesticide, liquid, toxic, flammable | 131        | 3013        |
| Solids containing flammable liquid, n.o.s.                      | 133        | 3175        | Substituted nitrophenol pesticide, solid, poisonous         | 153        | 2779        |
| Solids containing poisonous liquid, n.o.s.                      | 151        | 3243        | Substituted nitrophenol pesticide, solid, toxic             | 153        | 2779        |
| Solids containing toxic liquid, n.o.s.                          | 151        | 3243        | Sulfamic acid   | 154        | 2967        |
| <b>Soman</b>  | <b>153</b> | <b>—</b>    | Sulfur  | 133        | 1350        |
| Stannic chloride, anhydrous                                     | 137        | 1827        | Sulfur, molten  | 133        | 2448        |
| Stannic chloride, pentahydrate                                  | 154        | 2440        | <b>Sulfur chlorides</b>                                     | <b>137</b> | <b>1828</b> |
| Stannic phosphides  | 139        | 1433        | <b>Sulfur dioxide</b>                                       | <b>125</b> | <b>1079</b> |
| <b>Stibine</b>  | <b>119</b> | <b>2676</b> | Sulfur hexafluoride   | 126        | 1080        |
| Straw, wet, damp or contaminated with oil                       | 133        | 1327        | Sulfuric acid   | 137        | 1830        |
| Strontium arsenite  | 151        | 1691        | <b>Sulfuric acid, fuming</b>                                | <b>137</b> | <b>1831</b> |
| Strontium chlorate  | 143        | 1506        | Sulfuric acid, spent  | 137        | 1832        |
| Strontium nitrate   | 140        | 1507        | Sulfuric acid, with more than 51% acid                      | 137        | 1830        |
| Strontium perchlorate   | 140        | 1508        | Sulfuric acid, with not more than 51% acid                  | 157        | 2796        |
| Strontium peroxide  | 143        | 1509        | Sulfuric acid and Hydrofluoric acid mixture                 | 157        | 1786        |
| <b>Strontium phosphide</b>                                      | <b>139</b> | <b>2013</b> | Sulfurous acid  | 154        | 1833        |
| Strychnine  | 151        | 1692        | <b>Sulfur tetrafluoride</b>                                 | <b>125</b> | <b>2418</b> |
| Strychnine salts  | 151        | 1692        | <b>Sulfur trioxide, stabilized</b>                          | <b>137</b> | <b>1829</b> |
| Styrene monomer, stabilized                                     | 128P       | 2055        | <b>Sulfuryl chloride</b>                                    | <b>137</b> | <b>1834</b> |
| Substituted nitrophenol pesticide, liquid, flammable, poisonous | 131        | 2780        | <b>Sulfuryl fluoride</b>                                    | <b>123</b> | <b>2191</b> |
| Substituted nitrophenol pesticide, liquid, flammable, toxic     | 131        | 2780        | Sulphamic acid  | 154        | 2967        |
| Substituted nitrophenol pesticide, liquid, poisonous            | 153        | 3014        | Sulphur   | 133        | 1350        |
| Substituted nitrophenol pesticide, liquid, poisonous, flammable | 131        | 3013        | Sulphur, molten   | 133        | 2448        |
| Substituted nitrophenol pesticide, liquid, toxic                | 153        | 3014        | <b>Sulphur chlorides</b>                                    | <b>137</b> | <b>1828</b> |
|   |            |             | <b>Sulphur dioxide</b>                                      | <b>125</b> | <b>1079</b> |
|   |            |             | Sulphur hexafluoride  | 126        | 1080        |
|   |            |             | Sulphuric acid  | 137        | 1830        |
|   |            |             | <b>Sulphuric acid, fuming</b>                               | <b>137</b> | <b>1831</b> |

| Name of Material   | Guide No. | ID No. | Name of Material                                      | Guide No. | ID No. |
|--|-----------|--------|---|-----------|--------|
| Sulphuric acid, spent  | 137       | 1832   | Tetrafluoroethylene, stabilized                       | 116P      | 1081   |
| Sulphuric acid, with more than 51% acid  | 137       | 1830   | Tetrafluoromethane                                    | 126       | 1982   |
| Sulphuric acid, with not more than 51% acid  | 157       | 2796   | Tetrafluoromethane, compressed                        | 126       | 1982   |
| Sulphuric acid and Hydrofluoric acid mixture   | 157       | 1786   | 1,2,3,6-Tetrahydrobenzaldehyde                        | 129       | 2498   |
| Sulphurous acid  | 154       | 1833   | Tetrahydrofuran                                       | 127       | 2056   |
| Sulphur tetrafluoride  | 125       | 2418   | Tetrahydrofurfurylamine                               | 129       | 2943   |
| Sulphur trioxide, stabilized   | 137       | 1829   | Tetrahydrophthalic anhydrides                         | 156       | 2698   |
| Sulphuryl chloride   | 137       | 1834   | 1,2,3,6-Tetrahydropyridine                            | 129       | 2410   |
| Sulphuryl fluoride   | 123       | 2191   | Tetrahydrothiophene                                   | 130       | 2412   |
| Tabun  | 153       | —      | Tetramethylammonium hydroxide, solid                  | 153       | 3423   |
| Tars, liquid   | 130       | 1999   | Tetramethylammonium hydroxide, solution               | 153       | 1835   |
| Tear gas candles   | 159       | 1700   | Tetramethylsilane                                     | 130       | 2749   |
| Tear gas devices   | 159       | 1693   | Tetranitromethane                                     | 143       | 1510   |
| Tear gas grenades  | 159       | 1700   | Tetrapropyl orthotitanate                             | 128       | 2413   |
| Tear gas substance, liquid, n.o.s.   | 159       | 1693   | Textile waste, wet                                    | 133       | 1857   |
| Tear gas substance, solid, n.o.s.  | 159       | 3448   | Thallium chlorate                                     | 141       | 2573   |
| Tellurium compound, n.o.s.   | 151       | 3284   | Thallium compound, n.o.s.                             | 151       | 1707   |
| Tellurium hexafluoride   | 125       | 2195   | Thallium nitrate                                      | 141       | 2727   |
| Terpene hydrocarbons, n.o.s.   | 128       | 2319   | 4-Thiapentanal  | 152       | 2785   |
| Terpinolene  | 128       | 2541   | Thickened GD  | 153       | —      |
| Tetrabromoethane   | 159       | 2504   | Thioacetic acid                                       | 129       | 2436   |
| 1,1,2,2-Tetrachloroethane  | 151       | 1702   | Thiocarbamate pesticide, liquid, flammable, poisonous | 131       | 2772   |
| Tetrachloroethylene  | 160       | 1897   | Thiocarbamate pesticide, liquid, flammable, toxic     | 131       | 2772   |
| Tetraethyl dithiopyrophosphate   | 153       | 1704   | Thiocarbamate pesticide, liquid, poisonous            | 151       | 3006   |
| Tetraethylenepentamine   | 153       | 2320   | Thiocarbamate pesticide, liquid, poisonous, flammable | 131       | 3005   |
| Tetraethyl silicate  | 129       | 1292   | Thiocarbamate pesticide, liquid, toxic                | 151       | 3006   |
| 1,1,1,2-Tetrafluoroethane  | 126       | 3159   |   |           |        |
| Tetrafluoroethane and Ethylene oxide mixture, with not more than 5.6% Ethylene oxide | 126       | 3299   |   |           |        |

| Name of Material                                     | Guide ID |      | Name of Material  | Guide ID |      |
|--|----------|------|---|----------|------|
|  | No.      | No.  |   | No.      | No.  |
| Thiocarbamate pesticide, liquid, toxic, flammable    | 131      | 3005 | 2,4-Toluenediamine, solution  | 151      | 3418 |
| Thiocarbamate pesticide, solid, poisonous            | 151      | 2771 | Toluene diisocyanate  | 156      | 2078 |
| Thiocarbamate pesticide, solid, toxic                | 151      | 2771 | Toluidines, liquid  | 153      | 1708 |
| Thioglycol   | 153      | 2966 | Toluidines, solid   | 153      | 3451 |
| Thioglycolic acid                                    | 153      | 1940 | 2,4-Toluylenediamine, solid   | 151      | 1709 |
| Thiolactic acid                                      | 153      | 2936 | 2,4-Toluylenediamine, solution  | 151      | 3418 |
| Thionyl chloride                                     | 137      | 1836 | Toxic by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone A) | 131      | 3492 |
| Thiophene  | 130      | 2414 | Toxic by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone B) | 131      | 3493 |
| Thiophosgene   | 157      | 2474 | Toxic by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone A)            | 154      | 3389 |
| Thiophosphoryl chloride                              | 157      | 1837 | Toxic by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone B)            | 154      | 3390 |
| Thiourea dioxide                                     | 135      | 3341 | Toxic by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A) | 131      | 3488 |
| Tinctures, medicinal                                 | 127      | 1293 | Toxic by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B) | 131      | 3489 |
| Tin tetrachloride                                    | 137      | 1827 | Toxic by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone A)            | 131      | 3383 |
| Titanium disulfide                                   | 135      | 3174 | Toxic by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone B)            | 131      | 3384 |
| Titanium disulphide                                  | 135      | 3174 | Toxic by inhalation liquid, n.o.s. (Inhalation Hazard Zone A)                       | 151      | 3381 |
| Titanium hydride                                     | 170      | 1871 | Toxic by inhalation liquid, n.o.s. (Inhalation Hazard Zone B)                       | 151      | 3382 |
| Titanium powder, dry                                 | 135      | 2546 | Toxic by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone A)            | 142      | 3387 |
| Titanium powder, wetted with not less than 25% water | 170      | 1352 | Toxic by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone B)            | 142      | 3388 |
| Titanium sponge granules                             | 170      | 2878 | Toluene   | 130      | 1294 |
| Titanium sponge powders                              | 170      | 2878 | 2,4-Toluenediamine, solid   | 151      | 1709 |
| Titanium tetrachloride                               | 137      | 1838 |   |          |      |
| Titanium trichloride, pyrophoric                     | 135      | 2441 |   |          |      |
| Titanium trichloride mixture                         | 157      | 2869 |   |          |      |
| Titanium trichloride mixture, pyrophoric             | 135      | 2441 |   |          |      |
| TNT, wetted with not less than 10% water             | 113      | 3366 |   |          |      |
| TNT, wetted with not less than 30% water             | 113      | 1356 |   |          |      |



| Name of Material   | Guide ID No. | Guide ID No. | Name of Material                                      | Guide ID No. | Guide ID No. |
|--|--------------|--------------|---|--------------|--------------|
| Toxic by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone A) | 155          | 3490         | Toxins  | 153          | ---          |
| Toxic by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone B) | 155          | 3491         | Toxins, extracted from living sources, liquid, n.o.s. | 153          | 3172         |
| Toxic by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone A)            | 139          | 3385         | Toxins, extracted from living sources, solid, n.o.s.  | 153          | 3462         |
| Toxic by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone B)            | 139          | 3386         | Triallylamine   | 132          | 2610         |
| Toxic liquid, corrosive, inorganic, n.o.s.   | 154          | 3289         | Triallyl borate                                       | 156          | 2609         |
| Toxic liquid, corrosive, organic, n.o.s.   | 154          | 2927         | Triazine pesticide, liquid, flammable, poisonous      | 131          | 2764         |
| Toxic liquid, flammable, organic, n.o.s.   | 131          | 2929         | Triazine pesticide, liquid, flammable, toxic          | 131          | 2764         |
| Toxic liquid, inorganic, n.o.s.  | 151          | 3287         | Triazine pesticide, liquid, poisonous                 | 151          | 2998         |
| Toxic liquid, organic, n.o.s.  | 153          | 2810         | Triazine pesticide, liquid, poisonous, flammable      | 131          | 2997         |
| Toxic liquid, oxidizing, n.o.s.  | 142          | 3122         | Triazine pesticide, liquid, toxic                     | 151          | 2998         |
| Toxic liquid, water-reactive, n.o.s.   | 139          | 3123         | Triazine pesticide, liquid, toxic, flammable          | 131          | 2997         |
| Toxic solid, corrosive, inorganic, n.o.s.  | 154          | 3290         | Triazine pesticide, solid, poisonous                  | 151          | 2763         |
| Toxic solid, corrosive, organic, n.o.s.  | 154          | 2928         | Triazine pesticide, solid, toxic                      | 151          | 2763         |
| Toxic solid, flammable, inorganic, n.o.s.  | 134          | 3535         | Tributylamine   | 153          | 2542         |
| Toxic solid, flammable, organic, n.o.s.  | 134          | 2930         | Tributylphosphane                                     | 135          | 3254         |
| Toxic solid, inorganic, n.o.s.   | 151          | 3288         | Trichloroacetic acid                                  | 153          | 1839         |
| Toxic solid, organic, n.o.s.   | 154          | 2811         | Trichloroacetic acid, solution                        | 153          | 2564         |
| Toxic solid, oxidizing, n.o.s.   | 141          | 3086         | Trichloroacetyl chloride                              | 156          | 2442         |
| Toxic solid, self-heating, n.o.s.  | 136          | 3124         | Trichlorobenzenes, liquid                             | 153          | 2321         |
| Toxic solid, water-reactive, n.o.s.  | 139          | 3125         | Trichlorobutene                                       | 152          | 2322         |
|  |              |              | 1,1,1-Trichloroethane                                 | 160          | 2831         |
|  |              |              | Trichloroethylene                                     | 160          | 1710         |
|  |              |              | Trichloroisocyanuric acid, dry                        | 140          | 2468         |
|  |              |              | Trichlorosilane                                       | 139          | 1295         |
|  |              |              | Tricresyl phosphate                                   | 151          | 2574         |
|  |              |              | Triethylamine   | 132          | 1296         |
|  |              |              | Triethylenetetramine                                  | 153          | 2259         |

| Name of Material   | Guide No. | ID No. | Name of Material  | Guide No. | ID No. |
|--|-----------|--------|---|-----------|--------|
| Triethyl phosphite   | 130       | 2323   | Trinitrobenzoic acid, wetted with not less than 10% water   | 113       | 3368   |
| Trifluoroacetic acid   | 154       | 2699   | Trinitrobenzoic acid, wetted with not less than 30% water   | 113       | 1355   |
| Trifluoroacetyl chloride   | 125       | 3057   | Trinitrochlorobenzene, wetted with not less than 10% water  | 113       | 3365   |
| Trifluorochloroethylene, stabilized  | 119P      | 1082   | Trinitrophenol, wetted with not less than 10% water   | 113       | 3364   |
| 1,1,1-Trifluoroethane  | 115       | 2035   | Trinitrophenol, wetted with not less than 30% water   | 113       | 1344   |
| Trifluoromethane   | 126       | 1984   | Trinitrotoluene, wetted with not less than 10% water  | 113       | 3366   |
| Trifluoromethane, refrigerated liquid  | 120       | 3136   | Trinitrotoluene, wetted with not less than 30% water  | 113       | 1356   |
| Trifluoromethane and Chlorotrifluoromethane azeotropic mixture with approximately 60% Chlorotrifluoromethane | 126       | 2599   | Tripropylamine  | 132       | 2260   |
| 2-Trifluoromethylaniline   | 153       | 2942   | Tripropylene  | 128       | 2057   |
| 3-Trifluoromethylaniline   | 153       | 2948   | Tris-(1-aziridinyl)phosphine oxide, solution  | 152       | 2501   |
| Triisobutylene   | 128       | 2324   | Tungsten hexafluoride   | 125       | 2196   |
| Triisopropyl borate  | 129       | 2616   | Turpentine  | 128       | 1299   |
| Trimethoxysilane   | 132       | 9269   | Turpentine substitute   | 128       | 1300   |
| Trimethylacetyl chloride   | 131       | 2438   | Undecane  | 128       | 2330   |
| Trimethylamine, anhydrous  | 118       | 1083   | Uranium hexafluoride, radioactive material, excepted package, less than 0.1 kg per package, non-fissile or fissile-excepted | 166       | 3507   |
| Trimethylamine, aqueous solution   | 132       | 1297   | Uranium hexafluoride, radioactive material, fissile   | 166       | 2977   |
| 1,3,5-Trimethylbenzene   | 129       | 2325   | Uranium hexafluoride, radioactive material, non fissile or fissile-excepted   | 166       | 2978   |
| Trimethyl borate   | 129       | 2416   | Urea hydrogen peroxide  | 140       | 1511   |
| Trimethylchlorosilane  | 155       | 1298   | Urea nitrate, wetted with not less than 10% water   | 113       | 3370   |
| Trimethylcyclohexylamine   | 153       | 2326   | Urea nitrate, wetted with not less than 20% water   | 113       | 1357   |
| Trimethylhexamethylenediamines   | 153       | 2327   | Valeraldehyde   | 129       | 2058   |
| Trimethylhexamethylene diisocyanate  | 156       | 2328   | Valeryl chloride  | 132       | 2502   |
| Trimethyl phosphite  | 130       | 2329   |   |           |        |
| Trinitrobenzene, wetted with not less than 10% water   | 113       | 3367   |   |           |        |
| Trinitrobenzene, wetted with not less than 30% water   | 113       | 1354   |   |           |        |

| Name of Material                             | Guide No. | ID No. | Name of Material                                    | Guide No. | ID No. |
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| Vanadium compound, n.o.s.                    | 151       | 3285   | Water-reactive liquid, poisonous, n.o.s.            | 139       | 3130   |
| Vanadium oxytrichloride                      | 137       | 2443   | Water-reactive liquid, toxic, n.o.s.                | 139       | 3130   |
| Vanadium pentoxide                           | 151       | 2862   | Water-reactive solid, corrosive, n.o.s.             | 138       | 3131   |
| Vanadium tetrachloride                       | 137       | 2444   | Water-reactive solid, flammable, n.o.s.             | 138       | 3132   |
| Vanadium trichloride                         | 157       | 2475   | Water-reactive solid, n.o.s.                        | 138       | 2813   |
| Vanadyl sulfate                              | 151       | 2931   | Water-reactive solid, oxidizing, n.o.s.             | 138       | 3133   |
| Vanadyl sulphate                             | 151       | 2931   | Water-reactive solid, poisonous, n.o.s.             | 139       | 3134   |
| Vehicle, flammable gas powered               | 115       | 3166   | Water-reactive solid, self-heating, n.o.s.          | 138       | 3135   |
| Vehicle, flammable liquid powered            | 128       | 3166   | Water-reactive solid, toxic, n.o.s.                 | 139       | 3134   |
| Vehicle, fuel cell, flammable gas powered    | 115       | 3166   | Wheelchair, electric, with batteries                | 154       | 3171   |
| Vehicle, fuel cell, flammable liquid powered | 128       | 3166   | White asbestos                                      | 171       | 2590   |
| Vinyl acetate, stabilized                    | 129P      | 1301   | White phosphorus, dry or under water or in solution | 136       | 1381   |
| Vinyl bromide, stabilized                    | 116P      | 1085   | White phosphorus, molten                            | 136       | 2447   |
| Vinyl butyrate, stabilized                   | 129P      | 2838   | Wood preservatives, liquid                          | 129       | 1306   |
| Vinyl chloride, stabilized                   | 116P      | 1086   | Wool waste, wet                                     | 133       | 1387   |
| Vinyl chloroacetate                          | 155       | 2589   | Xanthates   | 135       | 3342   |
| Vinyl ethyl ether, stabilized                | 127P      | 1302   | Xenon   | 120       | 2036   |
| Vinyl fluoride, stabilized                   | 116P      | 1860   | Xenon, compressed                                   | 120       | 2036   |
| Vinylidene chloride, stabilized              | 130P      | 1303   | Xenon, refrigerated liquid (cryogenic liquid)       | 120       | 2591   |
| Vinyl isobutyl ether, stabilized             | 127P      | 1304   | Xylenes   | 130       | 1307   |
| Vinyl methyl ether, stabilized               | 116P      | 1087   | Xylenols, liquid                                    | 153       | 3430   |
| Vinylpyridines, stabilized                   | 131P      | 3073   | Xylenols, solid                                     | 153       | 2261   |
| Vinyltoluenes, stabilized                    | 130P      | 2618   | Xylidines, liquid                                   | 153       | 1711   |
| Vinyltrichlorosilane                         | 155P      | 1305   | Xylidines, solid                                    | 153       | 3452   |
| Vinyltrichlorosilane, stabilized             | 155P      | 1305   | Xylyl bromide, liquid                               | 152       | 1701   |
| VX   | 153       | —      |   |           |        |
| Water-reactive liquid, corrosive, n.o.s.     | 138       | 3129   |   |           |        |
| Water-reactive liquid, n.o.s.                | 138       | 3148   |   |           |        |

| <b>Name of Material</b>                                     | <b>Guide No.</b> | <b>ID No.</b> | <b>Name of Material</b>                                  | <b>Guide No.</b> | <b>ID No.</b> |
|---|------------------|---------------|--|------------------|---------------|
| Xylyl bromide, solid  | 152              | 3417          | Zirconium, dry, finished sheets, strips or coiled wire   | 135              | 2009          |
| Yellow phosphorus, dry or under water or in solution        | 136              | 1381          | Zirconium hydride  | 138              | 1437          |
| Zinc ammonium nitrite                                       | 140              | 1512          | Zirconium nitrate  | 140              | 2728          |
| Zinc arsenate   | 151              | 1712          | Zirconium picramate, wetted with not less than 20% water | 113              | 1517          |
| Zinc arsenate and Zinc arsenite mixture                     | 151              | 1712          | Zirconium powder, dry                                    | 135              | 2008          |
| Zinc arsenite   | 151              | 1712          | Zirconium powder, wetted with not less than 25% water    | 170              | 1358          |
| Zinc arsenite and Zinc arsenate mixture                     | 151              | 1712          | Zirconium scrap  | 135              | 1932          |
| Zinc ashes  | 138              | 1435          | Zirconium suspended in a flammable liquid                | 170              | 1308          |
| Zinc bromate  | 140              | 2469          | Zirconium suspended in a liquid (flammable)              | 170              | 1308          |
| Zinc chlorate   | 140              | 1513          | Zirconium tetrachloride                                  | 137              | 2503          |
| Zinc chloride, anhydrous                                    | 154              | 2331          |  |                  |               |
| Zinc chloride, solution                                     | 154              | 1840          |  |                  |               |
| Zinc cyanide  | 151              | 1713          |  |                  |               |
| Zinc dithionite   | 171              | 1931          |  |                  |               |
| Zinc dross  | 138              | 1435          |  |                  |               |
| Zinc dust   | 138              | 1436          |  |                  |               |
| Zinc fluorosilicate   | 151              | 2855          |  |                  |               |
| Zinc hydrosulfite   | 171              | 1931          |  |                  |               |
| Zinc hydrosulphite  | 171              | 1931          |  |                  |               |
| Zinc nitrate  | 140              | 1514          |  |                  |               |
| Zinc permanganate   | 140              | 1515          |  |                  |               |
| Zinc peroxide   | 143              | 1516          |  |                  |               |
| Zinc phosphide  | 139              | 1714          |  |                  |               |
| Zinc powder   | 138              | 1436          |  |                  |               |
| Zinc residue  | 138              | 1435          |  |                  |               |
| Zinc resinate   | 133              | 2714          |  |                  |               |
| Zinc silicofluoride   | 151              | 2855          |  |                  |               |
| Zinc skimmings  | 138              | 1435          |  |                  |               |
| Zirconium, dry, coiled wire, finished metal sheets or strip | 170              | 2858          |  |                  |               |

NOTES

# SUGGESTED OPERATIONS SHOULD ONLY BE PERFORMED BY ADEQUATELY TRAINED AND EQUIPPED PERSONNEL

## HOW TO USE THE ORANGE GUIDES

1

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GASES - TOXIC - FLAMMABLE  
(EXTREME HAZARD)

GASES - TOXIC - FLAMMABLE  
(EXTREME HAZARD)

GUIDE  
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**POTENTIAL HAZARDS**

**HEALTH**

- TOXIC: Extremely Hazardous.
  - May be fatal if inhaled or absorbed through skin.
  - Initial odor may be irritating or foul and may deaden your sense of smell.
  - Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
  - Fire will produce irritating, corrosive and/or toxic gases.
  - Ranoff from fire control or dilution water may cause environmental contamination.

**FIRE OR EXPLOSION**

- These materials are extremely flammable.
  - May form explosive mixtures with air.
  - May be ignited by heat, sparks or flames.
  - Vapors from liquefied gas are initially heavier than air and spread along ground.
  - Vapors may travel to source of ignition and flash back.
  - Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
  - Ranoff may create fire or explosion hazard.
  - Cylinders exposed to fire may vent and release toxic and flammable gas through pressure relief devices.
  - Containers may explode when heated.
  - Repacked cylinders may rocket.

**PUBLIC SAFETY**

- CALL 911.** Then call emergency response telephone number on shipping paper, if shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
  - Keep unauthorized personnel away.
  - Stay upwind, uphill and/or upstream.
  - Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
  - Ventilate closed spaces before entering, but only if properly trained and equipped.

**PROTECTIVE CLOTHING**

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer when there is **NO RISK OF FIRE**.
- Structural firefighters' protective clothing provides thermal protection but only limited chemical protection.

**EVACUATION**

**Immediate precautionary measure**

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

**Spill**

- See **Table 1 - Initial Isolation and Protective Action Distances**.

**Fire**

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.

 In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 391).

**EMERGENCY RESPONSE**

**FIRE**

**DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.**

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or regular foam.

**Large Fire**

- Water spray, fog or regular foam.
- If it can be done safely, move uninvolved containers away from the area around the fire.
- Damaged cylinders should be handled only by specialists.

**Fire Involving Tanks**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; long may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Prevent entry into waterways, sewers, basements or confined areas.
- Isolate area until gas has dispersed.
- Consider igniting spill or leak to eliminate toxic gas concerns.

**FIRST AID**

- Call 911 or emergency medical services.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- In case of contact with liquefied gas, then frostbitten parts with lukewarm water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.
- Keep victim under observation.
- Effects of contact or inhalation may be delayed.

4

3

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1

### GUIDE NUMBER AND TITLE

- The guide title identifies the general hazards associated with the materials in this Guide.

2


### POTENTIAL HAZARDS

- Emergency responders should consult this section first!
- Describes the material hazard in terms of **FIRE OR EXPLOSION** and **HEALTH** effects upon exposure.
- The primary potential hazard is listed first.
- Allows the responders to make decisions to protect the emergency response team, and the surrounding population.

# SUGGESTED OPERATIONS SHOULD ONLY BE PERFORMED BY ADEQUATELY TRAINED AND EQUIPPED PERSONNEL

## 3

### PUBLIC SAFETY

- This section is divided into three subsections:
  - › **General Information:** describes initial precautionary measures to be taken by those first on the scene.
  - › **PROTECTIVE CLOTHING:** provides general guidance on personal protective equipment requirements including respiratory protection. The protective clothing information is general and correct selection is situation dependent, after considering the physical and chemical properties of the material, weather conditions, spill versus fire, topography, etc.
  - › **EVACUATION:** suggests protective distances for immediate precautionary measures defined for small and large spills, including suggested guidance for conditions where fire is present or likely (potential fragmentation hazard).
    - The term “isolate” indicates a zone of no entry that applies to the public and first responders who are not equipped, trained, and prepared to mitigate the incident.
    - The term “evacuate” indicates people should be removed from inside this zone, if it can be done safely. If removal is too risky, sheltering-in-place can also be considered in this zone. Evacuation aims to protect as many people as possible, and applies mainly to the public.
- Materials **highlighted in green** in the yellow-bordered and blue-bordered pages direct the reader to consult Table 1, detailing specific response distances for toxic inhalation hazard materials, water-reactive materials and chemical warfare agents (green-bordered pages).
  -  ■ If a Canadian flag appears in this section, and the incident is located in Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product.

## 4

### EMERGENCY RESPONSE

- This section is divided into three subsections:
  - › **FIRE:** provides extinguishing procedures for **Small Fire**, **Large Fire**, and/or **Fire Involving Tanks or Car/Trailer Loads**
  - › **SPILL OR LEAK:** includes general recommendations, and may describe the response procedure for **Small Spill** and **Large Spill**
  - › **FIRST AID:** provides general guidance prior to seeking expert medical care.

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- May explode from heat, shock, friction or contamination.
- May react violently or explosively on contact with air, water or foam.
- May be ignited by heat, sparks or flames.
- Vapors may travel to source of ignition and flash back.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

#### HEALTH

- Inhalation, ingestion or contact with substance may cause severe injury, infection, disease or death.
- High concentration of gas may cause asphyxiation without warning.
- Contact may cause burns to skin and eyes.
- Fire or contact with water may produce irritating, toxic and/or corrosive gases.
- Runoff from fire control or dilution water may cause environmental contamination.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



## EMERGENCY RESPONSE

**FIRE**

**CAUTION:** Material may react with extinguishing agent.

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or regular foam.

**Large Fire**

- Water spray, fog or regular foam.
- If it can be done safely, move undamaged containers away from the area around the fire.

**Fire Involving Tanks**

- Cool containers with flooding quantities of water until well after fire is out.
- Do not get water inside containers.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

**SPILL OR LEAK**

- Do not touch or walk through spilled material.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Prevent entry into waterways, sewers, basements or confined areas.

**Small Spill**

- Pick up with sand or other non-combustible absorbent material and place into containers for later disposal.

**Large Spill**

- Dike far ahead of liquid spill for later disposal.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Shower and wash with soap and water.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

# GUIDE EXPLOSIVES\* - DIVISION 1.1, 1.2, 1.3 OR 1.5

## 112

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- **MAY EXPLODE AND THROW FRAGMENTS 1600 METERS (1 MILE) OR MORE IF FIRE REACHES CARGO.**
- For information on "Compatibility Group" letters, refer to Glossary section.

#### HEALTH

- Fire may produce irritating, corrosive and/or toxic gases.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Move people out of line of sight of the scene and away from windows.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area immediately for at least 500 meters (1/3 mile) in all directions.

##### Large Spill

- **Consider initial evacuation for 800 meters (1/2 mile) in all directions.**

##### Fire

- If rail car or trailer is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, initiate evacuation including emergency responders for 1600 meters (1 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**\* FOR INFORMATION ON "COMPATIBILITY GROUP" LETTERS, REFER TO THE GLOSSARY SECTION.**

## EMERGENCY RESPONSE

## FIRE

## CARGO Fire

- **DO NOT fight fire when fire reaches cargo! Cargo may EXPLODE!**
- Stop all traffic and clear the area for at least 1600 meters (1 mile) in all directions and let burn.
- **Do not move cargo or vehicle if cargo has been exposed to heat.**

## TIRE or VEHICLE Fire

- **Use plenty of water - FLOOD it! If water is not available, use CO<sub>2</sub>, dry chemical or dirt.**
- If possible, and WITHOUT RISK, use unmanned master stream devices or monitor nozzles from maximum distance to prevent fire from spreading to cargo area.
- Pay special attention to tire fires as re-ignition may occur. Stand by, at a safe distance, with extinguisher ready for possible re-ignition.

## SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- DO NOT OPERATE RADIO TRANSMITTERS WITHIN 100 METERS (330 FEET) OF ELECTRIC DETONATORS.
- **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

## FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.

\* FOR INFORMATION ON "COMPATIBILITY GROUP" LETTERS, REFER TO THE GLOSSARY SECTION.

# GUIDE 113 FLAMMABLE MATERIALS (WET/DESENSITIZED EXPLOSIVE)

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- Flammable/combustible material.
- May be ignited by heat, sparks or flames.
- **DRIED OUT material may explode if exposed to heat, flame, friction or shock; treat as an explosive (GUIDE 112).**
- **Keep material wet with water or treat as an explosive (GUIDE 112).**
- Runoff to sewer may create fire or explosion hazard.

### HEALTH

- **Some are toxic** and may be fatal if inhaled, ingested or absorbed through skin. Specifically, Dinitrophenol, wetted (UN1320); Dinitrophenolates, wetted (UN1321), Sodium dinitro-o-cresolate, wetted (UN1348); and Barium azide, wetted (UN1571) are known to be toxic.
- Contact may cause burns to skin and eyes.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause environmental contamination.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area immediately for at least 100 meters (330 feet) in all directions.

#### Large Spill

- **Consider initial evacuation for 500 meters (1/3 mile) in all directions.**

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**EMERGENCY RESPONSE**

**FIRE**

**CARGO Fire**

- **DO NOT fight fire when fire reaches cargo! Cargo may EXPLODE!**
- Stop all traffic and clear the area for at least 1600 meters (1 mile) in all directions and let burn.
- **Do not move cargo or vehicle if cargo has been exposed to heat.**

**TIRE or VEHICLE Fire**

- **Use plenty of water - FLOOD it! If water is not available, use CO<sub>2</sub>, dry chemical or dirt.**
- If possible, and WITHOUT RISK, use unmanned master stream devices or monitor nozzles from maximum distance to prevent fire from spreading to cargo area.
- Pay special attention to tire fires as re-ignition may occur. Stand by, at a safe distance, with extinguisher ready for possible re-ignition.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.

**Small Spill**

- Flush area with large amounts of water.

**Large Spill**

- Wet down with water and dike for later disposal.
- **KEEP "WETTED" PRODUCT WET BY SLOWLY ADDING FLOODING QUANTITIES OF WATER.**

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.

# GUIDE EXPLOSIVES\* - DIVISION 1.4 OR 1.6

## 114

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- **MAY EXPLODE AND THROW FRAGMENTS 800 METERS (1/2 MILE) OR MORE IF FIRE REACHES CARGO.**
- For information on "Compatibility Group" letters, refer to Glossary section.

#### HEALTH

- Fire may produce irritating, corrosive and/or toxic gases.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Move people out of line of sight of the scene and away from windows.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area immediately for at least 100 meters (330 feet) in all directions.

##### Large Spill

- **Consider initial evacuation for 250 meters (800 feet) in all directions.**

##### Fire

- If rail car or trailer is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also initiate evacuation including emergency responders for 800 meters (1/2 mile) in all directions.
- If fire threatens cargo area containing packages bearing the 1.4S label or packages containing material classified as 1.4S, consider isolating at least 15 meters (50 feet) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**\* FOR INFORMATION ON "COMPATIBILITY GROUP" LETTERS, REFER TO THE GLOSSARY SECTION.**

## EMERGENCY RESPONSE

## FIRE

## CARGO Fire

- **DO NOT fight fire when fire reaches cargo! Cargo may EXPLODE!**
- Stop all traffic and clear the area for at least 800 meters (1/2 mile) in all directions and let burn.
- **Do not move cargo or vehicle if cargo has been exposed to heat.**

## TIRE or VEHICLE Fire

- **Use plenty of water - FLOOD it! If water is not available, use CO<sub>2</sub>, dry chemical or dirt.**
- If possible, and WITHOUT RISK, use unmanned master stream devices or monitor nozzles from maximum distance to prevent fire from spreading to cargo area.
- Pay special attention to tire fires as re-ignition may occur. Stand by, at a safe distance, with extinguisher ready for possible re-ignition.

## CLASS 1.4S Fire

- Packages bearing the 1.4S label or packages containing material classified as 1.4S are designed or packaged in such a manner that when involved in a fire, they may burn vigorously with localized detonations and projection of fragments.
- Effects are usually confined to immediate vicinity of packages.
- Fight fire with normal precautions from a reasonable distance.

## SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- **DO NOT OPERATE RADIO TRANSMITTERS WITHIN 100 METERS (330 FEET) OF ELECTRIC DETONATORS.**
- **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

## FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.

\* FOR INFORMATION ON "COMPATIBILITY GROUP" LETTERS, REFER TO THE GLOSSARY SECTION.

# GUIDE 115 GASES - FLAMMABLE (INCLUDING REFRIGERATED LIQUIDS)

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

#### • EXTREMELY FLAMMABLE.

- Will be easily ignited by heat, sparks or flames.
- Will form explosive mixtures with air.
- Vapors from liquefied gas are initially heavier than air and spread along ground.

**CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966), Methane (UN1971) and Hydrogen and Methane mixture, compressed (UN2034) are lighter than air and will rise. Hydrogen and Deuterium fires are difficult to detect since they burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)**

- Vapors may travel to source of ignition and flash back.
- Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

### HEALTH

- Vapors may cause dizziness or asphyxiation without warning.
- Some may be irritating if inhaled at high concentrations.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire may produce irritating and/or toxic gases.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

#### Large Spill

- Consider initial downwind evacuation for at least 800 meters (1/2 mile).

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.
- In fires involving Liquefied Petroleum Gases (LPG) (UN1075), Butane (UN1011), Butylene (UN1012), Isobutylene (UN1055), Propylene (UN1077), Isobutane (UN1969), and Propane (UN1978), also refer to BLEVE – SAFETY PRECAUTIONS (Page 366).



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).



EMERGENCY RESPONSE

**FIRE**

- DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.

**CAUTION:** Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966) and Hydrogen and Methane mixture, compressed (UN2034) will burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)

**Small Fire**

- Dry chemical or CO<sub>2</sub>.

**Large Fire**

- Water spray or fog.
- If it can be done safely, move undamaged containers away from the area around the fire.

**CAUTION:** For LNG - Liquefied natural gas (UN1972) pool fires, DO NOT USE water. Use dry chemical or high-expansion foam.

**Fire Involving Tanks**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.

**CAUTION:** For LNG - Liquefied natural gas (UN1972), DO NOT apply water, regular or alcohol-resistant foam directly on spill. Use a high-expansion foam if available to reduce vapors.

- Prevent spreading of vapors through sewers, ventilation systems and confined areas.
- Isolate area until gas has dispersed.

**CAUTION:** When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Clothing frozen to the skin should be thawed before being removed.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
  - Keep victim calm and warm.

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- **EXTREMELY FLAMMABLE.**

- Will be easily ignited by heat, sparks or flames.
- Will form explosive mixtures with air. Acetylene (UN1001, UN3374) may react explosively even in the absence of air.
- Silane (UN2203) will ignite spontaneously in air.
- Those substances designated with a **(P)** may polymerize explosively when heated or involved in a fire.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Vapors may travel to source of ignition and flash back.
- Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

#### HEALTH

- Vapors may cause dizziness or asphyxiation without warning.
- Some may be toxic if inhaled at high concentrations.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire may produce irritating and/or toxic gases.

#### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

##### Large Spill

- Consider initial downwind evacuation for at least 800 meters (1/2 mile).

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**EMERGENCY RESPONSE****FIRE**

- **DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.**

**Small Fire**

- Dry chemical or CO<sub>2</sub>.

**Large Fire**

- Water spray or fog.
- If it can be done safely, move undamaged containers away from the area around the fire.

**Fire Involving Tanks**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Stop leak if you can do it without risk.
- Do not touch or walk through spilled material.
- Do not direct water at spill or source of leak.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Prevent entry into waterways, sewers, basements or confined areas.
- Isolate area until gas has dispersed.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.

# GUIDE 117 GASES - TOXIC - FLAMMABLE (EXTREME HAZARD)

## POTENTIAL HAZARDS

### HEALTH

- **TOXIC; Extremely Hazardous.**
- May be fatal if inhaled or absorbed through skin.
- Initial odor may be irritating or foul and may deaden your sense of smell.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause environmental contamination.

### FIRE OR EXPLOSION

- These materials are extremely flammable.
- May form explosive mixtures with air.
- May be ignited by heat, sparks or flames.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Vapors may travel to source of ignition and flash back.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Runoff may create fire or explosion hazard.
- Cylinders exposed to fire may vent and release toxic and flammable gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Ventilate closed spaces before entering, but only if properly trained and equipped.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

#### Spill

- See [Table 1 - Initial Isolation and Protective Action Distances.](#)

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

## FIRE

- **DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.**

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or regular foam.

**Large Fire**

- Water spray, fog or regular foam.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Damaged cylinders should be handled only by specialists.

**Fire Involving Tanks**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

## SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Prevent entry into waterways, sewers, basements or confined areas.
- Isolate area until gas has dispersed.
- Consider igniting spill or leak to eliminate toxic gas concerns.

## FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.
- Keep victim under observation.
- Effects of contact or inhalation may be delayed.

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- **EXTREMELY FLAMMABLE.**

- May be ignited by heat, sparks or flames.
- May form explosive mixtures with air.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Vapors may travel to source of ignition and flash back.
- Some of these materials may react violently with water.
- Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

#### HEALTH

- May cause toxic effects if inhaled.
- Vapors are extremely irritating.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause environmental contamination.

#### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

##### Large Spill

- Consider initial downwind evacuation for at least 800 meters (1/2 mile).

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**EMERGENCY RESPONSE****FIRE**

- **DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.**

**Small Fire**

- Dry chemical or CO<sub>2</sub>.

**Large Fire**

- Water spray, fog or regular foam.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Damaged cylinders should be handled only by specialists.

**Fire Involving Tanks**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- Isolate area until gas has dispersed.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.
- Keep victim under observation.
- Effects of contact or inhalation may be delayed.

### POTENTIAL HAZARDS

#### HEALTH

- **TOXIC; may be fatal if inhaled or absorbed through skin. TOXIC may cause severe skin burns and eye damage.**
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause environmental contamination.

#### FIRE OR EXPLOSION

- Flammable; may be ignited by heat, sparks or flames.
- May form explosive mixtures with air. Ethylene oxide (UN1040) may react explosively even in the absence of air.
- Those substances designated with a **(P)** may polymerize explosively when heated or involved in a fire.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Vapors may travel to source of ignition and flash back.
- Some of these materials may react violently with water.
- Cylinders exposed to fire may vent and release toxic and flammable gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.
- Runoff may create fire or explosion hazard.

#### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

##### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).



## EMERGENCY RESPONSE

## FIRE

- **DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.**

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or alcohol-resistant foam.

**Large Fire**

- Water spray, fog or alcohol-resistant foam.
- **FOR CHLOROSILANES, DO NOT USE WATER;** use AFFF alcohol-resistant medium-expansion foam.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Damaged cylinders should be handled only by specialists.

**Fire Involving Tanks**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

## SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Do not direct water at spill or source of leak.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- **FOR CHLOROSILANES,** use AFFF alcohol-resistant medium-expansion foam to reduce vapors.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Prevent entry into waterways, sewers, basements or confined areas.
- Isolate area until gas has dispersed.

## FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.
- Keep victim under observation.
- Effects of contact or inhalation may be delayed.

# GUIDE 120

## GASES - INERT (INCLUDING REFRIGERATED LIQUIDS)

### POTENTIAL HAZARDS

#### HEALTH

- Vapors may cause dizziness or asphyxiation without warning.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.

#### FIRE OR EXPLOSION

- **Non-flammable gases.**
- Containers may explode when heated.
- Ruptured cylinders may rocket.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids or solids.

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

##### Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

## EMERGENCY RESPONSE

### FIRE

- Use extinguishing agent suitable for type of surrounding fire.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Damaged cylinders should be handled only by specialists.

### Fire Involving Tanks

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

### SPILL OR LEAK

- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Prevent entry into waterways, sewers, basements or confined areas.
- Allow substance to evaporate.
- Ventilate the area.

**CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.**

### FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Clothing frozen to the skin should be thawed before being removed.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- Keep victim calm and warm.

# GUIDE 121

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*There are no materials that refer to this guide.*

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*There are no materials that refer to this guide.*

# GUIDE 122 GASES - OXIDIZING (INCLUDING REFRIGERATED LIQUIDS)

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- Substance does not burn but will support combustion.
- Some may react explosively with fuels.
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Runoff may create fire or explosion hazard.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

### HEALTH

- Vapors may cause dizziness or asphyxiation without warning.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire may produce irritating and/or toxic gases.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Ventilate closed spaces before entering, but only if properly trained and equipped.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

#### Large Spill

- Consider initial downwind evacuation for at least 500 meters (1/3 mile).

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

## FIRE

- Use extinguishing agent suitable for type of surrounding fire.

**Small Fire**

- Dry chemical or CO<sub>2</sub>.

**Large Fire**

- Water spray, fog or regular foam.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Damaged cylinders should be handled only by specialists.

**Fire Involving Tanks**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

## SPILL OR LEAK

- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Do not direct water at spill or source of leak.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Prevent entry into waterways, sewers, basements or confined areas.
- Allow substance to evaporate.
- Isolate area until gas has dispersed.

**CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.**

## FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Clothing frozen to the skin should be thawed before being removed.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- Keep victim calm and warm.

### POTENTIAL HAZARDS

#### HEALTH

- **TOXIC; may be fatal if inhaled or absorbed through skin.**
- Vapors may be irritating and/or corrosive.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause environmental contamination.

#### FIRE OR EXPLOSION

- Some may burn but none ignite readily.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Cylinders exposed to fire may vent and release toxic and/or corrosive gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

##### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).



**EMERGENCY RESPONSE****FIRE****Small Fire**

- Dry chemical or CO<sub>2</sub>.

**Large Fire**

- Water spray, fog or regular foam.
- Do not get water inside containers.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Damaged cylinders should be handled only by specialists.

**Fire Involving Tanks**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

**SPILL OR LEAK**

- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Prevent entry into waterways, sewers, basements or confined areas.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- Isolate area until gas has dispersed.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.
- Keep victim under observation.
- Effects of contact or inhalation may be delayed.

### POTENTIAL HAZARDS

#### HEALTH

- **TOXIC; may be fatal if inhaled or absorbed through skin.**
- Fire will produce irritating, corrosive and/or toxic gases.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Runoff from fire control or dilution water may cause environmental contamination.

#### FIRE OR EXPLOSION

- Substance does not burn but will support combustion.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- These are strong oxidizers and will react vigorously or explosively with many materials including fuels.
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- Some will react violently with air, moist air and/or water.
- Cylinders exposed to fire may vent and release toxic and/or corrosive gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

##### Spill

- See **Table 1 - Initial Isolation and Protective Action Distances.**

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

## FIRE

## Small Fire

**CAUTION:** These materials do not burn but will support combustion. Some will react violently with water.

- Contain fire and let burn. If fire must be fought, water spray or fog is recommended.
- **Water only; no dry chemical, CO<sub>2</sub> or Halon®.**
- Do not get water inside containers.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Damaged cylinders should be handled only by specialists.

## Fire Involving Tanks

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

## SPILL OR LEAK

- Do not touch or walk through spilled material.
- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Stop leak if you can do it without risk.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Prevent entry into waterways, sewers, basements or confined areas.
- Isolate area until gas has dispersed.
- Ventilate the area.

## FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Clothing frozen to the skin should be thawed before being removed.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.
- Keep victim under observation.
- Effects of contact or inhalation may be delayed.

## POTENTIAL HAZARDS

### HEALTH

- **TOXIC; may be fatal if inhaled, ingested or absorbed through skin.**
- Vapors are extremely irritating and corrosive.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause environmental contamination.

### FIRE OR EXPLOSION

- Some may burn but none ignite readily.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Some of these materials may react violently with water.
- Cylinders exposed to fire may vent and release toxic and/or corrosive gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.
- For UN1005: Anhydrous ammonia, at high concentrations in confined spaces, presents a flammability risk if a source of ignition is introduced.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Ventilate closed spaces before entering, but only if properly trained and equipped.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

#### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**EMERGENCY RESPONSE**

**FIRE**

**Small Fire**

- Dry chemical or CO<sub>2</sub>.

**Large Fire**

- Water spray, fog or regular foam.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Do not get water inside containers.
- Damaged cylinders should be handled only by specialists.

**Fire Involving Tanks**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

**SPILL OR LEAK**

- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Prevent entry into waterways, sewers, basements or confined areas.
- Do not direct water at spill or source of leak.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Isolate area until gas has dispersed.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- **In case of skin contact with hydrogen fluoride, anhydrous (UN1052), if calcium gluconate gel is available, rinse 5 minutes, then apply gel. Otherwise, continue rinsing until medical treatment is available.**
- Keep victim calm and warm.
- Keep victim under observation.
- Effects of contact or inhalation may be delayed.

# GUIDE 126 GASES - COMPRESSED OR LIQUEFIED (INCLUDING REFRIGERANT GASES)

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- Some may burn but none ignite readily.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

**CAUTION: Aerosols (UN1950) may contain a flammable propellant.**

### HEALTH

- Vapors may cause dizziness or asphyxiation without warning.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire may produce irritating, corrosive and/or toxic gases.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Ventilate closed spaces before entering, but only if properly trained and equipped.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

#### Large Spill

- Consider initial downwind evacuation for at least 500 meters (1/3 mile).

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

**EMERGENCY RESPONSE**

**FIRE**

- Use extinguishing agent suitable for type of surrounding fire.

**Small Fire**

- Dry chemical or CO<sub>2</sub>.

**Large Fire**

- Water spray, fog or regular foam.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Damaged cylinders should be handled only by specialists.

**Fire Involving Tanks**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- Some of these materials, if spilled, may evaporate leaving a flammable residue.

**SPILL OR LEAK**

- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Do not direct water at spill or source of leak.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Prevent entry into waterways, sewers, basements or confined areas.
- Allow substance to evaporate.
- Ventilate the area.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- Keep victim calm and warm.

# GUIDE **FLAMMABLE LIQUIDS** 127 **(WATER-MISCIBLE)**

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE:** Will be easily ignited by heat, sparks or flames.
- **CAUTION:** Ethanol (UN1170) can burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Vapor explosion hazard indoors, outdoors or in sewers.
- Those substances designated with a **(P)** may polymerize explosively when heated or involved in a fire.
- Runoff to sewer may create fire or explosion hazard.
- Containers may explode when heated.
- Many liquids will float on water.

