

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

# 2016

## EMERGENCY RESPONSE GUIDEBOOK



U.S. Department  
of Transportation  
**Pipeline and  
Hazardous Materials  
Safety Administration**



Transport  
Canada

Transports  
Canada

SCT  
SECRETARÍA DE  
COMUNICACIONES  
Y TRANSPORTES



## SHIPPING DOCUMENTS (PAPERS)

Shipping Documents (Papers) are synonymous and can 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 aircraft pilot
- Marine – kept in a holder on the bridge of a vessel

Shipping Documents (Papers) provide vital information regarding the hazardous materials/dangerous goods to initiate protective actions\*

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 shipping document) \*\*

<b>EMERGENCY CONTACT</b> 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>QUANTITY</b>		<b>NO. &amp; TYPE OF PACKAGES</b>
UN1219	ISOPROPANOL	3	II	12 000 LITERS	1 TANKTRUCK
↑ <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**

\* For the purposes of this guidebook, the terms hazardous materials/dangerous goods are synonymous.

\*\* In the United States, this requirement may be satisfied by attaching a guide from the ERG2016 to the shipping document, or by having the entire guidebook available for reference.