### HEALTH

- Inhalation or contact with material may irritate or burn skin and eyes.
- Fire may produce irritating, corrosive and/or toxic gases.
- Vapors may cause dizziness or asphyxiation.
- Runoff from fire control or dilution water may cause environmental contamination.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area for at least 50 meters (150 feet) in all directions.

#### Large Spill

- Consider initial downwind evacuation for at least 300 meters (1000 feet).

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).



**EMERGENCY RESPONSE**

**FIRE**

**CAUTION:** The majority of these products have a very low flash point. Use of water spray when fighting fire may be inefficient.

**CAUTION:** For fire involving UN1170, UN1987 or UN3475, alcohol-resistant foam should be used.

**CAUTION:** Ethanol (UN1170) can burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or alcohol-resistant foam.

**Large Fire**

- Water spray, fog or alcohol-resistant foam.
- Avoid aiming straight or solid streams directly onto the product.
- If it can be done safely, move undamaged containers away from the area around the fire.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- A vapor-suppressing foam may be used to reduce vapors.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- Use clean, non-sparking tools to collect absorbed material.

**Large Spill**

- Dike far ahead of liquid spill for later disposal.
- Water spray may reduce vapor, but may not prevent ignition in closed spaces.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Wash skin with soap and water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE:** Will be easily ignited by heat, sparks or flames.
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Vapor explosion hazard indoors, outdoors or in sewers.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Runoff to sewer may create fire or explosion hazard.
- Containers may explode when heated.
- Many liquids will float on water.
- Substance may be transported hot.
- For hybrid vehicles, GUIDE 147 (lithium ion batteries) or GUIDE 138 (sodium batteries) should also be consulted.
- **If molten aluminum is involved, refer to GUIDE 169.**

#### HEALTH

**CAUTION:** Petroleum crude oil (UN1267) may contain **TOXIC** hydrogen sulphide gas.

- Inhalation or contact with material may irritate or burn skin and eyes.
- Fire may produce irritating, corrosive and/or toxic gases.
- Vapors may cause dizziness or asphyxiation.
- Runoff from fire control or dilution water may cause environmental contamination.

#### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 50 meters (150 feet) in all directions.

##### Large Spill

- Consider initial downwind evacuation for at least 300 meters (1000 feet).

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**EMERGENCY RESPONSE**

**FIRE**

**CAUTION:** The majority of these products have a very low flash point. Use of water spray when fighting fire may be inefficient.

**CAUTION:** For mixtures containing alcohol or polar solvent, alcohol-resistant foam may be more effective.

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or regular foam.

**Large Fire**

- Water spray, fog or regular foam.
- Avoid aiming straight or solid streams directly onto the product.
- If it can be done safely, move undamaged containers away from the area around the fire.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- For petroleum crude oil, do not spray water directly into a breached tank car. This can lead to a dangerous boil over.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- A vapor-suppressing foam may be used to reduce vapors.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- Use clean, non-sparking tools to collect absorbed material.

**Large Spill**

- Dike far ahead of liquid spill for later disposal.
- Water spray may reduce vapor, but may not prevent ignition in closed spaces.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Wash skin with soap and water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.

# GUIDE 129

## FLAMMABLE LIQUIDS (WATER-MISCIBLE/NOXIOUS)

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.**
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Vapor explosion hazard indoors, outdoors or in sewers.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Runoff to sewer may create fire or explosion hazard.
- Containers may explode when heated.
- Many liquids will float on water.

#### HEALTH

- May cause toxic effects if inhaled or absorbed through skin.
- Inhalation or contact with material may irritate or burn skin and eyes.
- Fire will produce irritating, corrosive and/or toxic gases.
- Vapors may cause dizziness or asphyxiation.
- Runoff from fire control or dilution water may cause environmental contamination.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 50 meters (150 feet) in all directions.

##### Large Spill

- Consider initial downwind evacuation for at least 300 meters (1000 feet).

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

EMERGENCY RESPONSE

**FIRE**

**CAUTION:** The majority of these products have a very low flash point. Use of water spray when fighting fire may be inefficient.

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or alcohol-resistant foam.
- **Do not use dry chemical extinguishers to control fires involving nitromethane (UN1261) or nitroethane (UN2842).**

**Large Fire**

- Water spray, fog or alcohol-resistant foam.
- Avoid aiming straight or solid streams directly onto the product.
- If it can be done safely, move undamaged containers away from the area around the fire.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- A vapor-suppressing foam may be used to reduce vapors.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- Use clean, non-sparking tools to collect absorbed material.

**Large Spill**

- Dike far ahead of liquid spill for later disposal.
- Water spray may reduce vapor, but may not prevent ignition in closed spaces.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Wash skin with soap and water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

# GUIDE 130 FLAMMABLE LIQUIDS (WATER-IMMISCIBLE/NOXIOUS)

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.**
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Vapor explosion hazard indoors, outdoors or in sewers.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Runoff to sewer may create fire or explosion hazard.
- Containers may explode when heated.
- Many liquids will float on water.

### HEALTH

- May cause toxic effects if inhaled or absorbed through skin.
- Inhalation or contact with material may irritate or burn skin and eyes.
- Fire will produce irritating, corrosive and/or toxic gases.
- Vapors may cause dizziness or asphyxiation.
- Runoff from fire control or dilution water may cause environmental contamination.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area for at least 50 meters (150 feet) in all directions.

#### Large Spill

- Consider initial downwind evacuation for at least 300 meters (1000 feet).

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

EMERGENCY RESPONSE

**FIRE**

**CAUTION:** The majority of these products have a very low flash point. Use of water spray when fighting fire may be inefficient.

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or regular foam.

**Large Fire**

- Water spray, fog or regular foam.
- Avoid aiming straight or solid streams directly onto the product.
- If it can be done safely, move undamaged containers away from the area around the fire.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- A vapor-suppressing foam may be used to reduce vapors.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- Use clean, non-sparking tools to collect absorbed material.

**Large Spill**

- Dike far ahead of liquid spill for later disposal.
- Water spray may reduce vapor, but may not prevent ignition in closed spaces.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Wash skin with soap and water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

# GUIDE FLAMMABLE LIQUIDS - TOXIC 131

## POTENTIAL HAZARDS

### HEALTH

- **TOXIC; may be fatal if inhaled, ingested or absorbed through skin.**
- Inhalation or contact with some of these materials will irritate or burn skin and eyes.
- Fire will produce irritating, corrosive and/or toxic gases.
- Vapors may cause dizziness or asphyxiation.
- Runoff from fire control or dilution water may cause environmental contamination.

### FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.**
- **CAUTION: Methanol (UN1230) will burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)**
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Vapor explosion and poison hazard indoors, outdoors or in sewers.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Runoff to sewer may create fire or explosion hazard.
- Containers may explode when heated.
- Many liquids will float on water.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area for at least 50 meters (150 feet) in all directions.

#### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).



**EMERGENCY RESPONSE**

**FIRE**

**CAUTION:** The majority of these products have a very low flash point. Use of water spray when fighting fire may be inefficient.

**CAUTION:** Methanol (UN1230) will burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or alcohol-resistant foam.

**Large Fire**

- Water spray, fog or alcohol-resistant foam.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Dike runoff from fire control for later disposal.
- Avoid aiming straight or solid streams directly onto the product.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- A vapor-suppressing foam may be used to reduce vapors.

**Small Spill**

- Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.
- Use clean, non-sparking tools to collect absorbed material.

**Large Spill**

- Dike far ahead of liquid spill for later disposal.
- Water spray may reduce vapor, but may not prevent ignition in closed spaces.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
  - Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Wash skin with soap and water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
  - Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

# GUIDE FLAMMABLE LIQUIDS - CORROSIVE

## 132

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- Flammable/combustible material.
- May be ignited by heat, sparks or flames.
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Vapor explosion hazard indoors, outdoors or in sewers.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Runoff to sewer may create fire or explosion hazard.
- Containers may explode when heated.
- Many liquids will float on water.

#### HEALTH

- May cause toxic effects if inhaled or ingested.
- Contact with substance may cause severe burns to skin and eyes.
- Fire will produce irritating, corrosive and/or toxic gases.
- Vapors may cause dizziness or asphyxiation.
- Runoff from fire control or dilution water may cause environmental contamination.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 50 meters (150 feet) in all directions.

##### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

### FIRE

- **Some of these materials may react violently with water.**

#### Small Fire

- Dry chemical, CO<sub>2</sub>, water spray or alcohol-resistant foam.

#### Large Fire

- Water spray, fog or alcohol-resistant foam.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Dike runoff from fire control for later disposal.
- Do not get water inside containers.

#### Fire Involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

### SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- A vapor-suppressing foam may be used to reduce vapors.
- Absorb with earth, sand or other non-combustible material.
- For **hydrazine**, absorb with DRY sand or inert absorbent (vermiculite or absorbent pads).
- Use clean, non-sparking tools to collect absorbed material.

#### Large Spill

- Dike far ahead of liquid spill for later disposal.
- Water spray may reduce vapor, but may not prevent ignition in closed spaces.

### FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- Flammable/combustible material.
- May be ignited by friction, heat, sparks or flames.
- Some may burn rapidly with flare-burning effect.
- Powders, dusts, shavings, borings, turnings or cuttings may explode or burn with explosive violence.
- Substance may be transported in a molten form at a temperature that may be above its flash point.
- May re-ignite after fire is extinguished.

#### HEALTH

- Fire may produce irritating and/or toxic gases.
- Contact may cause burns to skin and eyes.
- Contact with molten substance may cause severe burns to skin and eyes.
- Runoff from fire control or dilution water may cause environmental contamination.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 25 meters (75 feet) in all directions.

##### Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**EMERGENCY RESPONSE**

**FIRE**

**Small Fire**

- Dry chemical, CO<sub>2</sub>, sand, earth, water spray or regular foam.

**Large Fire**

- Water spray, fog or regular foam.
- If it can be done safely, move undamaged containers away from the area around the fire.

**Fire Involving Metal Pigments or Pastes (e.g. "Aluminum Paste")**

- Aluminum Paste fires should be treated as a combustible metal fire. Use DRY sand, graphite powder, dry sodium chloride-based extinguishers or class D extinguishers. Also, see GUIDE 170.

**Fire Involving Tanks or Car/Trailer Loads**

- Cool containers with flooding quantities of water until well after fire is out.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Do not touch or walk through spilled material.

**Small Dry Spill**

- With clean shovel, place material into clean, dry container and cover loosely; move containers from spill area.

**Large Spill**

- Wet down with water and dike for later disposal.
- Prevent entry into waterways, sewers, basements or confined areas.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Removal of solidified molten material from skin requires medical assistance.
- Keep victim calm and warm.

# GUIDE 134

## FLAMMABLE SOLIDS - TOXIC AND/OR CORROSIVE

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- Flammable/combustible material.
- May be ignited by heat, sparks or flames.
- When heated, vapors may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.
- Contact with metals may evolve flammable hydrogen gas.
- Containers may explode when heated.

#### HEALTH

- **TOXIC**; inhalation, ingestion or skin contact with material may cause severe injury or death.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Stay upwind, uphill and/or upstream.
- Keep unauthorized personnel away.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 25 meters (75 feet) in all directions.

##### Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

## FIRE

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or alcohol-resistant foam.

**Large Fire**

- Water spray, fog or alcohol-resistant foam.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Avoid aiming straight or solid streams directly onto the product.
- Do not get water inside containers.
- Dike runoff from fire control for later disposal.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

## SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Stop leak if you can do it without risk.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Prevent entry into waterways, sewers, basements or confined areas.
- Use clean, non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal.

## FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

# GUIDE SUBSTANCES - SPONTANEOUSLY COMBUSTIBLE

## 135

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- Flammable/combustible material.
- May ignite on contact with moist air or moisture.
- May burn rapidly with flare-burning effect.
- Some react vigorously or explosively on contact with water.
- Some may decompose explosively when heated or involved in a fire.
- May re-ignite after fire is extinguished.
- Runoff may create fire or explosion hazard.
- Containers may explode when heated.

#### HEALTH

- Fire will produce irritating, corrosive and/or toxic gases.
- Inhalation of decomposition products may cause severe injury or death.
- Contact with substance may cause severe burns to skin and eyes.
- Runoff from fire control or dilution water may cause environmental contamination.

**CAUTION: Pentaborane (UN1380) is highly toxic and may be fatal if inhaled, ingested or absorbed through skin.**

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Stay upwind, uphill and/or upstream.
- Keep unauthorized personnel away.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

##### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).



## EMERGENCY RESPONSE

## FIRE

- DO NOT USE WATER, CO<sub>2</sub> OR FOAM ON MATERIAL ITSELF.
- Some of these materials may react violently with water.

**CAUTION:** For Xanthates, UN3342 and for Dithionite (Hydrosulfite/Hydrosulphite) UN1384, UN1923 and UN1929, USE FLOODING AMOUNTS OF WATER for SMALL AND LARGE fires to stop the reaction. Smothering will not work for these materials, they do not need air to burn.

**Small Fire**

- Dry chemical, soda ash, lime or DRY sand, EXCEPT for UN1384, UN1923, UN1929 and UN3342.

**Large Fire**

- DRY sand, dry chemical, soda ash or lime EXCEPT for UN1384, UN1923, UN1929 and UN3342, or withdraw from area and let fire burn.

**CAUTION:** UN3342 when flooded with water will continue to evolve flammable Carbon disulfide/Carbon disulphide vapors.

- If it can be done safely, move undamaged containers away from the area around the fire.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Do not get water inside containers or in contact with substance.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

## SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.

**Small Spill**

**CAUTION:** For spills of Xanthates, UN3342 and for Dithionite (Hydrosulfite/Hydrosulphite), UN1384, UN1923 and UN1929, dissolve in 5 parts water and collect for proper disposal.

**CAUTION:** UN3342 when flooded with water will continue to evolve flammable Carbon disulfide/Carbon disulphide vapors.

- Cover with DRY earth, DRY sand or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain.
- Use clean, non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal.
- Prevent entry into waterways, sewers, basements or confined areas.

## FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

# GUIDE 136 SUBSTANCES - SPONTANEOUSLY COMBUSTIBLE - TOXIC AND/OR CORROSIVE (AIR-REACTIVE)

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- Extremely flammable; will ignite itself if exposed to air.
- Burns rapidly, releasing dense, white, irritating fumes.
- Substance may be transported in a molten form.
- May re-ignite after fire is extinguished.
- Corrosive substances in contact with metals may produce flammable hydrogen gas.
- Containers may explode when heated.

### HEALTH

- Fire will produce irritating, corrosive and/or toxic gases.
- **TOXIC**; ingestion of substance or inhalation of decomposition products will cause severe injury or death.
- Contact with substance may cause severe burns to skin and eyes.
- Some effects may be experienced due to skin absorption.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Stay upwind, uphill and/or upstream.
- Keep unauthorized personnel away.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**
- **For Phosphorus (UN1381): Special aluminized protective clothing should be worn when direct contact with the substance is possible.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

#### Spill

- Consider initial downwind evacuation for at least 300 meters (1000 feet).

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**EMERGENCY RESPONSE**

**FIRE**

**Small Fire**

- Water spray, wet sand or wet earth.

**Large Fire**

- Water spray or fog.
- **Do not scatter spilled material with high-pressure water streams.**
- If it can be done safely, move undamaged containers away from the area around the fire.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Do not touch or walk through spilled material.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.

**Small Spill**

- Cover with water, sand or earth. Shovel into metal container and keep material under water.

**Large Spill**

- Dike for later disposal and cover with wet sand or earth.
- Prevent entry into waterways, sewers, basements or confined areas.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- In case of contact with substance, keep exposed skin areas immersed in water or covered with wet bandages until medical attention is received.
- Removal of solidified molten material from skin requires medical assistance.
- Remove and isolate contaminated clothing and shoes at the site and place in metal container filled with water. Fire hazard if allowed to dry.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.
- Keep victim calm and warm.

# GUIDE SUBSTANCES - WATER-REACTIVE - CORROSIVE

## 137

### POTENTIAL HAZARDS

#### HEALTH

- CORROSIVE and/or TOXIC; inhalation, ingestion or contact (skin, eyes) with vapors, dusts or substance may cause severe injury, burns or death.
- Fire will produce irritating, corrosive and/or toxic gases.
- Reaction with water may generate much heat that will increase the concentration of fumes in the air.
- Contact with molten substance may cause severe burns to skin and eyes.
- Runoff from fire control or dilution water may cause environmental contamination.

#### FIRE OR EXPLOSION

- **EXCEPT FOR ACETIC ANHYDRIDE (UN1715), THAT IS FLAMMABLE**, some of these materials may burn, but none ignite readily.
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- Substance will react with water (some violently), releasing corrosive and/or toxic gases and runoff.
- Flammable/toxic gases may accumulate in confined areas (basement, tanks, hopper/tank cars, etc.).
- Contact with metals may evolve flammable hydrogen gas.
- Containers may explode when heated or if contaminated with water.
- Substance may be transported in a molten form.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE**.
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection**.

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

##### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**EMERGENCY RESPONSE**

**FIRE**

- **When material is not involved in fire, do not use water on material itself.**

**Small Fire**

- Dry chemical or CO<sub>2</sub>.
- If it can be done safely, move undamaged containers away from the area around the fire.

**Large Fire**

- Flood fire area with large quantities of water, while knocking down vapors with water fog. If insufficient water supply, responders should withdraw.

**Fire Involving Tanks or Car/Trailer Loads**

- Cool containers with flooding quantities of water until well after fire is out.
- Do not get water inside containers.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

**SPILL OR LEAK**

- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- Use water spray to reduce vapors; do not put water directly on leak, spill area or inside container.
- Keep combustibles (wood, paper, oil, etc.) away from spilled material.

**Small Spill**

- Cover with DRY earth, DRY sand or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain.
- Use clean, non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal.
- Prevent entry into waterways, sewers, basements or confined areas.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Removal of solidified molten material from skin requires medical assistance.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

# GUIDE 138 SUBSTANCES - WATER-REACTIVE (EMITTING FLAMMABLE GASES)

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- Produce flammable gases on contact with water.
- May ignite on contact with water or moist air.
- Some react vigorously or explosively on contact with water.
- May be ignited by heat, sparks or flames.
- May re-ignite after fire is extinguished.
- Some are transported in highly flammable liquids.
- Runoff may create fire or explosion hazard.

### HEALTH

- Inhalation or contact with vapors, substance or decomposition products may cause severe injury or death.
- May produce corrosive solutions on contact with water.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause environmental contamination.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

#### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

**FIRE**

- **DO NOT USE WATER OR FOAM.**

**Small Fire**

- Dry chemical, soda ash, lime or sand.

**Large Fire**

- DRY sand, dry chemical, soda ash or lime or withdraw from area and let fire burn.
- If it can be done safely, move undamaged containers away from the area around the fire.

**Fire Involving Metals or Powders (Aluminum, Lithium, Magnesium, etc.)**

- Use dry chemical, DRY sand, sodium chloride powder, graphite powder or class D extinguishers; in addition, for Lithium you may use Lith-X® powder or copper powder. Also, see GUIDE 170.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Do not get water inside containers.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- **DO NOT GET WATER on spilled substance or inside containers.**

**Small Spill**

- Cover with DRY earth, DRY sand or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain.
- Dike for later disposal; do not apply water unless directed to do so.

**Powder Spill**

- Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry.
- **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, wipe from skin immediately; flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

# GUIDE 139 SUBSTANCES - WATER-REACTIVE (EMITTING FLAMMABLE AND TOXIC GASES)

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- Produce flammable and toxic gases on contact with water.
- May ignite on contact with water or moist air.
- Some react vigorously or explosively on contact with water.
- May be ignited by heat, sparks or flames.
- May re-ignite after fire is extinguished.
- Some are transported in highly flammable liquids.
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

### HEALTH

- Highly toxic: contact with water produces toxic gas, may be fatal if inhaled.
- Inhalation or contact with vapors, substance or decomposition products may cause severe injury or death.
- May produce corrosive solutions on contact with water.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause environmental contamination.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

#### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).



**EMERGENCY RESPONSE**

**FIRE**

- **DO NOT USE WATER OR FOAM. (FOAM MAY BE USED FOR CHLOROSILANES, SEE BELOW)**

**Small Fire**

- Dry chemical, soda ash, lime or sand.

**Large Fire**

- DRY sand, dry chemical, soda ash or lime or withdraw from area and let fire burn.
- **FOR CHLOROSILANES, DO NOT USE WATER;** use AFFF alcohol-resistant medium-expansion foam; **DO NOT USE** dry chemicals, soda ash or lime on chlorosilane fires (large or small) as they may release large quantities of hydrogen gas that may explode.
- If it can be done safely, move undamaged containers away from the area around the fire.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not get water inside containers.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- **DO NOT GET WATER on spilled substance or inside containers.**
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- **FOR CHLOROSILANES,** use AFFF alcohol-resistant medium-expansion foam to reduce vapors.

**Small Spill**

- Cover with DRY earth, DRY sand or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain.
- Dike for later disposal; do not apply water unless directed to do so.

**Powder Spill**

- Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry.
- **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, wipe from skin immediately; flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- These substances will accelerate burning when involved in a fire.
- Some may decompose explosively when heated or involved in a fire.
- May explode from heat or contamination.
- Some will react explosively with hydrocarbons (fuels).
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

#### HEALTH

- Inhalation, ingestion or contact (skin, eyes) with vapors or substance may cause severe injury, burns or death.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause environmental contamination.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

##### Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.
- If **ammonium nitrate** is in a tank, rail car or tank truck and involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, initiate evacuation including emergency responders for 1600 meters (1 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

### FIRE

#### Small Fire

- Use water. Do not use dry chemicals or foams. CO<sub>2</sub> or Halon® may provide limited control.

#### Large Fire

- Flood fire area with water from a distance.
- Do not move cargo or vehicle if cargo has been exposed to heat.
- If it can be done safely, move undamaged containers away from the area around the fire.

#### Fire Involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

### SPILL OR LEAK

- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- Do not get water inside containers.

#### Small Dry Spill

- With clean shovel, place material into clean, dry container and cover loosely; move containers from spill area.

#### Small Liquid Spill

- Use a non-combustible material like vermiculite or sand to soak up the product and place into a container for later disposal.

#### Large Spill

- Dike far ahead of liquid spill for later disposal.

### FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Contaminated clothing may be a fire risk when dry.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- These substances will accelerate burning when involved in a fire.
- May explode from heat or contamination.
- Some may burn rapidly.
- Some will react explosively with hydrocarbons (fuels).
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

#### HEALTH

- Toxic by ingestion.
- Inhalation of dust is toxic.
- Fire may produce irritating, corrosive and/or toxic gases.
- Contact with substance may cause severe burns to skin and eyes.
- Runoff from fire control or dilution water may cause environmental contamination.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

##### Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

### FIRE

#### Small Fire

- Use water. Do not use dry chemicals or foams. CO<sub>2</sub> or Halon® may provide limited control.

#### Large Fire

- Flood fire area with water from a distance.
- Do not move cargo or vehicle if cargo has been exposed to heat.
- If it can be done safely, move undamaged containers away from the area around the fire.

#### Fire Involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

### SPILL OR LEAK

- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.

#### Small Dry Spill

- With clean shovel, place material into clean, dry container and cover loosely; move containers from spill area.

#### Large Spill

- Dike far ahead of spill for later disposal.

### FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Contaminated clothing may be a fire risk when dry.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

# GUIDE OXIDIZERS - TOXIC (LIQUID)

## 142

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- These substances will accelerate burning when involved in a fire.
- May explode from heat or contamination.
- Some will react explosively with hydrocarbons (fuels).
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

#### HEALTH

- **TOXIC**; inhalation, ingestion or contact (skin, eyes) with vapors or substance may cause severe injury, burns or death.
- Fire may produce irritating, corrosive and/or toxic gases.
- Toxic/flammable fumes may accumulate in confined areas (basement, tanks, tank cars, etc.).
- Runoff from fire control or dilution water may cause environmental contamination.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 50 meters (150 feet) in all directions.

##### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

### FIRE

#### **Small Fire**

- Use water. Do not use dry chemicals or foams. CO<sub>2</sub> or Halon® may provide limited control.

#### **Large Fire**

- Flood fire area with water from a distance.
- Do not move cargo or vehicle if cargo has been exposed to heat.
- If it can be done safely, move undamaged containers away from the area around the fire.

#### **Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

### SPILL OR LEAK

- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- Use water spray to reduce vapors or divert vapor cloud drift.
- Do not get water inside containers.

#### **Small Liquid Spill**

- Use a non-combustible material like vermiculite or sand to soak up the product and place into a container for later disposal.

#### **Large Spill**

- Dike far ahead of liquid spill for later disposal.

### FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Contaminated clothing may be a fire risk when dry.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

# GUIDE OXIDIZERS (UNSTABLE)

## 143

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- May explode from friction, heat or contamination.
- These substances will accelerate burning when involved in a fire.
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- Some will react explosively with hydrocarbons (fuels).
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

#### HEALTH

- **TOXIC**; inhalation, ingestion or contact (skin, eyes) with vapors, dusts or substance may cause severe injury, burns or death.
- Fire may produce irritating and/or toxic gases.
- Toxic fumes or dust may accumulate in confined areas (basement, tanks, hopper/tank cars, etc.).
- Runoff from fire control or dilution water may cause environmental contamination.

#### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

##### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).



**EMERGENCY RESPONSE**

**FIRE**

**Small Fire**

- Use water. Do not use dry chemicals or foams. CO<sub>2</sub> or Halon® may provide limited control.

**Large Fire**

- Flood fire area with water from a distance.
- Do not move cargo or vehicle if cargo has been exposed to heat.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Do not get water inside containers: a violent reaction may occur.

**Fire Involving Tanks or Car/Trailer Loads**

- Cool containers with flooding quantities of water until well after fire is out.
- Dike runoff from fire control for later disposal.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

**SPILL OR LEAK**

- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Use water spray to reduce vapors or divert vapor cloud drift.
- Prevent entry into waterways, sewers, basements or confined areas.

**Small Spill**

- Flush area with large amounts of water.

**Large Spill**

- **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Contaminated clothing may be a fire risk when dry.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

# GUIDE OXIDIZERS (WATER-REACTIVE)

## 144

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- May ignite combustibles (wood, paper, oil, clothing, etc.).
- React vigorously and/or explosively with water.
- Produce toxic and/or corrosive substances on contact with water.
- Flammable/toxic gases may accumulate in tanks and hopper cars.
- Some may produce flammable hydrogen gas upon contact with metals.
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

#### HEALTH

- **TOXIC**; inhalation or contact with vapor, substance, or decomposition products may cause severe injury or death.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause environmental contamination.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

##### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

### EMERGENCY RESPONSE

#### FIRE

- **DO NOT USE WATER OR FOAM.**

##### Small Fire

- Dry chemical, soda ash or lime.

##### Large Fire

- DRY sand, dry chemical, soda ash or lime or withdraw from area and let fire burn.
- Do not move cargo or vehicle if cargo has been exposed to heat.
- If it can be done safely, move undamaged containers away from the area around the fire.

##### Fire Involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

#### SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- **DO NOT GET WATER on spilled substance or inside containers.**

##### Small Spill

- Cover with DRY earth, DRY sand or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain.

##### Large Spill

- **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

#### FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Contaminated clothing may be a fire risk when dry.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.
- Keep victim under observation.
- Effects of contact or inhalation may be delayed.

# GUIDE 145 ORGANIC PEROXIDES (HEAT AND CONTAMINATION SENSITIVE)

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- May explode from heat or contamination.
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- May be ignited by heat, sparks or flames.
- May burn rapidly with flare-burning effect.
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

### HEALTH

- Fire may produce irritating, corrosive and/or toxic gases.
- Ingestion or contact (skin, eyes) with substance may cause severe injury or burns.
- Runoff from fire control or dilution water may cause environmental contamination.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

#### Large Spill

- Consider initial evacuation for at least 250 meters (800 feet) in all directions.

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

## EMERGENCY RESPONSE

**FIRE****Small Fire**

- Water spray or fog is preferred; if water not available use dry chemical, CO<sub>2</sub> or regular foam.

**Large Fire**

- Flood fire area with water from a distance.
- Use water spray or fog; avoid aiming straight or solid streams directly onto the product.
- Do not move cargo or vehicle if cargo has been exposed to heat.
- If it can be done safely, move undamaged containers away from the area around the fire.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Keep substance wet using water spray.
- Stop leak if you can do it without risk.

**Small Spill**

- Pick up with inert, damp, non-combustible material using clean, non-sparking tools and place into loosely covered plastic containers for later disposal.

**Large Spill**

- Wet down with water and dike for later disposal.
- Prevent entry into waterways, sewers, basements or confined areas.
- **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Contaminated clothing may be a fire risk when dry.
- Remove material from skin immediately.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

# GUIDE 146 ORGANIC PEROXIDES (HEAT, CONTAMINATION AND FRICTION SENSITIVE)

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- May explode from heat, shock, friction or contamination.
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- May be ignited by heat, sparks or flames.
- May burn rapidly with flare-burning effect.
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

### HEALTH

- Fire may produce irritating, corrosive and/or toxic gases.
- Ingestion or contact (skin, eyes) with substance may cause severe injury or burns.
- Runoff from fire control or dilution water may cause environmental contamination.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

#### Large Spill

- Consider initial evacuation for at least 250 meters (800 feet) in all directions.

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

### FIRE

#### Small Fire

- Water spray or fog is preferred; if water not available use dry chemical, CO<sub>2</sub> or regular foam.

#### Large Fire

- Flood fire area with water from a distance.
- Use water spray or fog; avoid aiming straight or solid streams directly onto the product.
- Do not move cargo or vehicle if cargo has been exposed to heat.
- If it can be done safely, move undamaged containers away from the area around the fire.

#### Fire Involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

### SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Keep substance wet using water spray.
- Stop leak if you can do it without risk.

#### Small Spill

- Pick up with inert, damp, non-combustible material using clean, non-sparking tools and place into loosely covered plastic containers for later disposal.

#### Large Spill

- Wet down with water and dike for later disposal.
- Prevent entry into waterways, sewers, basements or confined areas.
- **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

### FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Contaminated clothing may be a fire risk when dry.
- Remove material from skin immediately.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- Lithium ion batteries contain flammable liquid electrolyte that may vent, ignite and produce sparks when subjected to high temperatures (> 150°C (302°F)), when damaged or abused (e.g., mechanical damage or electrical overcharging).
- May burn rapidly with flare-burning effect.
- May ignite other batteries in close proximity.

#### HEALTH

- Contact with battery electrolyte may be irritating to skin, eyes and mucous membranes.
- Fire will produce irritating, corrosive and/or toxic gases.
- Burning batteries may produce toxic hydrogen fluoride gas (see GUIDE 125).
- Fumes may cause dizziness or asphyxiation.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 25 meters (75 feet) in all directions.

##### Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

##### Fire

- If rail car or trailer is involved in a fire, ISOLATE for 500 meters (1/3 mile) in all directions; also initiate evacuation including emergency responders for 500 meters (1/3 mile) in all directions.



**EMERGENCY RESPONSE****FIRE****Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or regular foam.

**Large Fire**

- Water spray, fog or regular foam.
- If it can be done safely, move undamaged containers away from the area around the fire.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Do not touch or walk through spilled material.
- Absorb with earth, sand or other non-combustible material.
- Leaking batteries and contaminated absorbent material should be placed in metal containers.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.

# GUIDE 148 ORGANIC PEROXIDES (HEAT AND CONTAMINATION SENSITIVE/TEMPERATURE CONTROLLED)

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- May explode from heat, contamination or loss of temperature control.
- These materials are particularly sensitive to temperature rises. Above a given "Control Temperature" they decompose violently and catch fire.
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- May ignite spontaneously if exposed to air.
- May be ignited by heat, sparks or flames.
- May burn rapidly with flare-burning effect.
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

### HEALTH

- Fire may produce irritating, corrosive and/or toxic gases.
- Ingestion or contact (skin, eyes) with substance may cause severe injury or burns.
- Runoff from fire control or dilution water may cause environmental contamination.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

#### Large Spill

- Consider initial evacuation for at least 250 meters (800 feet) in all directions.

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

## FIRE

- The temperature of the substance must be maintained at or below the "Control Temperature" at all times.

**Small Fire**

- Water spray or fog is preferred; if water not available use dry chemical, CO<sub>2</sub> or regular foam.

**Large Fire**

- Flood fire area with water from a distance.
- Use water spray or fog; avoid aiming straight or solid streams directly onto the product.
- Do not move cargo or vehicle if cargo has been exposed to heat.
- If it can be done safely, move undamaged containers away from the area around the fire.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- **BEWARE OF POSSIBLE CONTAINER EXPLOSION.**
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

## SPILL OR LEAK

- **DO NOT allow the substance to warm up. Use a coolant agent such as dry ice or ice (wear thermal protective gloves). If this is not possible or none can be obtained, evacuate the area immediately.**
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.

**Small Spill**

- Pick up with inert, damp, non-combustible material using clean, non-sparking tools and place into loosely covered plastic containers for later disposal.

**Large Spill**

- Dike far ahead of liquid spill for later disposal.
- Prevent entry into waterways, sewers, basements or confined areas.
- **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

## FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Contaminated clothing may be a fire risk when dry.
- Remove material from skin immediately.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

# GUIDE SUBSTANCES (SELF-REACTIVE)

## 149

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- **Self-decomposition, self-polymerization, or self-ignition may be triggered by heat, chemical reaction, friction or impact.**
- May be ignited by heat, sparks or flames.
- Some may decompose explosively when heated or involved in a fire.
- Those substances designated with a **(P)** may polymerize explosively when heated or involved in a fire.
- May burn violently. Decomposition or polymerization may be self-accelerating and produce large amounts of gases.
- Vapors or dust may form explosive mixtures with air.

#### HEALTH

- Inhalation or contact with vapors, substance or decomposition products may cause severe injury or death.
- May produce irritating, toxic and/or corrosive gases.
- Runoff from fire control or dilution water may cause environmental contamination.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

##### Large Spill

- Consider initial evacuation for at least 250 meters (800 feet) in all directions.

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**EMERGENCY RESPONSE**

**FIRE**

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or regular foam.

**Large Fire**

- Flood fire area with water from a distance.
- If it can be done safely, move undamaged containers away from the area around the fire.

**Fire Involving Tanks or Car/Trailer Loads**

- **BEWARE OF POSSIBLE CONTAINER EXPLOSION.**
- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.

**Small Spill**

- Pick up with inert, damp, non-combustible material using clean, non-sparking tools and place into loosely covered plastic containers for later disposal.
- Prevent entry into waterways, sewers, basements or confined areas.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- **Self-decomposition, self-polymerization, or self-ignition may be triggered by heat, chemical reaction, friction or impact.**
- Self-accelerating decomposition may occur if the specific control temperature is not maintained.
- These materials are particularly sensitive to temperature rises. Above a given "Control Temperature" they decompose or polymerize violently and may catch fire.
- May be ignited by heat, sparks or flames.
- Those substances designated with a **(P)** may polymerize explosively when heated or involved in a fire.
- Some may decompose explosively when heated or involved in a fire.
- May burn violently. Decomposition or polymerization may be self-accelerating and produce large amounts of gases.
- Vapors or dust may form explosive mixtures with air.

### HEALTH

- Inhalation or contact with vapors, substance or decomposition products may cause severe injury or death.
- May produce irritating, toxic and/or corrosive gases.
- Runoff from fire control or dilution water may cause environmental contamination.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

#### Large Spill

- Consider initial evacuation for at least 250 meters (800 feet) in all directions.

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

## FIRE

- The temperature of the substance must be maintained at or below the “Control Temperature” at all times.

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or regular foam.

**Large Fire**

- Flood fire area with water from a distance.
- If it can be done safely, move undamaged containers away from the area around the fire.

**Fire Involving Tanks or Car/Trailer Loads**

- **BEWARE OF POSSIBLE CONTAINER EXPLOSION.**
- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

## SPILL OR LEAK

- **DO NOT allow the substance to warm up. Use a coolant agent such as dry ice or ice (wear thermal protective gloves). If this is not possible or none can be obtained, evacuate the area immediately.**
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.

**Small Spill**

- Pick up with inert, damp, non-combustible material using clean, non-sparking tools and place into loosely covered plastic containers for later disposal.
- Prevent entry into waterways, sewers, basements or confined areas.
- **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

## FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

# GUIDE SUBSTANCES - TOXIC (NON-COMBUSTIBLE)

## 151

### POTENTIAL HAZARDS

#### HEALTH

- **Highly toxic**, may be fatal if inhaled, ingested or absorbed through skin.
- Avoid any skin contact.
- Effects of contact or inhalation may be delayed.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination.

#### FIRE OR EXPLOSION

- Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
- Containers may explode when heated.
- Runoff may pollute waterways.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

##### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).



**EMERGENCY RESPONSE**

**FIRE**

**Small Fire**

- Dry chemical, CO<sub>2</sub> or water spray.

**Large Fire**

- Water spray, fog or regular foam.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Dike runoff from fire control for later disposal.
- Avoid aiming straight or solid streams directly onto the product.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Do not get water inside containers.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

**SPILL OR LEAK**

- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- Cover with plastic sheet to prevent spreading.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- DO NOT GET WATER INSIDE CONTAINERS.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

# GUIDE SUBSTANCES - TOXIC (COMBUSTIBLE)

## 152

### POTENTIAL HAZARDS

#### HEALTH

- **Highly toxic**, may be fatal if inhaled, ingested or absorbed through skin.
- Contact with molten substance may cause severe burns to skin and eyes.
- Avoid any skin contact.
- Effects of contact or inhalation may be delayed.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination.

#### FIRE OR EXPLOSION

- Combustible material: may burn but does not ignite readily.
- Containers may explode when heated.
- Runoff may pollute waterways.
- Substance may be transported in a molten form.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

##### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**EMERGENCY RESPONSE**

**FIRE**

**Small Fire**

- Dry chemical, CO<sub>2</sub> or water spray.

**Large Fire**

- Water spray, fog or regular foam.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Dike runoff from fire control for later disposal.
- Avoid aiming straight or solid streams directly onto the product.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Do not get water inside containers.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- Cover with plastic sheet to prevent spreading.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- DO NOT GET WATER INSIDE CONTAINERS.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

# GUIDE SUBSTANCES - TOXIC AND/OR CORROSIVE 153 (COMBUSTIBLE)

## POTENTIAL HAZARDS

### HEALTH

- **TOXIC**; inhalation, ingestion or skin contact with material may cause severe injury or death.
- Contact with molten substance may cause severe burns to skin and eyes.
- Avoid any skin contact.
- Effects of contact or inhalation may be delayed.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination.

### FIRE OR EXPLOSION

- Combustible material: may burn but does not ignite readily.
- When heated, vapors may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.
- Those substances designated with a **(P)** may polymerize explosively when heated or involved in a fire.
- Contact with metals may evolve flammable hydrogen gas.
- Containers may explode when heated.
- Runoff may pollute waterways.
- Substance may be transported in a molten form.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

#### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

## FIRE

**Small Fire**

- Dry chemical, CO<sub>2</sub> or water spray.

**Large Fire**

- Dry chemical, CO<sub>2</sub>, alcohol-resistant foam or water spray.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Dike runoff from fire control for later disposal.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Do not get water inside containers.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

## SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- DO NOT GET WATER INSIDE CONTAINERS.

## FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

# GUIDE SUBSTANCES - TOXIC AND/OR CORROSIVE 154 (NON-COMBUSTIBLE)

## POTENTIAL HAZARDS

### HEALTH

- **TOXIC**; inhalation, ingestion or skin contact with material may cause severe injury or death.
- Contact with molten substance may cause severe burns to skin and eyes.
- Avoid any skin contact.
- Effects of contact or inhalation may be delayed.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination.

### FIRE OR EXPLOSION

- Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
- Some are oxidizers and may ignite combustibles (wood, paper, oil, clothing, etc.).
- Contact with metals may evolve flammable hydrogen gas.
- Containers may explode when heated.
- For electric vehicles or equipment, GUIDE 147 (lithium ion batteries) or GUIDE 138 (sodium batteries) should also be consulted.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

#### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

## FIRE

**Small Fire**

- Dry chemical, CO<sub>2</sub> or water spray.

**Large Fire**

- Dry chemical, CO<sub>2</sub>, alcohol-resistant foam or water spray.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Dike runoff from fire control for later disposal.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Do not get water inside containers.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

## SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- DO NOT GET WATER INSIDE CONTAINERS.

## FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

# GUIDE SUBSTANCES - TOXIC AND/OR CORROSIVE 155 (FLAMMABLE/WATER-SENSITIVE)

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE:** Will be easily ignited by heat, sparks or flames.
- Vapors form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.
- Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Vapors may travel to source of ignition and flash back.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Substance will react with water (some violently) releasing flammable, toxic or corrosive gases and runoff.
- Contact with metals may evolve flammable hydrogen gas.
- Containers may explode when heated or if contaminated with water.

### HEALTH

- **TOXIC;** inhalation, ingestion or contact (skin, eyes) with vapors, dusts or substance may cause severe injury, burns or death.
- **Bromoacetates and chloroacetates are extremely irritating/lachrymators (cause eye irritation and flow of tears).**
- Reaction with water or moist air will release toxic, corrosive or flammable gases.
- Reaction with water may generate much heat that will increase the concentration of fumes in the air.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

#### Spill

- For **highlighted materials:** see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).



## EMERGENCY RESPONSE

## FIRE

- Note: Most foams will react with the material and release corrosive/toxic gases.

**CAUTION: For Acetyl chloride (UN1717), use CO<sub>2</sub> or dry chemical only.**

**Small Fire**

- CO<sub>2</sub>, dry chemical, dry sand, alcohol-resistant foam.

**Large Fire**

- Water spray, fog or alcohol-resistant foam.
- **FOR CHLOROSILANES, DO NOT USE WATER**; use AFFF alcohol-resistant medium-expansion foam.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Avoid aiming straight or solid streams directly onto the product.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Do not get water inside containers.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

## SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- A vapor-suppressing foam may be used to reduce vapors.
- **FOR CHLOROSILANES**, use AFFF alcohol-resistant medium-expansion foam to reduce vapors.
- **DO NOT GET WATER on spilled substance or inside containers.**
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Prevent entry into waterways, sewers, basements or confined areas.

**Small Spill**

- Cover with DRY earth, DRY sand or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain.
- Use clean, non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal.

## FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

# GUIDE SUBSTANCES - TOXIC AND/OR CORROSIVE 156 (COMBUSTIBLE/WATER-SENSITIVE)

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- Combustible material: may burn but does not ignite readily.
- Substance will react with water (some violently) releasing flammable, toxic or corrosive gases and runoff.
- When heated, vapors may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.
- Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Vapors may travel to source of ignition and flash back.
- Contact with metals may evolve flammable hydrogen gas.
- Containers may explode when heated or if contaminated with water.

### HEALTH

- **TOXIC**; inhalation, ingestion or contact (skin, eyes) with vapors, dusts or substance may cause severe injury, burns or death.
- Contact with molten substance may cause severe burns to skin and eyes.
- Reaction with water or moist air will release toxic, corrosive or flammable gases.
- Reaction with water may generate much heat that will increase the concentration of fumes in the air.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

#### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

## FIRE

- Note: Most foams will react with the material and release corrosive/toxic gases.

**Small Fire**

- CO<sub>2</sub>, dry chemical, dry sand, alcohol-resistant foam.

**Large Fire**

- Water spray, fog or alcohol-resistant foam.
- **FOR CHLOROSILANES, DO NOT USE WATER**; use AFFF alcohol-resistant medium-expansion foam.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Avoid aiming straight or solid streams directly onto the product.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Do not get water inside containers.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

## SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- A vapor-suppressing foam may be used to reduce vapors.
- **FOR CHLOROSILANES**, use AFFF alcohol-resistant medium-expansion foam to reduce vapors.
- **DO NOT GET WATER on spilled substance or inside containers.**
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Prevent entry into waterways, sewers, basements or confined areas.

**Small Spill**

- Cover with DRY earth, DRY sand or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain.
- Use clean, non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal.

## FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

# GUIDE SUBSTANCES - TOXIC AND/OR CORROSIVE 157 (NON-COMBUSTIBLE/WATER-SENSITIVE)

## POTENTIAL HAZARDS

### HEALTH

- **TOXIC**; inhalation, ingestion or contact (skin, eyes) with vapors, dusts or substance may cause severe injury, burns or death.
- Reaction with water or moist air may release toxic, corrosive or flammable gases.
- Reaction with water may generate much heat that will increase the concentration of fumes in the air.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination.

### FIRE OR EXPLOSION

- Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
- UN1796, UN1802, UN1826, UN2032, UN3084, UN3085, and, at concentrations above 65%, UN2031 may act as oxidizers. Also consult GUIDE 140.
- Vapors may accumulate in confined areas (basement, tanks, hopper/tank cars, etc.).
- Substance may react with water (some violently), releasing corrosive and/or toxic gases and runoff.
- Contact with metals may evolve flammable hydrogen gas.
- Containers may explode when heated or if contaminated with water.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

#### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

## FIRE

- Note: Some foams will react with the material and release corrosive/toxic gases.

**Small Fire**

- CO<sub>2</sub> (except for Cyanides), dry chemical, dry sand, alcohol-resistant foam.

**Large Fire**

- Water spray, fog or alcohol-resistant foam.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Avoid aiming straight or solid streams directly onto the product.
- Dike runoff from fire control for later disposal.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Do not get water inside containers.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

## SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- A vapor-suppressing foam may be used to reduce vapors.
- DO NOT GET WATER INSIDE CONTAINERS.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Prevent entry into waterways, sewers, basements or confined areas.

**Small Spill**

- Cover with DRY earth, DRY sand or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain.
- Use clean, non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal.

## FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- **In case of skin contact with Hydrofluoric acid (UN1790)**, if calcium gluconate gel is available, rinse 5 minutes, then apply gel. Otherwise, continue rinsing until medical treatment is available.
- For minor skin contact, avoid spreading material on unaffected skin.
- Keep victim calm and warm.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

### POTENTIAL HAZARDS

#### HEALTH

- Inhalation or contact with substance may cause infection, disease or death.
- Category A Infectious Substances (UN2814, UN2900 or UN3549) are more hazardous, or are in a more hazardous form, than infectious substances shipped as Category B Biological Substances (UN3373) or clinical waste/medical waste (UN3291).
- Runoff from fire control or dilution water may cause environmental contamination.
- Damaged packages containing solid CO<sub>2</sub> as a refrigerant may produce water or frost from condensation of air. Do not touch this liquid as it could be contaminated by the contents of the parcel.
- Contact with solid CO<sub>2</sub> may cause burns, severe injury and/or frostbite.

#### FIRE OR EXPLOSION

- Some of these materials may burn, but none ignite readily.
- Some may be transported in flammable liquids.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Consult the shipping paper to identify the substance involved.

#### PROTECTIVE CLOTHING

- Use judgement based on the amount of material present and the possible routes of exposure to select protective clothing.
- Wear appropriate respiratory protection, such as fit-tested N95 respirator (at minimum), powered air purifying respirator (PAPR), or positive pressure self-contained breathing apparatus (SCBA).
- Wear full coverage body protection (e.g., Tyvek suit), faceshield, and disposable fluid-resistant gloves (e.g., latex or nitrile).
- Wear appropriate footwear; disposable shoe covers can be worn to protect against contamination.
- Puncture- and cut-resistant gloves should be worn over fluid-resistant gloves if sharp objects (e.g., broken glass, needles) are present.
- Wear insulated gloves (e.g. cryo gloves) over fluid-resistant gloves when handling dry ice (UN1845).
- Decontaminate protective clothing and personal protective equipment after use and before cleaning or disposal with a compatible chemical disinfectant (e.g., 10% solution of bleach, equivalent to 0.5% sodium hypochlorite) or through a validated decontamination technology (e.g., autoclave) or process.
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**
- For more information on decontamination, consult p. 362

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 25 meters (75 feet) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**EMERGENCY RESPONSE**

**FIRE**

**Small Fire**

- Dry chemical, soda ash, lime or sand.

**Large Fire**

- Use extinguishing agent suitable for type of surrounding fire.
- Do not scatter spilled material with high-pressure water streams.
- If it can be done safely, move undamaged containers away from the area around the fire.

**SPILL OR LEAK**

- Do not touch or walk through spilled material.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Absorb with earth, sand or other non-combustible material.
- Cover damaged package or spilled material with absorbent material such as paper towel, towel or rag to absorb any liquids, and, beginning from outside edge, pour liquid bleach or other chemical disinfectant to saturate. Keep wet with liquid bleach or other disinfectant.
- **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to a safe isolated area if it can be done safely.

**CAUTION: Victim may be a source of contamination.**

- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush eyes with running water and wash skin with soap and water for at least 20 minutes. Take caution not to break the skin.
- Effects of exposure (inhalation, ingestion, injection/inoculation or skin contact) to substance may be delayed. Victim should consult medical professional for information regarding symptoms and treatment.
- **For further assistance, contact your local Poison Control Center.**

# GUIDE SUBSTANCES (IRRITATING)

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### POTENTIAL HAZARDS

#### HEALTH

- Inhalation of vapors or dust is extremely irritating.
- May cause burning of eyes and lachrymation (flow of tears).
- May cause coughing, difficult breathing and nausea.
- Brief exposure effects last only a few minutes.
- Exposure in an enclosed area may be very harmful.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause environmental contamination.

#### FIRE OR EXPLOSION

- Some of these materials may burn, but none ignite readily.
- Containers may explode when heated.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

##### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).



**EMERGENCY RESPONSE**

**FIRE**

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or regular foam.

**Large Fire**

- Water spray, fog or regular foam.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Dike runoff from fire control for later disposal.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Do not get water inside containers.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

**SPILL OR LEAK**

- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.

**Small Spill**

- Pick up with sand or other non-combustible absorbent material and place into containers for later disposal.

**Large Spill**

- Dike far ahead of liquid spill for later disposal.
- Prevent entry into waterways, sewers, basements or confined areas.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Keep victim calm and warm.
- Effects should disappear after individual has been exposed to fresh air for approximately 10 minutes.

# GUIDE HALOGENATED SOLVENTS

## 160

### POTENTIAL HAZARDS

#### HEALTH

- Toxic by ingestion.
- Vapors may cause dizziness or asphyxiation.
- Exposure in an enclosed area may be very harmful.
- Contact may irritate or burn skin and eyes.
- Fire may produce irritating and/or toxic gases.
- Runoff from fire control or dilution water may cause environmental contamination.

#### FIRE OR EXPLOSION

- Some of these materials may burn, but none ignite readily.
- Most vapors are heavier than air.
- Air/vapor mixtures may explode when ignited.
- Container may explode in heat of fire.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 50 meters (150 feet) in all directions.

##### Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

**EMERGENCY RESPONSE**

**FIRE**

**Small Fire**

- Dry chemical, CO<sub>2</sub> or water spray.

**Large Fire**

- Dry chemical, CO<sub>2</sub>, alcohol-resistant foam or water spray.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Dike runoff from fire control for later disposal.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Stop leak if you can do it without risk.

**Small Liquid Spill**

- Pick up with sand, earth or other non-combustible absorbent material.

**Large Spill**

- Dike far ahead of liquid spill for later disposal.
- Prevent entry into waterways, sewers, basements or confined areas.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Wash skin with soap and water.
- Keep victim calm and warm.

### POTENTIAL HAZARDS

#### HEALTH

- Radiation presents minimal risk to transport workers, emergency response personnel and the public during transportation accidents. Packaging durability increases as potential hazard of radioactive content increases.
- Very low levels of contained radioactive materials and low radiation levels outside packages result in low risks to people. Damaged packages may release measurable amounts of radioactive material, but the resulting risks are expected to be low.
- Some radioactive materials cannot be detected by commonly available instruments.
- Packages do not have RADIOACTIVE I, II, or III labels. Some may have EMPTY labels or may have the word "Radioactive" in the package marking.

#### FIRE OR EXPLOSION

- Some of these materials may burn, but most do not ignite readily.
- Many have cardboard outer packaging; content (physically large or small) can be of many different physical forms.
- Radioactivity does not change flammability or other properties of materials.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- **Priorities for rescue, life-saving, first aid, fire control and other hazards are higher than the priority for measuring radiation levels.**
- Radiation Authority must be notified of accident conditions. Radiation Authority is usually responsible for decisions about radiological consequences and closure of emergencies.
- Stay upwind, uphill and/or upstream.
- Keep unauthorized personnel away.
- Detain or isolate uninjured persons or equipment suspected to be contaminated; delay decontamination and cleanup until instructions are received from Radiation Authority.

#### PROTECTIVE CLOTHING

- Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide adequate protection.

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 25 meters (75 feet) in all directions.

##### Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

##### Fire

- When a large quantity of this material is involved in a major fire, consider an initial evacuation distance of 300 meters (1000 feet) in all directions.

## EMERGENCY RESPONSE

**FIRE**

- Presence of radioactive material will not influence the fire control processes and should not influence selection of techniques.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Do not move damaged packages; move undamaged packages out of fire zone.

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or regular foam.

**Large Fire**

- Water spray, fog (flooding amounts).

**SPILL OR LEAK**

- Do not touch damaged packages or spilled material.
- Cover liquid spill with sand, earth or other non-combustible absorbent material.
- Cover powder spill with plastic sheet or tarp to minimize spreading.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Medical problems take priority over radiological concerns.
- Use first aid treatment according to the nature of the injury.
- Do not delay care and transport of a seriously injured person.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Injured persons contaminated by contact with released material are not a serious hazard to health care personnel, equipment or facilities.

# GUIDE RADIOACTIVE MATERIALS 162 (LOW TO MODERATE LEVEL RADIATION)

## POTENTIAL HAZARDS

### HEALTH

- Radiation presents minimal risk to transport workers, emergency response personnel and the public during transportation accidents. Packaging durability increases as potential hazard of radioactive content increases.
- Undamaged packages are safe. Contents of damaged packages may cause higher external radiation exposure, or both external and internal radiation exposure if contents are released.
- Low radiation hazard when material is inside container. If material is released from package or bulk container, hazard will vary from low to moderate. Level of hazard will depend on the type and amount of radioactivity, the kind of material it is in, and/or the surfaces it is on.
- Some material may be released from packages during accidents of moderate severity but risks to people are not great.
- Released radioactive materials or contaminated objects usually will be visible if packaging fails.
- Some exclusive use shipments of bulk and packaged materials will not have "RADIOACTIVE" labels. Placards, markings and shipping papers provide identification.
- Some packages may have a "RADIOACTIVE" label and a second hazard label. The second hazard is usually greater than the radiation hazard; so follow this GUIDE as well as the response GUIDE for the second hazard class label.
- Some radioactive materials cannot be detected by commonly available instruments.
- Runoff from control of cargo fire may cause low-level pollution.

### FIRE OR EXPLOSION

- Some of these materials may burn, but most do not ignite readily.
- Uranium and Thorium metal cuttings may ignite spontaneously if exposed to air (see GUIDE 136).
- Nitrates are oxidizers and may ignite other combustibles (see GUIDE 141).

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- **Priorities for rescue, life-saving, first aid, fire control and other hazards are higher than the priority for measuring radiation levels.**
- Radiation Authority must be notified of accident conditions. Radiation Authority is usually responsible for decisions about radiological consequences and closure of emergencies.
- Stay upwind, uphill and/or upstream.
- Keep unauthorized personnel away.
- Detain or isolate uninjured persons or equipment suspected to be contaminated; delay decontamination and cleanup until instructions are received from Radiation Authority.

### PROTECTIVE CLOTHING

- Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide adequate protection.

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area for at least 25 meters (75 feet) in all directions.

#### Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

#### Fire

- When a large quantity of this material is involved in a major fire, consider an initial evacuation distance of 300 meters (1000 feet) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**EMERGENCY RESPONSE**

**FIRE**

- Presence of radioactive material will not influence the fire control processes and should not influence selection of techniques.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Do not move damaged packages; move undamaged packages out of fire zone.

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or regular foam.

**Large Fire**

- Water spray, fog (flooding amounts).
- Dike runoff from fire control for later disposal.

**SPILL OR LEAK**

- Do not touch damaged packages or spilled material.
- Cover liquid spill with sand, earth or other non-combustible absorbent material.
- Dike to collect large liquid spills.
- Cover powder spill with plastic sheet or tarp to minimize spreading.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Medical problems take priority over radiological concerns.
- Use first aid treatment according to the nature of the injury.
- Do not delay care and transport of a seriously injured person.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- In case of contact with substance, wipe from skin immediately; flush skin or eyes with running water for at least 20 minutes.
- Injured persons contaminated by contact with released material are not a serious hazard to health care personnel, equipment or facilities.

# GUIDE RADIOACTIVE MATERIALS 163 (LOW TO HIGH LEVEL RADIATION)

## POTENTIAL HAZARDS

### HEALTH

- Radiation presents minimal risk to transport workers, emergency response personnel and the public during transportation accidents. Packaging durability increases as potential hazard of radioactive content increases.
- Undamaged packages are safe. Contents of damaged packages may cause higher external radiation exposure, or both external and internal radiation exposure if contents are released.
- Type A packages (cartons, boxes, drums, articles, etc.) identified as "Type A" by marking on packages or by shipping papers contain non-life-endangering amounts. Partial releases might be expected if "Type A" packages are damaged in moderately severe accidents.
- Type B packages, and the rarely occurring Type C packages (large and small, usually metal), contain the most hazardous amounts. They can be identified by package markings or by shipping papers. Life-threatening conditions may exist only if contents are released or package shielding fails. Because of design, evaluation and testing of packages, these conditions would be expected only for accidents of utmost severity.
- The rarely occurring "Special Arrangement" shipments may be of Type A, Type B or Type C packages. Package type will be marked on packages, and shipment details will be on shipping papers.
- Radioactive White-I labels indicate radiation levels outside single, isolated, undamaged packages are very low (less than 0.005 mSv/h (0.5 mrem/h)).
- Radioactive Yellow-II and Yellow-III labeled packages have higher radiation levels. The transport index (TI) on the label identifies the maximum radiation level in mrem/h one meter from a single, isolated, undamaged package.
- Some radioactive materials cannot be detected by commonly available instruments.
- Water from cargo fire control may cause pollution.

### FIRE OR EXPLOSION

- Some of these materials may burn, but most do not ignite readily.
- Radioactivity does not change flammability or other properties of materials.
- Type B packages are designed and evaluated to withstand total engulfment in flames at temperatures of 800°C (1475°F) for a period of 30 minutes.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- **Priorities for rescue, life-saving, first aid, fire control and other hazards are higher than the priority for measuring radiation levels.**
- Radiation Authority must be notified of accident conditions. Radiation Authority is usually responsible for decisions about radiological consequences and closure of emergencies.
- Stay upwind, uphill and/or upstream. • Keep unauthorized personnel away.
- Detain or isolate uninjured persons or equipment suspected to be contaminated; delay decontamination and cleanup until instructions are received from Radiation Authority.

### PROTECTIVE CLOTHING

- Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide adequate protection against internal radiation exposure, but not external radiation exposure.

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area for at least 25 meters (75 feet) in all directions.

#### Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

#### Fire

- When a large quantity of this material is involved in a major fire, consider an initial evacuation distance of 300 meters (1000 feet) in all directions.



**EMERGENCY RESPONSE**

**FIRE**

- Presence of radioactive material will not influence the fire control processes and should not influence selection of techniques.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Do not move damaged packages; move undamaged packages out of fire zone.

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or regular foam.

**Large Fire**

- Water spray, fog (flooding amounts).
- Dike runoff from fire control for later disposal.

**SPILL OR LEAK**

- Do not touch damaged packages or spilled material.
- Damp surfaces on undamaged or slightly damaged packages are seldom an indication of packaging failure. Most packaging for liquid content have inner containers and/or inner absorbent materials.
- Cover liquid spill with sand, earth or other non-combustible absorbent material.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Medical problems take priority over radiological concerns.
- Use first aid treatment according to the nature of the injury.
- Do not delay care and transport of a seriously injured person.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Injured persons contaminated by contact with released material are not a serious hazard to health care personnel, equipment or facilities.

# GUIDE 164 RADIOACTIVE MATERIALS (SPECIAL FORM/ LOW TO HIGH LEVEL EXTERNAL RADIATION)

## POTENTIAL HAZARDS

### HEALTH

- Radiation presents minimal risk to transport workers, emergency response personnel and the public during transportation accidents. Packaging durability increases as potential hazard of radioactive content increases.
- Undamaged packages are safe; contents of damaged packages may cause external radiation exposure, and much higher external exposure if contents (source capsules) are released.
- Contamination and internal radiation hazards are not expected, but not impossible.
- Type A packages (cartons, boxes, drums, articles, etc.) identified as "Type A" by marking on packages or by shipping papers contain non-life-endangering amounts. Radioactive sources may be released if "Type A" packages are damaged in moderately severe accidents.
- Type B packages, and the rarely occurring Type C packages, (large and small, usually metal) contain the most hazardous amounts. They can be identified by package markings or by shipping papers. Life-threatening conditions may exist only if contents are released or package shielding fails. Because of design, evaluation and testing of packages, these conditions would be expected only for accidents of utmost severity.
- Radioactive White-I labels indicate radiation levels outside single, isolated, undamaged packages are very low (less than 0.005 mSv/h (0.5 mrem/h)).
- Radioactive Yellow-II and Yellow-III labeled packages have higher radiation levels. The transport index (TI) on the label identifies the maximum radiation level in mrem/h one meter from a single, isolated, undamaged package.
- Radiation from the package contents, usually in durable metal capsules, can be detected by most radiation instruments.
- Water from cargo fire control is not expected to cause pollution.

### FIRE OR EXPLOSION

- Packagings can burn completely without risk of content loss from sealed source capsule.
- Radioactivity does not change flammability or other properties of materials.
- Radioactive source capsules and Type B packages are designed and evaluated to withstand total engulfment in flames at temperatures of 800°C (1475°F) for a period of 30 minutes.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- **Priorities for rescue, life-saving, first aid, fire control and other hazards are higher than the priority for measuring radiation levels.**
- Radiation Authority must be notified of accident conditions. Radiation Authority is usually responsible for decisions about radiological consequences and closure of emergencies.
- Stay upwind, uphill and/or upstream. • Keep unauthorized personnel away.
- Delay final cleanup until instructions or advice is received from Radiation Authority.

### PROTECTIVE CLOTHING

- Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide adequate protection against internal radiation exposure, but not external radiation exposure.

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area for at least 25 meters (75 feet) in all directions.

#### Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

#### Fire

- When a large quantity of this material is involved in a major fire, consider an initial evacuation distance of 300 meters (1000 feet) in all directions.

## EMERGENCY RESPONSE

**FIRE**

- Presence of radioactive material will not influence the fire control processes and should not influence selection of techniques.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Do not move damaged packages; move undamaged packages out of fire zone.

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or regular foam.

**Large Fire**

- Water spray, fog (flooding amounts).

**SPILL OR LEAK**

- Do not touch damaged packages or spilled material.
- Damp surfaces on undamaged or slightly damaged packages are seldom an indication of packaging failure. Contents are seldom liquid. Content is usually a metal capsule, easily seen if released from package.
- If source capsule is identified as being out of package, **DO NOT TOUCH**. Stay away and await advice from Radiation Authority.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Medical problems take priority over radiological concerns.
- Use first aid treatment according to the nature of the injury.
- Do not delay care and transport of a seriously injured person.
- Persons exposed to special form sources are not likely to be contaminated with radioactive material.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Injured persons contaminated by contact with released material are not a serious hazard to health care personnel, equipment or facilities.

# GUIDE RADIOACTIVE MATERIALS 165 (FISSILE/LOW TO HIGH LEVEL RADIATION)

## POTENTIAL HAZARDS

### HEALTH

- Radiation presents minimal risk to transport workers, emergency response personnel and the public during transportation accidents. Packaging durability increases as potential radiation and criticality hazards of the content increase.
- Undamaged packages are safe. Contents of damaged packages may cause higher external radiation exposure, or both external and internal radiation exposure if contents are released.
- Type AF or IF packages, identified by package markings, do not contain life-threatening amounts of material. External radiation levels are low and packages are designed, evaluated and tested to control releases and to prevent a fission chain reaction under severe transport conditions.
- Type B(U)F, B(M)F and CF packages (identified by markings on packages or shipping papers) contain potentially life-endangering amounts. Because of design, evaluation and testing of packages, fission chain reactions are prevented and releases are not expected to be life-endangering for all accidents except those of utmost severity.
- The rarely occurring "Special Arrangement" shipments may be of Type AF, BF or CF packages. Package type will be marked on packages, and shipment details will be on shipping papers.
- The transport index (TI) shown on labels or a shipping paper might not indicate the radiation level at one meter from a single, isolated, undamaged package; instead, it might relate to controls needed during transport because of the fissile properties of the materials. Alternatively, the fissile nature of the contents may be indicated by a criticality safety index (CSI) on a special FISSILE label or on the shipping paper.
- Some radioactive materials cannot be detected by commonly available instruments.
- Water from cargo fire control is not expected to cause pollution.

### FIRE OR EXPLOSION

- These materials are seldom flammable. Packages are designed to withstand fires without damage to contents.
- Radioactivity does not change flammability or other properties of materials.
- Type AF, IF, B(U)F, B(M)F and CF packages are designed and evaluated to withstand total engulfment in flames at temperatures of 800°C (1475°F) for a period of 30 minutes.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- **Priorities for rescue, life-saving, first aid, fire control and other hazards are higher than the priority for measuring radiation levels.** • Radiation Authority must be notified of accident conditions. Radiation Authority is usually responsible for decisions about radiological consequences and closure of emergencies.
- Stay upwind, uphill and/or upstream. • Keep unauthorized personnel away.
- Detain or isolate uninjured persons or equipment suspected to be contaminated; delay decontamination and cleanup until instructions are received from Radiation Authority.

### PROTECTIVE CLOTHING

- Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide adequate protection against internal radiation exposure, but not external radiation exposure.

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area for at least 25 meters (75 feet) in all directions.

#### Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

#### Fire

- When a large quantity of this material is involved in a major fire, consider an initial evacuation distance of 300 meters (1000 feet) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**EMERGENCY RESPONSE**

**FIRE**

- Presence of radioactive material will not influence the fire control processes and should not influence selection of techniques.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Do not move damaged packages; move undamaged packages out of fire zone.

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or regular foam.

**Large Fire**

- Water spray, fog (flooding amounts).

**SPILL OR LEAK**

- Do not touch damaged packages or spilled material.
- Damp surfaces on undamaged or slightly damaged packages are seldom an indication of packaging failure. Most packaging for liquid content have inner containers and/or inner absorbent materials.

**Liquid Spill**

- Package contents are seldom liquid. If any radioactive contamination resulting from a liquid release is present, it probably will be low-level.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Medical problems take priority over radiological concerns.
- Use first aid treatment according to the nature of the injury.
- Do not delay care and transport of a seriously injured person.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Injured persons contaminated by contact with released material are not a serious hazard to health care personnel, equipment or facilities.

# GUIDE 166 RADIOACTIVE MATERIALS - CORROSIVE (URANIUM HEXAFLUORIDE/WATER-SENSITIVE)

## POTENTIAL HAZARDS

### HEALTH

- Radiation presents minimal risk to transport workers, emergency response personnel and the public during transportation accidents. Packaging durability increases as potential radiation and criticality hazards of the content increase.
- **Chemical hazard greatly exceeds radiation hazard.**
- Substance reacts with water and water vapor in air to form **toxic and corrosive hydrogen fluoride gas, hydrofluoric acid**, and an extremely irritating and corrosive, white-colored, water-soluble residue.
- If inhaled, may be fatal. • Direct contact causes burns to skin, eyes, and respiratory tract.
- Low-level radioactive material; very low radiation hazard to people.
- Runoff from control of cargo fire may cause low-level pollution.

### FIRE OR EXPLOSION

- Substance does not burn. • The material may react violently with fuels.
- Product will decompose to produce toxic and/or corrosive fumes.
- Containers in protective overpacks (horizontal cylindrical shape with short legs for tie-downs), are identified with "AF", "B(U)F" or "H(U)" on shipping papers or by markings on the overpacks. They are designed and evaluated to withstand severe conditions including total engulfment in flames at temperatures of 800°C (1475°F) for a period of 30 minutes.
- Bare filled cylinders, identified with UN2978 as part of the marking (may also be marked H(U) or H(M)), may rupture in heat of engulfing fire; bare empty (except for residue) cylinders will not rupture in fires.
- Radioactivity does not change flammability or other properties of materials.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- **Priorities for rescue, life-saving, first aid, fire control and other hazards are higher than the priority for measuring radiation levels.**
- Radiation Authority must be notified of accident conditions. Radiation Authority is usually responsible for decisions about radiological consequences and closure of emergencies.
- Stay upwind, uphill and/or upstream. • Keep unauthorized personnel away.
- Detain or isolate uninjured persons or equipment suspected to be contaminated; delay decontamination and cleanup until instructions are received from Radiation Authority.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area for at least 25 meters (75 feet) in all directions.

#### Spill

- See [Table 1 - Initial Isolation and Protective Action Distances](#).

#### Fire

- When a large quantity of this material is involved in a major fire, consider an initial evacuation distance of 300 meters (1000 feet) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**EMERGENCY RESPONSE**

**FIRE**

- DO NOT USE WATER OR FOAM ON MATERIAL ITSELF.
- If it can be done safely, move undamaged containers away from the area around the fire.

**Small Fire**

- Dry chemical or CO<sub>2</sub>.

**Large Fire**

- Water spray, fog or regular foam.
- Cool containers with flooding quantities of water until well after fire is out.
- If this is impossible, withdraw from area and let fire burn.
- ALWAYS stay away from tanks engulfed in fire.

**SPILL OR LEAK**

- Do not touch damaged packages or spilled material.
- DO NOT GET WATER INSIDE CONTAINERS.
- Without fire or smoke, leak will be evident by visible and irritating vapors and residue forming at the point of release.
- Use fine water spray to reduce vapors; do not put water directly on point of material release from container.
- Residue buildup may self-seal small leaks.
- Dike far ahead of spill to collect runoff water.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Medical problems take priority over radiological concerns.
- Use first aid treatment according to the nature of the injury.
- **In case of skin contact with hydrogen fluoride gas and/or Hydrofluoric acid**, if calcium gluconate gel is available, rinse 5 minutes, then apply gel. Otherwise, continue rinsing until medical treatment is available.
- Do not delay care and transport of a seriously injured person.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.
- Keep victim calm and warm.

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*There are no materials that refer to this guide.*

# GUIDE CARBON MONOXIDE (REFRIGERATED LIQUID)

## 168

### POTENTIAL HAZARDS

#### HEALTH

- **TOXIC; Extremely Hazardous.**
- Inhalation extremely dangerous; may be fatal.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Odorless, will not be detected by sense of smell.

#### FIRE OR EXPLOSION

- **EXTREMELY FLAMMABLE.**
- **CAUTION: Flame can be invisible. Use an alternate method of detection (thermal camera, broom handle, etc.)**
- May be ignited by heat, sparks or flames.
- Containers may explode when heated.
- Vapor explosion and poison hazard indoors, outdoors or in sewers.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Vapors may travel to source of ignition and flash back.
- Runoff may create fire or explosion hazard.

#### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

##### Spill

- See **Table 1 - Initial Isolation and Protective Action Distances.**

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

## EMERGENCY RESPONSE

### FIRE

**CAUTION:** Flame can be invisible. Use an alternate method of detection (thermal camera, broom handle, etc.)

- **DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.**

#### Small Fire

- Dry chemical, CO<sub>2</sub> or water spray.

#### Large Fire

- Water spray, fog or regular foam.
- If it can be done safely, move undamaged containers away from the area around the fire.

#### Fire Involving Tanks

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

### SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Prevent entry into waterways, sewers, basements or confined areas.
- Isolate area until gas has dispersed.

### FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- Keep victim calm and warm.
- Keep victim under observation.
- Effects of contact or inhalation may be delayed.

# GUIDE ALUMINUM (MOLTEN)

## 169

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- Substance is transported in molten form at a temperature above 705°C (1300°F).
- Violent reaction with water; contact may cause an explosion or may produce a flammable gas.
- Will ignite combustible materials (wood, paper, oil, debris, etc.).
- Contact with nitrates or other oxidizers may cause an explosion.
- Contact with containers or other materials, including cold, wet or dirty tools, may cause an explosion.
- Contact with concrete will cause spalling and small pops.

#### HEALTH

- Contact causes severe burns to skin and eyes.
- Fire may produce irritating and/or toxic gases.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Stay upwind, uphill and/or upstream.
- Keep unauthorized personnel away.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear flame-retardant structural firefighters' protective clothing, including faceshield, helmet and gloves, as this will provide limited thermal protection.

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 50 meters (150 feet) in all directions.

## EMERGENCY RESPONSE

### FIRE

- Do not use water, except in life-threatening situations and then only in a fine spray.
- Do not use halogenated extinguishing agents or foam.
- Move combustibles out of path of advancing pool if you can do so without risk.
- Extinguish fires started by molten material by using appropriate method for the burning material; keep water, halogenated extinguishing agents and foam away from the molten material.

### SPILL OR LEAK

- Do not touch or walk through spilled material.
- Do not attempt to stop leak, due to danger of explosion.
- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Substance is very fluid, spreads quickly, and may splash. Do not try to stop it with shovels or other objects.
- Dike far ahead of spill; use dry sand to contain the flow of material.
- Where possible allow molten material to solidify naturally.
- Avoid contact even after material solidifies. Molten, heated and cold aluminum look alike; do not touch unless you know it is cold.
- Clean up under the supervision of an expert after material has solidified.

### FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- For severe burns, immediate medical attention is required.
- Removal of solidified molten material from skin requires medical assistance.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

# GUIDE 170 METALS (POWDERS, DUSTS, SHAVINGS, BORINGS, TURNINGS, OR CUTTINGS, ETC.)

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- May react violently or explosively on contact with water.
- Some are transported in flammable liquids.
- May be ignited by friction, heat, sparks or flames.
- Some of these materials will burn with intense heat.
- Dusts or fumes may form explosive mixtures in air.
- Containers may explode when heated.
- May re-ignite after fire is extinguished.

### HEALTH

- Oxides from metallic fires are a severe health hazard.
- Inhalation or contact with substance or decomposition products may cause severe injury or death.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause environmental contamination.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Stay upwind, uphill and/or upstream.
- Keep unauthorized personnel away.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

#### Large Spill

- Consider initial downwind evacuation for at least 50 meters (160 feet).

#### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**EMERGENCY RESPONSE**

**FIRE**

- **DO NOT USE WATER, FOAM OR CO<sub>2</sub>.**
- Dousing metallic fires with water will generate hydrogen gas, an extremely dangerous explosion hazard, particularly if fire is in a confined environment (i.e., building, cargo hold, etc.).
- Use DRY sand, graphite powder, dry sodium chloride-based extinguishers, or class D extinguishers.
- Confining and smothering metal fires is preferable rather than applying water.
- If it can be done safely, move undamaged containers away from the area around the fire.

**Fire Involving Tanks or Car/Trailer Loads**

- If impossible to extinguish, protect surroundings and allow fire to burn itself out.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

# GUIDE SUBSTANCES (LOW TO MODERATE HAZARD)

## 171

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- Some may burn but none ignite readily.
- Containers may explode when heated.
- Some may be transported hot.
- For UN3508, Capacitor, asymmetric, be aware of possible short circuiting as this product is transported in a charged state.
- Polymeric beads, expandable (UN2211) may evolve flammable vapours.

#### HEALTH

- Inhalation of material may be harmful.
- Contact may cause burns to skin and eyes.
- Inhalation of Asbestos dust may have a damaging effect on the lungs.
- Fire may produce irritating, corrosive and/or toxic gases.
- Some liquids produce vapors that may cause dizziness or asphyxiation.
- Runoff from fire control or dilution water may cause environmental contamination.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

##### Spill

- For **highlighted materials**: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

##### Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.



**EMERGENCY RESPONSE****FIRE****Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or regular foam.

**Large Fire**

- Water spray, fog or regular foam.
- Do not scatter spilled material with high-pressure water streams.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Dike runoff from fire control for later disposal.

**Fire Involving Tanks**

- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

**SPILL OR LEAK**

- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent dust cloud.
- For Asbestos, avoid inhalation of dust. Cover spill with plastic sheet or tarp to minimize spreading. Do not clean up or dispose of, except under supervision of a specialist.

**Small Dry Spill**

- With clean shovel, place material into clean, dry container and cover loosely; move containers from spill area.

**Small Spill**

- Pick up with sand or other non-combustible absorbent material and place into containers for later disposal.

**Large Spill**

- Dike far ahead of liquid spill for later disposal.
- Cover powder spill with plastic sheet or tarp to minimize spreading.
- Prevent entry into waterways, sewers, basements or confined areas.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.

# GUIDE GALLIUM AND MERCURY

## 172

### POTENTIAL HAZARDS

#### HEALTH

- Inhalation of vapors or contact with substance will result in contamination and potential harmful effects.
- Fire will produce irritating, corrosive and/or toxic gases.

#### FIRE OR EXPLOSION

- Non-combustible, substance itself does not burn but may react upon heating to produce corrosive and/or toxic fumes.
- Runoff may pollute waterways.

### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Stay upwind, uphill and/or upstream.
- Keep unauthorized personnel away.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 50 meters (150 feet) in all directions.

##### Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

##### Fire

- When any large container is involved in a fire, consider initial evacuation for 500 meters (1/3 mile) in all directions.

**EMERGENCY RESPONSE****FIRE**

- Use extinguishing agent suitable for type of surrounding fire.
- **Do not direct water at the heated metal.**

**SPILL OR LEAK**

- Do not touch or walk through spilled material.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- Do not use steel or aluminum tools or equipment.
- Cover with earth, sand or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain.
- For mercury, use a mercury spill kit.
- Mercury spill areas may be subsequently treated with calcium sulphide/calcium sulfide or with sodium thiosulphate/sodium thiosulfate wash to neutralize any residual mercury.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim calm and warm.

### POTENTIAL HAZARDS

#### HEALTH

- **TOXIC; may be fatal if inhaled or absorbed through skin.**
- Vapors may be irritating.
- Contact with gas may cause burns and injury.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause environmental contamination.

#### FIRE OR EXPLOSION

- Some gases may burn or be ignited by heat, sparks or flames.
- May form explosive mixtures with air.
- Oxidizers may ignite combustibles (wood, paper, oil, clothing, etc.) but NOT readily due to low transportation pressures.
- Vapors may travel to source of ignition and flash back.
- Some of these materials may react violently with water.
- Cylinders exposed to fire may vent and release toxic and flammable gas through pressure relief devices.
- Runoff may create fire hazard.

#### PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Ventilate closed spaces before entering, but only if properly trained and equipped.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

#### EVACUATION

##### Immediate precautionary measure

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

##### Spill

- See [Table 1 - Initial Isolation and Protective Action Distances](#).

##### Fire

- If several small packages (inside a railcar or trailer) are involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

**\* SOME SUBSTANCES MAY ALSO BE FLAMMABLE, CORROSIVE AND/OR OXIDIZING**

## EMERGENCY RESPONSE

### FIRE

- **DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.**

#### Small Fire

- Dry chemical, CO<sub>2</sub>, water spray or alcohol-resistant foam.
- **For UN3515, UN3518, UN3520**, use water only; no dry chemical, CO<sub>2</sub> or Halon®.

#### Large Fire

- Water spray, fog or alcohol-resistant foam.
- Do not get water inside containers.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Damaged cylinders should be handled only by specialists.

#### Fire Involving Several Small Packages (inside a railcar or trailer)

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- **ALWAYS** stay away from tanks engulfed in fire.

### SPILL OR LEAK

- Some gases may be flammable. **ELIMINATE** all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- For flammable gases, all equipment used when handling the product must be grounded.
- For oxidizing substances, keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Do not direct water at spill or source of leak.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Prevent entry into waterways, sewers, basements or confined areas.
- Isolate area until gas has dispersed.

### FIRST AID

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- **Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.
- Keep victim under observation.
- Effects of contact or inhalation may be delayed.

# GUIDE ADSORBED GASES - FLAMMABLE OR OXIDIZING 174

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- Some gases will be ignited by heat, sparks or flames.
- Substance does not burn but will support combustion.
- Vapors may travel to source of ignition and flash back.
- Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
- Containers may explode when exposed to prolonged direct flame impingement.

### HEALTH

- Vapors may cause dizziness or asphyxiation without warning.
- Some may be irritating if inhaled at high concentrations.
- Contact with gas may cause burns and injury.
- Fire may produce irritating and/or toxic gases.

## PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Ventilate closed spaces before entering, but only if properly trained and equipped.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

### EVACUATION

#### Immediate precautionary measure

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

#### Large Spill

- Consider initial downwind evacuation for at least 800 meters (1/2 mile).

#### Fire

- If several small packages (inside a railcar or trailer) are involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the ERAP Program Section (page 390).

## EMERGENCY RESPONSE

**FIRE**

- **DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.**

- Use extinguishing agent suitable for type of surrounding fire.

**Small Fire**

- Dry chemical or CO<sub>2</sub>.

**Large Fire**

- Water spray or fog.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Damaged cylinders should be handled only by specialists.

**Fire Involving Several Small Packages (inside a railcar or trailer)**

- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

**SPILL OR LEAK**

- For flammable gases, ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- For oxidizing substances, keep combustibles (wood, paper, oil, etc.) away from spilled material.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- Prevent spreading of vapors through sewers, ventilation systems and confined areas.
- Ventilate the area.
- Isolate area until gas has dispersed.

**FIRST AID**

- Call 911 or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.

## INTRODUCTION TO GREEN TABLES

### TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

This table suggests distances useful to protect people from vapors/gases resulting from spills involving:

- materials that are considered toxic by inhalation (TIH) (PIH in the US)
- materials that produce toxic gases upon contact with water
- chemical warfare agents

This table provides first responders with initial guidance until technically qualified emergency response personnel are available. For each material, first responders will find distances for the following zones:

- The **Initial Isolation Zone** defines an area **surrounding** the incident in which people may be exposed to dangerous (upwind) and life-threatening (downwind) concentrations of material.
- The **Protective Action Zone** defines an area **downwind** from the incident in which people may become incapacitated and unable to take protective action and/or incur serious or irreversible health effects. Table 1 provides specific guidance for small and large spills occurring day or night.

Adjusting distances for a specific incident involves many interdependent variables. These adjustments should only be made by technically qualified personnel. For this reason, no precise guidance can be provided in this document to aid in adjusting the table distances; however, general guidance follows.

### Factors that May Change the Protective Action Distances

#### Fire

In the **orange-bordered pages**, under **EVACUATION – Fire**, the evacuation distance required to protect against fragmentation hazard of a large container is clearly indicated. If involved in a fire, the toxic hazard may be less dangerous than the fire or explosion hazard.

In these cases, the **fire hazard distance should be used** as an isolation distance and Table 1 should be used to protect downwind for residual material release.

#### Worst-case scenario: terrorism, sabotage or catastrophic accident

Initial isolation and protective action distances are derived from historical data on transportation incidents and the use of statistical models. For worst-case scenarios involving the instantaneous release of the entire contents of a package (e.g., as a result of terrorism, sabotage or catastrophic accident), the distances may increase substantially.

For such events, **doubling** the initial isolation and protective action distances is appropriate in absence of other information.

#### When more than one large package is leaking

If more than one rail car, tank truck, tank or large cylinder, containing TIH materials is leaking, **large spill** distances may need to be increased.



### Other factors that can increase the protective action distance:

- If a material has a **protective action distance of 11.0+ km (7.0+ miles)**, the actual distance can be larger in certain atmospheric conditions.
- If the material's vapor plume is **channeled in a valley** or **between many tall buildings**, protective action distances may be larger than shown due to less mixing of the plume with the atmosphere.
- If there is a **daytime spill** in a region with known **strong temperature inversions** or **snow cover**, or it occurs **near sunset**, this may require an increase of the protective action distance because airborne contaminants mix and disperse more slowly and may travel much farther downwind.
  - › In such cases, the nighttime protective action distances may be more appropriate.
- If the temperature of the **liquid spill** or the **outdoor temperature exceeds 30°C (86°F)**, the protective action distance may be larger.

### Water-reactive materials

Materials that react with water to produce large amounts of toxic gases are included in Table 1. Some of these materials have 2 entries in Table 1. They are identified by **(when spilled on land)** since they are TIH products and **(when spilled in water)** because they produce additional toxic gases when spilled in water.

Choose the **larger protective action distance** if:

- it is not clear whether the spill is on land or in water
- the spill occurs both on land and in water

### TABLE 2 - WATER-REACTIVE MATERIALS WHICH PRODUCE TOXIC GASES

This table lists materials that produce large amounts of Toxic Inhalation Hazard gases (TIH) when spilled in water as well as the TIH gases that are produced.

**NOTE:** The produced TIH gases indicated in Table 2 are for information purposes only. In Table 1, the initial isolation and protective action distances have already taken into consideration the produced TIH gas.

When a water-reactive TIH-producing material is spilled into a river or stream, the source of the toxic gas may flow downstream for a great distance.

### TABLE 3 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES FOR LARGE SPILLS FOR DIFFERENT QUANTITIES OF SIX COMMON TIH (PIH IN THE US) GASES

This table lists materials that may be more commonly encountered. These materials are:

- UN1005 - Ammonia, anhydrous
- UN1017 - Chlorine
- UN1040 - Ethylene oxide and UN1040 - Ethylene oxide with nitrogen

- UN1050 - Hydrogen chloride, anhydrous and UN2186 - Hydrogen chloride, refrigerated liquid
- UN1052 - Hydrogen fluoride, anhydrous
- UN1079 - Sulfur dioxide/Sulphur dioxide

This table provides initial isolation and protective action distances for large spills (more than 208 liters or 55 US gallons):

- involving different container types (therefore different volume capacities)
- for daytime and nighttime situations
- for different wind speeds (low, moderate and high)

## PROTECTIVE ACTIONS

**Protective actions** are the steps taken to preserve the health and safety of emergency responders and the public during an incident involving releases of hazardous materials/dangerous goods.

Table 1 - Initial Isolation and Protective Action Distances (green-bordered pages) predicts the size of the area that could be affected by a cloud of toxic gas. People in this area should be evacuated and/or sheltered-in-place inside buildings.

**Isolate hazard area and deny entry** means to keep everybody away from the area if they are not directly involved in emergency response operations. Unprotected emergency responders should not be allowed to enter the isolation zone.

This "isolation" task is done to establish control over the area of operations. This is the first step for any protective actions that may follow.

**Evacuate** means to move all people from a threatened area to a safer place. To perform an evacuation, there must be enough time for people to be warned, get ready, and leave an area. If there is enough time, evacuation is the best protective action.

Begin evacuating people nearby and those who are outdoors in direct view of the scene. When additional help arrives, expand the area to be evacuated downwind and crosswind to at least the extent recommended in this guidebook.

Even after people move to the distances recommended, they may not be completely safe from harm. They should not be permitted to gather at such distances. Send evacuees to a definite place, by a specific route, far enough away so they will not have to be moved again if the wind shifts.

**Shelter-in-place** means people should seek shelter inside a building and remain inside until the danger passes. **It is vital for first responders to maintain communications with sheltered-in-place people** so that they are advised about changing conditions.

Sheltering-in-place is used either when:

- evacuating the public would cause greater risk than staying where they are
- an evacuation cannot be performed

Direct the people inside to:

- close all doors and windows
- shut off all ventilating, heating and cooling systems
- stay far from windows to avoid shattered glass and projectile metal fragments in the event of a fire and/or explosion
- tune in to local radio or TV stations, and stay inside until told it is safe to leave by first responders

Shelter-in-place may not be the best option if:

- the vapors are flammable

- it will take a long time for the gas to clear the area
- buildings cannot be closed tightly

Vehicles can offer some protection for a short period if the windows are closed and the ventilation systems are shut off. Vehicles are not as effective as buildings for in-place protection.

**NOTE:** Every hazardous materials/dangerous goods incident is different. Each will have special problems and concerns. Actions to protect the public must be carefully selected. These pages can help with **initial** decisions on how to protect the public. Officials must continue to gather information and monitor the situation until the threat is removed.

## **PROTECTIVE ACTION DECISION FACTORS TO CONSIDER**

The choice of protective actions for a given situation depends on a number of factors. For some cases, evacuation may be the best option; in others, sheltering-in-place may be the best course. Sometimes, these two actions may be used in combination. In any emergency, officials need to quickly give the public instructions. The public will need continuing information and instructions while being evacuated or sheltered-in-place.

Proper evaluation of the factors listed below will determine the effectiveness of evacuation or in-place protection (shelter-in-place). The importance of these factors can vary with emergency conditions. In specific emergencies, other factors may need to be identified and considered as well. This list indicates what kind of information may be needed to make the initial decision.

### **The hazardous materials/dangerous goods:**

- degree of health hazard
- chemical and physical properties
- amount involved
- containment/control of release
- rate of vapor movement

### **The population threatened:**

- location
- number of people
- time available to evacuate or shelter-in-place
- ability to control evacuation or shelter-in-place
- building types and availability
- special institutions or populations, e.g., nursing homes, hospitals, prisons

### **The weather conditions:**

- effect on vapor and cloud movement
- potential for change
- effect on evacuation or shelter-in-place

## **BACKGROUND ON TABLE 1 – INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

Initial isolation and protective action distances in this guidebook were determined for small and large spills occurring during day or night. The overall analysis, statistical in nature, was conducted using:

- state-of-the-art emission rate and dispersion models
- statistical release data from the U.S. Department of Transportation (DOT) Hazardous Materials Information System (HMIS) database
- meteorological observations from more than 120 locations in the United States, Canada, and Mexico
- the most current toxicological exposure guidelines

For each chemical, thousands of hypothetical releases were modeled to account for the statistical variance in both release amount and atmospheric conditions. Based on this statistical sample, they selected the 90th percentile protective action distance for each chemical and category to appear in the table. A brief description of the analysis is provided below.

A detailed report outlining the methodology and data used to generate the initial isolation and protective action distances may be obtained from the U.S. DOT, Pipeline and Hazardous Materials Safety Administration (PHMSA).

### **DESCRIPTION OF THE ANALYSIS**

**Release amounts and emission rates** into the atmosphere were statistically modeled based on:

- data from the U.S. DOT HMIS database
- container types and sizes authorized for transport as specified in 49 CFR §172.101 and Part 173
- physical properties of the individual materials
- atmospheric data from a historical database

For liquefied gases, which can flash to form both a vapor/aerosol mixture and an evaporating pool, the emission model calculated one or both of:

- the release of vapor due to evaporation of pools on the ground
- direct release of vapors from the container

The emission model also calculated the emission of toxic vapor by-products generated from spilling water-reactive materials in water.

**Small spills** involve 208 liters (55 US gallons) or less.

**Large spills** involve greater quantities.

The exceptions are the entries at the beginning of Table 1 marked **(when used as a weapon)**. The volumes used for these calculations varies, but in most cases:

- Small spills include releases up to 2 kg (4.4 lbs.).
- Large spills include releases up to 25 kg (55 lbs.).

**Downwind dispersion** of the vapor was estimated for each case modeled. Using a database containing hourly meteorological data from 120 American, Canadian, and Mexican cities, the atmospheric parameters affecting the dispersion and the emission rate were selected.

The dispersion calculation accounted for both the:

- time-dependent emission rate from the source
- density of the vapor plume (i.e., heavy gas effects)

Since atmospheric mixing is less effective at dispersing vapor plumes during nighttime, day and night were separated in the analysis.

In the table:

- **day** refers to time periods after sunrise and before sunset
- **night** includes all hours between sunset and sunrise

**Toxicological short-term exposure guidelines** for the materials were applied to determine the downwind distance to which people may:

- become incapacitated and unable to take protective action
- incur serious health effects after a single, or rare, exposure

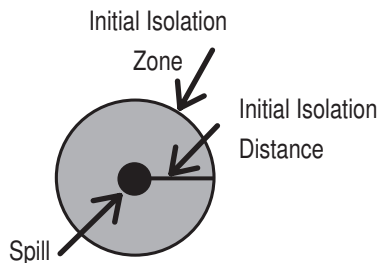
When available, toxicological exposure guidelines were chosen from AEGL-2 or ERPG-2 emergency response guidelines. AEGL-2 values were the first choice.

For materials without AEGL-2 or ERPG-2 values, emergency response guidelines were estimated based on lethal concentration limits derived from animal-based-studies. This approach was recommended by an independent panel of toxicological experts from industry and academia.

## HOW TO USE TABLE 1 – INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

- (1) The responder should already have:
  - identified the material by its ID number and name (if you cannot find an ID number, use the Name of Material index in the blue-bordered pages to find that number);
  - confirmed that the material is highlighted in green in the yellow or blue-bordered pages. If not, Table 1 doesn't apply;
  - found the three-digit guide for the material, in order to consult emergency actions it recommends along with this table; and
  - **noted the wind direction**
- (2) Look in Table 1 (green-bordered pages) for the ID number and name of the material involved. Some ID numbers have more than one shipping name listed. Look for the specific name of the material. If you do not know the shipping name and Table 1 lists more than one name for the same ID number, use the entry with the largest distances.
- (3) Determine if the incident involves a SMALL or LARGE spill and if it is DAY or NIGHT. A SMALL SPILL consists of a release of 208 liters (55 US gallons) or less. This generally corresponds to a spill from a single small package (for example, a drum), a small cylinder, or a small leak from a large package. A LARGE SPILL consists of a release of more than 208 liters (55 US gallons). This usually involves a spill from a large package, or multiple spills from many small packages. DAY is any time after sunrise and before sunset. NIGHT is any time between sunset and sunrise.

- (4) Look up the INITIAL ISOLATION DISTANCE. This distance defines the radius of a zone (initial isolation zone) surrounding the spill in ALL DIRECTIONS. In this zone, protective clothing and respiratory protection is required. Evacuate the general public in a direction perpendicular to wind direction (crosswind) and away from the spill.



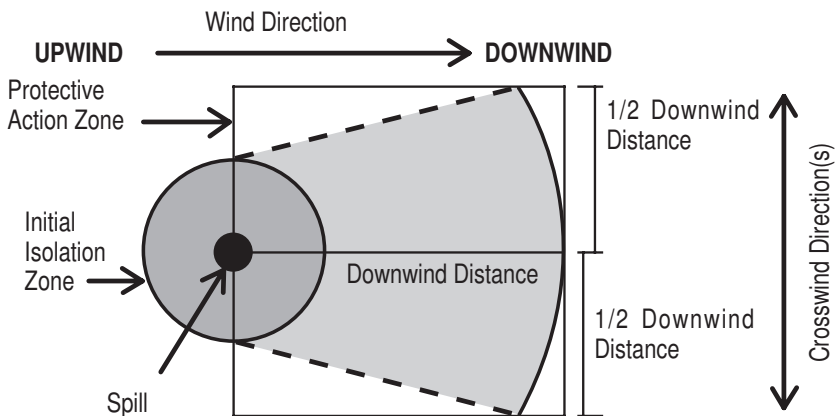
- (5) Look up the PROTECTIVE ACTION DISTANCE. For a given material, spill size, and whether day or night, Table 1 gives the downwind distance—in kilometers and miles—from the spill or leak source, for which you should consider protective actions. For practical purposes, the protective action zone (i.e., the area in which people are at risk of harmful exposure) is a square. Its length and width are the same as the downwind distance shown in Table 1. Protective actions are the



steps you take to preserve the health and safety of emergency responders and the public. People in this area should be evacuated and/or sheltered-in-place. Consult pages 289-291.

- (6) Initiate protective actions beginning with those closest to the spill site and working away in a downwind direction. When a water-reactive TIH (PIH in the US) producing material is spilled into a river or stream, the source of the toxic gas may move with the current or stretch from the spill point downstream for a large distance.

In the figure below, the spill is located at the center of the small black circle. The larger circle represents the initial isolation zone around the spill. The square (the protective action zone) is the area in which you should take protective actions.



**Note 1:** For factors that may change the protective action distances, see "Introduction to Green Tables" (page 286).

**Note 2:** When a product in Table 1 has the mention (when spilled in water), you can refer to Table 2 for the list of gases produced when these materials are spilled in water. The TIH gases indicated in Table 2 are for information purposes only.

For more information on the material, safety precautions and mitigation procedures, call the emergency response telephone number listed on the shipping paper or the appropriate response agency as soon as possible.

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | Guide | NAME OF MATERIAL                    | SMALL SPILLS<br>(From a small package or small leak from a large package) |                    |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |                    |   |                             |
|--------|-------|-------------------------------------|---|--------------------|---|-----------------------------|--|--------------------|---|-----------------------------|
|        |       |                                     | First ISOLATE<br>in all Directions  |                    | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions                                 |                    | Then PROTECT<br>persons Downwind during |                             |
|        |       |                                     | Meters (Feet)   | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) | Meters (Feet)  | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| —      | 117   | AC (when used as a weapon)          | 60 m (200 ft)   | 0.3 km (0.2 mi)    | 1.0 km (0.6 mi)                         | 1000 m (3000 ft)            | 3.7 km (2.3 mi)  | 8.4 km (5.3 mi)    |   |                             |
| —      | 154   | Adamsite<br>(when used as a weapon) | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 60 m (200 ft)               | 0.3 km (0.2 mi)  | 1.4 km (0.9 mi)    |   |                             |
| —      | 153   | Buzz<br>(when used as a weapon)     | 60 m (200 ft)   | 0.4 km (0.2 mi)    | 1.7 km (1.1 mi)                         | 400 m (1250 ft)             | 2.2 km (1.4 mi)  | 8.1 km (5.0 mi)    |   |                             |
| —      | 153   | BZ (when used as a weapon)          | 60 m (200 ft)   | 0.4 km (0.2 mi)    | 1.7 km (1.1 mi)                         | 400 m (1250 ft)             | 2.2 km (1.4 mi)  | 8.1 km (5.0 mi)    |   |                             |
| —      | 159   | CA (when used as a weapon)          | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.3 mi)                         | 100 m (300 ft)              | 0.5 km (0.4 mi)  | 2.6 km (1.6 mi)    |   |                             |
| —      | 125   | CG (when used as a weapon)          | 150 m (500 ft)  | 0.8 km (0.5 mi)    | 3.2 km (2.0 mi)                         | 1000 m (3000 ft)            | 7.5 km (4.7 mi)  | 11.0+ km (7.0+ mi) |   |                             |
| —      | 125   | CK (when used as a weapon)          | 30 m (100 ft)   | 0.2 km (0.2 mi)    | 1.4 km (0.9 mi)                         | 300 m (1000 ft)             | 1.4 km (0.9 mi)  | 6.1 km (3.8 mi)    |   |                             |
| —      | 153   | CN (when used as a weapon)          | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 60 m (200 ft)               | 0.3 km (0.2 mi)  | 1.2 km (0.8 mi)    |   |                             |
| —      | 153   | CS (when used as a weapon)          | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.6 km (0.4 mi)                         | 100 m (300 ft)              | 0.4 km (0.3 mi)  | 1.9 km (1.2 mi)    |   |                             |
| —      | 154   | CX (when used as a weapon)          | 60 m (200 ft)   | 0.2 km (0.2 mi)    | 1.1 km (0.7 mi)                         | 200 m (600 ft)              | 1.2 km (0.7 mi)  | 5.1 km (3.2 mi)    |   |                             |
| —      | 151   | DA (when used as a weapon)          | 30 m (100 ft)   | 0.2 km (0.1 mi)    | 0.8 km (0.5 mi)                         | 300 m (1000 ft)             | 1.9 km (1.2 mi)  | 7.5 km (4.7 mi)    |   |                             |
| —      | 153   | DC (when used as a weapon)          | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.6 km (0.4 mi)                         | 60 m (200 ft)               | 0.4 km (0.3 mi)  | 1.8 km (1.1 mi)    |   |                             |
| —      | 154   | DM (when used as a weapon)          | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 60 m (200 ft)               | 0.3 km (0.2 mi)  | 1.4 km (0.9 mi)    |   |                             |
| —      | 125   | DP (when used as a weapon)          | 30 m (100 ft)   | 0.2 km (0.1 mi)    | 0.7 km (0.4 mi)                         | 200 m (600 ft)              | 1.0 km (0.7 mi)  | 2.4 km (1.5 mi)    |   |                             |
| —      | 151   | ED (when used as a weapon)          | 150 m (500 ft)  | 0.9 km (0.6 mi)    | 2.1 km (1.3 mi)                         | 1000 m (3000 ft)            | 5.9 km (3.7 mi)  | 8.3 km (5.2 mi)    |   |                             |
| —      | 153   | GA (when used as a weapon)          | 30 m (100 ft)   | 0.2 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 100 m (300 ft)              | 0.5 km (0.4 mi)  | 0.6 km (0.4 mi)    |   |                             |

|   |     |  |                 |                 |                 |                  |                    |                    |
|---|-----|--|-----------------|-----------------|-----------------|------------------|--------------------|--------------------|
| — | 153 | GB (when used as a weapon)               | 60 m (200 ft)   | 0.4 km (0.3 mi) | 1.1 km (0.7 mi) | 400 m (1250 ft)  | 2.1 km (1.3 mi)    | 4.9 km (3.0 mi)    |
| — | 153 | GD (when used as a weapon)               | 60 m (200 ft)   | 0.4 km (0.3 mi) | 0.7 km (0.5 mi) | 300 m (1000 ft)  | 1.8 km (1.1 mi)    | 2.7 km (1.7 mi)    |
| — | 153 | GF (when used as a weapon)               | 30 m (100 ft)   | 0.2 km (0.2 mi) | 0.3 km (0.2 mi) | 150 m (500 ft)   | 0.8 km (0.5 mi)    | 1.0 km (0.6 mi)    |
| — | 153 | H (when used as a weapon)                | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 60 m (200 ft)    | 0.3 km (0.2 mi)    | 0.4 km (0.3 mi)    |
| — | 153 | HD (when used as a weapon)               | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 60 m (200 ft)    | 0.3 km (0.2 mi)    | 0.4 km (0.3 mi)    |
| — | 153 | HL (when used as a weapon)               | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 100 m (300 ft)   | 0.5 km (0.3 mi)    | 1.0 km (0.6 mi)    |
| — | 153 | HN-1 (when used as a weapon)             | 60 m (200 ft)   | 0.3 km (0.2 mi) | 0.5 km (0.3 mi) | 200 m (600 ft)   | 1.1 km (0.7 mi)    | 1.8 km (1.1 mi)    |
| — | 153 | HN-2 (when used as a weapon)             | 60 m (200 ft)   | 0.3 km (0.2 mi) | 0.6 km (0.4 mi) | 300 m (1000 ft)  | 1.3 km (0.8 mi)    | 2.1 km (1.3 mi)    |
| — | 153 | HN-3 (when used as a weapon)             | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 60 m (200 ft)    | 0.3 km (0.2 mi)    | 0.3 km (0.2 mi)    |
| — | 153 | L (Lewisite) (when used as a weapon)     | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 100 m (300 ft)   | 0.5 km (0.3 mi)    | 1.0 km (0.6 mi)    |
| — | 153 | Lewisite (when used as a weapon)         | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 100 m (300 ft)   | 0.5 km (0.3 mi)    | 1.0 km (0.6 mi)    |
| — | 152 | MD (when used as a weapon)               | 300 m (1000 ft) | 1.6 km (1.0 mi) | 4.3 km (2.7 mi) | 1000 m (3000 ft) | 11.0+ km (7.0+ mi) | 11.0+ km (7.0+ mi) |
| — | 153 | Mustard (when used as a weapon)          | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 60 m (200 ft)    | 0.3 km (0.2 mi)    | 0.4 km (0.3 mi)    |
| — | 153 | Mustard Lewisite (when used as a weapon) | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 100 m (300 ft)   | 0.5 km (0.3 mi)    | 1.0 km (0.6 mi)    |
| — | 152 | PD (when used as a weapon)               | 60 m (200 ft)   | 0.4 km (0.3 mi) | 0.4 km (0.3 mi) | 300 m (1000 ft)  | 1.6 km (1.0 mi)    | 1.6 km (1.0 mi)    |
| — | 119 | SA (when used as a weapon)               | 300 m (1000 ft) | 1.9 km (1.2 mi) | 5.7 km (3.6 mi) | 1000 m (3000 ft) | 8.9 km (5.6 mi)    | 11.0+ km (7.0+ mi) |
| — | 153 | Sarin (when used as a weapon)            | 60 m (200 ft)   | 0.4 km (0.3 mi) | 1.1 km (0.7 mi) | 400 m (1250 ft)  | 2.1 km (1.3 mi)    | 4.9 km (3.0 mi)    |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | Guide | NAME OF MATERIAL                        | SMALL SPILLS<br>(From a small package or small leak from a large package) |                    |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |                    |   |                             |
|--------|-------|---|---|--------------------|---|-----------------------------|--|--------------------|---|-----------------------------|
|        |       |   | First ISOLATE<br>in all Directions  |                    | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions                                 |                    | Then PROTECT<br>persons Downwind during |                             |
|        |       |   | Meters (Feet)   | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) | Meters (Feet)  | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| —      | 153   | Soman<br>(when used as a weapon)        | 60 m (200 ft)   | 0.4 km (0.3 mi)    | 0.7 km (0.5 mi)                         | 300 m (1000 ft)             | 1.8 km (1.1 mi)  | 2.7 km (1.7 mi)    |   |                             |
| —      | 153   | Tabun<br>(when used as a weapon)        | 30 m (100 ft)   | 0.2 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 100 m (300 ft)              | 0.5 km (0.4 mi)  | 0.6 km (0.4 mi)    |   |                             |
| —      | 153   | Thickened GD<br>(when used as a weapon) | 60 m (200 ft)   | 0.4 km (0.3 mi)    | 0.7 km (0.5 mi)                         | 300 m (1000 ft)             | 1.8 km (1.1 mi)  | 2.7 km (1.7 mi)    |   |                             |
| —      | 153   | VX (when used as a weapon)              | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 60 m (200 ft)               | 0.4 km (0.2 mi)  | 0.3 km (0.2 mi)    |   |                             |
| 1005   | 125   | Ammonia, anhydrous                      | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         |                             | <b>Refer to table 3</b>  |                    |   |                             |
| 1005   | 125   | Anhydrous ammonia                       | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         |                             | <b>Refer to table 3</b>  |                    |   |                             |
| 1008   | 125   | Boron trifluoride                       | 30 m (100 ft)   | 0.2 km (0.1 mi)    | 0.7 km (0.5 mi)                         | 400 m (1250 ft)             | 2.3 km (1.4 mi)  | 5.1 km (3.2 mi)    |   |                             |
| 1008   | 125   | Boron trifluoride, compressed           | 30 m (100 ft)   | 0.2 km (0.1 mi)    | 0.7 km (0.5 mi)                         | 400 m (1250 ft)             | 2.3 km (1.4 mi)  | 5.1 km (3.2 mi)    |   |                             |
| 1016   | 119   | Carbon monoxide                         | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 200 m (600 ft)              | 1.2 km (0.7 mi)  | 4.3 km (2.7 mi)    |   |                             |
| 1016   | 119   | Carbon monoxide, compressed             | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 200 m (600 ft)              | 1.2 km (0.7 mi)  | 4.3 km (2.7 mi)    |   |                             |
| 1017   | 124   | Chlorine                                | 60 m (200 ft)   | 0.3 km (0.2 mi)    | 1.4 km (0.9 mi)                         |                             | <b>Refer to table 3</b>  |                    |   |                             |
| 1026   | 119   | Cyanogen                                | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.3 mi)                         | 60 m (200 ft)               | 0.3 km (0.2 mi)  | 1.1 km (0.7 mi)    |   |                             |
| 1040   | 119P  | Ethylene oxide                          | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.2 mi)                         |                             | <b>Refer to table 3</b>  |                    |   |                             |
| 1040   | 119P  | Ethylene oxide with Nitrogen            | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.2 mi)                         |                             | <b>Refer to table 3</b>  |                    |   |                             |
| 1045   | 124   | Fluorine                                | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 100 m (300 ft)              | 0.5 km (0.3 mi)  | 2.3 km (1.4 mi)    |   |                             |
| 1045   | 124   | Fluorine, compressed                    | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 100 m (300 ft)              | 0.5 km (0.3 mi)  | 2.3 km (1.4 mi)    |   |                             |
| 1048   | 125   | Hydrogen bromide, anhydrous             | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.2 mi)                         | 150 m (500 ft)              | 1.0 km (0.6 mi)  | 3.4 km (2.1 mi)    |   |                             |
| 1050   | 125   | Hydrogen chloride, anhydrous            | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         |                             | <b>Refer to table 3</b>  |                    |   |                             |

|      |      |   |                |                 |                 |                 |                         |                  |
|------|------|---|----------------|-----------------|-----------------|-----------------|-------------------------|------------------|
| 1051 | 117P | Hydrogen cyanide, anhydrous, stabilized | 60 m (200 ft)  | 0.2 km (0.1 mi) | 0.6 km (0.4 mi) | 200 m (600 ft)  | 0.7 km (0.5 mi)         | 1.7 km (1.1 mi)  |
| 1051 | 117P | Hydrogen cyanide, stabilized            | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.5 km (0.3 mi) |                 | <b>Refer to table 3</b> |                  |
| 1052 | 125  | Hydrogen fluoride, anhydrous            | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.5 km (0.3 mi) | 400 m (1250 ft) | 2.2 km (1.4 mi)         | 6.3 km (3.9 mi)  |
| 1053 | 117  | Hydrogen sulfide                        | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.5 km (0.3 mi) | 200 m (600 ft)  | 0.7 km (0.4 mi)         | 2.1 km (1.3 mi)  |
| 1053 | 117  | Hydrogen sulphide                       | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.5 km (0.3 mi) | 150 m (500 ft)  | 0.3 km (0.2 mi)         | 0.8 km (0.5 mi)  |
| 1061 | 118  | Methylamine, anhydrous                  | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 200 m (600 ft)  | 1.3 km (0.8 mi)         | 4.1 km (2.6 mi)  |
| 1062 | 123  | Methyl bromide                          | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 150 m (500 ft)  | 0.3 km (0.2 mi)         | 0.8 km (0.5 mi)  |
| 1064 | 117  | Methyl mercaptan                        | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 200 m (600 ft)  | 1.3 km (0.8 mi)         | 4.1 km (2.6 mi)  |
| 1067 | 124  | Dinitrogen tetroxide                    | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.4 km (0.3 mi) | 400 m (1250 ft) | 1.4 km (0.9 mi)         | 3.3 km (2.1 mi)  |
| 1067 | 124  | Nitrogen dioxide                        | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.4 km (0.3 mi) | 400 m (1250 ft) | 1.4 km (0.9 mi)         | 3.3 km (2.1 mi)  |
| 1069 | 125  | Nitrosyl chloride                       | 30 m (100 ft)  | 0.2 km (0.2 mi) | 1.0 km (0.6 mi) | 800 m (2500 ft) | 4.3 km (2.7 mi)         | 10.8 km (6.7 mi) |
| 1076 | 125  | Phosgene                                | 100 m (300 ft) | 0.6 km (0.4 mi) | 2.4 km (1.5 mi) | 500 m (1500 ft) | 2.9 km (1.8 mi)         | 9.2 km (5.7 mi)  |
| 1079 | 125  | Sulfur dioxide                          | 100 m (300 ft) | 0.6 km (0.4 mi) | 2.5 km (1.6 mi) |                 | <b>Refer to table 3</b> |                  |
| 1079 | 125  | Sulphur dioxide                         | 100 m (300 ft) | 0.6 km (0.4 mi) | 2.5 km (1.6 mi) |                 | <b>Refer to table 3</b> |                  |
| 1082 | 119P | Refrigerant gas R-1113                  | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 60 m (200 ft)   | 0.4 km (0.2 mi)         | 0.8 km (0.5 mi)  |
| 1082 | 119P | Trifluorochloroethylene, stabilized     | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 60 m (200 ft)   | 0.4 km (0.2 mi)         | 0.8 km (0.5 mi)  |
| 1092 | 131P | Acrolein, stabilized                    | 100 m (300 ft) | 1.2 km (0.8 mi) | 3.3 km (2.1 mi) | 500 m (1500 ft) | 6.1 km (3.8 mi)         | 10.8 km (6.7 mi) |
| 1093 | 131P | Acrylonitrile, stabilized               | 30 m (100 ft)  | 0.2 km (0.2 mi) | 0.6 km (0.4 mi) | 100 m (300 ft)  | 1.2 km (0.8 mi)         | 2.3 km (1.4 mi)  |
| 1098 | 131  | Allyl alcohol                           | 30 m (100 ft)  | 0.2 km (0.1 mi) | 0.3 km (0.2 mi) | 60 m (200 ft)   | 0.7 km (0.5 mi)         | 1.2 km (0.8 mi)  |
| 1135 | 131  | Ethylene chlorohydrin                   | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)   | 0.1 km (0.1 mi)         | 0.1 km (0.1 mi)  |
| 1143 | 131P | Crotonaldehyde                          | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 60 m (200 ft)   | 0.5 km (0.3 mi)         | 0.7 km (0.5 mi)  |
| 1143 | 131P | Crotonaldehyde, stabilized              | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 60 m (200 ft)   | 0.5 km (0.3 mi)         | 0.7 km (0.5 mi)  |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

|        |       | SMALL SPILLS<br>(From a small package or small leak from a large package) |                                    |                             | LARGE SPILLS<br>(From a large package or from many small packages) |                                    |                             |                    |
|--------|-------|---|------------------------------------|-----------------------------|--|------------------------------------|-----------------------------|--------------------|
| ID No. | Guide | NAME OF MATERIAL  | First ISOLATE                      | Then PROTECT                |  | First ISOLATE                      | Then PROTECT                |                    |
|        |       |   | Meters (Feet)<br>in all Directions | persons Downwind during DAY | NIGHT  | Meters (Feet)<br>in all Directions | persons Downwind during DAY | NIGHT              |
|        |       |   | Kilometers (Miles)                 | Kilometers (Miles)          | Kilometers (Miles)   | Meters (Feet)                      | Kilometers (Miles)          | Kilometers (Miles) |
| 1162   | 155   | Dimethyldichlorosilane<br>(when spilled in water)                         | 30 m (100 ft)                      | 0.1 km (0.1 mi)             | 0.2 km (0.2 mi)  | 60 m (200 ft)                      | 0.6 km (0.4 mi)             | 1.8 km (1.1 mi)    |
| 1163   | 131   | Dimethylhydrazine,<br>unsymmetrical                                       | 30 m (100 ft)                      | 0.2 km (0.1 mi)             | 0.5 km (0.3 mi)  | 100 m (300 ft)                     | 1.0 km (0.6 mi)             | 1.8 km (1.1 mi)    |
| 1182   | 155   | Ethyl chloroformate   | 30 m (100 ft)                      | 0.2 km (0.1 mi)             | 0.3 km (0.2 mi)  | 60 m (200 ft)                      | 0.6 km (0.4 mi)             | 0.9 km (0.6 mi)    |
| 1183   | 139   | Ethyldichlorosilane<br>(when spilled in water)                            | 30 m (100 ft)                      | 0.1 km (0.1 mi)             | 0.1 km (0.1 mi)  | 60 m (200 ft)                      | 0.6 km (0.4 mi)             | 2.0 km (1.3 mi)    |
| 1185   | 131P  | Ethyleneimine, stabilized   | 30 m (100 ft)                      | 0.2 km (0.1 mi)             | 0.5 km (0.3 mi)  | 200 m (600 ft)                     | 0.9 km (0.6 mi)             | 1.8 km (1.1 mi)    |
| 1196   | 155   | Ethyltrichlorosilane<br>(when spilled in water)                           | 30 m (100 ft)                      | 0.1 km (0.1 mi)             | 0.5 km (0.3 mi)  | 200 m (600 ft)                     | 2.1 km (1.3 mi)             | 5.8 km (3.6 mi)    |
| 1238   | 155   | Methyl chloroformate  | 30 m (100 ft)                      | 0.2 km (0.2 mi)             | 0.5 km (0.4 mi)  | 150 m (500 ft)                     | 1.1 km (0.7 mi)             | 2.1 km (1.3 mi)    |
| 1239   | 131   | Methyl chloromethyl ether   | 60 m (200 ft)                      | 0.5 km (0.3 mi)             | 1.5 km (0.9 mi)  | 300 m (1000 ft)                    | 3.1 km (2.0 mi)             | 5.8 km (3.6 mi)    |
| 1242   | 139   | Methyldichlorosilane<br>(when spilled in water)                           | 30 m (100 ft)                      | 0.1 km (0.1 mi)             | 0.1 km (0.1 mi)  | 60 m (200 ft)                      | 0.8 km (0.5 mi)             | 2.3 km (1.5 mi)    |
| 1244   | 131   | Methylhydrazine   | 30 m (100 ft)                      | 0.3 km (0.2 mi)             | 0.6 km (0.4 mi)  | 100 m (300 ft)                     | 1.4 km (0.9 mi)             | 2.1 km (1.3 mi)    |
| 1250   | 155   | Methyltrichlorosilane<br>(when spilled in water)                          | 30 m (100 ft)                      | 0.1 km (0.1 mi)             | 0.1 km (0.1 mi)  | 60 m (200 ft)                      | 0.8 km (0.5 mi)             | 2.5 km (1.6 mi)    |
| 1251   | 131P  | Methyl vinyl ketone, stabilized   | 100 m (300 ft)                     | 0.3 km (0.2 mi)             | 0.7 km (0.4 mi)  | 800 m (2500 ft)                    | 1.6 km (1.0 mi)             | 2.8 km (1.8 mi)    |
| 1259   | 131   | Nickel carbonyl   | 100 m (300 ft)                     | 1.3 km (0.8 mi)             | 5.0 km (3.1 mi)  | 1000 m (3000 ft)                   | 10.8 km (6.8 mi)            | 11.0+ km (7.0+ mi) |

|      |      |  |               |                 |                 |                 |                 |                 |                 |
|------|------|--|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1295 | 139  | Trichlorosilane<br>(when spilled in water)   | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 60 m (200 ft)   | 0.6 km (0.4 mi) | 2.1 km (1.3 mi) |
| 1298 | 155  | Trimethylchlorosilane<br>(when spilled in water)   | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 60 m (200 ft)   | 0.5 km (0.3 mi) | 1.4 km (0.9 mi) |
| 1305 | 155P | Vinyltrichlorosilane<br>(when spilled in water)  | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 60 m (200 ft)   | 0.6 km (0.4 mi) | 1.9 km (1.2 mi) |
| 1305 | 155P | Vinyltrichlorosilane, stabilized<br>(when spilled in water)                                      | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 60 m (200 ft)   | 0.6 km (0.4 mi) | 1.9 km (1.2 mi) |
| 1340 | 139  | Phosphorus pentasulfide,<br>free from yellow and<br>white Phosphorus                             | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 60 m (200 ft)   | 0.3 km (0.2 mi) | 1.4 km (0.9 mi) |
| 1340 | 139  | Phosphorus pentasulphide,<br>free from yellow and<br>white Phosphorus<br>(when spilled in water) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 60 m (200 ft)   | 0.3 km (0.2 mi) | 1.4 km (0.9 mi) |
| 1360 | 139  | Calcium phosphide<br>(when spilled in water)   | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.4 km (0.3 mi) | 0.4 km (0.3 mi) | 300 m (1000 ft) | 1.0 km (0.6 mi) | 3.5 km (2.2 mi) |
| 1380 | 135  | Pentaborane  | 60 m (200 ft) | 0.6 km (0.4 mi) | 1.9 km (1.2 mi) | 1.9 km (1.2 mi) | 200 m (600 ft)  | 2.7 km (1.7 mi) | 6.2 km (3.9 mi) |
| 1384 | 135  | Sodium dithionite<br>(when spilled in water)   | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.4 km (0.3 mi) | 0.4 km (0.3 mi) | 60 m (200 ft)   | 0.6 km (0.4 mi) | 2.5 km (1.6 mi) |
| 1384 | 135  | Sodium hydrosulfite<br>(when spilled in water)   | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.4 km (0.3 mi) | 0.4 km (0.3 mi) | 60 m (200 ft)   | 0.6 km (0.4 mi) | 2.5 km (1.6 mi) |
| 1384 | 135  | Sodium hydrosulphite<br>(when spilled in water)  | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.4 km (0.3 mi) | 0.4 km (0.3 mi) | 60 m (200 ft)   | 0.6 km (0.4 mi) | 2.5 km (1.6 mi) |
| 1390 | 139  | Alkali metal amides<br>(when spilled in water)   | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 0.3 km (0.2 mi) | 60 m (200 ft)   | 0.6 km (0.4 mi) | 2.2 km (1.4 mi) |
| 1397 | 139  | Aluminum phosphide<br>(when spilled in water)  | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.7 km (0.5 mi) | 0.7 km (0.5 mi) | 500 m (1500 ft) | 2.0 km (1.2 mi) | 6.5 km (4.0 mi) |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | Guide No. | NAME OF MATERIAL   | SMALL SPILLS<br>(From a small package or small leak from a large package) |                    |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |                    |   |                             |
|--------|-----------|--|---|--------------------|---|-----------------------------|--|--------------------|---|-----------------------------|
|        |           |  | First ISOLATE<br>in all Directions  |                    | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions                                 |                    | Then PROTECT<br>persons Downwind during |                             |
|        |           |  | Meters (Feet)   | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) | Meters (Feet)  | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| 1419   | 139       | Magnesium aluminum phosphide<br>(when spilled in water)    | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.6 km (0.4 mi)                         | 500 m (1500 ft)             | 1.8 km (1.1 mi)  | 5.8 km (3.6 mi)    |   |                             |
| 1432   | 139       | Sodium phosphide<br>(when spilled in water)                | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.2 mi)                         | 300 m (1000 ft)             | 1.3 km (0.8 mi)  | 3.8 km (2.4 mi)    |   |                             |
| 1510   | 143       | Tetranitromethane  | 30 m (100 ft)   | 0.2 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 30 m (100 ft)               | 0.4 km (0.3 mi)  | 0.7 km (0.4 mi)    |   |                             |
| 1541   | 155       | Acetone cyanohydrin, stabilized<br>(when spilled in water) | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 60 m (200 ft)               | 0.2 km (0.2 mi)  | 0.8 km (0.5 mi)    |   |                             |
| 1556   | 152       | Methyldichloroarsine                                       | 100 m (300 ft)  | 1.4 km (0.9 mi)    | 2.1 km (1.3 mi)                         | 300 m (1000 ft)             | 3.8 km (2.4 mi)  | 5.2 km (3.3 mi)    |   |                             |
| 1560   | 157       | Arsenic chloride   | 30 m (100 ft)   | 0.2 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 100 m (300 ft)              | 1.0 km (0.6 mi)  | 1.5 km (1.0 mi)    |   |                             |
| 1560   | 157       | Arsenic trichloride  | 30 m (100 ft)   | 0.4 km (0.3 mi)    | 1.2 km (0.7 mi)                         | 150 m (500 ft)              | 1.6 km (1.0 mi)  | 3.2 km (2.0 mi)    |   |                             |
| 1569   | 131       | Bromoacetone   | 60 m (200 ft)   | 0.5 km (0.3 mi)    | 1.2 km (0.8 mi)                         | 200 m (600 ft)              | 2.2 km (1.4 mi)  | 3.6 km (2.3 mi)    |   |                             |
| 1580   | 154       | Chloropicrin   | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.6 km (0.4 mi)                         | 300 m (1000 ft)             | 2.1 km (1.3 mi)  | 5.9 km (3.7 mi)    |   |                             |
| 1581   | 123       | Chloropicrin and Methyl bromide mixture                    | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.3 mi)                         | 60 m (200 ft)               | 0.4 km (0.2 mi)  | 1.7 km (1.1 mi)    |   |                             |
| 1581   | 123       | Methyl bromide and Chloropicrin mixture                    | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.3 mi)                         | 60 m (200 ft)               | 0.4 km (0.2 mi)  | 1.7 km (1.1 mi)    |   |                             |
| 1582   | 119       | Chloropicrin and Methyl chloride mixture                   | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.3 mi)                         | 60 m (200 ft)               | 0.4 km (0.2 mi)  | 1.7 km (1.1 mi)    |   |                             |
| 1582   | 119       | Methyl chloride and Chloropicrin mixture                   | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.3 mi)                         | 60 m (200 ft)               | 0.4 km (0.2 mi)  | 1.7 km (1.1 mi)    |   |                             |
| 1583   | 154       | Chloropicrin mixture, n.o.s.                               | 60 m (200 ft)   | 0.5 km (0.3 mi)    | 1.2 km (0.8 mi)                         | 200 m (600 ft)              | 2.2 km (1.4 mi)  | 3.6 km (2.3 mi)    |   |                             |



|      |     |   |                 |                 |                 |                  |                 |                    |
|------|-----|---|-----------------|-----------------|-----------------|------------------|-----------------|--------------------|
| 1589 | 125 | Cyanogen chloride, stabilized   | 300 m (1000 ft) | 1.8 km (1.2 mi) | 6.4 km (4.0 mi) | 1000 m (3000 ft) | 9.7 km (6.0 mi) | 11.0+ km (7.0+ mi) |
| 1595 | 156 | Dimethyl sulfate  | 30 m (100 ft)   | 0.2 km (0.1 mi) | 0.2 km (0.1 mi) | 60 m (200 ft)    | 0.5 km (0.3 mi) | 0.6 km (0.4 mi)    |
| 1595 | 156 | Dimethyl sulphate   | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)    | 0.1 km (0.1 mi) | 0.2 km (0.1 mi)    |
| 1605 | 154 | Ethylene dibromide  | 100 m (300 ft)  | 0.8 km (0.5 mi) | 2.7 km (1.7 mi) | 400 m (1250 ft)  | 3.5 km (2.2 mi) | 8.1 km (5.1 mi)    |
| 1612 | 123 | Compressed gas and hexaethyl tetraphosphate mixture                         |                 |                 |                 |                  |                 |                    |
| 1612 | 123 | Hexaethyl tetraphosphate and compressed gas mixture                         |                 |                 |                 |                  |                 |                    |
| 1613 | 154 | Hydrocyanic acid, aqueous solution, with not more than 20% Hydrogen cyanide | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 100 m (300 ft)   | 0.5 km (0.3 mi) | 1.1 km (0.7 mi)    |
| 1613 | 154 | Hydrogen cyanide, aqueous solution, with not more than 20% Hydrogen cyanide | 60 m (200 ft)   | 0.2 km (0.1 mi) | 0.6 km (0.4 mi) | 150 m (500 ft)   | 0.5 km (0.3 mi) | 1.5 km (0.9 mi)    |
| 1647 | 151 | Ethylene dibromide and Methyl bromide mixture, liquid                       | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 150 m (500 ft)   | 0.3 km (0.2 mi) | 0.8 km (0.5 mi)    |
| 1647 | 151 | Methyl bromide and Ethylene dibromide mixture, liquid                       | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.6 km (0.4 mi) | 100 m (300 ft)   | 0.6 km (0.4 mi) | 2.2 km (1.4 mi)    |
| 1660 | 124 | Nitric oxide  | 30 m (100 ft)   | 0.2 km (0.2 mi) | 0.4 km (0.2 mi) | 100 m (300 ft)   | 0.8 km (0.5 mi) | 1.2 km (0.8 mi)    |
| 1660 | 124 | Nitric oxide, compressed  | 30 m (100 ft)   | 0.2 km (0.1 mi) | 0.2 km (0.1 mi) | 60 m (200 ft)    | 0.5 km (0.3 mi) | 0.7 km (0.4 mi)    |
| 1670 | 157 | Perchloromethyl mercaptan   | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 60 m (200 ft)    | 0.2 km (0.2 mi) | 1.0 km (0.6 mi)    |
| 1672 | 151 | Phenylcarbamylamine chloride  | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 100 m (300 ft)   | 0.3 km (0.2 mi) | 1.2 km (0.7 mi)    |
| 1680 | 157 | Potassium cyanide, solid (when spilled in water)                            |                 |                 |                 |                  |                 |                    |
| 1689 | 157 | Sodium cyanide, solid (when spilled in water)                               |                 |                 |                 |                  |                 |                    |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | Guide | NAME OF MATERIAL  | SMALL SPILLS<br>(From a small package or small leak from a large package) |                    |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |                    |   |                             |
|--------|-------|---|---|--------------------|---|-----------------------------|--|--------------------|---|-----------------------------|
|        |       |   | First ISOLATE<br>in all Directions  |                    | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions                                 |                    | Then PROTECT<br>persons Downwind during |                             |
|        |       |   | Meters (Feet)   | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) | Meters (Feet)  | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| 1695   | 131   | Chloroacetone, stabilized                                   | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 0.2 km (0.1 mi)             | 60 m (200 ft)  | 0.4 km (0.3 mi)    | 0.6 km (0.4 mi)                         |                             |
| 1716   | 156   | Acetyl bromide<br>(when spilled in water)                   | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 30 m (100 ft)  | 0.3 km (0.2 mi)    | 0.9 km (0.6 mi)                         |                             |
| 1717   | 155   | Acetyl chloride<br>(when spilled in water)                  | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 100 m (300 ft)   | 0.9 km (0.6 mi)    | 2.6 km (1.6 mi)                         |                             |
| 1722   | 155   | Allyl chloroacetate   | 100 m (300 ft)  | 0.3 km (0.2 mi)    | 0.8 km (0.5 mi)                         |                             | 400 m (1250 ft)  | 1.4 km (0.9 mi)    | 2.4 km (1.5 mi)                         |                             |
| 1722   | 155   | Allyl chloroformate   |   |                    |   |                             |  |                    |   |                             |
| 1724   | 155   | Allyltrichlorosilane, stabilized<br>(when spilled in water) | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 60 m (200 ft)  | 0.5 km (0.3 mi)    | 1.7 km (1.1 mi)                         |                             |
| 1725   | 137   | Aluminum bromide, anhydrous<br>(when spilled in water)      | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 30 m (100 ft)  | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         |                             |
| 1726   | 137   | Aluminum chloride, anhydrous<br>(when spilled in water)     | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 0.2 km (0.1 mi)             | 60 m (200 ft)  | 0.5 km (0.3 mi)    | 2.0 km (1.2 mi)                         |                             |
| 1728   | 155   | Amyltrichlorosilane<br>(when spilled in water)              | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 60 m (200 ft)  | 0.5 km (0.3 mi)    | 1.7 km (1.0 mi)                         |                             |
| 1732   | 157   | Antimony pentafluoride<br>(when spilled in water)           | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 0.3 km (0.2 mi)             | 100 m (300 ft)   | 1.1 km (0.7 mi)    | 3.9 km (2.4 mi)                         |                             |
| 1741   | 125   | Boron trichloride<br>(when spilled on land)                 | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 0.3 km (0.2 mi)             | 100 m (300 ft)   | 0.6 km (0.4 mi)    | 1.4 km (0.9 mi)                         |                             |
| 1741   | 125   | Boron trichloride<br>(when spilled in water)                | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 0.3 km (0.2 mi)             | 100 m (300 ft)   | 1.2 km (0.8 mi)    | 3.6 km (2.2 mi)                         |                             |

|      |     |  |                |                 |                 |                 |                 |                  |
|------|-----|--|----------------|-----------------|-----------------|-----------------|-----------------|------------------|
| 1744 | 154 | Bromine  | 60 m (200 ft)  | 0.8 km (0.5 mi) | 2.3 km (1.5 mi) | 300 m (1000 ft) | 3.8 km (2.4 mi) | 7.5 km (4.7 mi)  |
| 1744 | 154 | Bromine, solution  |                |                 |                 |                 |                 |                  |
| 1744 | 154 | Bromine, solution<br>(Inhalation Hazard Zone A)                                    | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) | 30 m (100 ft)   | 0.3 km (0.2 mi) | 0.5 km (0.3 mi)  |
| 1745 | 144 | Bromine pentafluoride<br>(when spilled on land)                                    | 100 m (300 ft) | 0.9 km (0.5 mi) | 2.5 km (1.6 mi) | 400 m (1250 ft) | 5.4 km (3.3 mi) | 10.7 km (6.6 mi) |
| 1745 | 144 | Bromine pentafluoride<br>(when spilled in water)                                   | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 150 m (500 ft)  | 1.2 km (0.7 mi) | 4.0 km (2.5 mi)  |
| 1746 | 144 | Bromine trifluoride<br>(when spilled on land)                                      | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 30 m (100 ft)   | 0.3 km (0.2 mi) | 0.4 km (0.3 mi)  |
| 1746 | 144 | Bromine trifluoride<br>(when spilled in water)                                     | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 100 m (300 ft)  | 1.0 km (0.7 mi) | 3.7 km (2.3 mi)  |
| 1747 | 155 | Butyltrichlorosilane<br>(when spilled in water)                                    | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 60 m (200 ft)   | 0.5 km (0.3 mi) | 1.6 km (1.0 mi)  |
| 1749 | 124 | Chlorine trifluoride   | 60 m (200 ft)  | 0.3 km (0.2 mi) | 1.1 km (0.7 mi) | 200 m (600 ft)  | 1.4 km (0.9 mi) | 3.6 km (2.3 mi)  |
| 1752 | 156 | Chloroacetyl chloride<br>(when spilled on land)                                    | 30 m (100 ft)  | 0.3 km (0.2 mi) | 0.6 km (0.4 mi) | 100 m (300 ft)  | 1.1 km (0.7 mi) | 1.9 km (1.2 mi)  |
| 1752 | 156 | Chloroacetyl chloride<br>(when spilled in water)                                   | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)   | 0.2 km (0.1 mi) | 0.6 km (0.4 mi)  |
| 1753 | 156 | Chlorophenyltrichlorosilane<br>(when spilled in water)                             | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)   | 0.2 km (0.2 mi) | 0.8 km (0.5 mi)  |
| 1754 | 137 | Chlorosulfonic acid (with or<br>without sulfur trioxide)<br>(when spilled on land) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)   | 0.2 km (0.2 mi) | 0.3 km (0.2 mi)  |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | Guide | NAME OF MATERIAL  | SMALL SPILLS<br>(From a small package or small leak from a large package) |                    |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |                    |   |                             |
|--------|-------|---|---|--------------------|---|-----------------------------|--|--------------------|---|-----------------------------|
|        |       |   | First ISOLATE<br>in all Directions  |                    | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions                                 |                    | Then PROTECT<br>persons Downwind during |                             |
|        |       |   | Meters (Feet)   | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) | Meters (Feet)  | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| 1754   | 137   | Chlorosulfonic acid (with or without sulfur trioxide)<br><b>(when spilled in water)</b>   | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 60 m (200 ft)  | 0.7 km (0.4 mi)    | 2.3 km (1.4 mi)                         |                             |
| 1754   | 137   | Chlorosulphonic acid (with or without sulphur trioxide)<br><b>(when spilled on land)</b>  | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 30 m (100 ft)  | 0.2 km (0.2 mi)    | 0.3 km (0.2 mi)                         |                             |
| 1754   | 137   | Chlorosulphonic acid (with or without sulphur trioxide)<br><b>(when spilled in water)</b> | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 60 m (200 ft)  | 0.7 km (0.4 mi)    | 2.3 km (1.4 mi)                         |                             |
| 1758   | 137   | Chromium oxychloride<br><b>(when spilled in water)</b>                                    | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 30 m (100 ft)  | 0.1 km (0.1 mi)    | 0.5 km (0.3 mi)                         |                             |
| 1762   | 156   | Cyclohexenyltrichlorosilane<br><b>(when spilled in water)</b>                             | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 30 m (100 ft)  | 0.3 km (0.2 mi)    | 1.2 km (0.7 mi)                         |                             |
| 1763   | 156   | Cyclohexyltrichlorosilane<br><b>(when spilled in water)</b>                               | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 30 m (100 ft)  | 0.3 km (0.2 mi)    | 1.2 km (0.7 mi)                         |                             |
| 1765   | 156   | Dichloroacetyl chloride<br><b>(when spilled in water)</b>                                 | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 30 m (100 ft)  | 0.2 km (0.1 mi)    | 0.7 km (0.5 mi)                         |                             |
| 1766   | 156   | Dichlorophenyltrichlorosilane<br><b>(when spilled in water)</b>                           | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 60 m (200 ft)  | 0.5 km (0.4 mi)    | 2.0 km (1.2 mi)                         |                             |
| 1767   | 155   | Diethylchlorosilane<br><b>(when spilled in water)</b>                                     | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 30 m (100 ft)  | 0.3 km (0.2 mi)    | 0.9 km (0.5 mi)                         |                             |

|      |     |   |               |                 |                 |                 |                |                 |                 |
|------|-----|---|---------------|-----------------|-----------------|-----------------|----------------|-----------------|-----------------|
| 1769 | 156 | Diphenyldichlorosilane<br>(when spilled in water)   | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.3 km (0.2 mi) | 1.1 km (0.7 mi) |
| 1771 | 156 | Dodecyltrichlorosilane<br>(when spilled in water)   | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.4 km (0.3 mi) | 1.2 km (0.8 mi) |
| 1777 | 137 | Fluorosulfonic acid<br>(when spilled in water)      | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.2 km (0.1 mi) | 0.5 km (0.3 mi) |
| 1777 | 137 | Fluorosulphonic acid<br>(when spilled in water)     | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.2 km (0.1 mi) | 0.5 km (0.3 mi) |
| 1781 | 156 | Hexadecyltrichlorosilane<br>(when spilled in water) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.4 km (0.3 mi) |
| 1784 | 156 | Hexyltrichlorosilane<br>(when spilled in water)     | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.4 km (0.2 mi) | 1.3 km (0.8 mi) |
| 1799 | 156 | Nonyltrichlorosilane<br>(when spilled in water)     | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.4 km (0.3 mi) | 1.4 km (0.9 mi) |
| 1800 | 156 | Octadecyltrichlorosilane<br>(when spilled in water) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.4 km (0.3 mi) | 1.3 km (0.8 mi) |
| 1801 | 156 | Octyltrichlorosilane<br>(when spilled in water)     | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.4 km (0.3 mi) | 1.4 km (0.9 mi) |
| 1804 | 156 | Phenyltrichlorosilane<br>(when spilled in water)    | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.4 km (0.2 mi) | 1.3 km (0.8 mi) |
| 1806 | 137 | Phosphorus pentachloride<br>(when spilled in water) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.3 km (0.2 mi) | 1.3 km (0.8 mi) |
| 1808 | 137 | Phosphorus tribromide<br>(when spilled in water)    | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.4 km (0.3 mi) | 1.5 km (0.9 mi) |
| 1809 | 137 | Phosphorus trichloride<br>(when spilled on land)    | 30 m (100 ft) | 0.2 km (0.2 mi) | 0.6 km (0.4 mi) | 0.6 km (0.4 mi) | 100 m (300 ft) | 1.0 km (0.7 mi) | 2.1 km (1.3 mi) |
| 1809 | 137 | Phosphorus trichloride<br>(when spilled in water)   | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 60 m (200 ft)  | 0.7 km (0.4 mi) | 2.4 km (1.5 mi) |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

|               |              | <b>SMALL SPILLS</b><br>(From a small package or small leak from a large package) |   |  | <b>LARGE SPILLS</b><br>(From a large package or from many small packages) |   |  |                                    |
|---------------|--------------|--|---|--|---|---|--|------------------------------------|
| <b>ID No.</b> | <b>Guide</b> | <b>NAME OF MATERIAL</b>  | <b>First ISOLATE</b><br>in all Directions | <b>Then PROTECT</b><br>persons Downwind during |   | <b>First ISOLATE</b><br>in all Directions | <b>Then PROTECT</b><br>persons Downwind during |                                    |
|               |              |  | Meters (Feet)                             | <b>DAY</b><br>Kilometers (Miles)               | <b>NIGHT</b><br>Kilometers (Miles)  | Meters (Feet)                             | <b>DAY</b><br>Kilometers (Miles)               | <b>NIGHT</b><br>Kilometers (Miles) |
| 1810          | 137          | Phosphorus oxychloride<br>(when spilled on land)                                 | 30 m (100 ft)                             | 0.3 km (0.2 mi)                                | 0.6 km (0.4 mi)   | 100 m (300 ft)                            | 1.0 km (0.7 mi)                                | 1.9 km (1.2 mi)                    |
| 1810          | 137          | Phosphorus oxychloride<br>(when spilled in water)                                | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.1 km (0.1 mi)   | 60 m (200 ft)                             | 0.6 km (0.4 mi)                                | 2.1 km (1.3 mi)                    |
| 1815          | 132          | Propionyl chloride<br>(when spilled in water)                                    | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.1 km (0.1 mi)   | 30 m (100 ft)                             | 0.2 km (0.1 mi)                                | 0.5 km (0.3 mi)                    |
| 1816          | 155          | Propyltrichlorosilane<br>(when spilled in water)                                 | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.1 km (0.1 mi)   | 60 m (200 ft)                             | 0.5 km (0.3 mi)                                | 1.9 km (1.2 mi)                    |
| 1818          | 157          | Silicon tetrachloride<br>(when spilled in water)                                 | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.2 km (0.1 mi)   | 60 m (200 ft)                             | 0.8 km (0.5 mi)                                | 2.7 km (1.7 mi)                    |
| 1828          | 137          | Sulfur chlorides<br>(when spilled on land)                                       | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.1 km (0.1 mi)   | 60 m (200 ft)                             | 0.3 km (0.2 mi)                                | 0.4 km (0.3 mi)                    |
| 1828          | 137          | Sulfur chlorides<br>(when spilled in water)                                      | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.1 km (0.1 mi)   | 30 m (100 ft)                             | 0.3 km (0.2 mi)                                | 1.0 km (0.6 mi)                    |
| 1828          | 137          | Sulphur chlorides<br>(when spilled on land)                                      | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.1 km (0.1 mi)   | 60 m (200 ft)                             | 0.3 km (0.2 mi)                                | 0.4 km (0.3 mi)                    |
| 1828          | 137          | Sulphur chlorides<br>(when spilled in water)                                     | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.1 km (0.1 mi)   | 30 m (100 ft)                             | 0.3 km (0.2 mi)                                | 1.0 km (0.6 mi)                    |
| 1829          | 137          | Sulfur trioxide, stabilized  | 60 m (200 ft)                             | 0.4 km (0.2 mi)                                | 1.0 km (0.6 mi)   | 300 m (1000 ft)                           | 2.9 km (1.8 mi)                                | 6.3 km (4.0 mi)                    |
| 1831          | 137          | Sulfuric acid, fuming  | 60 m (200 ft)                             | 0.4 km (0.2 mi)                                | 1.0 km (0.6 mi)   | 300 m (1000 ft)                           | 2.9 km (1.8 mi)                                | 6.3 km (4.0 mi)                    |
| 1831          | 137          | Sulphuric acid, fuming   |   |  |   |   |  |                                    |

|      |     |   |                |                 |                 |                 |                 |                    |
|------|-----|---|----------------|-----------------|-----------------|-----------------|-----------------|--------------------|
| 1834 | 137 | Sulfuryl chloride<br>(when spilled on land)       | 30 m (100 ft)  | 0.2 km (0.1 mi) | 0.4 km (0.3 mi) | 60 m (200 ft)   | 0.8 km (0.5 mi) | 1.5 km (0.9 mi)    |
| 1834 | 137 | Sulfuryl chloride<br>(when spilled in water)      | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)   | 0.4 km (0.3 mi) | 1.6 km (1.0 mi)    |
| 1834 | 137 | Sulphuryl chloride<br>(when spilled on land)      | 30 m (100 ft)  | 0.2 km (0.1 mi) | 0.4 km (0.3 mi) | 60 m (200 ft)   | 0.8 km (0.5 mi) | 1.5 km (0.9 mi)    |
| 1834 | 137 | Sulphuryl chloride<br>(when spilled in water)     | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)   | 0.4 km (0.3 mi) | 1.6 km (1.0 mi)    |
| 1836 | 137 | Thionyl chloride<br>(when spilled on land)        | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) | 30 m (100 ft)   | 0.3 km (0.2 mi) | 0.5 km (0.3 mi)    |
| 1836 | 137 | Thionyl chloride<br>(when spilled in water)       | 100 m (300 ft) | 0.9 km (0.6 mi) | 2.9 km (1.8 mi) | 800 m (2500 ft) | 9.7 km (6.0 mi) | 11.0+ km (7.0+ mi) |
| 1838 | 137 | Titanium tetrachloride<br>(when spilled on land)  | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 30 m (100 ft)   | 0.3 km (0.2 mi) | 0.5 km (0.3 mi)    |
| 1838 | 137 | Titanium tetrachloride<br>(when spilled in water) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 60 m (200 ft)   | 0.5 km (0.3 mi) | 1.7 km (1.0 mi)    |
| 1859 | 125 | Silicon tetrafluoride                             | 30 m (100 ft)  | 0.2 km (0.1 mi) | 0.8 km (0.5 mi) | 100 m (300 ft)  | 0.5 km (0.3 mi) | 1.8 km (1.2 mi)    |
| 1859 | 125 | Silicon tetrafluoride,<br>compressed              | 150 m (500 ft) | 1.5 km (0.9 mi) | 2.1 km (1.3 mi) | 400 m (1250 ft) | 4.6 km (2.9 mi) | 6.4 km (4.0 mi)    |
| 1892 | 151 | Ethyldichloroarsine                               | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)   | 0.4 km (0.3 mi) | 1.1 km (0.7 mi)    |
| 1898 | 156 | Acetyl iodide<br>(when spilled in water)          | 60 m (200 ft)  | 0.3 km (0.2 mi) | 1.2 km (0.7 mi) | 300 m (1000 ft) | 1.5 km (1.0 mi) | 4.6 km (2.9 mi)    |
| 1911 | 119 | Diborane  |                |                 |                 |                 |                 |                    |
| 1911 | 119 | Diborane, compressed                              |                |                 |                 |                 |                 |                    |
| 1911 | 119 | Diborane mixtures                                 |                |                 |                 |                 |                 |                    |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | NAME OF MATERIAL  | SMALL SPILLS<br>(From a small package or small leak from a large package) |                    |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |                    |   |                             |
|--------|---|---|--------------------|---|-----------------------------|--|--------------------|---|-----------------------------|
|        |   | First ISOLATE<br>in all Directions  |                    | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions                                 |                    | Then PROTECT<br>persons Downwind during |                             |
|        |   | Meters (Feet)   | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) | Meters (Feet)  | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| 1923   | 135 Calcium dithionite<br>(when spilled in water)                                 | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.3 mi)                         | 60 m (200 ft)               | 0.7 km (0.4 mi)  | 2.6 km (1.6 mi)    |   |                             |
| 1923   | 135 Calcium hydrosulfite<br>(when spilled in water)                               | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.3 mi)                         | 60 m (200 ft)               | 0.7 km (0.4 mi)  | 2.6 km (1.6 mi)    |   |                             |
| 1923   | 135 Calcium hydrosulphite<br>(when spilled in water)                              | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.3 mi)                         | 60 m (200 ft)               | 0.7 km (0.4 mi)  | 2.6 km (1.6 mi)    |   |                             |
| 1929   | 135 Potassium dithionite<br>(when spilled in water)                               | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.2 mi)                         | 60 m (200 ft)               | 0.6 km (0.4 mi)  | 2.3 km (1.5 mi)    |   |                             |
| 1929   | 135 Potassium hydrosulfite<br>(when spilled in water)                             | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.2 mi)                         | 60 m (200 ft)               | 0.6 km (0.4 mi)  | 2.3 km (1.5 mi)    |   |                             |
| 1929   | 135 Potassium hydrosulphite<br>(when spilled in water)                            | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.2 mi)                         | 60 m (200 ft)               | 0.6 km (0.4 mi)  | 2.3 km (1.5 mi)    |   |                             |
| 1931   | 171 Zinc dithionite<br>(when spilled in water)                                    | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.3 mi)                         | 60 m (200 ft)               | 0.6 km (0.4 mi)  | 2.4 km (1.5 mi)    |   |                             |
| 1931   | 171 Zinc hydrosulfite<br>(when spilled in water)                                  | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.3 mi)                         | 60 m (200 ft)               | 0.6 km (0.4 mi)  | 2.4 km (1.5 mi)    |   |                             |
| 1931   | 171 Zinc hydrosulphite<br>(when spilled in water)                                 | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.3 mi)                         | 60 m (200 ft)               | 0.6 km (0.4 mi)  | 2.4 km (1.5 mi)    |   |                             |
| 1953   | 119 Compressed gas, poisonous,<br>flammable, n.o.s.                               | 150 m (500 ft)  | 1.0 km (0.6 mi)    | 3.8 km (2.4 mi)                         | 1000 m (3000 ft)            | 5.7 km (3.6 mi)  | 10.1 km (6.3 mi)   |   |                             |
| 1953   | 119 Compressed gas, poisonous,<br>flammable, n.o.s.<br>(Inhalation Hazard Zone A) | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.2 mi)                         | 300 m (1000 ft)             | 1.3 km (0.8 mi)  | 3.4 km (2.1 mi)    |   |                             |
| 1953   | 119 Compressed gas, poisonous,<br>flammable, n.o.s.<br>(Inhalation Hazard Zone B) | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.2 mi)                         | 300 m (1000 ft)             | 1.3 km (0.8 mi)  | 3.4 km (2.1 mi)    |   |                             |



|      |     |   |                |                 |                 |                  |                 |                  |
|------|-----|---|----------------|-----------------|-----------------|------------------|-----------------|------------------|
| 1953 | 119 | Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 150 m (500 ft)   | 1.0 km (0.6 mi) | 2.9 km (1.8 mi)  |
| 1953 | 119 | Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 150 m (500 ft)   | 0.8 km (0.5 mi) | 2.0 km (1.3 mi)  |
| 1953 | 119 | Compressed gas, toxic, flammable, n.o.s.                                |                |                 |                 |                  |                 |                  |
| 1953 | 119 | Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)     | 150 m (500 ft) | 1.0 km (0.6 mi) | 3.8 km (2.4 mi) | 1000 m (3000 ft) | 5.7 km (3.6 mi) | 10.1 km (6.3 mi) |
| 1953 | 119 | Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)     | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.4 km (0.2 mi) | 300 m (1000 ft)  | 1.3 km (0.8 mi) | 3.4 km (2.1 mi)  |
| 1953 | 119 | Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)     | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 150 m (500 ft)   | 1.0 km (0.6 mi) | 2.9 km (1.8 mi)  |
| 1953 | 119 | Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)     | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 150 m (500 ft)   | 0.8 km (0.5 mi) | 2.0 km (1.3 mi)  |
| 1955 | 123 | Compressed gas, poisonous, n.o.s.                                       |                |                 |                 |                  |                 |                  |
| 1955 | 123 | Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone A)            | 100 m (300 ft) | 0.5 km (0.3 mi) | 2.5 km (1.6 mi) | 1000 m (3000 ft) | 5.7 km (3.6 mi) | 10.1 km (6.3 mi) |
| 1955 | 123 | Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone B)            | 30 m (100 ft)  | 0.2 km (0.1 mi) | 0.9 km (0.6 mi) | 400 m (1250 ft)  | 2.3 km (1.4 mi) | 5.1 km (3.2 mi)  |
| 1955 | 123 | Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone C)            | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 150 m (500 ft)   | 1.0 km (0.6 mi) | 2.9 km (1.8 mi)  |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | Guide NAME OF MATERIAL   | SMALL SPILLS<br>(From a small package or small leak from a large package) |                    |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |                    |   |                             |
|--------|--|---|--------------------|---|-----------------------------|--|--------------------|---|-----------------------------|
|        |  | First ISOLATE<br>in all Directions  |                    | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions                                 |                    | Then PROTECT<br>persons Downwind during |                             |
|        |  | Meters (Feet)   | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) | Meters (Feet)  | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| 1955   | 123 Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone D) | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 150 m (500 ft)   | 0.8 km (0.5 mi)    | 2.0 km (1.3 mi)                         |                             |
| 1955   | 123 Compressed gas, toxic, n.o.s.                                | 100 m (300 ft)  | 0.5 km (0.3 mi)    | 2.5 km (1.6 mi)                         | 1000 m (3000 ft)            | 5.7 km (3.6 mi)  | 10.1 km (6.3 mi)   | 2.3 km (1.4 mi)                         |                             |
| 1955   | 123 Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone A)     |   |                    |   |                             |  |                    |   |                             |
| 1955   | 123 Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone B)     | 30 m (100 ft)   | 0.2 km (0.1 mi)    | 0.9 km (0.6 mi)                         | 400 m (1250 ft)             | 2.3 km (1.4 mi)  | 5.1 km (3.2 mi)    |   |                             |
| 1955   | 123 Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone C)     | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 150 m (500 ft)              | 1.0 km (0.6 mi)  | 2.9 km (1.8 mi)    |   |                             |
| 1955   | 123 Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone D)     | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 150 m (500 ft)              | 0.8 km (0.5 mi)  | 2.0 km (1.3 mi)    |   |                             |
| 1955   | 123 Organic phosphate compound mixed with compressed gas         | 100 m (300 ft)  | 1.0 km (0.7 mi)    | 3.4 km (2.1 mi)                         | 500 m (1500 ft)             | 4.4 km (2.7 mi)  | 9.6 km (6.0 mi)    |   |                             |
| 1955   | 123 Organic phosphate mixed with compressed gas                  |   |                    |   |                             |  |                    |   |                             |
| 1955   | 123 Organic phosphorus compound mixed with compressed gas        |   |                    |   |                             |  |                    |   |                             |
| 1967   | 123 Insecticide gas, poisonous, n.o.s.                           | 100 m (300 ft)  | 1.0 km (0.7 mi)    | 3.4 km (2.1 mi)                         | 500 m (1500 ft)             | 4.4 km (2.7 mi)  | 9.6 km (6.0 mi)    |   |                             |
| 1967   | 123 Insecticide gas, toxic, n.o.s.                               |   |                    |   |                             |  |                    |   |                             |
| 1967   | 123 Parathion and compressed gas mixture                         |   |                    |   |                             |  |                    |   |                             |

|      |     |  |                 |                 |                 |                  |                    |                    |                 |  |  |  |  |
|------|-----|--|-----------------|-----------------|-----------------|------------------|--------------------|--------------------|-----------------|--|--|--|--|
| 1975 | 124 | Dinitrogen tetroxide and Nitric oxide mixture  |                 |                 |                 |                  |                    |                    |                 |  |  |  |  |
| 1975 | 124 | Nitric oxide and Dinitrogen tetroxide mixture  |                 |                 |                 |                  |                    |                    |                 |  |  |  |  |
| 1975 | 124 | Nitric oxide and Nitrogen dioxide mixture      | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.6 km (0.4 mi) | 100 m (300 ft)   | 0.6 km (0.4 mi)    | 2.2 km (1.4 mi)    | 0.6 km (0.4 mi) |  |  |  |  |
| 1975 | 124 | Nitrogen dioxide and Nitric oxide mixture      |                 |                 |                 |                  |                    |                    |                 |  |  |  |  |
| 1994 | 136 | Iron pentacarbonyl                             | 100 m (300 ft)  | 0.9 km (0.6 mi) | 2.0 km (1.2 mi) | 400 m (1250 ft)  | 4.8 km (3.0 mi)    | 7.5 km (4.7 mi)    |                 |  |  |  |  |
| 2004 | 135 | Magnesium diamide<br>(when spilled in water)   | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 60 m (200 ft)    | 0.6 km (0.4 mi)    | 2.2 km (1.4 mi)    |                 |  |  |  |  |
| 2011 | 139 | Magnesium phosphide<br>(when spilled in water) | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.6 km (0.4 mi) | 500 m (1500 ft)  | 1.7 km (1.1 mi)    | 5.4 km (3.4 mi)    |                 |  |  |  |  |
| 2012 | 139 | Potassium phosphide<br>(when spilled in water) | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 300 m (1000 ft)  | 1.1 km (0.7 mi)    | 3.6 km (2.2 mi)    |                 |  |  |  |  |
| 2013 | 139 | Srontium phosphide<br>(when spilled in water)  | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 300 m (1000 ft)  | 1.1 km (0.7 mi)    | 3.4 km (2.2 mi)    |                 |  |  |  |  |
| 2032 | 157 | Nitric acid, red fuming                        | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 150 m (500 ft)   | 0.3 km (0.2 mi)    | 0.5 km (0.3 mi)    |                 |  |  |  |  |
| 2186 | 125 | Hydrogen chloride, refrigerated liquid         | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) |                  |                    |                    |                 |  |  |  |  |
| 2188 | 119 | Arsine   | 150 m (500 ft)  | 1.0 km (0.6 mi) | 3.8 km (2.4 mi) | 1000 m (3000 ft) | 5.7 km (3.6 mi)    | 10.1 km (6.3 mi)   |                 |  |  |  |  |
| 2189 | 119 | Dichlorosilane                                 | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.4 km (0.2 mi) | 300 m (1000 ft)  | 1.3 km (0.8 mi)    | 3.4 km (2.1 mi)    |                 |  |  |  |  |
| 2190 | 124 | Oxygen difluoride                              |                 |                 |                 |                  |                    |                    |                 |  |  |  |  |
| 2190 | 124 | Oxygen difluoride, compressed                  | 300 m (1000 ft) | 1.8 km (1.1 mi) | 7.1 km (4.4 mi) | 1000 m (3000 ft) | 11.0+ km (7.0+ mi) | 11.0+ km (7.0+ mi) |                 |  |  |  |  |
| 2191 | 123 | Sulphury fluoride                              | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.5 km (0.3 mi) | 400 m (1250 ft)  | 2.2 km (1.4 mi)    | 5.3 km (3.3 mi)    |                 |  |  |  |  |
| 2191 | 123 | Sulphury fluoride                              |                 |                 |                 |                  |                    |                    |                 |  |  |  |  |
| 2192 | 119 | Germane  | 150 m (500 ft)  | 0.9 km (0.5 mi) | 3.3 km (2.1 mi) | 500 m (1500 ft)  | 3.3 km (2.1 mi)    | 7.5 km (4.7 mi)    |                 |  |  |  |  |
| 2194 | 125 | Selenium hexafluoride                          | 200 m (600 ft)  | 1.1 km (0.7 mi) | 3.5 km (2.2 mi) | 600 m (2000 ft)  | 3.5 km (2.2 mi)    | 7.9 km (4.9 mi)    |                 |  |  |  |  |

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

|        |   | <b>SMALL SPILLS</b><br>(From a small package or small leak from a large package) |                    |   |                             | <b>LARGE SPILLS</b><br>(From a large package or from many small packages) |                    |   |                             |
|--------|---|--|--------------------|---|-----------------------------|---|--------------------|---|-----------------------------|
| ID No. | Guide NAME OF MATERIAL                                    | First ISOLATE<br>in all Directions   |                    | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions  |                    | Then PROTECT<br>persons Downwind during |                             |
|        |   | Meters (Feet)  | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) | Meters (Feet)   | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| 2195   | 125 Tellurium hexafluoride                                | 1000 m (3000 ft)   | 5.8 km (3.6 mi)    | 10.9 km (6.8 mi)                        | 1000 m (3000 ft)            | 11.0+ km (7.0+ mi)  | 11.0+ km (7.0+ mi) | 11.0+ km (7.0+ mi)                      | 11.0+ km (7.0+ mi)          |
| 2196   | 125 Tungsten hexafluoride                                 | 30 m (100 ft)  | 0.2 km (0.1 mi)    | 0.8 km (0.5 mi)                         | 150 m (500 ft)              | 0.8 km (0.5 mi)   | 2.7 km (1.7 mi)    | 0.8 km (0.5 mi)                         | 2.7 km (1.7 mi)             |
| 2197   | 125 Hydrogen iodide, anhydrous                            | 30 m (100 ft)  | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 150 m (500 ft)              | 1.0 km (0.6 mi)   | 2.9 km (1.8 mi)    | 1.0 km (0.6 mi)                         | 2.9 km (1.8 mi)             |
| 2198   | 125 Phosphorus pentafluoride                              | 30 m (100 ft)  | 0.2 km (0.2 mi)    | 1.0 km (0.7 mi)                         | 150 m (500 ft)              | 1.0 km (0.6 mi)   | 3.5 km (2.2 mi)    | 1.0 km (0.6 mi)                         | 3.5 km (2.2 mi)             |
| 2198   | 125 Phosphorus pentatluoride, compressed                  | 30 m (100 ft)  | 0.2 km (0.2 mi)    | 1.0 km (0.7 mi)                         | 150 m (500 ft)              | 1.0 km (0.6 mi)   | 3.5 km (2.2 mi)    | 1.0 km (0.6 mi)                         | 3.5 km (2.2 mi)             |
| 2199   | 119 Phosphine   | 60 m (200 ft)  | 0.3 km (0.2 mi)    | 1.1 km (0.7 mi)                         | 300 m (1000 ft)             | 1.3 km (0.8 mi)   | 3.7 km (2.3 mi)    | 1.3 km (0.8 mi)                         | 3.7 km (2.3 mi)             |
| 2202   | 117 Hydrogen selenide, anhydrous                          | 300 m (1000 ft)  | 1.7 km (1.1 mi)    | 6.0 km (3.7 mi)                         | 1000 m (3000 ft)            | 10.7 km (6.7 mi)  | 11.0+ km (7.0+ mi) | 10.7 km (6.7 mi)                        | 11.0+ km (7.0+ mi)          |
| 2204   | 119 Carbonyl sulfide                                      | 30 m (100 ft)  | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 300 m (1000 ft)             | 1.6 km (1.0 mi)   | 3.8 km (2.4 mi)    | 1.6 km (1.0 mi)                         | 3.8 km (2.4 mi)             |
| 2204   | 119 Carbonyl sulphide                                     | 30 m (100 ft)  | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 300 m (1000 ft)             | 1.6 km (1.0 mi)   | 3.8 km (2.4 mi)    | 1.6 km (1.0 mi)                         | 3.8 km (2.4 mi)             |
| 2232   | 153 Chloroacetaldehyde                                    | 30 m (100 ft)  | 0.2 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 60 m (200 ft)               | 0.6 km (0.4 mi)   | 1.1 km (0.7 mi)    | 0.6 km (0.4 mi)                         | 1.1 km (0.7 mi)             |
| 2232   | 153 2-Chloroethanal                                       | 30 m (100 ft)  | 0.2 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 60 m (200 ft)               | 0.6 km (0.4 mi)   | 1.1 km (0.7 mi)    | 0.6 km (0.4 mi)                         | 1.1 km (0.7 mi)             |
| 2285   | 156 Isocyanatobenzotrifluorides                           | 30 m (100 ft)  | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 30 m (100 ft)               | 0.4 km (0.3 mi)   | 0.6 km (0.4 mi)    | 0.4 km (0.3 mi)                         | 0.6 km (0.4 mi)             |
| 2308   | 157 Nitrosylsulfuric acid, liquid                         | 30 m (100 ft)  | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 300 m (1000 ft)             | 1.0 km (0.6 mi)   | 2.9 km (1.8 mi)    | 1.0 km (0.6 mi)                         | 2.9 km (1.8 mi)             |
| 2308   | 157 Nitrosylsulfuric acid, liquid (when spilled in water) | 30 m (100 ft)  | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 300 m (1000 ft)             | 1.0 km (0.6 mi)   | 2.9 km (1.8 mi)    | 1.0 km (0.6 mi)                         | 2.9 km (1.8 mi)             |
| 2308   | 157 Nitrosylsulfuric acid, liquid (when spilled in water) | 30 m (100 ft)  | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 300 m (1000 ft)             | 1.0 km (0.6 mi)   | 2.9 km (1.8 mi)    | 1.0 km (0.6 mi)                         | 2.9 km (1.8 mi)             |
| 2334   | 131 Allylamine  | 30 m (100 ft)  | 0.2 km (0.1 mi)    | 0.5 km (0.4 mi)                         | 150 m (500 ft)              | 1.4 km (0.9 mi)   | 2.5 km (1.6 mi)    | 1.4 km (0.9 mi)                         | 2.5 km (1.6 mi)             |
| 2337   | 131 Phenyl mercaptan                                      | 30 m (100 ft)  | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 30 m (100 ft)               | 0.3 km (0.2 mi)   | 0.4 km (0.2 mi)    | 0.3 km (0.2 mi)                         | 0.4 km (0.2 mi)             |
| 2353   | 132 Butyl chloride (when spilled in water)                | 30 m (100 ft)  | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 30 m (100 ft)               | 0.3 km (0.2 mi)   | 0.7 km (0.5 mi)    | 0.3 km (0.2 mi)                         | 0.7 km (0.5 mi)             |

|      |     |  |                |                 |                 |                  |                    |                    |
|------|-----|--|----------------|-----------------|-----------------|------------------|--------------------|--------------------|
| 2382 | 131 | Dimethylhydrazine, symmetrical                     | 30 m (100 ft)  | 0.2 km (0.1 mi) | 0.3 km (0.2 mi) | 60 m (200 ft)    | 0.7 km (0.5 mi)    | 1.3 km (0.8 mi)    |
| 2395 | 132 | Isobutryl chloride (when spilled in water)         | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)    | 0.2 km (0.1 mi)    | 0.4 km (0.3 mi)    |
| 2407 | 155 | Isopropyl chloroformate                            | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) | 60 m (200 ft)    | 0.5 km (0.3 mi)    | 0.9 km (0.6 mi)    |
| 2417 | 125 | Carbonyl fluoride                                  | 150 m (500 ft) | 0.7 km (0.5 mi) | 2.5 km (1.6 mi) | 600 m (2000 ft)  | 3.6 km (2.3 mi)    | 7.8 km (4.9 mi)    |
| 2417 | 125 | Carbonyl fluoride, compressed                      | 100 m (300 ft) | 0.5 km (0.3 mi) | 2.3 km (1.5 mi) | 400 m (1250 ft)  | 2.1 km (1.3 mi)    | 6.0 km (3.7 mi)    |
| 2418 | 125 | Sulfur tetrafluoride                               | 100 m (300 ft) | 0.7 km (0.4 mi) | 2.7 km (1.7 mi) | 1000 m (3000 ft) | 11.0+ km (7.0+ mi) | 11.0+ km (7.0+ mi) |
| 2418 | 125 | Sulphur tetrafluoride                              | 100 m (300 ft) | 0.3 km (0.2 mi) | 1.2 km (0.7 mi) | 200 m (600 ft)   | 1.2 km (0.8 mi)    | 4.2 km (2.6 mi)    |
| 2420 | 125 | Hexafluoroacetone                                  | 60 m (200 ft)  | 0.3 km (0.2 mi) | 1.2 km (0.7 mi) | 200 m (600 ft)   | 1.2 km (0.8 mi)    | 4.2 km (2.6 mi)    |
| 2421 | 124 | Nitrogen trioxide                                  | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)    | 0.1 km (0.1 mi)    | 0.4 km (0.3 mi)    |
| 2434 | 156 | Dibenzylchlorosilane (when spilled in water)       | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)    | 0.3 km (0.2 mi)    | 0.9 km (0.6 mi)    |
| 2435 | 156 | Ethylphenyldichlorosilane (when spilled in water)  | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)    | 0.3 km (0.2 mi)    | 0.9 km (0.6 mi)    |
| 2437 | 156 | Methylphenyldichlorosilane (when spilled in water) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)    | 0.4 km (0.2 mi)    | 1.2 km (0.8 mi)    |
| 2438 | 131 | Trimethylacetyl chloride                           | 60 m (200 ft)  | 0.5 km (0.3 mi) | 1.0 km (0.6 mi) | 200 m (600 ft)   | 2.1 km (1.3 mi)    | 3.3 km (2.1 mi)    |
| 2442 | 156 | Trichloroacetyl chloride                           | 30 m (100 ft)  | 0.2 km (0.1 mi) | 0.3 km (0.2 mi) | 60 m (200 ft)    | 0.7 km (0.4 mi)    | 1.1 km (0.7 mi)    |
| 2474 | 157 | Thiophosgene                                       | 60 m (200 ft)  | 0.6 km (0.4 mi) | 1.7 km (1.1 mi) | 200 m (600 ft)   | 2.1 km (1.3 mi)    | 4.0 km (2.5 mi)    |
| 2477 | 131 | Methyl isothiocyanate                              | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)    | 0.3 km (0.2 mi)    | 0.4 km (0.3 mi)    |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

|        |       | <b>SMALL SPILLS</b><br>(From a small package or small leak from a large package) |                                 |                    |                                      | <b>LARGE SPILLS</b><br>(From a large package or from many small packages) |  |                                      |                             |
|--------|-------|--|---------------------------------|--------------------|--------------------------------------|---|--|--------------------------------------|-----------------------------|
| ID No. | Guide | NAME OF MATERIAL   | First ISOLATE in all Directions |                    | Then PROTECT persons Downwind during |   | First ISOLATE in all Directions<br>Meters (Feet) | Then PROTECT persons Downwind during |                             |
|        |       |  | Meters (Feet)                   | Kilometers (Miles) | DAY<br>Kilometers (Miles)            | NIGHT<br>Kilometers (Miles)   |  | DAY<br>Kilometers (Miles)            | NIGHT<br>Kilometers (Miles) |
| 2478   | 155   | Isocyanate solution, flammable, poisonous, n.o.s.                                |                                 |                    |                                      |   |  |                                      |                             |
| 2478   | 155   | Isocyanate solution, flammable, toxic, n.o.s.                                    | 60 m (200 ft)                   | 0.8 km (0.5 mi)    | 1.8 km (1.1 mi)                      | 400 m (1250 ft)   | 4.4 km (2.7 mi)                                  | 7.0 km (4.3 mi)                      |                             |
| 2478   | 155   | Isocyanates, flammable, poisonous, n.o.s.  |                                 |                    |                                      |   |  |                                      |                             |
| 2478   | 155   | Isocyanates, flammable, toxic, n.o.s.  |                                 |                    |                                      |   |  |                                      |                             |
| 2480   | 155P  | Methyl isocyanate  | 150 m (500 ft)                  | 1.7 km (1.1 mi)    | 5.0 km (3.1 mi)                      | 1000 m (3000 ft)  | 11.0+ km (7.0+ mi)                               | 11.0+ km (7.0+ mi)                   |                             |
| 2481   | 155   | Ethyl isocyanate   | 150 m (500 ft)                  | 2.0 km (1.2 mi)    | 5.1 km (3.2 mi)                      | 1000 m (3000 ft)  | 11.0+ km (7.0+ mi)                               | 11.0+ km (7.0+ mi)                   |                             |
| 2482   | 155P  | n-Propyl isocyanate  | 100 m (300 ft)                  | 1.3 km (0.8 mi)    | 2.7 km (1.7 mi)                      | 600 m (2000 ft)   | 7.4 km (4.6 mi)                                  | 10.8 km (6.7 mi)                     |                             |
| 2483   | 155P  | Isopropyl isocyanate   | 150 m (500 ft)                  | 1.5 km (0.9 mi)    | 3.2 km (2.0 mi)                      | 1000 m (3000 ft)  | 11.0 km (6.9 mi)                                 | 11.0+ km (7.0+ mi)                   |                             |
| 2484   | 155   | tert-Butyl isocyanate  | 60 m (200 ft)                   | 0.8 km (0.5 mi)    | 1.8 km (1.1 mi)                      | 400 m (1250 ft)   | 4.4 km (2.7 mi)                                  | 7.0 km (4.3 mi)                      |                             |
| 2485   | 155P  | n-Butyl isocyanate   | 60 m (200 ft)                   | 0.6 km (0.4 mi)    | 1.1 km (0.7 mi)                      | 200 m (600 ft)  | 2.6 km (1.7 mi)                                  | 4.0 km (2.5 mi)                      |                             |
| 2486   | 155P  | Isobutyl isocyanate  | 60 m (200 ft)                   | 0.6 km (0.4 mi)    | 1.2 km (0.8 mi)                      | 300 m (1000 ft)   | 3.1 km (1.9 mi)                                  | 4.7 km (3.0 mi)                      |                             |
| 2487   | 155   | Phenyl isocyanate  | 100 m (300 ft)                  | 0.9 km (0.6 mi)    | 1.4 km (0.9 mi)                      | 300 m (1000 ft)   | 3.7 km (2.3 mi)                                  | 5.4 km (3.4 mi)                      |                             |
| 2488   | 155   | Cyclohexyl isocyanate  | 30 m (100 ft)                   | 0.3 km (0.2 mi)    | 0.4 km (0.3 mi)                      | 100 m (300 ft)  | 1.0 km (0.6 mi)                                  | 1.4 km (0.9 mi)                      |                             |
| 2495   | 144   | Iodine pentafluoride<br>(when spilled in water)                                  | 30 m (100 ft)                   | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                      | 100 m (300 ft)  | 1.1 km (0.7 mi)                                  | 4.1 km (2.6 mi)                      |                             |
| 2521   | 131P  | Diketene, stabilized   | 30 m (100 ft)                   | 0.2 km (0.1 mi)    | 0.3 km (0.2 mi)                      | 60 m (200 ft)   | 0.6 km (0.4 mi)                                  | 1.0 km (0.6 mi)                      |                             |
| 2534   | 119   | Methylchlorosilane   | 30 m (100 ft)                   | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                      | 150 m (500 ft)  | 0.7 km (0.5 mi)                                  | 1.9 km (1.2 mi)                      |                             |

|      |     |  |                |                 |                 |                 |                 |                    |
|------|-----|--|----------------|-----------------|-----------------|-----------------|-----------------|--------------------|
| 2548 | 124 | Chlorine pentafluoride   | 100 m (300 ft) | 0.5 km (0.3 mi) | 2.5 km (1.6 mi) | 800 m (2500 ft) | 5.0 km (3.1 mi) | 11.0+ km (7.0+ mi) |
| 2605 | 155 | Methoxymethyl isocyanate   | 30 m (100 ft)  | 0.2 km (0.1 mi) | 0.2 km (0.2 mi) | 60 m (200 ft)   | 0.6 km (0.4 mi) | 0.9 km (0.6 mi)    |
| 2606 | 155 | Methyl orthosilicate   | 30 m (100 ft)  | 0.2 km (0.1 mi) | 0.3 km (0.2 mi) | 60 m (200 ft)   | 0.7 km (0.4 mi) | 1.1 km (0.7 mi)    |
| 2644 | 151 | Methyl iodide  | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 100 m (300 ft)  | 0.3 km (0.2 mi) | 0.7 km (0.4 mi)    |
| 2646 | 151 | Hexachlorocyclopentadiene  | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)   | 0.3 km (0.2 mi) | 0.3 km (0.2 mi)    |
| 2668 | 131 | Chloroacetonitrile   | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)   | 0.3 km (0.2 mi) | 0.4 km (0.2 mi)    |
| 2676 | 119 | Stibine  | 60 m (200 ft)  | 0.3 km (0.2 mi) | 1.6 km (1.0 mi) | 200 m (600 ft)  | 1.3 km (0.8 mi) | 4.1 km (2.6 mi)    |
| 2691 | 137 | Phosphorus pentabromide<br>(when spilled in water)   | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)   | 0.1 km (0.1 mi) | 0.5 km (0.3 mi)    |
| 2692 | 157 | Boron tribromide<br>(when spilled on land)   | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 30 m (100 ft)   | 0.2 km (0.1 mi) | 0.4 km (0.3 mi)    |
| 2692 | 157 | Boron tribromide<br>(when spilled in water)  | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 60 m (200 ft)   | 0.5 km (0.3 mi) | 1.9 km (1.2 mi)    |
| 2740 | 155 | n-Propyl chloroformate   | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 60 m (200 ft)   | 0.6 km (0.4 mi) | 1.0 km (0.7 mi)    |
| 2742 | 155 | sec-Butyl chloroformate  | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 30 m (100 ft)   | 0.4 km (0.2 mi) | 0.5 km (0.3 mi)    |
| 2742 | 155 | Chloroformates, poisonous,<br>corrosive, flammable, n.o.s.<br>Chloroformates, toxic,<br>corrosive, flammable, n.o.s. | 30 m (100 ft)  | 0.2 km (0.1 mi) | 0.2 km (0.2 mi) | 60 m (200 ft)   | 0.5 km (0.3 mi) | 0.7 km (0.5 mi)    |
| 2742 | 155 | Isobutyl chloroformate   | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)   | 0.3 km (0.2 mi) | 0.5 km (0.3 mi)    |
| 2743 | 155 | n-Butyl chloroformate  | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)   | 0.3 km (0.2 mi) | 0.4 km (0.3 mi)    |
| 2806 | 139 | Lithium nitride<br>(when spilled in water)   | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) | 60 m (200 ft)   | 0.5 km (0.3 mi) | 1.9 km (1.2 mi)    |
| 2826 | 155 | Ethyl chloroethoformate  | 30 m (100 ft)  | 0.2 km (0.1 mi) | 0.2 km (0.2 mi) | 60 m (200 ft)   | 0.5 km (0.3 mi) | 0.7 km (0.5 mi)    |
| 2845 | 135 | Ethyl phosphonous dichloride,<br>anhydrous   | 30 m (100 ft)  | 0.3 km (0.2 mi) | 0.7 km (0.5 mi) | 100 m (300 ft)  | 1.3 km (0.8 mi) | 2.3 km (1.5 mi)    |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

|               |              | <b>SMALL SPILLS</b><br>(From a small package or small leak from a large package)                              |   |                    |  | <b>LARGE SPILLS</b><br>(From a large package or from many small packages) |   |                    |  |                                    |
|---------------|--------------|---|---|--------------------|--|---|---|--------------------|--|------------------------------------|
| <b>ID No.</b> | <b>Guide</b> | <b>NAME OF MATERIAL</b>   | <b>First ISOLATE</b><br>in all Directions |                    | <b>Then PROTECT</b><br>persons Downwind during |   | <b>First ISOLATE</b><br>in all Directions |                    | <b>Then PROTECT</b><br>persons Downwind during |                                    |
|               |              |   | Meters (Feet)                             | Kilometers (Miles) | <b>DAY</b><br>Kilometers (Miles)               | <b>NIGHT</b><br>Kilometers (Miles)  | Meters (Feet)                             | Kilometers (Miles) | <b>DAY</b><br>Kilometers (Miles)               | <b>NIGHT</b><br>Kilometers (Miles) |
| 2845          | 135          | Methyl phosphorous dichloride   | 30 m (100 ft)                             | 0.4 km (0.3 mi)    | 1.1 km (0.7 mi)                                | 200 m (600 ft)  | 2.4 km (1.5 mi)                           | 4.1 km (2.6 mi)    |  |                                    |
| 2901          | 124          | Bromine chloride  | 100 m (300 ft)                            | 0.5 km (0.3 mi)    | 1.8 km (1.1 mi)                                | 1000 m (3000 ft)  | 5.4 km (3.4 mi)                           | 11.0+ km (7.0+ mi) |  |                                    |
| 2927          | 154          | Ethyl phosphonothioic dichloride, anhydrous   | 30 m (100 ft)                             | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                                | 30 m (100 ft)   | 0.2 km (0.1 mi)                           | 0.2 km (0.1 mi)    |  |                                    |
| 2927          | 154          | Ethyl phosphorodichloridate   | 30 m (100 ft)                             | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                                | 30 m (100 ft)   | 0.3 km (0.2 mi)                           | 0.3 km (0.2 mi)    |  |                                    |
| 2965          | 139          | Boron trifluoride dimethyl etherate<br><b>(when spilled in water)</b>   | 30 m (100 ft)                             | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                                | 100 m (300 ft)  | 1.2 km (0.8 mi)                           | 3.6 km (2.2 mi)    |  |                                    |
| 2977          | 166          | Radioactive material, Uranium hexafluoride, fissile<br><b>(when spilled in water)</b>                         | 30 m (100 ft)                             | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                                | 60 m (200 ft)   | 0.4 km (0.3 mi)                           | 2.1 km (1.3 mi)    |  |                                    |
| 2977          | 166          | Uranium hexafluoride, radioactive material, fissile<br><b>(when spilled in water)</b>                         | 30 m (100 ft)                             | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                                | 60 m (200 ft)   | 0.4 km (0.3 mi)                           | 2.1 km (1.3 mi)    |  |                                    |
| 2978          | 166          | Radioactive material, Uranium hexafluoride, non fissile or fissile-excepted<br><b>(when spilled in water)</b> | 30 m (100 ft)                             | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                                | 60 m (200 ft)   | 0.4 km (0.3 mi)                           | 2.1 km (1.3 mi)    |  |                                    |
| 2978          | 166          | Uranium hexafluoride, radioactive material, non fissile or fissile-excepted<br><b>(when spilled in water)</b> | 30 m (100 ft)                             | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                                | 60 m (200 ft)   | 0.4 km (0.3 mi)                           | 2.1 km (1.3 mi)    |  |                                    |



|      |      |   |                |                 |                 |                  |               |                 |                    |
|------|------|---|----------------|-----------------|-----------------|------------------|---------------|-----------------|--------------------|
| 2985 | 155  | Chlorosilanes, flammable, corrosive, n.o.s. (when spilled in water)                 | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 0.1 km (0.1 mi)  | 60 m (200 ft) | 0.5 km (0.3 mi) | 1.6 km (1.0 mi)    |
| 2986 | 155  | Chlorosilanes, corrosive, flammable, n.o.s. (when spilled in water)                 | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 0.1 km (0.1 mi)  | 60 m (200 ft) | 0.5 km (0.3 mi) | 1.6 km (1.0 mi)    |
| 2987 | 156  | Chlorosilanes, corrosive, n.o.s. (when spilled in water)                            | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 0.1 km (0.1 mi)  | 60 m (200 ft) | 0.5 km (0.3 mi) | 1.6 km (1.0 mi)    |
| 2988 | 139  | Chlorosilanes, water-reactive, flammable, corrosive, n.o.s. (when spilled in water) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 0.1 km (0.1 mi)  | 60 m (200 ft) | 0.5 km (0.3 mi) | 1.6 km (1.0 mi)    |
| 3023 | 131  | 2-Methyl-2-heptanethiol   | 30 m (100 ft)  | 0.2 km (0.1 mi) | 0.2 km (0.1 mi) | 0.1 km (0.1 mi)  | 60 m (200 ft) | 0.5 km (0.4 mi) | 0.8 km (0.5 mi)    |
| 3048 | 157  | Aluminum phosphide pesticide (when spilled in water)                                | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.7 km (0.5 mi) | 500 m (1500 ft)  |               | 2.0 km (1.3 mi) | 6.5 km (4.1 mi)    |
| 3057 | 125  | Trifluoroacetyl chloride  | 30 m (100 ft)  | 0.2 km (0.1 mi) | 0.9 km (0.6 mi) | 800 m (2500 ft)  |               | 5.2 km (3.3 mi) | 11.0+ km (7.0+ mi) |
| 3079 | 131P | Methacrylonitrile, stabilized   | 30 m (100 ft)  | 0.3 km (0.2 mi) | 0.7 km (0.5 mi) | 150 m (500 ft)   |               | 1.6 km (1.0 mi) | 2.7 km (1.7 mi)    |
| 3083 | 124  | Perchloryl fluoride   | 30 m (100 ft)  | 0.2 km (0.2 mi) | 1.1 km (0.7 mi) | 1000 m (3000 ft) |               | 5.5 km (3.4 mi) | 11.0+ km (7.0+ mi) |
| 3160 | 119  | Liquefied gas, poisonous, flammable, n.o.s.   |                |                 |                 |                  |               |                 |                    |
| 3160 | 119  | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)              | 150 m (500 ft) | 1.0 km (0.6 mi) | 3.8 km (2.4 mi) | 1000 m (3000 ft) |               | 5.7 km (3.6 mi) | 10.1 km (6.3 mi)   |
| 3160 | 119  | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)              | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.4 km (0.2 mi) | 300 m (1000 ft)  |               | 1.3 km (0.8 mi) | 3.4 km (2.1 mi)    |
| 3160 | 119  | Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)              | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 150 m (500 ft)   |               | 1.0 km (0.6 mi) | 2.9 km (1.8 mi)    |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | Guide NAME OF MATERIAL   | SMALL SPILLS<br>(From a small package or small leak from a large package) |                    |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |                    |   |                             |
|--------|--|---|--------------------|---|-----------------------------|--|--------------------|---|-----------------------------|
|        |  | First ISOLATE<br>in all Directions  |                    | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions                                 |                    | Then PROTECT<br>persons Downwind during |                             |
|        |  | Meters (Feet)   | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) | Meters (Feet)  | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| 3160   | 119 Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D) | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 150 m (500 ft)              | 0.8 km (0.5 mi)  | 2.0 km (1.3 mi)    |   |                             |
| 3160   | 119 Liquefied gas, toxic, flammable, n.o.s.                                |   |                    |   |                             |  |                    |   |                             |
| 3160   | 119 Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)     | 150 m (500 ft)  | 1.0 km (0.6 mi)    | 3.8 km (2.4 mi)                         | 1000 m (3000 ft)            | 5.7 km (3.6 mi)  | 10.1 km (6.3 mi)   |   |                             |
| 3160   | 119 Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)     | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.2 mi)                         | 300 m (1000 ft)             | 1.3 km (0.8 mi)  | 3.4 km (2.1 mi)    |   |                             |
| 3160   | 119 Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)     | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 150 m (500 ft)              | 1.0 km (0.6 mi)  | 2.9 km (1.8 mi)    |   |                             |
| 3160   | 119 Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)     | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 150 m (500 ft)              | 0.8 km (0.5 mi)  | 2.0 km (1.3 mi)    |   |                             |
| 3162   | 123 Liquefied gas, poisonous, n.o.s.                                       |   |                    |   |                             |  |                    |   |                             |
| 3162   | 123 Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone A)            | 100 m (300 ft)  | 0.5 km (0.3 mi)    | 2.5 km (1.6 mi)                         | 1000 m (3000 ft)            | 5.7 km (3.6 mi)  | 10.1 km (6.3 mi)   |   |                             |
| 3162   | 123 Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone B)            | 30 m (100 ft)   | 0.2 km (0.1 mi)    | 0.9 km (0.6 mi)                         | 400 m (1250 ft)             | 2.3 km (1.4 mi)  | 5.1 km (3.2 mi)    |   |                             |
| 3162   | 123 Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone C)            | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 150 m (500 ft)              | 1.0 km (0.6 mi)  | 2.9 km (1.8 mi)    |   |                             |

|      |     |   |                |                 |                 |                  |                 |                  |
|------|-----|---|----------------|-----------------|-----------------|------------------|-----------------|------------------|
| 3162 | 123 | Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone D) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 150 m (500 ft)   | 0.8 km (0.5 mi) | 2.0 km (1.3 mi)  |
| 3162 | 123 | Liquefied gas, toxic, n.o.s.                                | 100 m (300 ft) | 0.5 km (0.3 mi) | 2.5 km (1.6 mi) | 1000 m (3000 ft) | 5.7 km (3.6 mi) | 10.1 km (6.3 mi) |
| 3162 | 123 | Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone A)     |                |                 |                 |                  |                 |                  |
| 3162 | 123 | Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone B)     | 30 m (100 ft)  | 0.2 km (0.1 mi) | 0.9 km (0.6 mi) | 400 m (1250 ft)  | 2.3 km (1.4 mi) | 5.1 km (3.2 mi)  |
| 3162 | 123 | Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone C)     | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 150 m (500 ft)   | 1.0 km (0.6 mi) | 2.9 km (1.8 mi)  |
| 3162 | 123 | Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone D)     | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 150 m (500 ft)   | 0.8 km (0.5 mi) | 2.0 km (1.3 mi)  |
| 3246 | 156 | Methanesulfonyl chloride                                    | 30 m (100 ft)  | 0.2 km (0.2 mi) | 0.3 km (0.2 mi) | 60 m (200 ft)    | 0.7 km (0.4 mi) | 0.9 km (0.6 mi)  |
| 3246 | 156 | Methanesulphonyl chloride                                   | 30 m (100 ft)  | 0.2 km (0.2 mi) | 0.3 km (0.2 mi) | 150 m (500 ft)   | 1.6 km (1.0 mi) | 2.7 km (1.7 mi)  |
| 3275 | 131 | Nitriles, poisonous, flammable, n.o.s.                      | 30 m (100 ft)  | 0.3 km (0.2 mi) | 0.7 km (0.5 mi) | 150 m (500 ft)   | 1.6 km (1.0 mi) | 2.7 km (1.7 mi)  |
| 3275 | 131 | Nitriles, toxic, flammable, n.o.s.                          |                |                 |                 |                  |                 |                  |
| 3276 | 151 | Nitriles, liquid, poisonous, n.o.s.                         | 30 m (100 ft)  | 0.3 km (0.2 mi) | 0.7 km (0.5 mi) | 150 m (500 ft)   | 1.6 km (1.0 mi) | 2.7 km (1.7 mi)  |
| 3276 | 151 | Nitriles, liquid, toxic, n.o.s.                             |                |                 |                 |                  |                 |                  |
| 3276 | 151 | Nitriles, poisonous, liquid, n.o.s.                         |                |                 |                 |                  |                 |                  |
| 3276 | 151 | Nitriles, toxic, liquid, n.o.s.                             |                |                 |                 |                  |                 |                  |
| 3278 | 151 | Organophosphorus compound, liquid, poisonous, n.o.s.        | 30 m (100 ft)  | 0.4 km (0.3 mi) | 1.1 km (0.7 mi) | 200 m (600 ft)   | 2.4 km (1.5 mi) | 4.1 km (2.6 mi)  |
| 3278 | 151 | Organophosphorus compound, liquid, toxic, n.o.s.            |                |                 |                 |                  |                 |                  |
| 3278 | 151 | Organophosphorus compound, liquid, toxic, n.o.s.            |                |                 |                 |                  |                 |                  |
| 3278 | 151 | Organophosphorus compound, poisonous, liquid, n.o.s.        |                |                 |                 |                  |                 |                  |
| 3278 | 151 | Organophosphorus compound, toxic, liquid, n.o.s.            |                |                 |                 |                  |                 |                  |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | Guide | NAME OF MATERIAL   | SMALL SPILLS<br>(From a small package or small leak from a large package) |                    |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |                    |   |                             |
|--------|-------|--|---|--------------------|---|-----------------------------|--|--------------------|---|-----------------------------|
|        |       |  | First ISOLATE<br>in all Directions  |                    | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions                                 |                    | Then PROTECT<br>persons Downwind during |                             |
|        |       |  | Meters (Feet)   | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) | Meters (Feet)  | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| 3279   | 131   | Organophosphorus compound, poisonous, flammable, n.o.s.                        | 30 m (100 ft)   | 0.4 km (0.3 mi)    | 1.1 km (0.7 mi)                         | 200 m (600 ft)              | 2.4 km (1.5 mi)  | 4.1 km (2.6 mi)    |   |                             |
| 3279   | 131   | Organophosphorus compound, toxic, flammable, n.o.s.                            | 30 m (100 ft)   | 0.2 km (0.1 mi)    | 0.7 km (0.4 mi)                         | 150 m (500 ft)              | 1.6 km (1.0 mi)  | 3.6 km (2.2 mi)    |   |                             |
| 3280   | 151   | Organoarsenic compound, liquid, n.o.s.   | 100 m (300 ft)  | 1.3 km (0.8 mi)    | 5.0 km (3.1 mi)                         | 1000 m (3000 ft)            | 10.8 km (6.8 mi)   | 11.0+ km (7.0+ mi) |   |                             |
| 3294   | 131   | Hydrogen cyanide, solution in alcohol, with not more than 45% Hydrogen cyanide | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 200 m (600 ft)              | 0.5 km (0.3 mi)  | 1.9 km (1.2 mi)    |   |                             |
| 3300   | 119P  | Carbon dioxide and Ethylene oxide mixture, with more than 87% Ethylene oxide   | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.2 mi)                         | 150 m (500 ft)              | 0.8 km (0.5 mi)  | 2.2 km (1.4 mi)    |   |                             |
| 3300   | 119P  | Ethylene oxide and Carbon dioxide mixture, with more than 87% Ethylene oxide   | 100 m (300 ft)  | 0.5 km (0.3 mi)    | 2.5 km (1.6 mi)                         | 800 m (2500 ft)             | 5.0 km (3.1 mi)  | 11.0+ km (7.0+ mi) |   |                             |
| 3303   | 124   | Compressed gas, poisonous, oxidizing, n.o.s.                                   | 60 m (200 ft)   | 0.3 km (0.2 mi)    | 1.1 km (0.7 mi)                         | 400 m (1250 ft)             | 2.5 km (1.5 mi)  | 6.7 km (4.2 mi)    |   |                             |
| 3303   | 124   | Compressed gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone A)        |   |                    |   |                             |  |                    |   |                             |
| 3303   | 124   | Compressed gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone B)        |   |                    |   |                             |  |                    |   |                             |

|      |            |   |                |                 |                 |                 |                 |                    |
|------|------------|---|----------------|-----------------|-----------------|-----------------|-----------------|--------------------|
| 3303 | <b>124</b> | Compressed gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone C) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 150 m (500 ft)  | 1.0 km (0.6 mi) | 2.9 km (1.8 mi)    |
| 3303 | <b>124</b> | Compressed gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone D) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 150 m (500 ft)  | 0.8 km (0.5 mi) | 2.0 km (1.3 mi)    |
| 3303 | <b>124</b> | Compressed gas, toxic, oxidizing, n.o.s.                                |                |                 |                 |                 |                 |                    |
| 3303 | <b>124</b> | Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone A)     | 100 m (300 ft) | 0.5 km (0.3 mi) | 2.5 km (1.6 mi) | 800 m (2500 ft) | 5.0 km (3.1 mi) | 11.0+ km (7.0+ mi) |
| 3303 | <b>124</b> | Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone B)     | 60 m (200 ft)  | 0.3 km (0.2 mi) | 1.1 km (0.7 mi) | 400 m (1250 ft) | 2.5 km (1.5 mi) | 6.7 km (4.2 mi)    |
| 3303 | <b>124</b> | Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone C)     | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 150 m (500 ft)  | 1.0 km (0.6 mi) | 2.9 km (1.8 mi)    |
| 3303 | <b>124</b> | Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone D)     | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 150 m (500 ft)  | 0.8 km (0.5 mi) | 2.0 km (1.3 mi)    |
| 3304 | <b>125</b> | Compressed gas, poisonous, corrosive, n.o.s.                            |                |                 |                 |                 |                 |                    |
| 3304 | <b>125</b> | Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone A) | 100 m (300 ft) | 0.5 km (0.3 mi) | 2.5 km (1.6 mi) | 500 m (1500 ft) | 2.9 km (1.8 mi) | 9.2 km (5.7 mi)    |
| 3304 | <b>125</b> | Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone B) | 30 m (100 ft)  | 0.2 km (0.2 mi) | 1.0 km (0.7 mi) | 400 m (1250 ft) | 2.3 km (1.4 mi) | 5.1 km (3.2 mi)    |
| 3304 | <b>125</b> | Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone C) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.5 km (0.3 mi) | 300 m (1000 ft) | 1.6 km (1.0 mi) | 3.2 km (2.0 mi)    |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | Guide NAME OF MATERIAL   | SMALL SPILLS<br>(From a small package or small leak from a large package) |                    |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |                    |   |                             |
|--------|--|---|--------------------|---|-----------------------------|--|--------------------|---|-----------------------------|
|        |  | First ISOLATE<br>in all Directions  |                    | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions                                 |                    | Then PROTECT<br>persons Downwind during |                             |
|        |  | Meters (Feet)   | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) | Meters (Feet)  | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| 3304   | 125 Compressed gas,<br>poisonous, corrosive, n.o.s.<br>(Inhalation Hazard Zone D)            | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 150 m (500 ft)              | 0.8 km (0.5 mi)  | 2.0 km (1.3 mi)    |   |                             |
| 3304   | 125 Compressed gas,<br>toxic, corrosive, n.o.s.  |   |                    |   |                             |  |                    |   |                             |
| 3304   | 125 Compressed gas,<br>toxic, corrosive, n.o.s.<br>(Inhalation Hazard Zone A)                | 100 m (300 ft)  | 0.5 km (0.3 mi)    | 2.5 km (1.6 mi)                         | 500 m (1500 ft)             | 2.9 km (1.8 mi)  | 9.2 km (5.7 mi)    |   |                             |
| 3304   | 125 Compressed gas,<br>toxic, corrosive, n.o.s.<br>(Inhalation Hazard Zone B)                | 30 m (100 ft)   | 0.2 km (0.2 mi)    | 1.0 km (0.7 mi)                         | 400 m (1250 ft)             | 2.3 km (1.4 mi)  | 5.1 km (3.2 mi)    |   |                             |
| 3304   | 125 Compressed gas,<br>toxic, corrosive, n.o.s.<br>(Inhalation Hazard Zone C)                | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.5 km (0.3 mi)                         | 300 m (1000 ft)             | 1.6 km (1.0 mi)  | 3.2 km (2.0 mi)    |   |                             |
| 3304   | 125 Compressed gas,<br>toxic, corrosive, n.o.s.<br>(Inhalation Hazard Zone D)                | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 150 m (500 ft)              | 0.8 km (0.5 mi)  | 2.0 km (1.3 mi)    |   |                             |
| 3305   | 119 Compressed gas, poisonous,<br>flammable, corrosive, n.o.s.                               |   |                    |   |                             |  |                    |   |                             |
| 3305   | 119 Compressed gas, poisonous,<br>flammable, corrosive, n.o.s.<br>(Inhalation Hazard Zone A) | 100 m (300 ft)  | 0.5 km (0.3 mi)    | 2.5 km (1.6 mi)                         | 500 m (1500 ft)             | 2.9 km (1.8 mi)  | 9.2 km (5.7 mi)    |   |                             |

|      |     |  |                |                 |                 |                 |                 |                 |
|------|-----|--|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 3305 | 119 | Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B) | 30 m (100 ft)  | 0.2 km (0.2 mi) | 1.0 km (0.7 mi) | 400 m (1250 ft) | 2.3 km (1.4 mi) | 5.1 km (3.2 mi) |
| 3305 | 119 | Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.5 km (0.3 mi) | 300 m (1000 ft) | 1.6 km (1.0 mi) | 3.2 km (2.0 mi) |
| 3305 | 119 | Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 150 m (500 ft)  | 0.8 km (0.5 mi) | 2.0 km (1.3 mi) |
| 3305 | 119 | Compressed gas, toxic, flammable, corrosive, n.o.s.                                |                |                 |                 |                 |                 |                 |
| 3305 | 119 | Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)     | 100 m (300 ft) | 0.5 km (0.3 mi) | 2.5 km (1.6 mi) | 500 m (1500 ft) | 2.9 km (1.8 mi) | 9.2 km (5.7 mi) |
| 3305 | 119 | Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)     | 30 m (100 ft)  | 0.2 km (0.2 mi) | 1.0 km (0.7 mi) | 400 m (1250 ft) | 2.3 km (1.4 mi) | 5.1 km (3.2 mi) |
| 3305 | 119 | Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)     | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.5 km (0.3 mi) | 300 m (1000 ft) | 1.6 km (1.0 mi) | 3.2 km (2.0 mi) |
| 3305 | 119 | Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)     | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 150 m (500 ft)  | 0.8 km (0.5 mi) | 2.0 km (1.3 mi) |
| 3306 | 124 | Compressed gas, poisonous, oxidizing, corrosive, n.o.s.                            |                |                 |                 |                 |                 |                 |
| 3306 | 124 | Compressed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A) | 100 m (300 ft) | 0.5 km (0.3 mi) | 2.5 km (1.6 mi) | 500 m (1500 ft) | 2.9 km (1.8 mi) | 9.2 km (5.7 mi) |
| 3306 | 124 | Compressed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B) | 30 m (100 ft)  | 0.2 km (0.2 mi) | 1.0 km (0.7 mi) | 400 m (1250 ft) | 2.3 km (1.4 mi) | 5.1 km (3.2 mi) |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | Guide | NAME OF MATERIAL   | SMALL SPILLS<br>(From a small package or small leak from a large package) |                    |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |                    |   |                             |
|--------|-------|--|---|--------------------|---|-----------------------------|--|--------------------|---|-----------------------------|
|        |       |  | First ISOLATE<br>in all Directions  |                    | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions                                 |                    | Then PROTECT<br>persons Downwind during |                             |
|        |       |  | Meters (Feet)   | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) | Meters (Feet)  | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| 3306   | 124   | Compressed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C) | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.5 km (0.3 mi)                         | 300 m (1000 ft)             | 1.6 km (1.0 mi)  | 3.2 km (2.0 mi)    |   |                             |
| 3306   | 124   | Compressed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone D) | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 150 m (500 ft)              | 0.8 km (0.5 mi)  | 2.0 km (1.3 mi)    |   |                             |
| 3306   | 124   | Compressed gas, toxic, oxidizing, corrosive, n.o.s.                                |   |                    |   |                             |  |                    |   |                             |
| 3306   | 124   | Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A)     | 100 m (300 ft)  | 0.5 km (0.3 mi)    | 2.5 km (1.6 mi)                         | 500 m (1500 ft)             | 2.9 km (1.8 mi)  | 9.2 km (5.7 mi)    |   |                             |
| 3306   | 124   | Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B)     | 30 m (100 ft)   | 0.2 km (0.2 mi)    | 1.0 km (0.7 mi)                         | 400 m (1250 ft)             | 2.3 km (1.4 mi)  | 5.1 km (3.2 mi)    |   |                             |
| 3306   | 124   | Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C)     | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.5 km (0.3 mi)                         | 300 m (1000 ft)             | 1.6 km (1.0 mi)  | 3.2 km (2.0 mi)    |   |                             |
| 3306   | 124   | Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone D)     | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 150 m (500 ft)              | 0.8 km (0.5 mi)  | 2.0 km (1.3 mi)    |   |                             |



|      |   |                |                 |                 |                 |                 |                    |
|------|---|----------------|-----------------|-----------------|-----------------|-----------------|--------------------|
| 3307 | <b>124</b> Liquefied gas, poisonous, oxidizing, n.o.s.                            | 100 m (300 ft) | 0.5 km (0.3 mi) | 2.5 km (1.6 mi) | 800 m (2500 ft) | 5.0 km (3.1 mi) | 11.0+ km (7.0+ mi) |
| 3307 | <b>124</b> Liquefied gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone A) | 60 m (200 ft)  | 0.3 km (0.2 mi) | 1.1 km (0.7 mi) | 400 m (1250 ft) | 2.5 km (1.5 mi) | 6.7 km (4.2 mi)    |
| 3307 | <b>124</b> Liquefied gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone B) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 150 m (500 ft)  | 1.0 km (0.6 mi) | 2.9 km (1.8 mi)    |
| 3307 | <b>124</b> Liquefied gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone C) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 150 m (500 ft)  | 0.8 km (0.5 mi) | 2.0 km (1.3 mi)    |
| 3307 | <b>124</b> Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone D)     | 100 m (300 ft) | 0.5 km (0.3 mi) | 2.5 km (1.6 mi) | 800 m (2500 ft) | 5.0 km (3.1 mi) | 11.0+ km (7.0+ mi) |
| 3307 | <b>124</b> Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone A)     | 60 m (200 ft)  | 0.3 km (0.2 mi) | 1.1 km (0.7 mi) | 400 m (1250 ft) | 2.5 km (1.5 mi) | 6.7 km (4.2 mi)    |
| 3307 | <b>124</b> Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone B)     | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 150 m (500 ft)  | 1.0 km (0.6 mi) | 2.9 km (1.8 mi)    |
| 3307 | <b>124</b> Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone C)     | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 150 m (500 ft)  | 0.8 km (0.5 mi) | 2.0 km (1.3 mi)    |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | Guide | NAME OF MATERIAL  | SMALL SPILLS<br>(From a small package or small leak from a large package) |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |   |                             |
|--------|-------|---|---|---|-----------------------------|--|---|-----------------------------|
|        |       |   | First ISOLATE<br>in all Directions<br>Meters (Feet)                       | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions<br>Meters (Feet)                | Then PROTECT<br>persons Downwind during |                             |
|        |       |   |   | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |  | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| 3308   | 125   | Liquefied gas, poisonous, corrosive, n.o.s.                               | 100 m (300 ft)  | 0.5 km (0.3 mi)                         | 2.5 km (1.6 mi)             | 500 m (1500 ft)  | 2.9 km (1.8 mi)                         | 9.2 km (5.7 mi)             |
| 3308   | 125   | Liquefied gas, poisonous, corrosive, n.o.s.<br>(Inhalation Hazard Zone A) | 30 m (100 ft)   | 0.2 km (0.2 mi)                         | 1.0 km (0.7 mi)             | 400 m (1250 ft)  | 2.3 km (1.4 mi)                         | 5.1 km (3.2 mi)             |
| 3308   | 125   | Liquefied gas, poisonous, corrosive, n.o.s.<br>(Inhalation Hazard Zone B) | 30 m (100 ft)   | 0.1 km (0.1 mi)                         | 0.5 km (0.3 mi)             | 300 m (1000 ft)  | 1.6 km (1.0 mi)                         | 3.2 km (2.0 mi)             |
| 3308   | 125   | Liquefied gas, poisonous, corrosive, n.o.s.<br>(Inhalation Hazard Zone D) | 30 m (100 ft)   | 0.1 km (0.1 mi)                         | 0.2 km (0.1 mi)             | 150 m (500 ft)   | 0.8 km (0.5 mi)                         | 2.0 km (1.3 mi)             |
| 3308   | 125   | Liquefied gas, toxic, corrosive, n.o.s.                                   | 100 m (300 ft)  | 0.5 km (0.3 mi)                         | 2.5 km (1.6 mi)             | 500 m (1500 ft)  | 2.9 km (1.8 mi)                         | 9.2 km (5.7 mi)             |
| 3308   | 125   | Liquefied gas, toxic, corrosive, n.o.s.<br>(Inhalation Hazard Zone B)     | 30 m (100 ft)   | 0.2 km (0.2 mi)                         | 1.0 km (0.7 mi)             | 400 m (1250 ft)  | 2.3 km (1.4 mi)                         | 5.1 km (3.2 mi)             |

|      |            |   |                |                 |                 |                 |                 |                 |
|------|------------|---|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 3308 | <b>125</b> | Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone C)                | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.5 km (0.3 mi) | 300 m (1000 ft) | 1.6 km (1.0 mi) | 3.2 km (2.0 mi) |
| 3308 | <b>125</b> | Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone D)                | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 150 m (500 ft)  | 0.8 km (0.5 mi) | 2.0 km (1.3 mi) |
| 3309 | <b>119</b> | Liquefied gas, poisonous, flammable, corrosive, n.o.s.                            |                |                 |                 |                 |                 |                 |
| 3309 | <b>119</b> | Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A) | 100 m (300 ft) | 0.5 km (0.3 mi) | 2.5 km (1.6 mi) | 500 m (1500 ft) | 2.9 km (1.8 mi) | 9.2 km (5.7 mi) |
| 3309 | <b>119</b> | Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B) | 30 m (100 ft)  | 0.2 km (0.2 mi) | 1.0 km (0.7 mi) | 400 m (1250 ft) | 2.3 km (1.4 mi) | 5.1 km (3.2 mi) |
| 3309 | <b>119</b> | Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.5 km (0.3 mi) | 300 m (1000 ft) | 1.6 km (1.0 mi) | 3.2 km (2.0 mi) |
| 3309 | <b>119</b> | Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 150 m (500 ft)  | 0.8 km (0.5 mi) | 2.0 km (1.3 mi) |
| 3309 | <b>119</b> | Liquefied gas, toxic, flammable, corrosive, n.o.s.                                |                |                 |                 |                 |                 |                 |
| 3309 | <b>119</b> | Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)     | 100 m (300 ft) | 0.5 km (0.3 mi) | 2.5 km (1.6 mi) | 500 m (1500 ft) | 2.9 km (1.8 mi) | 9.2 km (5.7 mi) |
| 3309 | <b>119</b> | Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)     | 30 m (100 ft)  | 0.2 km (0.2 mi) | 1.0 km (0.7 mi) | 400 m (1250 ft) | 2.3 km (1.4 mi) | 5.1 km (3.2 mi) |
| 3309 | <b>119</b> | Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)     | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.5 km (0.3 mi) | 300 m (1000 ft) | 1.6 km (1.0 mi) | 3.2 km (2.0 mi) |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | Guide NAME OF MATERIAL  | SMALL SPILLS<br>(From a small package or small leak from a large package) |                    |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |                    |   |                             |
|--------|---|---|--------------------|---|-----------------------------|--|--------------------|---|-----------------------------|
|        |   | First ISOLATE<br>in all Directions  |                    | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions                                 |                    | Then PROTECT<br>persons Downwind during |                             |
|        |   | Meters (Feet)   | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) | Meters (Feet)  | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| 3309   | 119 Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)     | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 150 m (500 ft)              | 0.8 km (0.5 mi)  | 2.0 km (1.3 mi)    |   |                             |
| 3310   | 124 Liquefied gas, poisonous, oxidizing, corrosive, n.o.s.                            |   |                    |   |                             |  |                    |   |                             |
| 3310   | 124 Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A) | 100 m (300 ft)  | 0.5 km (0.3 mi)    | 2.5 km (1.6 mi)                         | 500 m (1500 ft)             | 2.9 km (1.8 mi)  | 9.2 km (5.7 mi)    |   |                             |
| 3310   | 124 Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B) | 30 m (100 ft)   | 0.2 km (0.2 mi)    | 1.0 km (0.7 mi)                         | 400 m (1250 ft)             | 2.3 km (1.4 mi)  | 5.1 km (3.2 mi)    |   |                             |
| 3310   | 124 Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C) | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.5 km (0.3 mi)                         | 300 m (1000 ft)             | 1.6 km (1.0 mi)  | 3.2 km (2.0 mi)    |   |                             |
| 3310   | 124 Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone D) | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 150 m (500 ft)              | 0.8 km (0.5 mi)  | 2.0 km (1.3 mi)    |   |                             |
| 3310   | 124 Liquefied gas, toxic, oxidizing, corrosive, n.o.s.                                |   |                    |   |                             |  |                    |   |                             |
| 3310   | 124 Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A)     | 100 m (300 ft)  | 0.5 km (0.3 mi)    | 2.5 km (1.6 mi)                         | 500 m (1500 ft)             | 2.9 km (1.8 mi)  | 9.2 km (5.7 mi)    |   |                             |

|      |            |   |                |                 |                 |                  |                 |                  |
|------|------------|---|----------------|-----------------|-----------------|------------------|-----------------|------------------|
| 3310 | <b>124</b> | Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B) | 30 m (100 ft)  | 0.2 km (0.2 mi) | 1.0 km (0.7 mi) | 400 m (1250 ft)  | 2.3 km (1.4 mi) | 5.1 km (3.2 mi)  |
| 3310 | <b>124</b> | Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.5 km (0.3 mi) | 300 m (1000 ft)  | 1.6 km (1.0 mi) | 3.2 km (2.0 mi)  |
| 3310 | <b>124</b> | Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone D) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 150 m (500 ft)   | 0.8 km (0.5 mi) | 2.0 km (1.3 mi)  |
| 3318 | <b>125</b> | Ammonia solution, with more than 50% Ammonia                                  | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 150 m (500 ft)   | 0.8 km (0.5 mi) | 2.1 km (1.3 mi)  |
| 3355 | <b>119</b> | Insecticide gas, poisonous, flammable, n.o.s.                                 |                |                 |                 |                  |                 |                  |
| 3355 | <b>119</b> | Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)      | 150 m (500 ft) | 1.0 km (0.6 mi) | 3.8 km (2.4 mi) | 1000 m (3000 ft) | 5.7 km (3.6 mi) | 10.1 km (6.3 mi) |
| 3355 | <b>119</b> | Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)      | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.4 km (0.2 mi) | 300 m (1000 ft)  | 1.3 km (0.8 mi) | 3.4 km (2.1 mi)  |
| 3355 | <b>119</b> | Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)      | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.3 km (0.2 mi) | 150 m (500 ft)   | 1.0 km (0.6 mi) | 2.9 km (1.8 mi)  |
| 3355 | <b>119</b> | Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D)      | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 150 m (500 ft)   | 0.8 km (0.5 mi) | 2.0 km (1.3 mi)  |
| 3355 | <b>119</b> | Insecticide gas, toxic, flammable, n.o.s.                                     |                |                 |                 |                  |                 |                  |
| 3355 | <b>119</b> | Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)          | 150 m (500 ft) | 1.0 km (0.6 mi) | 3.8 km (2.4 mi) | 1000 m (3000 ft) | 5.7 km (3.6 mi) | 10.1 km (6.3 mi) |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | NAME OF MATERIAL   | SMALL SPILLS<br>(From a small package or small leak from a large package) |                    |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |                    |   |                             |
|--------|--|---|--------------------|---|-----------------------------|--|--------------------|---|-----------------------------|
|        |  | First ISOLATE<br>in all Directions  |                    | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions                                 |                    | Then PROTECT<br>persons Downwind during |                             |
|        |  | Meters (Feet)   | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) | Meters (Feet)  | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| 3355   | 119 Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)           | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.4 km (0.2 mi)                         | 300 m (1000 ft)             | 1.3 km (0.8 mi)  | 3.4 km (2.1 mi)    |   |                             |
| 3355   | 119 Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)           | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.3 km (0.2 mi)                         | 150 m (500 ft)              | 1.0 km (0.6 mi)  | 2.9 km (1.8 mi)    |   |                             |
| 3355   | 119 Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)           | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 150 m (500 ft)              | 0.8 km (0.5 mi)  | 2.0 km (1.3 mi)    |   |                             |
| 3361   | 156 Chlorosilanes, poisonous, corrosive, n.o.s. (when spilled in water)            | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 60 m (200 ft)               | 0.5 km (0.3 mi)  | 1.6 km (1.0 mi)    |   |                             |
| 3361   | 156 Chlorosilanes, toxic, corrosive, n.o.s. (when spilled in water)                | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 60 m (200 ft)               | 0.5 km (0.3 mi)  | 1.6 km (1.0 mi)    |   |                             |
| 3362   | 155 Chlorosilanes, poisonous, corrosive, flammable, n.o.s. (when spilled in water) | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 60 m (200 ft)               | 0.5 km (0.3 mi)  | 1.6 km (1.0 mi)    |   |                             |
| 3362   | 155 Chlorosilanes, toxic, corrosive, flammable, n.o.s. (when spilled in water)     | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 60 m (200 ft)               | 0.5 km (0.3 mi)  | 1.6 km (1.0 mi)    |   |                             |
| 3381   | 151 Poisonous by inhalation liquid, n.o.s. (Inhalation Hazard Zone A)              | 60 m (200 ft)   | 0.6 km (0.4 mi)    | 1.2 km (0.8 mi)                         | 200 m (600 ft)              | 2.2 km (1.4 mi)  | 4.2 km (2.6 mi)    |   |                             |
| 3381   | 151 Toxic by inhalation liquid, n.o.s. (Inhalation Hazard Zone A)                  | 60 m (200 ft)   | 0.6 km (0.4 mi)    | 1.2 km (0.8 mi)                         | 200 m (600 ft)              | 2.2 km (1.4 mi)  | 4.2 km (2.6 mi)    |   |                             |

|      |     |   |               |                 |                 |                 |                 |                 |
|------|-----|---|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 3382 | 151 | Poisonous by inhalation liquid, n.o.s. (Inhalation Hazard Zone B)                 | 30 m (100 ft) | 0.2 km (0.1 mi) | 0.2 km (0.2 mi) | 60 m (200 ft)   | 0.5 km (0.3 mi) | 0.7 km (0.5 mi) |
| 3382 | 151 | Toxic by inhalation liquid, n.o.s. (Inhalation Hazard Zone B)                     |               |                 |                 |                 |                 |                 |
| 3383 | 131 | Poisonous by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone A)      | 60 m (200 ft) | 0.5 km (0.3 mi) | 1.5 km (0.9 mi) | 300 m (1000 ft) | 3.1 km (2.0 mi) | 5.8 km (3.6 mi) |
| 3383 | 131 | Toxic by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone A)          |               |                 |                 |                 |                 |                 |
| 3384 | 131 | Poisonous by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone B)      | 30 m (100 ft) | 0.2 km (0.1 mi) | 0.3 km (0.2 mi) | 60 m (200 ft)   | 0.6 km (0.4 mi) | 1.0 km (0.6 mi) |
| 3384 | 131 | Toxic by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone B)          |               |                 |                 |                 |                 |                 |
| 3385 | 139 | Poisonous by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone A) | 60 m (200 ft) | 0.6 km (0.4 mi) | 1.2 km (0.8 mi) | 200 m (600 ft)  | 2.2 km (1.4 mi) | 4.2 km (2.6 mi) |
| 3385 | 139 | Toxic by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone A)     |               |                 |                 |                 |                 |                 |
| 3386 | 139 | Poisonous by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone B) | 30 m (100 ft) | 0.2 km (0.1 mi) | 0.2 km (0.2 mi) | 60 m (200 ft)   | 0.5 km (0.3 mi) | 0.7 km (0.5 mi) |
| 3386 | 139 | Toxic by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone B)     |               |                 |                 |                 |                 |                 |

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TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | Guide | NAME OF MATERIAL   | SMALL SPILLS<br>(From a small package or small leak from a large package) |                    |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |                    |   |                             |
|--------|-------|--|---|--------------------|---|-----------------------------|--|--------------------|---|-----------------------------|
|        |       |  | First ISOLATE<br>in all Directions  |                    | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions                                 |                    | Then PROTECT<br>persons Downwind during |                             |
|        |       |  | Meters (Feet)   | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) | Meters (Feet)  | Kilometers (Miles) | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| 3387   | 142   | Poisonous by inhalation<br>liquid, oxidizing, n.o.s.<br>(Inhalation Hazard Zone A) | 60 m (200 ft)   | 0.6 km (0.4 mi)    | 1.2 km (0.8 mi)                         | 200 m (600 ft)              | 2.2 km (1.4 mi)  | 4.2 km (2.6 mi)    |   |                             |
| 3387   | 142   | Toxic by inhalation<br>liquid, oxidizing, n.o.s.<br>(Inhalation Hazard Zone A)     | 60 m (200 ft)   | 0.6 km (0.4 mi)    | 1.2 km (0.8 mi)                         | 200 m (600 ft)              | 2.2 km (1.4 mi)  | 4.2 km (2.6 mi)    |   |                             |
| 3388   | 142   | Poisonous by inhalation<br>liquid, oxidizing, n.o.s.<br>(Inhalation Hazard Zone B) | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 30 m (100 ft)               | 0.3 km (0.2 mi)  | 0.4 km (0.3 mi)    |   |                             |
| 3388   | 142   | Toxic by inhalation<br>liquid, oxidizing, n.o.s.<br>(Inhalation Hazard Zone B)     | 30 m (100 ft)   | 0.1 km (0.1 mi)    | 0.1 km (0.1 mi)                         | 30 m (100 ft)               | 0.3 km (0.2 mi)  | 0.4 km (0.3 mi)    |   |                             |
| 3389   | 154   | Poisonous by inhalation<br>liquid, corrosive, n.o.s.<br>(Inhalation Hazard Zone A) | 100 m (300 ft)  | 0.3 km (0.2 mi)    | 0.8 km (0.5 mi)                         | 400 m (1250 ft)             | 1.4 km (0.9 mi)  | 3.3 km (2.1 mi)    |   |                             |
| 3389   | 154   | Toxic by inhalation<br>liquid, corrosive, n.o.s.<br>(Inhalation Hazard Zone A)     | 100 m (300 ft)  | 0.3 km (0.2 mi)    | 0.8 km (0.5 mi)                         | 400 m (1250 ft)             | 1.4 km (0.9 mi)  | 3.3 km (2.1 mi)    |   |                             |
| 3390   | 154   | Poisonous by inhalation<br>liquid, corrosive, n.o.s.<br>(Inhalation Hazard Zone B) | 30 m (100 ft)   | 0.2 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 30 m (100 ft)               | 0.4 km (0.3 mi)  | 0.6 km (0.4 mi)    |   |                             |
| 3390   | 154   | Toxic by inhalation<br>liquid, corrosive, n.o.s.<br>(Inhalation Hazard Zone B)     | 30 m (100 ft)   | 0.2 km (0.1 mi)    | 0.2 km (0.1 mi)                         | 30 m (100 ft)               | 0.4 km (0.3 mi)  | 0.6 km (0.4 mi)    |   |                             |



|      |     |   |                   |                    |                    |                    |                    |                    |
|------|-----|---|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 3456 | 157 | Nitrosylsulfuric acid, solid<br><b>(when spilled in water)</b>  | 30 m<br>(100 ft)  | 0.1 km<br>(0.1 mi) | 0.3 km<br>(0.2 mi) | 300 m<br>(1000 ft) | 1.0 km<br>(0.6 mi) | 2.9 km<br>(1.8 mi) |
| 3456 | 157 | Nitrosulphuric acid, solid<br><b>(when spilled in water)</b>  |                   |                    |                    |                    |                    |                    |
| 3488 | 131 | Poisonous by inhalation liquid,<br>flammable, corrosive, n.o.s.<br>(Inhalation Hazard Zone A)         |                   |                    |                    |                    |                    |                    |
| 3488 | 131 | Toxic by inhalation liquid,<br>flammable, corrosive, n.o.s.<br>(Inhalation Hazard Zone A)             | 100 m<br>(300 ft) | 0.9 km<br>(0.6 mi) | 2.0 km<br>(1.2 mi) | 400 m<br>(1250 ft) | 4.8 km<br>(3.0 mi) | 7.5 km<br>(4.7 mi) |
| 3489 | 131 | Poisonous by inhalation liquid,<br>flammable, corrosive, n.o.s.<br>(Inhalation Hazard Zone B)         |                   |                    |                    |                    |                    |                    |
| 3489 | 131 | Toxic by inhalation liquid,<br>flammable, corrosive, n.o.s.<br>(Inhalation Hazard Zone B)             | 30 m<br>(100 ft)  | 0.2 km<br>(0.1 mi) | 0.3 km<br>(0.2 mi) | 60 m<br>(200 ft)   | 0.6 km<br>(0.4 mi) | 1.0 km<br>(0.6 mi) |
| 3490 | 155 | Poisonous by inhalation liquid,<br>water-reactive, flammable,<br>n.o.s. (Inhalation Hazard<br>Zone A) |                   |                    |                    |                    |                    |                    |
| 3490 | 155 | Toxic by inhalation liquid, water-<br>reactive, flammable, n.o.s.<br>(Inhalation Hazard Zone A)       | 60 m<br>(200 ft)  | 0.5 km<br>(0.3 mi) | 1.5 km<br>(0.9 mi) | 300 m<br>(1000 ft) | 3.1 km<br>(2.0 mi) | 5.8 km<br>(3.6 mi) |
| 3491 | 155 | Poisonous by inhalation liquid,<br>water-reactive, flammable,<br>n.o.s. (Inhalation Hazard<br>Zone B) |                   |                    |                    |                    |                    |                    |
| 3491 | 155 | Toxic by inhalation liquid, water-<br>reactive, flammable, n.o.s.<br>(Inhalation Hazard Zone B)       | 30 m<br>(100 ft)  | 0.2 km<br>(0.1 mi) | 0.3 km<br>(0.2 mi) | 60 m<br>(200 ft)   | 0.6 km<br>(0.4 mi) | 1.0 km<br>(0.6 mi) |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | Guide | NAME OF MATERIAL  | SMALL SPILLS<br>(From a small package or small leak from a large package) |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |   |                             |
|--------|-------|---|---|---|-----------------------------|--|---|-----------------------------|
|        |       |   | First ISOLATE<br>in all Directions<br>Meters (Feet)                       | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions<br>Meters (Feet)                | Then PROTECT<br>persons Downwind during |                             |
|        |       |   |   | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |  | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| 3492   | 131   | Poisonous by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone A)   | 100 m (300 ft)  | 0.9 km (0.6 mi)                         | 2.0 km (1.2 mi)             | 400 m (1250 ft)  | 4.8 km (3.0 mi)                         | 7.5 km (4.7 mi)             |
| 3492   | 131   | Toxic by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone A)   | 100 m (300 ft)  | 0.9 km (0.6 mi)                         | 2.0 km (1.2 mi)             | 400 m (1250 ft)  | 4.8 km (3.0 mi)                         | 7.5 km (4.7 mi)             |
| 3493   | 131   | Poisonous by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone B)   | 30 m (100 ft)   | 0.2 km (0.1 mi)                         | 0.3 km (0.2 mi)             | 60 m (200 ft)  | 0.6 km (0.4 mi)                         | 1.0 km (0.6 mi)             |
| 3493   | 131   | Toxic by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone B)   | 30 m (100 ft)   | 0.2 km (0.1 mi)                         | 0.3 km (0.2 mi)             | 60 m (200 ft)  | 0.6 km (0.4 mi)                         | 1.0 km (0.6 mi)             |
| 3494   | 131   | Petroleum sour crude oil, flammable, poisonous  | 30 m (100 ft)   | 0.2 km (0.1 mi)                         | 0.2 km (0.2 mi)             | 60 m (200 ft)  | 0.5 km (0.3 mi)                         | 0.7 km (0.5 mi)             |
| 3494   | 131   | Petroleum sour crude oil, flammable, toxic  | 30 m (100 ft)   | 0.2 km (0.1 mi)                         | 0.2 km (0.2 mi)             | 60 m (200 ft)  | 0.5 km (0.3 mi)                         | 0.7 km (0.5 mi)             |
| 3507   | 166   | Uranium hexafluoride, radioactive material, excepted package, less than 0.1 kg per package, non-fissile or fissile-excepted (when spilled in water) | 30 m (100 ft)   | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 30 m (100 ft)  | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             |

|      |     |   |               |                 |                 |               |                 |                 |
|------|-----|---|---------------|-----------------|-----------------|---------------|-----------------|-----------------|
| 3512 | 173 | Adsorbed gas, poisonous, n.o.s.                                       | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3512 | 173 | Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone A)            | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3512 | 173 | Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone B)            | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) |
| 3512 | 173 | Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone C)            | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) |
| 3512 | 173 | Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone D)            | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3512 | 173 | Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone A)                | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3512 | 173 | Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone B)                | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) |
| 3512 | 173 | Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone C)                | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) |
| 3512 | 173 | Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone D)                | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3514 | 173 | Adsorbed gas, poisonous, flammable, n.o.s.                            | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3514 | 173 | Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone A) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | Guide | NAME OF MATERIAL  | SMALL SPILLS<br>(From a small package or small leak from a large package) |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |   |                             |
|--------|-------|---|---|---|-----------------------------|--|---|-----------------------------|
|        |       |   | First ISOLATE<br>in all Directions<br>Meters (Feet)                       | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions<br>Meters (Feet)                | Then PROTECT<br>persons Downwind during |                             |
|        |       |   |   | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |  | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| 3514   | 173   | Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone B) |   |   |                             |  |   |                             |
| 3514   | 173   | Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone C) | 30 m (100 ft)   | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 30 m (100 ft)  | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             |
| 3514   | 173   | Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone D) |   |   |                             |  |   |                             |
| 3514   | 173   | Adsorbed gas, toxic, flammable, n.o.s.                                |   |   |                             |  |   |                             |
| 3514   | 173   | Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone A)     | 30 m (100 ft)   | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 30 m (100 ft)  | 0.1 km (0.1 mi)                         | 0.2 km (0.2 mi)             |
| 3514   | 173   | Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone B)     |   |   |                             |  |   |                             |
| 3514   | 173   | Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone C)     | 30 m (100 ft)   | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 30 m (100 ft)  | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             |
| 3514   | 173   | Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone D)     |   |   |                             |  |   |                             |

|      |            |   |               |                 |               |                 |                 |
|------|------------|---|---------------|-----------------|---------------|-----------------|-----------------|
| 3515 | <b>173</b> | Adsorbed gas, poisonous, oxidizing, n.o.s.                            | 30 m (100 ft) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3515 | <b>173</b> | Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone A) | 30 m (100 ft) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3515 | <b>173</b> | Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone B) | 30 m (100 ft) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3515 | <b>173</b> | Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone C) | 30 m (100 ft) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3515 | <b>173</b> | Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone D) | 30 m (100 ft) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3515 | <b>173</b> | Adsorbed gas, toxic, oxidizing, n.o.s.                                | 30 m (100 ft) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3515 | <b>173</b> | Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone A)     | 30 m (100 ft) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3515 | <b>173</b> | Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone B)     | 30 m (100 ft) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3515 | <b>173</b> | Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone C)     | 30 m (100 ft) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3515 | <b>173</b> | Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone D)     | 30 m (100 ft) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3516 | <b>173</b> | Adsorbed gas, poisonous, corrosive, n.o.s.                            | 30 m (100 ft) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3516 | <b>173</b> | Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone A) | 30 m (100 ft) | 0.1 km (0.1 mi) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

|               |              | <b>SMALL SPILLS</b><br>(From a small package or small leak from a large package) |   | <b>LARGE SPILLS</b><br>(From a large package or from many small packages) |   |  |                                  |
|---------------|--------------|--|---|---|---|--|----------------------------------|
| <b>ID No.</b> | <b>Guide</b> | <b>NAME OF MATERIAL</b>  | <b>First ISOLATE</b><br>in all Directions | <b>Then PROTECT</b><br>persons Downwind during                            | <b>First ISOLATE</b><br>in all Directions | <b>Then PROTECT</b><br>persons Downwind during |                                  |
|               |              |  | Meters (Feet)                             | <b>DAY</b><br>Kilometers (Miles)  | <b>NIGHT</b><br>Kilometers (Miles)        | Meters (Feet)                                  | <b>DAY</b><br>Kilometers (Miles) |
| 3516          | 173          | Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone B)            | 30 m (100 ft)                             | 0.1 km (0.1 mi)   | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.1 km (0.1 mi)                  |
| 3516          | 173          | Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone C)            | 30 m (100 ft)                             | 0.1 km (0.1 mi)   | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.1 km (0.1 mi)                  |
| 3516          | 173          | Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone D)            | 30 m (100 ft)                             | 0.1 km (0.1 mi)   | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.1 km (0.1 mi)                  |
| 3516          | 173          | Adsorbed gas, toxic, corrosive, n.o.s.   | 30 m (100 ft)                             | 0.1 km (0.1 mi)   | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.2 km (0.2 mi)                  |
| 3516          | 173          | Adsorbed gas, toxic, corrosive, n.o.s. (Inhalation hazard zone A)                | 30 m (100 ft)                             | 0.1 km (0.1 mi)   | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.2 km (0.2 mi)                  |
| 3516          | 173          | Adsorbed gas, toxic, corrosive, n.o.s. (Inhalation hazard zone B)                | 30 m (100 ft)                             | 0.1 km (0.1 mi)   | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.1 km (0.1 mi)                  |
| 3516          | 173          | Adsorbed gas, toxic, corrosive, n.o.s. (Inhalation hazard zone C)                | 30 m (100 ft)                             | 0.1 km (0.1 mi)   | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.1 km (0.1 mi)                  |
| 3516          | 173          | Adsorbed gas, toxic, corrosive, n.o.s. (Inhalation hazard zone D)                | 30 m (100 ft)                             | 0.1 km (0.1 mi)   | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.2 km (0.2 mi)                  |
| 3517          | 173          | Adsorbed gas, poisonous, flammable, corrosive, n.o.s.                            | 30 m (100 ft)                             | 0.1 km (0.1 mi)   | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.2 km (0.2 mi)                  |
| 3517          | 173          | Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone A) | 30 m (100 ft)                             | 0.1 km (0.1 mi)   | 30 m (100 ft)                             | 0.1 km (0.1 mi)                                | 0.2 km (0.2 mi)                  |

|      |            |  |               |                 |                 |                 |                 |
|------|------------|--|---------------|-----------------|-----------------|-----------------|-----------------|
| 3517 | <b>173</b> | Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone B) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) |
| 3517 | <b>173</b> | Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone C) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) |
| 3517 | <b>173</b> | Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone D) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) |
| 3517 | <b>173</b> | Adsorbed gas, toxic, flammable, corrosive, n.o.s.                                | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3517 | <b>173</b> | Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone A)     | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) |
| 3517 | <b>173</b> | Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone B)     | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) |
| 3517 | <b>173</b> | Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone C)     | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) |
| 3517 | <b>173</b> | Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone D)     | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3518 | <b>173</b> | Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s.                            | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3518 | <b>173</b> | Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone A) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

| ID No. | Guide | NAME OF MATERIAL   | SMALL SPILLS<br>(From a small package or small leak from a large package) |   |                             | LARGE SPILLS<br>(From a large package or from many small packages) |   |                             |
|--------|-------|--|---|---|-----------------------------|--|---|-----------------------------|
|        |       |  | First ISOLATE<br>in all Directions<br>Meters (Feet)                       | Then PROTECT<br>persons Downwind during |                             | First ISOLATE<br>in all Directions<br>Meters (Feet)                | Then PROTECT<br>persons Downwind during |                             |
|        |       |  |   | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |  | DAY<br>Kilometers (Miles)               | NIGHT<br>Kilometers (Miles) |
| 3518   | 173   | Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone B) |   |   |                             |  |   |                             |
| 3518   | 173   | Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone C) | 30 m (100 ft)   | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 30 m (100 ft)  | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             |
| 3518   | 173   | Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone D) |   |   |                             |  |   |                             |
| 3518   | 173   | Adsorbed gas, toxic, oxidizing, corrosive, n.o.s.                                |   |   |                             |  |   |                             |
| 3518   | 173   | Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone A)     | 30 m (100 ft)   | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 30 m (100 ft)  | 0.1 km (0.1 mi)                         | 0.2 km (0.2 mi)             |
| 3518   | 173   | Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone B)     |   |   |                             |  |   |                             |
| 3518   | 173   | Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone C)     | 30 m (100 ft)   | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 30 m (100 ft)  | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             |
| 3518   | 173   | Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone D)     |   |   |                             |  |   |                             |
| 3519   | 173   | Boron trifluoride, adsorbed  | 30 m (100 ft)   | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 30 m (100 ft)  | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             |
| 3520   | 173   | Chlorine, adsorbed   | 30 m (100 ft)   | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             | 30 m (100 ft)  | 0.1 km (0.1 mi)                         | 0.1 km (0.1 mi)             |



|      |     |   |               |                 |                 |                |                 |                 |                 |
|------|-----|---|---------------|-----------------|-----------------|----------------|-----------------|-----------------|-----------------|
| 3521 | 173 | Silicon tetrafluoride, adsorbed                           | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) |
| 3522 | 173 | Arsine, adsorbed  | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3523 | 173 | Germane, adsorbed   | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.2 km (0.2 mi) |
| 3524 | 173 | Phosphorus pentafluoride, adsorbed                        | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) |
| 3525 | 173 | Phosphine, adsorbed                                       | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) |
| 3526 | 173 | Hydrogen selenide, adsorbed                               | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.4 km (0.3 mi) |
| 3539 | 123 | Articles containing toxic gas, n.o.s.                     | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 0.4 km (0.3 mi) |
| 9191 | 143 | Chlorine dioxide, hydrate, frozen (when spilled in water) | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.2 km (0.1 mi) | 0.2 km (0.1 mi) | 0.5 km (0.3 mi) |
| 9202 | 168 | Carbon monoxide, refrigerated liquid (cryogenic liquid)   | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 200 m (600 ft) | 1.2 km (0.7 mi) | 4.3 km (2.7 mi) |                 |
| 9206 | 137 | Methyl phosphonic dichloride                              | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.2 km (0.1 mi) | 30 m (100 ft)  | 0.4 km (0.3 mi) | 0.6 km (0.4 mi) |                 |
| 9263 | 156 | Chloroacetyl chloride                                     | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.2 km (0.2 mi) | 0.3 km (0.2 mi) |                 |
| 9264 | 151 | 3,5-Dichloro-2,4,6-trifluoropyridine                      | 30 m (100 ft) | 0.1 km (0.1 mi) | 0.1 km (0.1 mi) | 30 m (100 ft)  | 0.2 km (0.2 mi) | 0.3 km (0.2 mi) |                 |
| 9269 | 132 | Trimethoxysilane  | 30 m (100 ft) | 0.2 km (0.2 mi) | 0.6 km (0.4 mi) | 100 m (300 ft) | 1.3 km (0.8 mi) | 2.3 km (1.5 mi) |                 |

See Next Page for Table of Water-Reactive Materials Which Produce Toxic Gases

"+" means distance can be larger in certain atmospheric conditions

TABLE 1

## HOW TO USE TABLE 2 – WATER-REACTIVE MATERIALS THAT PRODUCE TOXIC GASES

Table 2 lists materials that produce large amounts of Toxic Inhalation Hazard (TIH) (PIH in the US) gases when spilled in water, and identifies the TIH gases produced.

The materials are listed by order of ID number.

These Water-Reactive materials are easily identified in Table 1 as their name is immediately followed by **(when spilled in water)**.

**Note 1:** The TIH gases indicated in Table 2 are for information purposes only. In Table 1, the initial isolation and protective action distances have already taken into consideration the TIH gases produced.

For example: Table 2 indicates that UN1689 sodium cyanide, when spilled in water, will generate hydrogen cyanide gas (HCN). In Table 1, you must refer to the distances for sodium cyanide and not the distances for hydrogen cyanide gas.

**Note 2:** Some Water-Reactive materials are also TIH materials themselves (e.g., UN1746 (Bromine trifluoride), UN1836 (Thionyl chloride)). In these instances, two entries are provided in Table 1 for land-based and water-based spills. If a water-reactive material only has one entry in Table 1 for **(when spilled in water)**, and the product is **NOT** spilled in water, Tables 1 and 2 do **NOT** apply. Refer only to the appropriate orange-bordered guide.

**Note 3:** Materials classified as a Division 4.3 are substances that, on contact with water, are liable to become spontaneously **FLAMMABLE** or give off **FLAMMABLE** or sometimes **TOXIC** gases in dangerous quantities. For the purpose of this table, water-reactive materials are materials that generate substantial quantities of **TOXIC** gases rapidly after a spill into water; therefore, a material classified as a Division 4.3 will not always be included in Table 2.

**TABLE 2 - WATER-REACTIVE MATERIALS WHICH PRODUCE TOXIC GASES**

**Materials Which Produce Large Amounts of Toxic-by-Inhalation (TIH)  
(PIH in the US) Gas(es) When Spilled in Water**

| <b>ID No.</b> | <b>Guide No.</b> | <b>Name of Material</b>   | <b>TIH Gas(es) Produced</b>      |
|---------------|------------------|---|----------------------------------|
| 1162          | 155              | Dimethyldichlorosilane  | HCl                              |
| 1183          | 139              | Ethyldichlorosilane   | HCl                              |
| 1196          | 155              | Ethyltrichlorosilane  | HCl                              |
| 1242          | 139              | Methyldichlorosilane  | HCl                              |
| 1250          | 155              | Methyltrichlorosilane   | HCl                              |
| 1295          | 139              | Trichlorosilane   | HCl                              |
| 1298          | 155              | Trimethylchlorosilane   | HCl                              |
| 1305          | 155P             | Vinyltrichlorosilane  | HCl                              |
| 1305          | 155P             | Vinyltrichlorosilane, stabilized                                | HCl                              |
| 1340          | 139              | Phosphorus pentasulfide, free from yellow and white Phosphorus  | H <sub>2</sub> S                 |
| 1340          | 139              | Phosphorus pentasulphide, free from yellow and white Phosphorus | H <sub>2</sub> S                 |
| 1360          | 139              | Calcium phosphide   | PH <sub>3</sub>                  |
| 1384          | 135              | Sodium dithionite   | H <sub>2</sub> S SO <sub>2</sub> |
| 1384          | 135              | Sodium hydrosulfite   | H <sub>2</sub> S SO <sub>2</sub> |
| 1384          | 135              | Sodium hydrosulphite  | H <sub>2</sub> S SO <sub>2</sub> |
| 1390          | 139              | Alkali metal amides   | NH <sub>3</sub>                  |
| 1397          | 139              | Aluminum phosphide  | PH <sub>3</sub>                  |
| 1419          | 139              | Magnesium aluminum phosphide                                    | PH <sub>3</sub>                  |
| 1432          | 139              | Sodium phosphide  | PH <sub>3</sub>                  |
| 1541          | 155              | Acetone cyanohydrin, stabilized                                 | HCN                              |
| 1680          | 157              | Potassium cyanide, solid  | HCN                              |
| 1689          | 157              | Sodium cyanide, solid   | HCN                              |

**Chemical Symbols for TIH (PIH in the US) Gases:**

|                 |                   |                  |                   |                 |                  |
|-----------------|-------------------|------------------|-------------------|-----------------|------------------|
| Br <sub>2</sub> | Bromine           | HF               | Hydrogen fluoride | NO <sub>2</sub> | Nitrogen dioxide |
| Cl <sub>2</sub> | Chlorine          | HI               | Hydrogen iodide   | PH <sub>3</sub> | Phosphine        |
| HBr             | Hydrogen bromide  | H <sub>2</sub> S | Hydrogen sulfide  | SO <sub>2</sub> | Sulfur dioxide   |
| HCl             | Hydrogen chloride | H <sub>2</sub> S | Hydrogen sulphide | SO <sub>2</sub> | Sulphur dioxide  |
| HCN             | Hydrogen cyanide  | NH <sub>3</sub>  | Ammonia           |                 |                  |

**TABLE 2**

**TABLE2 - WATER-REACTIVE MATERIALS WHICH PRODUCE TOXIC GASES**

**Materials Which Produce Large Amounts of Toxic-by-Inhalation (TIH)  
(PIH in the US) Gas(es) When Spilled in Water**

| <b>ID No.</b> | <b>Guide No.</b> | <b>Name of Material</b>                                 | <b>TIH Gas(es) Produced</b> |
|---------------|------------------|---|-----------------------------|
| 1716          | 156              | Acetyl bromide  | HBr                         |
| 1717          | 155              | Acetyl chloride   | HCl                         |
| 1724          | 155              | Allyltrichlorosilane, stabilized                        | HCl                         |
| 1725          | 137              | Aluminum bromide, anhydrous                             | HBr                         |
| 1726          | 137              | Aluminum chloride, anhydrous                            | HCl                         |
| 1728          | 155              | Amyltrichlorosilane                                     | HCl                         |
| 1732          | 157              | Antimony pentafluoride                                  | HF                          |
| 1741          | 125              | Boron trichloride                                       | HCl                         |
| 1745          | 144              | Bromine pentafluoride                                   | HF Br <sub>2</sub>          |
| 1746          | 144              | Bromine trifluoride                                     | HF Br <sub>2</sub>          |
| 1747          | 155              | Butyltrichlorosilane                                    | HCl                         |
| 1752          | 156              | Chloroacetyl chloride                                   | HCl                         |
| 1753          | 156              | Chlorophenyltrichlorosilane                             | HCl                         |
| 1754          | 137              | Chlorosulfonic acid (with or without sulfur trioxide)   | HCl                         |
| 1754          | 137              | Chlorosulphonic acid (with or without sulphur trioxide) | HCl                         |
| 1758          | 137              | Chromium oxychloride                                    | HCl                         |
| 1762          | 156              | Cyclohexenyltrichlorosilane                             | HCl                         |
| 1763          | 156              | Cyclohexyltrichlorosilane                               | HCl                         |
| 1765          | 156              | Dichloroacetyl chloride                                 | HCl                         |
| 1766          | 156              | Dichlorophenyltrichlorosilane                           | HCl                         |
| 1767          | 155              | Diethyldichlorosilane                                   | HCl                         |
| 1769          | 156              | Dipenyldichlorosilane                                   | HCl                         |
| 1771          | 156              | Dodecyltrichlorosilane                                  | HCl                         |

**Chemical Symbols for TIH (PIH in the US) Gases:**

|                 |                   |                  |                   |                 |                  |
|-----------------|-------------------|------------------|-------------------|-----------------|------------------|
| Br <sub>2</sub> | Bromine           | HF               | Hydrogen fluoride | NO <sub>2</sub> | Nitrogen dioxide |
| Cl <sub>2</sub> | Chlorine          | HI               | Hydrogen iodide   | PH <sub>3</sub> | Phosphine        |
| HBr             | Hydrogen bromide  | H <sub>2</sub> S | Hydrogen sulfide  | SO <sub>2</sub> | Sulfur dioxide   |
| HCl             | Hydrogen chloride | H <sub>2</sub> S | Hydrogen sulphide | SO <sub>2</sub> | Sulphur dioxide  |
| HCN             | Hydrogen cyanide  | NH <sub>3</sub>  | Ammonia           |                 |                  |

**TABLE 2 - WATER-REACTIVE MATERIALS WHICH PRODUCE TOXIC GASES**

**Materials Which Produce Large Amounts of Toxic-by-Inhalation (TIH)  
(PIH in the US) Gas(es) When Spilled in Water**

| <b>ID No.</b> | <b>Guide No.</b> | <b>Name of Material</b>  | <b>TIH Gas(es) Produced</b>          |
|---------------|------------------|--------------------------|--------------------------------------|
| 1777          | 137              | Fluorosulfonic acid      | HF                                   |
| 1777          | 137              | Fluorosulphonic acid     | HF                                   |
| 1781          | 156              | Hexadecyltrichlorosilane | HCl                                  |
| 1784          | 156              | Hexyltrichlorosilane     | HCl                                  |
| 1799          | 156              | Nonyltrichlorosilane     | HCl                                  |
| 1800          | 156              | Octadecyltrichlorosilane | HCl                                  |
| 1801          | 156              | Octyltrichlorosilane     | HCl                                  |
| 1804          | 156              | Phenyltrichlorosilane    | HCl                                  |
| 1806          | 137              | Phosphorus pentachloride | HCl                                  |
| 1808          | 137              | Phosphorus tribromide    | HBr                                  |
| 1809          | 137              | Phosphorus trichloride   | HCl                                  |
| 1810          | 137              | Phosphorus oxychloride   | HCl                                  |
| 1815          | 132              | Propionyl chloride       | HCl                                  |
| 1816          | 155              | Propyltrichlorosilane    | HCl                                  |
| 1818          | 157              | Silicon tetrachloride    | HCl                                  |
| 1828          | 137              | Sulfur chlorides         | HCl SO <sub>2</sub> H <sub>2</sub> S |
| 1828          | 137              | Sulphur chlorides        | HCl SO <sub>2</sub> H <sub>2</sub> S |
| 1834          | 137              | Sulfuryl chloride        | HCl                                  |
| 1834          | 137              | Sulphuryl chloride       | HCl                                  |
| 1836          | 137              | Thionyl chloride         | HCl SO <sub>2</sub>                  |
| 1838          | 137              | Titanium tetrachloride   | HCl                                  |
| 1898          | 156              | Acetyl iodide            | HI                                   |
| 1923          | 135              | Calcium dithionite       | H <sub>2</sub> S SO <sub>2</sub>     |

**TABLE 2**

**Chemical Symbols for TIH (PIH in the US) Gases:**

|                 |                   |                  |                   |                 |                  |
|-----------------|-------------------|------------------|-------------------|-----------------|------------------|
| Br <sub>2</sub> | Bromine           | HF               | Hydrogen fluoride | NO <sub>2</sub> | Nitrogen dioxide |
| Cl <sub>2</sub> | Chlorine          | HI               | Hydrogen iodide   | PH <sub>3</sub> | Phosphine        |
| HBr             | Hydrogen bromide  | H <sub>2</sub> S | Hydrogen sulfide  | SO <sub>2</sub> | Sulfur dioxide   |
| HCl             | Hydrogen chloride | H <sub>2</sub> S | Hydrogen sulphide | SO <sub>2</sub> | Sulphur dioxide  |
| HCN             | Hydrogen cyanide  | NH <sub>3</sub>  | Ammonia           |                 |                  |

**TABLE2 - WATER-REACTIVE MATERIALS WHICH PRODUCE TOXIC GASES**

**Materials Which Produce Large Amounts of Toxic-by-Inhalation (TIH)  
(PIH in the US) Gas(es) When Spilled in Water**

| <b>ID No.</b> | <b>Guide No.</b> | <b>Name of Material</b>        | <b>TIH Gas(es) Produced</b>      |
|---------------|------------------|--------------------------------|----------------------------------|
| 1923          | 135              | Calcium hydrosulfite           | H <sub>2</sub> S SO <sub>2</sub> |
| 1923          | 135              | Calcium hydrosulphite          | H <sub>2</sub> S SO <sub>2</sub> |
| 1929          | 135              | Potassium dithionite           | H <sub>2</sub> S SO <sub>2</sub> |
| 1929          | 135              | Potassium hydrosulfite         | H <sub>2</sub> S SO <sub>2</sub> |
| 1929          | 135              | Potassium hydrosulphite        | H <sub>2</sub> S SO <sub>2</sub> |
| 1931          | 171              | Zinc dithionite                | H <sub>2</sub> S SO <sub>2</sub> |
| 1931          | 171              | Zinc hydrosulfite              | H <sub>2</sub> S SO <sub>2</sub> |
| 1931          | 171              | Zinc hydrosulphite             | H <sub>2</sub> S SO <sub>2</sub> |
| 2004          | 135              | Magnesium diamide              | NH <sub>3</sub>                  |
| 2011          | 139              | Magnesium phosphide            | PH <sub>3</sub>                  |
| 2012          | 139              | Potassium phosphide            | PH <sub>3</sub>                  |
| 2013          | 139              | Strontium phosphide            | PH <sub>3</sub>                  |
| 2308          | 157              | Nitrosylsulfuric acid, liquid  | NO <sub>2</sub>                  |
| 2308          | 157              | Nitrosylsulphuric acid, liquid | NO <sub>2</sub>                  |
| 2353          | 132              | Butyryl chloride               | HCl                              |
| 2395          | 132              | Isobutyryl chloride            | HCl                              |
| 2434          | 156              | Dibenzylidichlorosilane        | HCl                              |
| 2435          | 156              | Ethylphenyldichlorosilane      | HCl                              |
| 2437          | 156              | Methylphenyldichlorosilane     | HCl                              |
| 2495          | 144              | Iodine pentafluoride           | HF                               |
| 2691          | 137              | Phosphorus pentabromide        | HBr                              |
| 2692          | 157              | Boron tribromide               | HBr                              |
| 2806          | 139              | Lithium nitride                | NH <sub>3</sub>                  |

**Chemical Symbols for TIH (PIH in the US) Gases:**

|                 |                   |                  |                   |                 |                  |
|-----------------|-------------------|------------------|-------------------|-----------------|------------------|
| Br <sub>2</sub> | Bromine           | HF               | Hydrogen fluoride | NO <sub>2</sub> | Nitrogen dioxide |
| Cl <sub>2</sub> | Chlorine          | HI               | Hydrogen iodide   | PH <sub>3</sub> | Phosphine        |
| HBr             | Hydrogen bromide  | H <sub>2</sub> S | Hydrogen sulfide  | SO <sub>2</sub> | Sulfur dioxide   |
| HCl             | Hydrogen chloride | H <sub>2</sub> S | Hydrogen sulphide | SO <sub>2</sub> | Sulphur dioxide  |
| HCN             | Hydrogen cyanide  | NH <sub>3</sub>  | Ammonia           |                 |                  |

**TABLE 2 - WATER-REACTIVE MATERIALS WHICH PRODUCE TOXIC GASES**

**Materials Which Produce Large Amounts of Toxic-by-Inhalation (TIH)  
(PIH in the US) Gas(es) When Spilled in Water**

| <b>ID No.</b> | <b>Guide No.</b> | <b>Name of Material</b>   | <b>TIH Gas(es) Produced</b> |
|---------------|------------------|---|-----------------------------|
| 2965          | 139              | Boron trifluoride dimethyl etherate   | HF                          |
| 2977          | 166              | Radioactive material, Uranium hexafluoride, fissile   | HF                          |
| 2977          | 166              | Uranium hexafluoride, radioactive material, fissile   | HF                          |
| 2978          | 166              | Radioactive material, Uranium hexafluoride, non fissile or fissile-excepted   | HF                          |
| 2978          | 166              | Uranium hexafluoride, radioactive material, non fissile or fissile-excepted   | HF                          |
| 2985          | 155              | Chlorosilanes, flammable, corrosive, n.o.s.   | HCl                         |
| 2986          | 155              | Chlorosilanes, corrosive, flammable, n.o.s.   | HCl                         |
| 2987          | 156              | Chlorosilanes, corrosive, n.o.s.  | HCl                         |
| 2988          | 139              | Chlorosilanes, water-reactive, flammable, corrosive, n.o.s.   | HCl                         |
| 3048          | 157              | Aluminum phosphide pesticide  | PH <sub>3</sub>             |
| 3361          | 156              | Chlorosilanes, poisonous, corrosive, n.o.s.   | HCl                         |
| 3361          | 156              | Chlorosilanes, toxic, corrosive, n.o.s.   | HCl                         |
| 3362          | 155              | Chlorosilanes, poisonous, corrosive, flammable, n.o.s.  | HCl                         |
| 3362          | 155              | Chlorosilanes, toxic, corrosive, flammable, n.o.s.  | HCl                         |
| 3456          | 157              | Nitrosylsulfuric acid, solid  | NO <sub>2</sub>             |
| 3456          | 157              | Nitrosylsulphuric acid, solid   | NO <sub>2</sub>             |
| 3507          | 166              | Uranium hexafluoride, radioactive material, excepted package, less than 0.1 kg per package, non-fissile or fissile-excepted | HF                          |
| 9191          | 143              | Chlorine dioxide, hydrate, frozen   | Cl <sub>2</sub>             |

**TABLE 2**

**Chemical Symbols for TIH (PIH in the US) Gases:**

|                 |                   |                  |                   |                 |                  |
|-----------------|-------------------|------------------|-------------------|-----------------|------------------|
| Br <sub>2</sub> | Bromine           | HF               | Hydrogen fluoride | NO <sub>2</sub> | Nitrogen dioxide |
| Cl <sub>2</sub> | Chlorine          | HI               | Hydrogen iodide   | PH <sub>3</sub> | Phosphine        |
| HBr             | Hydrogen bromide  | H <sub>2</sub> S | Hydrogen sulfide  | SO <sub>2</sub> | Sulfur dioxide   |
| HCl             | Hydrogen chloride | H <sub>2</sub> S | Hydrogen sulphide | SO <sub>2</sub> | Sulphur dioxide  |
| HCN             | Hydrogen cyanide  | NH <sub>3</sub>  | Ammonia           |                 |                  |

**HOW TO USE TABLE 3 – INITIAL ISOLATION AND PROTECTIVE ACTION  
DISTANCES FOR LARGE SPILLS FOR DIFFERENT QUANTITIES OF  
SIX COMMON TIH (PIH in the US) GASES**

Table 3 lists Toxic Inhalation Hazard (TIH) materials that may be more commonly encountered.

The selected materials are:

- UN1005 - Ammonia, anhydrous
- UN1017 - Chlorine
- UN1040 - Ethylene oxide and UN1040 – Ethylene oxide with nitrogen
- UN1050 - Hydrogen chloride, anhydrous and UN2186 - and Hydrogen chloride, refrigerated liquid
- UN1052 - Hydrogen fluoride, anhydrous
- UN1079 - Sulfur dioxide/Sulphur dioxide

The materials are presented in numerical order of ID number and provide Initial Isolation and Protective Action Distances **FOR LARGE SPILLS** (more than 208 liters or 55 US gallons) involving different container types (therefore different volume capacities, see below) for day time and night time situations and different wind speeds.

- Rail tank car: 80 000 kg (176 368 lbs.)
- Highway tank truck or trailer: 20 000 – 25 000 kg (44 092 – 55 115 lbs.)
- Agricultural nurse tank: 3785 L (1000 gallons)
- Small cylinder: 72 L (19 gallons)
- Ton cylinder: 757 - 1135 L (200 - 300 gallons)

**Estimating Wind Speed from Environmental Clues**

| mph    | km/h    | Wind Description | Specifications   |
|--------|---------|------------------|--|
| < 6    | < 10    | Low wind         | Wind felt on face; leaves rustle; ordinary vane moved by wind                                |
| 6 - 12 | 10 - 20 | Moderate wind    | Raises dust, loose paper; small branches are moved   |
| > 12   | > 20    | High wind        | Large branches in motion; whistling heard in telephone wires; umbrellas used with difficulty |

(Data taken from the Beaufort Wind Scale has been reworked in order to create 3 categories of wind speed: Low, Moderate and High)



**TABLE 3 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES FOR LARGE SPILLS FOR DIFFERENT QUANTITIES OF SIX COMMON TIH (PIH in the US) GASES**

|   | First ISOLATE<br>in all Directions | Then PROTECT persons Downwind during |   |  |                                      |   |  |           |                |  |
|---|------------------------------------|--------------------------------------|---|--|--------------------------------------|---|--|-----------|----------------|--|
|   |                                    | DAY                                  |   |  |                                      | NIGHT   |  |           |                |  |
|   |                                    | Low wind<br>(< 6 mph =<br>< 10 km/h) | Moderate wind<br>(6-12 mph =<br>10 - 20 km/h) | High wind<br>(> 12 mph =<br>> 20 km/h) | Low wind<br>(< 6 mph =<br>< 10 km/h) | Moderate wind<br>(6-12 mph =<br>10 - 20 km/h) | High wind<br>(> 12 mph =<br>> 20 km/h) | km        | (Miles)        |  |
| <b>TRANSPORT CONTAINER</b>                      | <b>Meters (Feet)</b>               | <b>km</b>                            | <b>(Miles)</b>                                | <b>km</b>                              | <b>(Miles)</b>                       | <b>km</b>                                     | <b>(Miles)</b>                         | <b>km</b> | <b>(Miles)</b> |  |
| <b>UN1005 Ammonia, anhydrous: Large Spills</b>  |                                    |                                      |   |  |                                      |   |  |           |                |  |
| Rail tank car                                   | 300 (1000)                         | 1.9 (1.2)                            | 1.5 (0.9)                                     | 1.1 (0.6)                              | 4.5 (2.8)                            | 2.5 (1.5)                                     | 1.4 (0.9)                              |           |                |  |
| Highway tank truck or trailer                   | 150 (500)                          | 0.9 (0.6)                            | 0.5 (0.3)                                     | 0.4 (0.3)                              | 2.0 (1.3)                            | 0.8 (0.5)                                     | 0.6 (0.4)                              |           |                |  |
| Agricultural nurse tank                         | 60 (200)                           | 0.5 (0.3)                            | 0.3 (0.2)                                     | 0.3 (0.2)                              | 1.4 (0.9)                            | 0.3 (0.2)                                     | 0.3 (0.2)                              |           |                |  |
| Multiple small cylinders                        | 30 (100)                           | 0.3 (0.2)                            | 0.2 (0.1)                                     | 0.1 (0.1)                              | 0.7 (0.5)                            | 0.3 (0.2)                                     | 0.2 (0.1)                              |           |                |  |
| <b>TRANSPORT CONTAINER: Large Spills</b>        |                                    |                                      |   |  |                                      |   |  |           |                |  |
| Rail tank car                                   | 1000 (3000)                        | 10.1 (6.3)                           | 6.8 (4.2)                                     | 5.3 (3.3)                              | 11+ (7+)                             | 9.2 (5.7)                                     | 6.9 (4.3)                              |           |                |  |
| Highway tank truck or trailer                   | 600 (2000)                         | 5.8 (3.6)                            | 3.4 (2.1)                                     | 2.9 (1.8)                              | 6.7 (4.3)                            | 5.0 (3.1)                                     | 4.1 (2.5)                              |           |                |  |
| Multiple ton cylinders                          | 300 (1000)                         | 2.1 (1.3)                            | 1.3 (0.8)                                     | 1.0 (0.6)                              | 4.0 (2.5)                            | 2.4 (1.5)                                     | 1.3 (0.8)                              |           |                |  |
| Multiple small cylinders or single ton cylinder | 150 (500)                          | 1.5 (0.9)                            | 0.8 (0.5)                                     | 0.5 (0.3)                              | 2.9 (1.8)                            | 1.3 (0.8)                                     | 0.6 (0.4)                              |           |                |  |

**TABLE 3**

"+" means distance can be larger in certain atmospheric conditions

**TABLE 3 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES FOR LARGE SPILLS FOR DIFFERENT QUANTITIES OF SIX COMMON TIH (PIH in the US) GASES**

|  |               | Then <b>PROTECT</b> persons Downwind during |   |                                  |                                |   |                                  |
|--|---------------|---|---|----------------------------------|--------------------------------|---|----------------------------------|
|  |               | DAY   |   |                                  | NIGHT                          |   |                                  |
| First ISOLATE in all Directions                                    | Meters (Feet) | Low wind (<6 mph = < 10 km/h)               | Moderate wind (6-12 mph = 10 - 20 km/h) | High wind (> 12 mph = > 20 km/h) | Low wind (< 6 mph = < 10 km/h) | Moderate wind (6-12 mph = 10 - 20 km/h) | High wind (> 12 mph = > 20 km/h) |
|  |               | km (Miles)                                  | km (Miles)                              | km (Miles)                       | km (Miles)                     | km (Miles)                              | km (Miles)                       |
| <b>TRANSPORT CONTAINER</b>   |               |   |   |                                  |                                |   |                                  |
| <b>UN1040 Ethylene oxide: Large Spills</b>                         |               |   |   |                                  |                                |   |                                  |
| <b>UN1040 Ethylene oxide with Nitrogen: Large Spills</b>           |               |   |   |                                  |                                |   |                                  |
| Rail tank car  | 200 (600)     | 1.6 (1.0)                                   | 0.8 (0.5)                               | 0.7 (0.5)                        | 3.3 (2.1)                      | 1.4 (0.9)                               | 0.8 (0.5)                        |
| Highway tank truck or trailer                                      | 100 (300)     | 0.9 (0.6)                                   | 0.5 (0.3)                               | 0.4 (0.3)                        | 2.0 (1.3)                      | 0.7 (0.4)                               | 0.4 (0.3)                        |
| Multiple small cylinders or single ton cylinder                    | 30 (100)      | 0.4 (0.3)                                   | 0.2 (0.1)                               | 0.1 (0.1)                        | 0.9 (0.6)                      | 0.3 (0.2)                               | 0.2 (0.1)                        |
| <b>TRANSPORT CONTAINER</b>   |               |   |   |                                  |                                |   |                                  |
| <b>UN1050 Hydrogen chloride, anhydrous: Large Spills</b>           |               |   |   |                                  |                                |   |                                  |
| <b>UN2186 Hydrogen chloride, refrigerated liquid: Large Spills</b> |               |   |   |                                  |                                |   |                                  |
| Rail tank car  | 500 (1500)    | 3.9 (2.5)                                   | 2.1 (1.2)                               | 1.8 (1.2)                        | 10.1 (6.3)                     | 3.5 (2.2)                               | 2.3 (1.5)                        |
| Highway tank truck or trailer                                      | 200 (600)     | 1.5 (0.9)                                   | 0.8 (0.5)                               | 0.6 (0.4)                        | 3.9 (2.5)                      | 1.5 (0.9)                               | 0.8 (0.5)                        |
| Multiple ton cylinders   | 30 (100)      | 0.4 (0.3)                                   | 0.2 (0.1)                               | 0.1 (0.1)                        | 1.1 (0.7)                      | 0.3 (0.2)                               | 0.2 (0.1)                        |
| Multiple small cylinders or single ton cylinder                    | 30 (100)      | 0.3 (0.2)                                   | 0.2 (0.1)                               | 0.1 (0.1)                        | 0.9 (0.6)                      | 0.3 (0.2)                               | 0.2 (0.1)                        |

**TABLE 3 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES FOR LARGE SPILLS FOR DIFFERENT QUANTITIES OF SIX COMMON TIH (PIH in the US) GASES**

|  | First ISOLATE in all Directions | Then PROTECT persons Downwind during               |   |  |  |   |  |
|--|---------------------------------|--|---|--|--|---|--|
|  |                                 | DAY  |   |  | NIGHT  |   |  |
|  |                                 | Low wind<br>(< 6 mph =<br>< 10 km/h)<br>km (Miles) | Moderate wind<br>(6-12 mph =<br>10 - 20 km/h)<br>km (Miles) | High wind<br>(> 12 mph =<br>> 20 km/h)<br>km (Miles) | Low wind<br>(< 6 mph =<br>< 10 km/h)<br>km (Miles) | Moderate wind<br>(6-12 mph =<br>10 - 20 km/h)<br>km (Miles) | High wind<br>(> 12 mph =<br>> 20 km/h)<br>km (Miles) |
| <b>UN1052 Hydrogen fluoride, anhydrous: Large Spills</b>   |                                 |  |   |  |  |   |  |
| TRANSPORT CONTAINER  | Meters (Feet)                   | Low wind<br>(< 6 mph =<br>< 10 km/h)<br>km (Miles) | Moderate wind<br>(6-12 mph =<br>10 - 20 km/h)<br>km (Miles) | High wind<br>(> 12 mph =<br>> 20 km/h)<br>km (Miles) | Low wind<br>(< 6 mph =<br>< 10 km/h)<br>km (Miles) | Moderate wind<br>(6-12 mph =<br>10 - 20 km/h)<br>km (Miles) | High wind<br>(> 12 mph =<br>> 20 km/h)<br>km (Miles) |
| Rail tank car  | 500 (1500)                      | 3.5 (2.2)  | 2.1 (1.3)   | 1.8 (1.2)  | 6.6 (4.1)  | 3.1 (1.9)   | 2.0 (1.2)  |
| Highway tank truck or trailer                              | 200 (700)                       | 2.0 (1.2)  | 1.0 (0.7)   | 0.9 (0.6)  | 3.7 (2.3)  | 1.6 (1.0)   | 0.9 (0.6)  |
| Multiple small cylinders or single ton cylinder            | 100 (300)                       | 0.8 (0.5)  | 0.4 (0.2)   | 0.3 (0.2)  | 1.7 (1.1)  | 0.5 (0.3)   | 0.3 (0.2)  |
| <b>UN1079 Sulfur dioxide/Sulphur dioxide: Large Spills</b> |                                 |  |   |  |  |   |  |
| TRANSPORT CONTAINER  | Meters (Feet)                   | Low wind<br>(< 6 mph =<br>< 10 km/h)<br>km (Miles) | Moderate wind<br>(6-12 mph =<br>10 - 20 km/h)<br>km (Miles) | High wind<br>(> 12 mph =<br>> 20 km/h)<br>km (Miles) | Low wind<br>(< 6 mph =<br>< 10 km/h)<br>km (Miles) | Moderate wind<br>(6-12 mph =<br>10 - 20 km/h)<br>km (Miles) | High wind<br>(> 12 mph =<br>> 20 km/h)<br>km (Miles) |
| Rail tank car  | 1000 (3000)                     | 11+ (7+)   | 11+ (7+)  | 7.2 (4.5)  | 11+ (7+)   | 11+ (7+)  | 10.1 (6.3)   |
| Highway tank truck or trailer                              | 1000 (3000)                     | 11+ (7+)   | 6.2 (3.8)   | 5.3 (3.3)  | 11+ (7+)   | 8.2 (5.1)   | 6.2 (3.9)  |
| Multiple ton cylinders                                     | 500 (1500)                      | 5.4 (3.4)  | 2.4 (1.5)   | 1.8 (1.1)  | 7.8 (4.8)  | 4.2 (2.6)   | 2.9 (1.8)  |
| Multiple small cylinders or single ton cylinder            | 200 (600)                       | 3.2 (2.0)  | 1.5 (0.9)   | 1.1 (0.7)  | 5.8 (3.6)  | 2.5 (1.6)   | 1.5 (0.9)  |

"+" means distance can be larger in certain atmospheric conditions

**TABLE 3**

## ERG2020 USER'S GUIDE

For the purposes of this guidebook, the terms hazardous materials/dangerous goods are synonymous.

The 2020 Emergency Response Guidebook (ERG2020) was developed jointly by Transport Canada (TC), the U.S. Department of Transportation (DOT), and the Secretariat of Communications and Transport of Mexico (SCT), with help from CIQUIME (Centro de Información Química para Emergencias) of Argentina.

This guidebook is for firefighters, police and other emergency services personnel who may be first to arrive at the scene of a transportation incident involving dangerous goods.

**It is primarily a guide to help first responders to quickly:**

- **identify the specific or generic hazards of material(s) involved in a transportation incident**
- **protect themselves and the general public during the initial response phase of the incident**

For the purposes of this guidebook, “initial response phase” is the period after first responders arrive at the scene of an incident. During this phase, responders:

- confirm the presence and/or identification of dangerous goods
- start taking protective action and securing the area
- request the help of qualified personnel

This guide is designed for use at a dangerous goods incident on a highway or railroad. It may have limited value at fixed-facility locations, or onboard aircrafts or vessels.

This guide **does not:**

- provide information on the physical or chemical properties of dangerous goods
- replace emergency response training, knowledge, or sound judgment
- address all possible circumstances that may be associated with a dangerous goods incident

ERG2020 incorporates dangerous goods lists from the most recent United Nations Recommendations, and from other international and national regulations.

Explosives are not listed individually (by either proper shipping name or ID number) but, under the general heading “Explosives”, they do appear:

- on the first page of the ID Number index (yellow-bordered pages)
- alphabetically in the Name of Material index (blue-bordered pages)

Chemical warfare agents do not have an assigned ID number because they are not commercially transported. In an emergency situation, the assigned guide (orange-bordered pages) will provide guidance for the initial response.

The letter **(P)** following the guide number in the yellow and blue bordered pages identifies materials that present a polymerization hazard under certain conditions. For example: UN1092 - Acrolein, stabilized GUIDE **131P**.

First responders at the scene of a dangerous goods incident should not solely rely on this guidebook. Always seek specific information about any material in question as soon as possible. To do so:

- Contact the appropriate emergency response agency listed on the inside back cover.
- Call the emergency response telephone number on the shipping paper.
- Consult information on or accompanying the shipping paper.

**BEFORE AN EMERGENCY – BECOME FAMILIAR WITH THIS GUIDEBOOK!** In the U.S., according to the requirements of the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA, 29 CFR 1910.120) and regulations issued by the U.S. Environmental Protection Agency (EPA, 40 CFR Part 311), first responders must be trained in how to use this guidebook.

## GUIDEBOOK CONTENTS

**1- Yellow-bordered pages:** Index list of dangerous goods in order of ID number. The list displays the 4-digit ID followed by its assigned emergency response guide and material name.

|                     |               |                  |                         |
|---------------------|---------------|------------------|-------------------------|
| <b>For example:</b> | <b>ID No.</b> | <b>GUIDE No.</b> | <b>Name of Material</b> |
|                     | 1090          | 127              | Acetone                 |

**2- Blue-bordered pages:** Index list of dangerous goods in alphabetical order of material name. The list displays the name followed by its assigned emergency response guide and 4-digit ID number.

|                     |                         |                  |               |
|---------------------|-------------------------|------------------|---------------|
| <b>For example:</b> | <b>Name of Material</b> | <b>GUIDE No.</b> | <b>ID No.</b> |
|                     | Sulfuric acid           | 137              | 1830          |

**3- Orange-bordered pages:** All safety recommendations are provided here. It is made up of 62 individual guides in a 2-page format. Each guide recommends safety and emergency response procedures to protect yourself and the public. The left-hand page gives safety-related information and evacuation distances. The right-hand page gives emergency response guidance for fires, spills or leaks, and first aid. Each guide applies to a group of materials with similar chemical and toxicological characteristics. The guide title identifies the general hazards of the dangerous goods.

For example: GUIDE 124 - **Gases - Toxic and/or Corrosive - Oxidizing.**

Each guide is divided into 3 main sections:

### **POTENTIAL HAZARDS:**

- Displays the hazards in terms of **FIRE OR EXPLOSION** and **HEALTH** effects upon exposure.
- Primary potential hazard is listed first.
- Consult this section first to help you make decisions about how to protect the emergency response team and surrounding population.

### **PUBLIC SAFETY:**

- Provides general information on initial precautionary measures to be taken by those first on scene.
- Provides general guidance on **PROTECTIVE CLOTHING** requirements and respiratory protection.
- Lists suggested **EVACUATION** distances for immediate precautionary measures, spills, and for fires (fragmentation hazard).
- When the material is highlighted in green in the yellow and blue bordered pages, it directs the reader to consult Table 1, which lists Toxic Inhalation Hazard (TIH) (PIH in the U.S.) materials, water-reactive materials and chemical warfare agents (green-bordered pages).

### **EMERGENCY RESPONSE:**

- Outlines special precautions for incidents that involve **FIRE**, **SPILL OR LEAK** or chemical exposure.
- Lists several recommendations under each part to further assist your decision-making process.
- Provides general **FIRST AID** guidance to use before seeking medical care.

**4- Green-bordered pages:** This section has 3 tables.

#### **Table 1 - Initial Isolation and Protective Action Distances**

Lists, by order of ID number:

- TIH (PIH in the U.S.) materials
- water-reactive materials that produce toxic gases upon contact with water
- certain chemical warfare agents

These materials are highlighted in green in the yellow and blue bordered pages so you can easily identify them.

Table 1 provides two types of recommended safety distances: “**initial isolation distances**” and “**protective action distances**” for:

- **small spills:** 208 liters (55 US gallons) or less
- **large spills:** more than 208 liters (55 US gallons)
- Exception: For entries marked (**when used as a weapon**), volumes vary, but in most cases, small spills include releases up to 2 kg (4.4 lbs.), and large spills include releases up to 25 kg (55 lbs.).

Within the “**initial isolation distance**”, protective clothing and respiratory protection is required. You should consider evacuating all people **in all directions** from the spill or leak source. This distance defines the radius of the “initial isolation zone” surrounding the spill in which people may be exposed to:

- dangerous concentrations upwind of the source
- life-threatening concentrations downwind of the source

The “**protective action distances**” are downwind distances from the spill or leak source, within which responders could carry out protective actions to:

- preserve the health and safety of emergency responders and the public
- evacuate and/or shelter-in-place people in this area (For more information, consult pp. 289 to 291)

The “protective action distance” is divided into **daytime** and **nighttime** incidents because varying atmospheric conditions affect a hazardous area’s size. In fact, the quantity or concentration of the material’s vapor poses problems, not its mere presence. During the night, the air is generally calmer. This causes the vapor to disperse less and therefore creates a greater toxic zone. In daytime, the atmosphere is more active, so the vapor disperses more. As a result, there is a lower concentration of vapor in the surrounding air and the area that reaches toxic levels is smaller. Daytime is after sunrise and before sunset. Nighttime is between sunset and sunrise.

For example, in the case of a small spill of UN1955 - compressed gas, toxic, n.o.s., the “**initial isolation distance**” is 100 meters (300 feet); therefore its “initial isolation zone” is 200 meters (600 feet) in diameter. Its “**protective action distance**” is 0.5 kilometers (0.3 miles) for daytime and 2.5 kilometers (1.6 miles) for nighttime.

**Note 1:** Some water-reactive materials have 2 entries in Table 1. They are identified by (**when spilled on land**) since they are TIH products and (**when spilled in water**) because they produce additional toxic gases when spilled in water.

For example: UN1746 - Bromine trifluoride and UN1836 - Thionyl chloride.

**Note 2:** If a water-reactive material only has one entry in Table 1 for (**when spilled in water**) and the product is NOT spilled in water, Table 1 and Table 2 do not apply. You will find safe distances in the appropriate orange-bordered guide.

For example: UN1183 - Ethyldichlorosilane and UN1898 – Acetyl iodide.

## Table 2 - Water-Reactive Materials Which Produce Toxic Gases

Lists:

- by order of ID number, materials that produce large amounts of Toxic Inhalation Hazard (TIH) gases when spilled in water; and
- TIH gases produced by these materials.

You can easily identify water-reactive materials in **Table 1**, as their names are immediately followed by **(when spilled in water)**.

**NOTE:** The TIH gases indicated in Table 2 are for information purposes only. These TIH gases have already been taken into consideration in the distances of Table 1.

For example, Table 2 indicates that UN1689 sodium cyanide, when spilled in water, will generate hydrogen cyanide gas (HCN). In Table 1, you must refer to the distances for sodium cyanide, solid and not the distances for hydrogen cyanide gas.

## Table 3 - Initial Isolation and Protective Action Distances for Large Spills for Different Quantities of Six Common TIH Gases

Lists the following 6 most common TIH materials:

- UN1005 - Ammonia, anhydrous
- UN1017 - Chlorine
- UN1040 - Ethylene oxide and UN1040 - Ethylene oxide with nitrogen
- UN1050 - Hydrogen chloride, anhydrous and UN2186 - Hydrogen chloride, refrigerated liquid
- UN1052 - Hydrogen fluoride, anhydrous
- UN1079 - Sulfur dioxide/Sulphur dioxide

Table 3 shows:

- initial isolation and protective action distances for large spills (more than 208 liters or 55 US gallons)
- different container types (therefore different volume capacities) for daytime and nighttime, and for three different wind speeds (low, moderate and high)



## HOW TO CHOOSE THE APPROPRIATE ISOLATION AND PROTECTIVE ACTION DISTANCES

ERG2020 lists isolation or evacuation distances in 2 places:

- the individual guides (orange-bordered pages)
- Table 1 – Initial Isolation and Protective Action Distances (green-bordered pages)

If you are dealing with a **non-TIH material** (not highlighted in green in the yellow-bordered or blue-bordered pages),

- Go to the assigned guide for the material (orange-bordered pages).
- Under **EVACUATION**, you will find:
  - initial isolation distance as an immediate precautionary measure
  - specific distances for spill or fire situations (fragmentation hazard)
  - **Please note** that certain guides may also refer to Table 1. This is just a reminder for green highlighted materials only.

If you are dealing with a **TIH, water-reactive** or **chemical warfare** material (green highlighted entries in the yellow or blue bordered pages):

### If there is no fire:

- Go directly to Table 1 – Initial Isolation and Protective Action Distances (green-bordered pages).
- Also, consult the assigned guide for the material (orange-bordered pages).

### If a fire is involved:

- Go directly to the assigned guide (orange-bordered pages) and apply the distances found under **EVACUATION** - Fire.
- Also, consult Table 1 distances for residual material release.

## PROTECTIVE CLOTHING

### **STREET CLOTHING AND WORK UNIFORMS**

These garments, such as uniforms worn by police and emergency medical services personnel, provide almost no protection from the harmful effects of hazardous materials/dangerous goods.

### **STRUCTURAL FIREFIGHTERS' PROTECTIVE CLOTHING (SFPC)**

This category of clothing, often called turnout or bunker gear, is the protective clothing firefighters normally wear during structural firefighting operations. It includes a helmet, coat, pants, boots, gloves and a hood to cover parts of the head that are not protected by the helmet and facepiece. It can be used with full-facepiece positive pressure self-contained breathing apparatus (SCBA). It should, at minimum, meet the OSHA Fire Brigades Standard (29 CFR 1910.156) or NFPA 1851.

Structural firefighters' protective clothing provides limited protection from heat and cold. It may not provide adequate protection from harmful vapors or liquids encountered during hazardous materials/dangerous goods incidents.

Each guide includes a statement about the use of SFPC in incidents involving the materials referenced by that guide. Some guides state that SFPC provides limited protection. In those cases, the responder wearing SFPC and SCBA may be able to perform a quick "in-and-out" operation. However, this type of operation can place the responder at risk of exposure, injury or death. The incident commander makes the decision to do this only if there is an overriding benefit (for example, to perform an immediate rescue, turn off a valve to control a leak, etc.).

Please note that the coverall-type protective clothing customarily worn to fight fires in forests or wildlands is not SFPC and **is not** recommended nor referred to elsewhere in this guidebook.

### **POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS (SCBA)**

This apparatus provides a constant, positive pressure flow of air within the facepiece.

You should always use an SCBA certified by NIOSH and the Department of Labor/Mine Safety and Health Administration, in accordance with:

- 42 CFR Part 84
- requirements for respiratory protection specified in OSHA 29 CFR 1910.134 (Respiratory Protection) and/or 29 CFR 1910.156 (f) (Fire Brigades Standard)
- NFPA 1852

Chemical-cartridge respirators or other filtering masks are not acceptable substitutes for positive pressure SCBA. Demand-type SCBA does not meet the OSHA 29 CFR 1910.156 (f)(1)(i) of the Fire Brigades Standard.

### **RESPIRATORS**

If you suspect a chemical warfare agent is involved in an incident, use NIOSH-certified respirators with CBRN protection.

N95 respirators are the most common of the seven types of particulate filtering facepiece respirators. This product filters at least 95% of airborne particles (0.3 microns), but is not resistant to oil. N95 filtering facepiece respirators do not protect against gases and vapors.

Powered air-purifying respirators (PAPR) force ambient air through the air-purifying cartridge or filter into the facepiece. A PAPR does not supply oxygen or air from a separate source (e.g., cylinders).

## **CHEMICAL PROTECTIVE CLOTHING AND EQUIPMENT**

For you to safely use this type of protective clothing and equipment, you need specific skills developed through training and experience. This type of special clothing may protect against one chemical but be readily permeated by chemicals for which it was not designed. Therefore, do not use this type of protective clothing unless it is compatible with the released material. Also, be aware that it offers little or no protection against heat and/or cold.

Examples of this type of equipment have been described as:

- (1) Vapor Protective Suits (NFPA 1991), also known as Totally-Encapsulating Chemical Protective Suits or Level A\* protection (OSHA 29 CFR 1910.120, Appendix A & B)
- (2) Liquid-Splash Protective Suits (NFPA 1992), also known as Level B\* or C\* protection (OSHA 29 CFR 1910.120, Appendix A & B), or suits for chemical/biological terrorism incidents (NFPA 1994), class 1, 2 or 3 Ensembles and Standard CAN/CGSB/CSA-Z1610-11 – Protection of first responders from chemical, biological, radiological, and nuclear (CBRN) events

No single protective clothing material will protect you from all hazardous materials/dangerous goods. Do not assume any protective clothing is resistant to cold and/or heat or flame exposure, unless certified by the manufacturer (NFPA 1991 5-3 Flammability Resistance Test and 5-6 Cold Temperature Performance Test).

\*Consult the glossary for more information about protection levels under the heading “Protective Clothing.”

## DECONTAMINATION

The ways to decontaminate people and equipment can vary. If you need help with decontamination, contact the emergency response telephone number provided on the shipping papers or the agencies listed on the inside back cover. These resources may be able to put you in contact with the chemical manufacturer to determine the appropriate procedure if not otherwise available.

Decontamination is the process of removing or neutralizing hazardous materials/dangerous goods that have contaminated people and equipment during an incident.

Contamination happens in the area generally referred to as the Hot Zone. Everything and everyone entering this zone should be decontaminated when leaving, including emergency response personnel. This reduces the chances that more contamination will occur.

There are two main types of contamination:

- **Direct contamination** happens in the Hot Zone.
- **Cross contamination** happens when someone or something outside the Hot Zone was not properly decontaminated and comes in contact with another object or person, usually in the Warm or Cold Zone.

To decontaminate, you must:

- physically remove contaminants; and/or
- chemically neutralize contaminants\*.

The NFPA 472, Chapter 3, describes the following four kinds of decontamination.

- (1) **Gross decontamination:** Quickly removing surface contamination, which usually happens by mechanically removing the contaminant or rinsing with water from handheld hose lines, emergency showers, or other nearby water sources.
- (2) **Technical decontamination:** Reducing contamination to a level as low as possible by chemical or physical methods. A hazmat team will perform this kind of decontamination.
- (3) **Mass decontamination:** Reducing or removing surface contaminants as fast as possible from a large number of people in potentially life-threatening situations.
- (4) **Emergency decontamination:** Immediately reducing contamination of people in potentially life-threatening situations with or without formally setting up a decontamination corridor. This process should be performed upwind and uphill from victims. Responders should avoid contact with victims, runoff or spray from the decontamination process.

Emergency and mass decontamination can be done with firefighting and rescue operations equipment. Nozzles can be put on wide-angle fog patterns and sprayed towards the ground to create a decontamination shower. Responders can also place nozzles on the discharge ports of engines.

Contaminated clothing and equipment must be removed after use and stored in a controlled area (Warm Zone) until cleanup procedures can begin. Sometimes protective clothing and equipment cannot be decontaminated and must be disposed of properly.

\*Chemical neutralization releases heat. DO NOT PERFORM on a victim.

## **FIRE AND SPILL CONTROL**

### **FIRE CONTROL**

Water is the most common and generally most available fire extinguishing agent. Use caution in selecting a fire extinguishing method, as there are many factors to consider. Water may be ineffective in fighting fires that involve some materials.

#### **Fires Involving a Spill of Flammable Liquids**

These fires are usually controlled by applying a firefighting foam to the surface of the burning material.

Fighting flammable liquid fires requires:

- foam concentrate that is chemically compatible with the burning material
- correct mixing of the foam concentrate with water and air
- careful application and maintenance of the foam blanket

There are two general types of firefighting foam: regular and alcohol-resistant. Examples of regular foam are protein-base, fluoroprotein, and aqueous film-forming foam (AFFF).

You can control some flammable liquid fires, including many petroleum products, by applying regular foam. Other flammable liquids, including polar solvents (flammable liquids that are water soluble), such as alcohols and ketones, have different chemical properties. You cannot easily control a fire that involves these materials with regular foam, and should use alcohol-resistant foam instead.

Polar solvent fires may be difficult to control and require a higher foam application rate than other flammable liquid fires (see NFPA Standards 11 for further information). Refer to the appropriate guide to determine which type of foam to use. For flammable liquids which have subsidiary corrosive or toxic hazards, it is difficult to make specific recommendations. However, alcohol-resistant foam may be effective for many of these materials.

Contact the emergency response telephone number on the shipping paper, or the appropriate emergency response agency, as soon as possible for guidance on the proper fire extinguishing agent to use.

How you decide to control the fire depends on factors such as:

- incident location
- exposure hazards
- size of the fire
- environmental concerns
- availability of extinguishing agents and equipment at the scene

### **WATER-REACTIVE MATERIALS**

Water is sometimes used to flush spills and reduce or direct vapors in spill situations. Some of the materials covered by this guidebook can react violently or even explosively with water. In these cases, consider letting the fire burn or leaving the spill alone (except to prevent its spreading by diking) until you can get more technical advice.

The applicable guides clearly warn you of these potentially dangerous reactions. Technical advice is required for these materials since:

- Water getting inside a ruptured or leaking container may cause an explosion.
- You may need to cool adjoining containers with water to prevent them from rupturing (exploding), or to prevent the fire spreading further.
- Water may be effective in mitigating an incident involving a water-reactive material, but only if you can apply it at a **sufficient flooding rate for a long period**.
- Products from the reaction with water may be more toxic, corrosive or undesirable than the product that caused the fire.

When you respond to an incident involving water-reactive materials, take into account:

- existing conditions, such as wind, precipitation, location and accessibility to the incident
- availability of agents to control the fire or spill

Because there are variables to consider, base your decision to use water on fires or spills involving water-reactive materials on information from a reliable source. For example, consult the material's manufacturer through the emergency response telephone number or the appropriate emergency response agency listed on the inside back cover.

## VAPOR CONTROL

Limiting the amount of vapor released from a pool of flammable or corrosive liquids is an operational concern. It requires proper protective clothing, specialized equipment, appropriate chemical agents and skilled personnel. Before you engage in vapor control, seek advice on tactics to be used from qualified personnel.

There are several ways to minimize the amount of vapors escaping from pools of spilled liquids, such as special foams, adsorbing agents, absorbents, and neutralizing agents. To be effective, you must select a method for the specific material involved, and use it in a way that mitigates, not worsens, the incident.

Where specific materials are known, such as at a manufacturing or storage facilities, the hazardous materials/dangerous goods response team should prearrange with the facility operators to select and stockpile these control agents before a spill.

In the field, first responders may not have the most effective vapor control agent for the material available. They will be more likely to have only water, and only one type of firefighting foam on their vehicles. If the available foam is not appropriate, they will probably use water spray. Because water is being used to form a vapor seal, care must be taken not to churn or further spread the spill during application. Vapors that do not react with water may be directed away from the site using the air currents surrounding the water spray. Before using water spray or other methods to safely control vapor emission or suppress ignition, get technical advice based on a specific chemical name.

## BLEVE AND HEAT INDUCED TEAR

### **BLEVE (BOILING LIQUID EXPANDING VAPOR EXPLOSION)**

The following pages present important safety-related information on BLEVEs, including a table, to consider in a situation involving Liquefied Petroleum Gases (LPG), UN1075.

LPGs include the following flammable gases:

- UN1011 - Butane
- UN1012 - Butylene
- UN1055 - Isobutylene
- UN1077 - Propylene
- UN1969 - Isobutane
- UN1978 - Propane

A BLEVE occurs when a fire impinged or damaged tank car fails to contain its internal pressure and explodes with a sudden product release. This catastrophic failure is more likely to occur with damaged pressure tank cars, even in the absence of an active fire.

The **main hazards** from a LPG BLEVE are:

- Fire: If the released substance is ignited, there is an immediate fireball.
- Thermal radiation: At a distance of about 4 times the radius of a fireball, the heat radiated from a fireball is enough to burn exposed skin in 2 seconds. Wearing protective clothing limits the thermal radiation dose.
- Blast: A concussive force caused by the sudden release of the pressurized substance. For a BLEVE occurring out in the open, the blast strength at a distance of 4 times the radius of a fireball can break window glass and may cause minor damage to buildings.
- Projectiles: Tank failure can throw metal fragments over large distances. These fragments can and have been deadly.

The danger decreases as you move away from the BLEVE centre. The furthest-reaching hazard is projectiles.

For a video with information on critical safety issues concerning BLEVEs, please visit <http://www.tc.gc.ca/eng/tdg/publications-menu-1238.html>.

### **HEAT INDUCED TEAR (HIT)**

A heat induced tear (HIT) is a rupture of a NON-PRESSURE tank car containing flammable liquids when exposed to the intense heat of a fire. The metal will soften and the pressure in the tank car will increase which can lead to containment failure. The tear generally occurs at the vapor space (upper side) of the container, venting large quantities of flammable liquid and vapors at high speed. A fireball and an intense heat wave will occur.

Compared to BLEVEs, HITs rarely result in the projection of tank car fragments. Heat induced tearing has occurred within 20 minutes of the derailment and as long as 10+ hours following the initial fire.

Responding to these types of incidents (BLEVE and HIT) requires specialized training, equipment and a tactical approach.

## **BLEVE – SAFETY PRECAUTIONS**

**Use with caution.** The following table gives a summary of tank properties, critical times, critical distances and cooling water flow rates for various tank sizes. This table is provided to give responders some guidance but it should be used with caution.

**Tank dimensions are approximate** and can vary depending on the tank design and application.

**Minimum time to failure** is based on *severe torch fire impingement* on the vapor space of a tank in good condition, and is approximate. Tanks may fail earlier if they are damaged or corroded. Tanks may fail minutes or hours later than these minimum times depending on the conditions. It has been assumed here that the tanks are not equipped with thermal barriers or water spray cooling.

**Minimum time to empty** is based on an engulfing fire with a properly sized pressure relief valve. If the tank is only partially engulfed, then time to empty will increase (i.e., if tank is 50% engulfed, then the tanks will take twice as long to empty). Once again, it has been assumed that the tank is not equipped with a thermal barrier or water spray.

**Tanks equipped with thermal barriers or water spray cooling** significantly increase the times to failure and the times to empty. A thermal barrier can reduce the heat input to a tank by a factor of ten or more. This means it could take ten times as long to empty the tank through the Pressure Relief Valve (PRV).

**Fireball radius and emergency response distance** is based on mathematical equations and is approximate. They assume spherical fireballs and this is not always the case.

**Two safety distances for public evacuation.** The minimum distance is based on tanks that are launched with a small elevation angle (i.e., a few degrees above horizontal). This is most common for horizontal cylinders. The preferred evacuation distance has more margin of safety since it assumes the tanks are launched at a 45 degree angle to the horizontal. This might be more appropriate if a vertical cylinder is involved.

It is understood that these distances are very large and may not be practical in a highly populated area. However, it should be understood that the risks increase rapidly the closer you are to a BLEVE. Keep in mind that the furthest reaching projectiles tend to come off in the zones 45 degrees on each side of the tank ends.

**Water flow rate is based on  $5(\sqrt{\text{capacity (USgal)}})$  = USgal/min needed to cool tank metal.**

**Warning:** the data given are approximate and should only be used with extreme caution. For example, where times are given for tank failure or tank emptying through the pressure relief valve – these times are typical but they can vary from situation to situation. Therefore, never risk life based on these times.



**WARNING:**

The data given are approximate and should only be used with extreme caution. These times can vary from situation to situation. LPG tanks have been known to BLEVE within minutes. Therefore, never risk life based on these times.

| <b>BLEVE<br/>(USE WITH CAUTION)</b> |               |               |                    |  |  |                 |                             |                             |                               |                         |           |
|-------------------------------------|---------------|---------------|--------------------|--|--|-----------------|-----------------------------|-----------------------------|-------------------------------|-------------------------|-----------|
| Capacity                            | Diameter      | Length        | Propane Mass       | Minimum time to failure for severe torch | Approximate time to empty for engulfing fire | Fireball radius | Emergency response distance | Minimum evacuation distance | Preferred evacuation distance | Cooling water flow rate |           |
| Litres (Gallons)                    | Meters (Feet) | Meters (Feet) | Kilograms (Pounds) | Minutes                                  | Minutes                                      | Meters (Feet)   | Meters (Feet)               | Meters (Feet)               | Meters (Feet)                 | Litres/min              | USgal/min |
| 100 (26.4)                          | 0.3 (1)       | 1.5 (4.9)     | 40 (88)            | 4  | 8  | 10 (33)         | 90 (295)                    | 154 (505)                   | 307 (1007)                    | 97                      | 26        |
| 400 (106)                           | 0.61 (2)      | 1.5 (4.9)     | 160 (353)          | 4  | 12   | 16 (53)         | 90 (295)                    | 244 (801)                   | 488 (1601)                    | 195                     | 51        |
| 2000 (528)                          | 0.96 (3.2)    | 3 (9.8)       | 800 (1764)         | 5  | 18   | 28 (92)         | 111 (364)                   | 417 (1368)                  | 834 (2736)                    | 435                     | 115       |
| 4000 (1057)                         | 1 (3.3)       | 4.9 (16.1)    | 1600 (3527)        | 5  | 20   | 35 (115)        | 140 (459)                   | 525 (1722)                  | 1050 (3445)                   | 615                     | 163       |
| 8000 (2113)                         | 1.25 (4.1)    | 6.5 (21.3)    | 3200 (7055)        | 6  | 22   | 44 (144)        | 176 (577)                   | 661 (2169)                  | 1323 (4341)                   | 870                     | 230       |
| 22000 (5812)                        | 2.1 (6.9)     | 6.7 (22)      | 8800 (19400)       | 7  | 28   | 62 (203)        | 247 (810)                   | 926 (3038)                  | 1852 (6076)                   | 1443                    | 381       |
| 42000 (11095)                       | 2.1 (6.9)     | 11.8 (38.7)   | 16800 (37037)      | 7  | 32   | 77 (253)        | 306 (1004)                  | 1149 (3770)                 | 2200 (7218)                   | 1994                    | 527       |
| 82000 (21662)                       | 2.75 (9)      | 13.7 (45)     | 32800 (72310)      | 8  | 40   | 96 (315)        | 383 (1257)                  | 1435 (4708)                 | 2200 (7218)                   | 2786                    | 736       |
| 140000 (36984)                      | 3.3 (10.8)    | 17.2 (56.4)   | 56000 (123457)     | 9  | 45   | 114 (374)       | 457 (1499)                  | 1715 (5627)                 | 2200 (7218)                   | 3640                    | 962       |

## CRIMINAL OR TERRORIST USE OF CHEMICAL, BIOLOGICAL AND RADIOLOGICAL AGENTS

If you suspect an intentional release of a chemical, biological or radiological agent (CBRN), you should immediately contact your local emergency response authorities (911). Additionally, for CBRN incidents occurring:

- within the United States, call the National Response Center at 1-800-424-8802
- within Canada, call CANUTEC at 613-996-6666 (1-888-226-8832)
- within Mexico, call CENACOM at 555128-0000 extensions 36428, 36422, 36469, 37807, 37810
- in other countries, consult page 392

The following is general guidance and does not serve as specialized incident response training. Do not enter the scene without appropriate training and equipment.

First responders can use the following information to make an initial assessment of a situation they suspect involves criminal or terrorist use of chemical agents, biological agents and/or radioactive materials (CBRN). To help with this, the following paragraphs have a list of observable indicators that a CB agent or radioactive material has been used or is present. This section ends with a Safe Stand-Off Distance Chart for various threats when improvised explosive devices (IEDs) are involved.

### **DIFFERENCES BETWEEN A CHEMICAL, BIOLOGICAL AND RADIOLOGICAL AGENT**

Chemical and biological agents as well as radioactive materials can be dispersed in the air we breathe, the water we drink, or on surfaces we physically contact. Dispersion methods may be as simple as opening a container or using conventional (garden) spray devices, or as elaborate as detonating an improvised explosive device.

**Chemical incidents** are characterized by the rapid onset of medical symptoms (in minutes to hours) and easily observed signatures (colored residue, dead foliage, pungent odor, dead insects and animals).

**Biological incidents** are characterized by the onset of symptoms in hours to days. Typically, there will be no characteristic signatures because biological agents are usually odorless and colorless. Because of the delayed onset of symptoms, the affected area may be greater due to the movement of infected people.

**Radiological incidents** are characterized by the onset of symptoms, if any, in days to weeks or longer. Typically, there will be no characteristic signatures because radioactive materials are usually odorless and colorless. Specialized equipment is needed to determine the size of the affected area, and if the level of radioactivity is an immediate or long-term health hazard. Because it is impossible to detect radioactivity without special equipment, the affected area may be greater due to the migration of contaminated people.

The most probable sources would not generate enough radiation to kill people or cause severe illness. In a radiological incident generated by a “dirty bomb,” or radiological dispersal device (RDD), in which a conventional explosive is detonated to spread radioactive contamination, the primary hazard is from the explosion. However, certain radioactive materials dispersed in the air could contaminate up to several city blocks, creating fear and possibly panic, and needing potentially costly cleanup.

## **INDICATORS OF A POSSIBLE CHEMICAL INCIDENT**

|  |  |
|--|--|
| <b>Dead animals/birds/fish</b>                                   | Not just an occasional road kill, but numerous animals (wild and domestic, small and large), birds, and fish in the same area.   |
| <b>Lack of insect life</b>                                       | If normal insect activity (ground, air, and/or water) is missing, check the ground, water surface or shore line for dead insects. If near water, check for dead fish and/or aquatic birds.         |
| <b>Unexplained odors</b>   | Possible odors include fruity, flowery, sharp, pungent, garlic, horseradish-like, bitter almonds, peach kernels, or newly mown hay. The odor is completely out of character with its surroundings. |
| <b>Unusual numbers of dying or sick people (mass casualties)</b> | Health problems including nausea, disorientation, difficulty in breathing, convulsions, localized sweating, conjunctivitis (reddening of eyes), erythema (reddening of skin) and death.            |
| <b>Pattern of casualties</b>                                     | Casualties will likely be distributed downwind, or if indoors, by the air ventilation system.  |
| <b>Blisters or rashes</b>  | Numerous people experiencing unexplained water-like blisters, weals (like bee stings), and/or rashes.  |
| <b>Illness in confined area</b>                                  | Different casualty rates for people working indoors versus outdoors dependent on where the agent was released.   |
| <b>Unusual liquid droplets</b>                                   | Numerous surfaces show oily droplets or film; numerous water surfaces have an oily film (no recent rain).  |
| <b>Different-looking areas</b>                                   | Not just a patch of dead weeds, but trees, shrubs, bushes, food crops, and/or lawns that are dead, discolored, or withered (no current drought).   |
| <b>Low-lying clouds</b>  | Low-lying cloud or fog-like condition not consistent with its surroundings.  |
| <b>Unusual metal debris</b>                                      | Unexplained bomb or munitions-like material, especially if it contains a liquid.   |

## INDICATORS OF A POSSIBLE BIOLOGICAL INCIDENT

|   |  |
|---|--|
| <b>Unusual numbers of sick or dying people or animals</b> | Any number of symptoms may occur. Casualties may occur hours to days after an incident has occurred. The time required before symptoms are observed is dependent on the agent. |
| <b>Unscheduled and unusual spray being disseminated</b>   | Especially if outdoors during periods of darkness.   |
| <b>Abandoned spray devices</b>                            | Devices may not have distinct odors.   |

## INDICATORS OF A POSSIBLE RADIOLOGICAL INCIDENT

|                               |  |
|-------------------------------|--|
| <b>Radiation Symbols</b>      | Containers may display a “propeller” radiation symbol.   |
| <b>Unusual metal debris</b>   | Unexplained bomb or munitions-like material.   |
| <b>Heat-emitting material</b> | Material that is hot or seems to emit heat without any sign of an external heat source.  |
| <b>Glowing material</b>       | Strongly radioactive material may emit or cause radioluminescence.   |
| <b>Sick people/animals</b>    | In very improbable scenarios there may be unusual numbers of sick or dying people or animals. Casualties may occur hours to days or weeks after an incident has occurred. The time required before symptoms are observed is dependent on the radioactive material used, and the dose received. Possible symptoms include skin reddening or vomiting. |

## PERSONAL SAFETY CONSIDERATIONS

When you approach a scene that may involve CB agents or radioactive materials, the most critical thing to consider is your safety and that of other responders.

Use protective clothing and respiratory protection of an appropriate level of safety. In incidents where you suspect that CBRN materials have been used as weapons, NIOSH-certified respirators with CBRN protection are highly recommended. Be aware that you may not be able to verify or identify CB agents or radioactive materials, especially in the case of biological or radiological agents.

The following actions apply to a chemical, biological or radiological incident. This guidance is general. Responders will need to apply it on a case-by-case basis.

### Approach and response strategies:

- Minimize exposure time.
- Maximize the distance between you and the item that is likely to harm you.
- Use cover as protection.

- Wear appropriate personal protective equipment and respiratory protection.
- Identify and estimate the hazard by using the indicators above.
- Isolate the area and secure the scene.
- Isolate and decontaminate potentially contaminated people as soon as possible.
- To the extent possible, take measures to limit the spread of contamination.

In the event of a **chemical** incident, the fading of chemical odors does not necessarily indicate reduced vapor concentrations. Some chemicals deaden the senses, giving you the false perception that the chemical is no longer present.

If there is any indication that an area may be contaminated with **radioactive** materials, including the site of any non-accidental explosion, responders:

- should be equipped with radiation detection equipment
- should have adequate training in how to use this equipment

This equipment should be designed to also alert responders when an unacceptable ambient dose rate or ambient dose has been reached.

**Initial actions** to consider in a potential CBRN/terrorism event:

- Avoid using cell phones, radios, etc. within 100 meters (300 feet) of a suspect device.
- Notify your local police by calling 911.
- Set up incident command upwind and uphill of the area.
- Do **not** touch or move suspicious packages or containers.
- Be cautious about the potential presence of secondary devices (e.g., improvised explosive devices (IEDs)).
- Avoid contamination.
- Limit access to only those responsible for rescue of victims or assessment of unknown materials or devices.
- Evacuate and isolate people who were potentially exposed to hazardous materials/dangerous goods.
- Isolate contaminated areas and secure the scene for analysis of material.

## DECONTAMINATION MEASURES

**For chemical and biological agents:** Emergency responders should follow standard decontamination procedures (flush-strip-flush). Mass casualty decontamination should begin as soon as possible by stripping all clothing, and flushing with soap and water. For further information, contact the agencies listed on the inside back cover of this guidebook.

**For people contaminated with radioactive material:** Take care to minimize the spread of the contamination to the extent possible. Move them to a low radiation area if necessary, and if it can be done safely. Remove their clothing and place it in a clearly marked and sealed receptacle, such as a plastic bag, for later testing. Use decontamination methods

described above, but avoid breaking the skin (e.g., vigorous brushing). External radiological contamination on intact skin rarely causes a high enough dose to be a hazard, to either the contaminated individual or the first responders. For this reason, prioritize medical stabilization for a contaminated injured individual.









**NOTE:** The above information was developed in part by the Department of National Defence (Canada), the U.S. Department of the Army, Aberdeen Proving Ground and the Federal Bureau of Investigation (FBI).

### **IMPROVISED EXPLOSIVE DEVICE (IED)**

An IED is a “homemade” bomb and/or destructive device used to destroy, incapacitate, harass, or distract. Because they are improvised, IEDs can come in many forms, ranging from a small pipe bomb to a sophisticated device capable of causing massive damage and loss of life.

The following table predicts the damage radius based on the volume or weight of explosive (TNT equivalent) and the type of bomb.

## Improvised Explosive Device (IED) SAFE STAND-OFF DISTANCE

| Threat Description  | Explosives Capacity <sup>1</sup> | Mandatory Evacuation Distance <sup>2</sup> | Shelter-in-Place Zone             | Preferred Evacuation Distance <sup>3</sup> |
|---|----------------------------------|--|-----------------------------------|--|
|  Pipe Bomb             | 5 lbs<br>2.3 kg                  | 70 ft<br>21 m                              | 71 - 1,199 ft<br>22 - 365 m       | +1,200 ft<br>366 m                         |
|  Suicide Bomber        | 20 lbs<br>9 kg                   | 110 ft<br>34 m                             | 111 - 1,699 ft<br>35 - 518 m      | +1,700 ft<br>519 m                         |
|  Briefcase/Suitcase    | 50 lbs<br>23 kg                  | 150 ft<br>46 m                             | 151 - 1,849 ft<br>47 - 563 m      | +1,850 ft<br>564 m                         |
|  Car                   | 500 lbs<br>227 kg                | 320 ft<br>98 m                             | 321 - 1,899 ft<br>99 - 579 m      | +1,900 ft<br>580 m                         |
|  SUV/Van               | 1,000 lbs<br>454 kg              | 400 ft<br>122 m                            | 401 - 2,399 ft<br>123 - 731 m     | +2,400 ft<br>732 m                         |
|  Small Delivery Truck  | 4,000 lbs<br>1,814 kg            | 640 ft<br>195 m                            | 641 - 3,799 ft<br>196 - 1,158 m   | +3,800 ft<br>1,159 m                       |
|  Container/Water Truck | 10,000 lbs<br>4,536 kg           | 860 ft<br>263 m                            | 861 - 5,099 ft<br>264 - 1,554 m   | +5,100 ft<br>1,555 m                       |
|  Semi-Trailer          | 60,000 lbs<br>27,216 kg          | 1,570 ft<br>475 m                          | 1,571 - 9,299 ft<br>476 - 2,834 m | +9,300 ft<br>2,835 m                       |

High Explosives (TNT Equivalent)

<sup>1</sup> Based on the maximum amount of material that could reasonably fit into a container or vehicle. Variations possible.

<sup>2</sup> Governed by the ability of an unreinforced building to withstand severe damage or collapse.

<sup>3</sup> Governed by the greater of fragment throw distance or glass breakage/falling glass hazard distance. These distances can be reduced for personnel wearing ballistic protection. Note that the pipe bomb, suicide bomb, and briefcase/suitcase bomb are assumed to have a fragmentation characteristic that requires greater stand-off distances than an equal amount of explosives in a vehicle.

## Improvised Explosive Device (IED) SAFE STAND-OFF DISTANCE

| Threat Description              | LPG Mass / Volume <sup>1</sup> | Fireball Diameter <sup>2</sup> | Safe Distance <sup>3,4</sup> |
|---------------------------------|--------------------------------|--------------------------------|------------------------------|
| Small LPG Tank                  | 20 lbs / 5 gal                 | 40 ft                          | 160 ft                       |
|                                 | 9 kg / 19 L                    | 12 m                           | 48 m                         |
| Large LPG Tank                  | 100 lbs / 25 gal               | 69 ft                          | 276 ft                       |
|                                 | 45 kg / 95 L                   | 21 m                           | 84 m                         |
| Commercial/Residential LPG Tank | 2,000 lbs / 500 gal            | 184 ft                         | 736 ft                       |
|                                 | 907 kg / 1,893 L               | 56 m                           | 224 m                        |
| Small LPG Truck                 | 8,000 lbs / 2,000 gal          | 292 ft                         | 1,168 ft                     |
|                                 | 3,630 kg / 7,570 L             | 89 m                           | 356 m                        |
| Semitanker LPG                  | 40,000 lbs / 10,000 gal        | 499 ft                         | 1,996 ft                     |
|                                 | 18,144 kg / 37,850 L           | 152 m                          | 608 m                        |

LPG - Butane or Propane

<sup>1</sup> Based on the maximum amount of LPG that could reasonably fit into a container or vehicle. Variations possible.

<sup>2</sup> Assuming efficient mixing of the flammable gas with ambient air.

<sup>3</sup> Determined by U.S. firefighting practices wherein safe distances are approximately 4 times the flame height.

<sup>4</sup> This table is for a loaded LPG tank with explosives on the exterior. Note that an LPG tank filled with high explosives would require a significantly greater stand-off distance than if it were filled with LPG.



## GLOSSARY

|                               |   |
|-------------------------------|---|
| <b>Adsorbed gas</b>           | A gas which sticks (adsorbs) to the surface of a solid and porous material (such as activated charcoal) contained within a metal cylinder. This results in an internal cylinder pressure of less than 101.3 kPa at 20°C (14 psi at 68°F) and less than 300 kPa at 50°C (43 psi at 122°F). These pressures are much lower than those of conventional cylinders containing compressed or liquefied gases.   |
| <b>AEGL(s)</b>                | Acute Exposure Guideline Level(s), AEGLs represent threshold exposure limits for the general public after a once-in-a-lifetime, or rare, exposure and are applicable to emergency exposure periods ranging from 10 minutes to 8 hours. Three levels AEGL-1, AEGL-2 and AEGL-3 are developed for each of five exposure periods (10 and 30 minutes, 1 hour, 4 hours, and 8 hours) and are distinguished by varying degrees of severity of toxic effects; see AEGL-1, AEGL-2 and AEGL-3. |
| <b>AEGL-1</b>                 | AEGL-1 is the airborne concentration (expressed as parts per million or milligrams per cubic meter [ppm or mg/m <sup>3</sup> ]) of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic, non-sensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.   |
| <b>AEGL-2</b>                 | AEGL-2 is the airborne concentration (expressed as ppm or mg/m <sup>3</sup> ) of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.  |
| <b>AEGL-3</b>                 | AEGL-3 is the airborne concentration (expressed as ppm or mg/m <sup>3</sup> ) of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.   |
| <b>Alcohol-resistant foam</b> | A foam that is resistant to polar chemicals such as ketones and esters which may break down other types of foam.  |
| <b>Biological agents</b>      | Pathogens (bacteria, viruses, etc.) or the toxins they produce (such as anthrax) that are dispersed with criminal intent. They can cause disease or death in otherwise healthy humans. <b>Refer to GUIDE 158.</b>   |
| <b>BLEVE</b>                  | Boiling Liquid Expanding Vapor Explosion  |

## GLOSSARY

|                                   |   |
|-----------------------------------|---|
| <b>Blister agents (vesicants)</b> | <p>Substances that cause blistering of the skin. Exposure is through liquid or vapor contact with any exposed tissue (eyes, skin, lungs). Mustard (H), Distilled Mustard (HD), Nitrogen Mustard (HN) and Lewisite (L) are blister agents.</p> <p><b>Symptoms:</b> Red eyes, skin irritation, burning of skin, blisters, upper respiratory damage, cough, hoarseness.</p>  |
| <b>Blood agents</b>               | <p>Substances that injure a person by interfering with cell respiration (the exchange of oxygen and carbon dioxide between blood and tissues). Hydrogen cyanide (AC) and Cyanogen chloride (CK) are blood agents.</p> <p><b>Symptoms:</b> Respiratory distress, headache, unresponsiveness, seizures, coma.</p>   |
| <b>Boil over</b>                  | <p>A sudden increase in fire intensity associated with the expulsion of burning flammable liquid caused by the boiling of water that has accumulated in the bottom of a tank car.</p>   |
| <b>Burn</b>                       | <p>Refers to either a chemical or thermal burn, the former may be caused by corrosive substances and the latter by liquefied cryogenic gases, hot molten substances, or flames.</p>   |
| <b>Carcinogen</b>                 | <p>A substance or mixture which induces cancer or increases its incidence.</p>  |
| <b>Category A</b>                 | <p>An infectious substance that poses a high risk to the health of individuals and/or animals or public health. These substances can cause serious disease and can lead to death. Effective treatment and preventative measures may not be available.</p>   |
| <b>Category B</b>                 | <p>An infectious substance that poses a low to moderate risk to individuals and/or animals and/or public health. These substances are unlikely to cause serious disease. Effective treatment and preventative measures are available.</p>   |
| <b>CBRN</b>                       | <p>Chemical, biological, radiological or nuclear agent.</p>   |
| <b>Choking agents</b>             | <p>Substances that cause physical injury to the lungs. Exposure is through inhalation. In extreme cases, membranes swell and lungs become filled with liquid (pulmonary edema). Death results from lack of oxygen; hence, the victim is "choked". Phosgene (CG) is a choking agent.</p> <p><b>Symptoms:</b> Irritation to eyes/nose/throat, respiratory distress, nausea and vomiting, burning of exposed skin.</p> |
| <b>CO<sub>2</sub></b>             | <p>Carbon dioxide gas.</p>  |

## GLOSSARY

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|----------------------------|--|
| <b>Cold zone</b>           | Area where the command post and support functions that are necessary to control the incident are located. This is also referred to as the clean zone, green zone or support zone in other documents. (EPA Standard Operating Safety Guidelines, OSHA 29 CFR 1910.120, NFPA 472).   |
| <b>Combustible liquid</b>  | Liquids which have a flash point greater than 60°C (140°F) and below 93°C (200°F). U.S. regulations permit a flammable liquid with a flash point between 38°C (100°F) and 60°C (140°F) to be reclassified as a combustible liquid.   |
| <b>Compatibility Group</b> | <p>Letters identify explosives that are deemed to be compatible. The definition of these Compatibility Groups in this Glossary are intended to be descriptive. Please consult the transportation of hazardous materials/dangerous goods or explosives regulations of your jurisdiction for the exact wording of the definitions. Class 1 materials are considered to be “compatible” if they can be transported together without significantly increasing either the probability of an incident or, for a given quantity, the magnitude of the effects of such an incident.</p> <p>A Substances which are expected to mass detonate very soon after fire reaches them.</p> <p>B Articles which are expected to mass detonate very soon after fire reaches them.</p> <p>C Substances or articles which may be readily ignited and burn violently without necessarily exploding.</p> <p>D Substances or articles which may mass detonate (with blast and/or fragment hazard) when exposed to fire.</p> <p>E &amp; F Articles which may mass detonate in a fire.</p> <p>G Substances and articles which may mass explode and give off smoke or toxic gases.</p> <p>H Articles which in a fire may eject hazardous projectiles and dense white smoke.</p> <p>J Articles which may mass explode.</p> <p>K Articles which in a fire may eject hazardous projectiles and toxic gases.</p> <p>L Substances and articles which present a special risk and could be activated by exposure to air or water.</p> |

## GLOSSARY

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|--|---|---|
| <b>Compatibility Group (continued)</b> | N | Articles which contain only extremely insensitive detonating substances and demonstrate a negligible probability of accidental ignition or propagation.   |
|  | S | Packaged substances or articles which, if accidentally initiated, produce effects that are usually confined to the immediate vicinity.  |
| <b>Control zones</b>                   |   | Designated areas at hazardous materials/dangerous goods incidents, based on safety and the degree of hazard. Many terms are used to describe control zones; however, in this guidebook, these zones are defined as the hot/exclusion/red/restricted zone, warm/contamination reduction/yellow/limited access zone, and cold/support/green/clean zone. (EPA Standard Operating Safety Guidelines, OSHA 29 CFR 1910.120, NFPA 472). |
| <b>Cryogenic liquid</b>                |   | A refrigerated, liquefied gas that has a boiling point colder than -90°C (-130°F) at atmospheric pressure or is handled or transported at a temperature equal to or less than -100°C (-148°F).  |
| <b>Decomposition products</b>          |   | Products of a chemical or thermal break-down of a substance.  |
| <b>Decontamination</b>                 |   | The removal of hazardous materials/dangerous goods from personnel and equipment to the extent necessary to prevent potential adverse health effects. See "Decontamination", page 362.   |
| <b>Dry chemical</b>                    |   | A preparation designed for fighting fires involving flammable liquids, pyrophoric substances and electrical equipment. Common types contain sodium bicarbonate or potassium bicarbonate.  |
| <b>Edema</b>                           |   | The accumulation of an excessive amount of watery fluid in cells and tissues. Pulmonary edema is an excessive buildup of water in the lungs, for instance, after inhalation of a gas that is corrosive to lung tissue.  |
| <b>ERPG(s)</b>                         |   | Emergency Response Planning Guideline(s). Values intended to provide estimates of concentration ranges above which one could reasonably anticipate observing adverse health effects; see ERPG-1, ERPG-2 and ERPG-3.   |
| <b>ERPG-1</b>                          |   | The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hour without experiencing more than mild, transient adverse health effects or without perceiving a clearly defined objectionable odor.  |

## GLOSSARY

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|---|---|
| <b>ERPG-2</b>   | The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual's ability to take protective action.   |
| <b>ERPG-3</b>   | The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects.  |
| <b>Flammable liquid</b>                               | A liquid that has a flash point of 60°C (140°F) or lower.   |
| <b>Flash point</b>                                    | Lowest temperature at which a liquid or solid gives off vapor in such a concentration that, when the vapor combines with air near the surface of the liquid or solid, a flammable mixture is formed. Hence, the lower the flash point, the more flammable the material.   |
| <b>Flooding quantities</b>                            | Minimum of 1900 L/min (500 US gal/min) of water.  |
| <b>Hazard zones<br/>(Inhalation Hazard<br/>Zones)</b> | <b>HAZARD<br/>ZONE A:</b> Gases: LC50 of less than or equal to 200 ppm,<br>Liquids: V equal to or greater than 500 LC50 and<br>LC50 less than or equal to 200 ppm.<br><b>HAZARD<br/>ZONE B:</b> Gases: LC50 greater than 200 ppm and less<br>than or equal to 1000 ppm, Liquids: V equal to<br>or greater than 10 LC50; LC50 less than or equal<br>to 1000 ppm and criteria for Hazard Zone A are<br>not met.<br><b>HAZARD<br/>ZONE C:</b> LC50 greater than 1000 ppm and less than or<br>equal to 3000 ppm.<br><b>HAZARD<br/>ZONE D:</b> LC50 greater than 3000 ppm and less than or<br>equal to 5000 ppm.<br>Please note: even though the term “zone” is used, hazard zones<br>are not an actual area or distance. How zones are assigned is<br>strictly a function of the lethal concentration 50 (LC50) of the<br>product. For example, TIH Zone A is more toxic than Zone D. |
| <b>High expansion foam</b>                            | Foams that have a high expansion ratio (over 1:200) with a low water content.   |
| <b>Hot zone</b>                                       | Area immediately surrounding a hazardous materials/dangerous goods incident which extends far enough to prevent adverse effects from the released product to personnel outside the zone. This zone is also referred to as exclusion zone, red zone or restricted zone in other documents. (EPA Standard Operating Safety Guidelines, OSHA 29 CFR 1910.120, NFPA 472).   |
| <b>IED</b>  | See “Improvised Explosive Device”.  |

## GLOSSARY

|                                    |   |
|------------------------------------|---|
| <b>Immiscible</b>                  | In this guidebook, means that a material does not mix readily with water.   |
| <b>Improvised Explosive Device</b> | A bomb that is manufactured from commercial, military or homemade explosives.   |
| <b>Large spill</b>                 | A spill that involves quantities that are greater than 208 liters (55 US gallons). This usually involves a spill from a large package, or multiple spills from many small packages.   |
| <b>LC50</b>                        | Lethal concentration 50. The concentration of a material administered by inhalation that is expected to cause the death of 50% of an experimental animal population within a specified time. (Concentration is reported in either ppm or mg/m <sup>3</sup> ).   |
| <b>Mass explosion</b>              | Explosion which affects almost the entire load virtually instantaneously.   |
| <b>MAWP</b>                        | Maximum Allowable Working Pressure: The maximum allowable internal pressure that the tank may experience during normal operations.  |
| <b>mg/m<sup>3</sup></b>            | Milligrams of a material per cubic meter of air.  |
| <b>Miscible</b>                    | In this guidebook, means that a material mixes readily with water.  |
| <b>mL/m<sup>3</sup></b>            | Milliliters of a material per cubic meter of air. (1 mL/m <sup>3</sup> equals 1 ppm).   |
| <b>Mutagen</b>                     | An agent giving rise to an increased occurrence of mutations in populations of cells and/or organisms. Mutation means a permanent change in the amount or structure of the genetic material in a cell.  |
| <b>Narcotic</b>                    | A substance which acts as a central nervous system depressor producing effects such as drowsiness, narcosis, reduced alertness, loss of reflexes, lack of coordination, and vertigo. These effects can also be manifested as severe headache or nausea, and can lead to reduced judgment, dizziness, irritability, fatigue, impaired memory function, deficit in perception and coordination, reaction time, or sleepiness. |
| <b>Nerve agents</b>                | Substances that interfere with the central nervous system. Exposure is primarily through contact with the liquid (via skin and eyes) and secondarily through inhalation of the vapor. Tabun (GA), Sarin (GB), Soman (GD) and VX are nerve agents.<br><b>Symptoms:</b> Pinpoint pupils, extreme headache, severe tightness in the chest, dyspnea, runny nose, coughing, salivation, unresponsiveness, seizures.              |

## GLOSSARY

|                         |  |
|-------------------------|--|
| <b>n.o.s.</b>           | These letters refer to “not otherwise specified”. The entries which use this description are generic names such as “Corrosive liquid, n.o.s.” This means that the actual chemical name for that corrosive liquid is not listed in the regulations; therefore, a generic name must be used to describe it on shipping papers.   |
| <b>Noxious</b>          | In this guidebook, means that a material may be harmful or injurious to health or physical well-being.   |
| <b>Organic Peroxide</b> | An organic (carbon-containing) compound having two oxygen atoms joined together. Organic peroxides are thermally unstable chemicals. They may have one or more of the following properties: be liable to explosive decomposition; burn rapidly; be sensitive to impact or friction; react dangerously with other substances.   |
| <b>Oxidizer</b>         | A chemical which supplies its own oxygen and which helps other combustible material burn more readily.   |
| <b>P</b>                | See “Polymerization”.  |
| <b>Packing Group</b>    | The Packing Group (PG) is assigned based on the degree of danger presented by the hazardous material/dangerous good:<br>PG I : Great danger<br>PG II : Medium danger<br>PG III : Minor danger  |
| <b>PG</b>               | See “Packing Group”.   |
| <b>pH</b>               | pH is a value that represents the acidity or alkalinity of a water solution. Pure water has a pH of 7. A pH value below 7 indicates an acid solution (a pH of 1 is extremely acidic). A pH above 7 indicates an alkaline solution (a pH of 14 is extremely alkaline). Acids and alkalies (bases) are commonly referred to as corrosive materials.  |
| <b>PIH</b>              | Poison Inhalation Hazard. See “TIH”.   |
| <b>Polar</b>            | See “Miscible”.  |
| <b>Polymerization</b>   | A chemical reaction that often produces heat and pressure. Once initiated, the reaction is accelerated by the heat that it produces. The uncontrolled buildup of heat and pressure can cause a fire or an explosion, or can rupture closed containers. The letter ( <b>P</b> ) following a guide number in the yellow-bordered and blue-bordered pages identifies a material that may polymerize violently under high temperature conditions or contamination with other products during a transportation incident. It is also used to identify materials that have a strong potential for polymerization in the absence of an inhibitor due to depletion of this inhibitor caused by accident conditions. |

## GLOSSARY

|                                   |   |
|-----------------------------------|---|
| <b>ppm</b>                        | Parts per million. (1 ppm equals 1 mL/m <sup>3</sup> ).   |
| <b>Protective clothing</b>        | <p>In this guidebook, protective clothing includes both respiratory and physical protection. One cannot assign a level of protection to clothing or respiratory devices separately. These levels were accepted and defined by response organizations such as U.S. Coast Guard, NIOSH, and U.S. EPA.</p> <p>Level A: SCBA plus totally encapsulating chemical resistant clothing (permeation resistant).</p> <p>Level B: SCBA plus hooded chemical resistant clothing (splash suit).</p> <p>Level C: Full or half-face respirator plus hooded chemical resistant clothing (splash suit).</p> <p>Level D: Coverall, including structural firefighters' protective clothing (SFPC), with no respiratory protection.</p> <p>SCBA: Self-contained breathing apparatus.</p> <p>Consult "Protective Clothing", pages 360-361</p> |
| <b>Pyrophoric</b>                 | A material which ignites spontaneously upon exposure to air (or oxygen).  |
| <b>Radiation Authority</b>        | As referred to in GUIDES 161 through 166 for radioactive materials, the Radiation Authority is either a Federal, state/provincial agency or state/province designated official. The responsibilities of this authority include evaluating radiological hazard conditions during normal operations and during emergencies. If the identity and telephone number of the authority are not known by emergency responders, or included in the local response plan, the information can be obtained from the agencies listed on the inside back cover. They maintain a periodically updated list of radiation authorities.   |
| <b>Radioactivity</b>              | The property of some substances to emit invisible and potentially harmful radiation.  |
| <b>Refrigerated liquid</b>        | See "Refrigerated liquefied gas".   |
| <b>Refrigerated liquefied gas</b> | A gas which when packaged for transport is made partially liquid because of its low temperature. See "Cryogenic liquid".  |
| <b>Respiratory sensitizer</b>     | A substance that induces hypersensitivity of the airways following inhalation of the substance.   |
| <b>Right-of-way</b>               | A defined area on a property containing one or more high-pressure natural gas pipelines.  |



## GLOSSARY

|                                |  |
|--------------------------------|--|
| <b>Shelter-in-place</b>        | People should seek shelter inside a building and remain inside until the danger passes. <b>Sheltering-in-place is used when evacuating the public would cause greater risk than staying where they are, or when an evacuation cannot be performed.</b> Direct the people inside to <b>close all doors and windows</b> and to <b>shut off all ventilating, heating and cooling systems.</b> In-place protection (shelter-in-place) may not be the best option if (a) the vapors are flammable; (b) if it will take a long time for the gas to clear the area; or (c) if buildings cannot be closed tightly. Vehicles can offer some protection for a short period if the windows are closed and the ventilating systems are shut off. Vehicles are not as effective as buildings for in-place protection. |
| <b>Skin corrosion</b>          | The production of irreversible damage to the skin following the application of a test substance for up to 4 hours.   |
| <b>Skin irritation</b>         | The production of reversible damage to the skin following the application of a test substance for up to 4 hours.   |
| <b>Skin sensitizer</b>         | A substance that will induce an allergic response following skin contact.  |
| <b>Small spill</b>             | A spill that involves quantities that are 208 liters (55 US gallons) or less. This generally corresponds to a spill from a single small package (for example, a drum), a small cylinder, or a small leak from a large package.   |
| <b>Specific gravity</b>        | Weight of a substance compared to the weight of an equal volume of water at a given temperature. Specific gravity less than 1 indicates a substance is lighter than water; specific gravity greater than 1 indicates a substance is heavier than water.  |
| <b>Straight (solid) stream</b> | Method used to apply or distribute water from the end of a hose. The water is delivered under pressure for penetration. In an efficient straight (solid) stream, approximately 90% of the water passes through an imaginary circle 38 cm (15 inches) in diameter at the breaking point. Hose (solid or straight) streams are frequently used to cool tanks and other equipment exposed to flammable liquid fires, or for washing burning spills away from danger points. However, straight streams will cause a spill fire to spread if improperly used or when directed into open containers of flammable and combustible liquids.  |
| <b>TIH</b>                     | Toxic Inhalation Hazard. Term used to describe gases and volatile liquids that are toxic when inhaled (same as PIH). These materials pose a known hazard to human health during transport or is presumed to be toxic to humans because of animal-based studies.  |

## GLOSSARY

|                                |  |
|--------------------------------|--|
| <b>V</b>                       | Saturated vapor concentration in air of a material in mL/m <sup>3</sup> (ppm) at 20°C and standard atmospheric pressure.   |
| <b>Vapor density</b>           | Weight of a volume of pure vapor or gas (with no air present) compared to the weight of an equal volume of dry air at the same temperature and pressure. A vapor density less than 1 (one) indicates that the vapor is lighter than air and will tend to rise. A vapor density greater than 1 (one) indicates that the vapor is heavier than air and may travel along the ground   |
| <b>Vapor pressure</b>          | Pressure at which a liquid and its vapor are in equilibrium at a given temperature. Liquids with high vapor pressures evaporate rapidly.   |
| <b>Viscosity</b>               | Measure of a liquid's internal resistance to flow. This property is important because it indicates how fast a material will leak out through holes in containers or tanks.   |
| <b>Warm zone</b>               | Area between Hot and Cold zones where personnel and equipment decontamination and hot zone support take place. It includes control points for the access corridor and thus assists in reducing the spread of contamination. Also referred to as the contamination reduction corridor (CRC), contamination reduction zone (CRZ), yellow zone or limited access zone in other documents. (EPA Standard Operating Safety Guidelines, OSHA 29 CFR 1910.120, NFPA 472). |
| <b>Water Reactive Material</b> | In this guidebook, materials which produce significant toxic gas when it comes in contact with water.  |
| <b>Water-sensitive</b>         | Substances which may produce flammable and/or toxic decomposition products upon contact with water.  |

## GLOSSARY

### **Water spray (fog)**

Method or way to apply or distribute water. The water is finely divided to provide for high heat absorption. Water spray patterns can range from about 10 to 90 degrees. Water spray streams can be used to extinguish or control the burning of a fire or to provide exposure protection for personnel, equipment, buildings, etc. **(This method can be used to absorb vapors, knock-down vapors or disperse vapors. Direct a water spray (fog), rather than a straight (solid) stream, into the vapor cloud to accomplish any of the above).**

Water spray is particularly effective on fires of flammable liquids and volatile solids having flash points above 37.8°C (100°F).

Regardless of the above, water spray can be used successfully on flammable liquids with low flash points. The effectiveness depends particularly on the method of application. With proper nozzles, even gasoline spill fires of some types have been extinguished when coordinated hose lines were used to sweep the flames off the surface of the liquid. Furthermore, water spray carefully applied has frequently been used with success in extinguishing fires involving flammable liquids with high flash points (or any viscous liquids) by causing frothing to occur only on the surface, and this foaming action blankets and extinguishes the fire.

## **PUBLICATION DATA**

The 2020 Emergency Response Guidebook (ERG2020) was prepared by the staff of Transport Canada, the U.S. Department of Transportation, and the Secretariat of Communications and Transport of Mexico with the assistance of many interested parties from government and industry including the collaboration of CIQUIME of Argentina. Printing and publication services are provided through U.S. DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA), Outreach, Engagement, and Grants Division.

ERG2020 is based on earlier Transport Canada, U.S. DOT, and Secretariat of Communications and Transport emergency response guidebooks. ERG2020 is published in three languages: English, French and Spanish. The Emergency Response Guidebook has been translated and printed in other languages, including Chinese, German, Hebrew, Japanese, Portuguese, Korean, Hungarian, Polish, Turkish and Thai.

We encourage countries that wish to translate this Guidebook to please contact any of the websites or telephone numbers in the next paragraph.

## **DISTRIBUTION OF THIS GUIDEBOOK**

The primary objective is to place one copy of the ERG2020 in each publicly owned emergency service vehicle through distribution to Federal, state, provincial and local public safety authorities. The distribution of this guidebook is being accomplished through the voluntary cooperation of a network of key agencies. Emergency service organizations that have not yet received copies of ERG2020 should contact the respective distribution center in their country, state or province. In the U.S., information about the distribution center for your location may be obtained from the Office of Hazardous Materials Safety website at <https://www.phmsa.dot.gov/hazmat/erg/emergency-response-guidebook-erg> or call 202-366-4900. In Canada, contact CANUTEC at 613-992-4624 or via the website at <https://www.tc.gc.ca/canutec> for information. In Mexico, call SCT at +52 55-57-23-93-00 ext. 20010 or 20577, or via email at [cserrano@sct.gob.mx](mailto:cserrano@sct.gob.mx). In Argentina, call CIQUIME at +54-11-5199-1409, or via the website at <http://www.ciquime.org> or via email at [gre@ciquime.org](mailto:gre@ciquime.org).

## **REPRODUCTION AND RESALE**

Copies of this document which are provided free-of-charge to fire, police and other emergency services may not be resold. ERG2020 (PHH50-ERG2020) may be reproduced without further permission subject to the following:

The names and the seals of the participating governments may not be reproduced on a copy of this document unless that copy accurately reproduces the entire content (text, format, and coloration) of this document without modification. In addition, the publisher's full name and address must be displayed on the outside back cover of each copy, replacing the wording placed on the center of the back cover.

Constructive comments concerning ERG2020 are solicited; in particular, comments concerning its use in handling incidents involving hazardous materials/dangerous goods. Comments should be addressed to:

**In Canada:**

Director, CANUTEC  
Transport Dangerous Goods  
Transport Canada  
Ottawa, Ontario  
Canada K1A 0N5

Phone: 613-992-4624 (information)

Fax: 613-954-5101

Email: [canutec@tc.gc.ca](mailto:canutec@tc.gc.ca)

**In the U.S.:**

U. S. Department of Transportation  
Pipeline and Hazardous Materials Safety Administration  
Outreach, Engagement, and Grants Division (PHH-50)  
Washington, DC 20590-0001

Phone: 202-366-4900

Fax: 202-366-7342

Email: [ERGComments@dot.gov](mailto:ERGComments@dot.gov)

**In Mexico:**

Secretaría de Comunicaciones y Transportes  
Dirección General de Autotransporte Federal  
Dirección General Adjunta de Normas y Especificaciones  
Técnicas y de Seguridad en el Autotransporte  
Calzada de las Bombas No. 411-2 piso,  
Col. Los Girasoles,  
Alcaldía de Coyoacán,  
Código Postal 04920,  
Ciudad de México

Phone: +52 55-57-23-93-00 ext. 20010 or 20577

Email: [cserrano@sct.gob.mx](mailto:cserrano@sct.gob.mx)

**In Argentina:**

Centro de Información Química para Emergencias (CIQUIME)  
Av. Alvarez Thomas 636  
C1427CCT Buenos Aires, Argentina  
Phone: +54-11-5199-1409  
Email: [gre@ciquime.org](mailto:gre@ciquime.org)

The Emergency Response Guidebook is normally revised and reissued every four years. However, in the event of a significant mistake, omission or change in the state of knowledge, special instructions to change the guidebook (in pen-and-ink, with paste-over stickers, or with a supplement) may be issued.

Users of this guidebook should check periodically (about every 6 months) to make sure their version is current. Changes should be annotated below. Contact:

**DOT/PHMSA**

<https://www.phmsa.dot.gov/hazmat/erg/emergency-response-guidebook-erg>

**TRANSPORT CANADA**

<https://www.tc.gc.ca/eng/canutec/menu.htm>

**CIQUIME**

<http://www.ciquime.org>

*This guidebook incorporates changes dated:*

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## CANADA AND UNITED STATES NATIONAL RESPONSE CENTERS

For the purposes of this guidebook, the terms hazardous materials/dangerous goods are synonymous.

### **CANADA**

#### 1. **CANUTEC**

**CANUTEC** is the **Canadian Transport Emergency Centre** operated by the Transportation of Dangerous Goods Directorate of Transport Canada.

**CANUTEC** provides a national bilingual (French and English) advisory service and is staffed by professional scientists experienced and trained in interpreting technical information and providing emergency response advice.

**In an emergency, CANUTEC may be called at 1-888-CANUTEC (226-8832)  
or collect at 613-996-6666 (24 hours)  
\*666 cellular (Press Star 666, Canada only)**

In a non-emergency situation, please call the information line at 613-992-4624 (24 hours).

#### 2. **PROVINCIAL/TERRITORIAL AGENCIES**

Although technical information and emergency response assistance can be obtained from **CANUTEC**, there are federal, provincial and territorial regulations requiring the reporting of dangerous goods incidents to certain authorities.

The following list of provincial/territorial agencies is supplied for your convenience.

| <b>Province</b>                 | <b>Emergency Authority and/or Telephone Number</b>                                    |
|---------------------------------|---|
| Alberta .....                   | Local Police and Provincial Authorities<br>1-800-272-9600 or 780-422-9600             |
| British Columbia .....          | Local Police and Provincial Authorities<br>1-800-663-3456                             |
| Manitoba.....                   | Provincial Authority 204-945-4888 and<br>Local Police or fire brigade, as appropriate |
| New Brunswick .....             | Local Police or 1-800-565-1633  |
| Newfoundland and Labrador ..... | Local Police and 709-772-2083   |
| Northwest Territories .....     | 867-920-8130  |
| Nova Scotia .....               | Local Police or 1-800-565-1633  |
| Nunavut.....                    | Local Police and 867-920-8130   |
| Ontario.....                    | Local Police  |
| Prince Edward Island.....       | Local Police or 1-800-565-1633  |
| Quebec.....                     | Local Police  |
| Saskatchewan .....              | Local Police or 1-800-667-7525  |
| Yukon Territory .....           | 867-667-7244  |

## NOTE:

1. The appropriate federal agency must be notified in the case of rail, air or marine incidents.
2. The nearest police department must be notified in the case of lost, stolen or misplaced explosives, radioactive materials or infectious substances.
3. **CANUTEC must** be notified in the case of:
  - a. lost, stolen or unlawfully interfered with dangerous goods (except Class 9)
  - b. an incident involving infectious substances
  - c. an accidental release from a cylinder that has suffered a catastrophic failure
  - d. an incident where the shipping papers display **CANUTEC's** telephone number 1-888-CANUTEC (226-8832) or 613-996-6666 as the emergency telephone number or
  - e. a dangerous goods incident in which a railway vehicle, a ship, an aircraft, an aerodrome or an air cargo facility is involved
3. **EMERGENCY RESPONSE ASSISTANCE PLANS (Applies in Canada ONLY)**

An ERAP or Emergency Response Assistance Plan is an approved plan that describes what is to be done in the event of a transportation accident involving certain higher risk dangerous goods. The ERAP is required by the Canadian *Transportation of Dangerous Goods Act* for dangerous goods that require special expertise and response equipment to respond to an incident. The plan is intended to assist local emergency responders by providing them with technical experts and specially trained and equipped emergency response personnel at the scene of a dangerous goods incident.

The ERAP will describe the specialized response capabilities, equipment and procedures that will be used to support a response to incidents involving high risk dangerous goods. The plan will also address emergency preparedness, including personnel training, response exercises and equipment maintenance. The ERAP plans supplement those of the carrier and of the local and provincial authorities, and must be integrated with other organizations to help mitigate the consequences of an accident.

For shipments that require an ERAP, the ERAP number and the phone number to activate the ERAP will be included on the shipping paper. If additional information is required, or to determine if the product involved in the emergency requires an ERAP, contact **CANUTEC**.

**CANUTEC may be called at 1-888-CANUTEC (226-8832)  
or collect at 613-996-6666 (24 hours)  
\*666 on cellular phone (Press star 666) In Canada Only**



**NATIONAL RESPONSE CENTER (NRC)**

The NRC, which is operated by the U.S. Coast Guard, receives reports required when hazardous materials are spilled. After receiving notification of an incident, the NRC will immediately notify the appropriate Federal On-Scene Coordinator and concerned Federal agencies. Federal law requires that anyone who releases into the environment a reportable quantity of a hazardous material (including oil when water is, or may be affected) or a material identified as a marine pollutant, must **immediately** notify the NRC. When in doubt as to whether the amount released equals the required reporting levels for these materials, the NRC should be notified.

**CALL NRC** (24 hours)

**1-800-424-8802**

(Toll-free in the U.S., Canada, and the U.S. Virgin Islands)

**202-267-2675** in the District of Columbia

Calling the emergency response telephone number, CHEMTREC®, CHEMTEL, INC., INFOTRAC or 3E COMPANY, does not constitute compliance with regulatory requirements to call the NRC.

## 24-HOUR EMERGENCY RESPONSE TELEPHONE NUMBERS

### **MEXICO**

#### 1. CENACOM

555128-0000 extensions 36428, 36422, 36469, 37807, 37810

#### 2. CONASENUSA

800-11-131-68 in the Republic of Mexico

#### 3. SETIQ

800-00-21-400 or 55-5559-1588

For calls originating elsewhere, call: +52-55-5559-1588

### **ARGENTINA**

#### 1. CIQUIME

0-800-222-2933 in the Republic of Argentina

For calls originating elsewhere, call: +54-11-4552-8747\*

### **BRAZIL**

#### 1. PRÓ-QUÍMICA

0-800-118270 in Brazil

For calls originating elsewhere, call: +55-19-3833-5310\*

### **COLOMBIA**

#### 1. CISPROQUIM

01-800-091-6012 in Colombia

For calls originating in Bogotá, Colombia call: 288-6012

For calls originating elsewhere call: +57-1-288-6012

### **CHILE**

#### 1. CITUC QUÍMICO

2-2247-3600 in the Republic of Chile

For calls originating elsewhere call +56-2-2247-3600

\* Collect calls are accepted

## 24-HOUR EMERGENCY RESPONSE TELEPHONE NUMBERS

### **CANADA**

#### **1. CANUTEC**

**1-888-CANUTEC (226-8832) or 613-996-6666 \***  
**\*666 (STAR 666) cellular** (in Canada only)

### **UNITED STATES**

#### **1. CHEMTREC**

**1-800-424-9300**  
(in the U.S., Canada and the U.S. Virgin Islands)  
For calls originating elsewhere: **703-527-3887 \***

#### **2. CHEMTEL, INC.**

**1-888-255-3924**  
(in the U.S., Canada, Puerto Rico and the U.S. Virgin Islands)  
For calls originating elsewhere: **813-248-0573 \***

#### **3. INFOTRAC**

**1-800-535-5053**  
(in the U.S., Canada and the U.S. Virgin Islands)  
For calls originating elsewhere: **352-323-3500 \***

#### **4. VERISK 3E**

**1-800-451-8346**  
(in the U.S., Canada and the U.S. Virgin Islands)  
For calls originating elsewhere: **760-602-8703 \***

The emergency response information services shown above maintain periodically updated lists of state and Federal radiation authorities who provide information and technical assistance on handling incidents involving radioactive materials.

**5. MILITARY SHIPMENTS**, for assistance at incidents involving materials being shipped by, for, or to the Department of Defense (DOD), call one of the following numbers:

**703-697-0218 \*** - Explosives/ammunition incidents  
(U.S. Army Operations Center)  
**1-800-851-8061** - All other hazardous materials/dangerous goods incidents  
(Defense Logistics Agency)

#### **6. NATIONWIDE POISON CONTROL CENTER** (United States only)

**1-800-222-1222**

\* Collect calls are accepted.

A guidebook intended for use by first responders  
during the initial phase of a transportation incident  
involving hazardous materials/dangerous goods

**THIS DOCUMENT SHOULD NOT BE USED TO  
DETERMINE COMPLIANCE WITH THE  
HAZARDOUS MATERIALS/  
DANGEROUS GOODS REGULATIONS  
OR  
TO CREATE WORKER SAFETY DOCUMENTS  
FOR SPECIFIC CHEMICALS**

## **NOT FOR SALE**

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free of charge to Public Safety Organizations  
by the US Department of Transportation and  
Transport Canada. This copy may not be  
resold by commercial distributors.**



U.S. Department of Transportation

**Pipeline and Hazardous Materials  
Safety Administration**

<https://www.phmsa.dot.gov/hazmat>



Transport  
Canada

Transports  
Canada

<https://www.tc.gc.ca/TDG>



**SCT**

SECRETARÍA DE  
COMUNICACIONES  
Y TRANSPORTES

<http://www.sct.gob.mx>

Exhibit M4c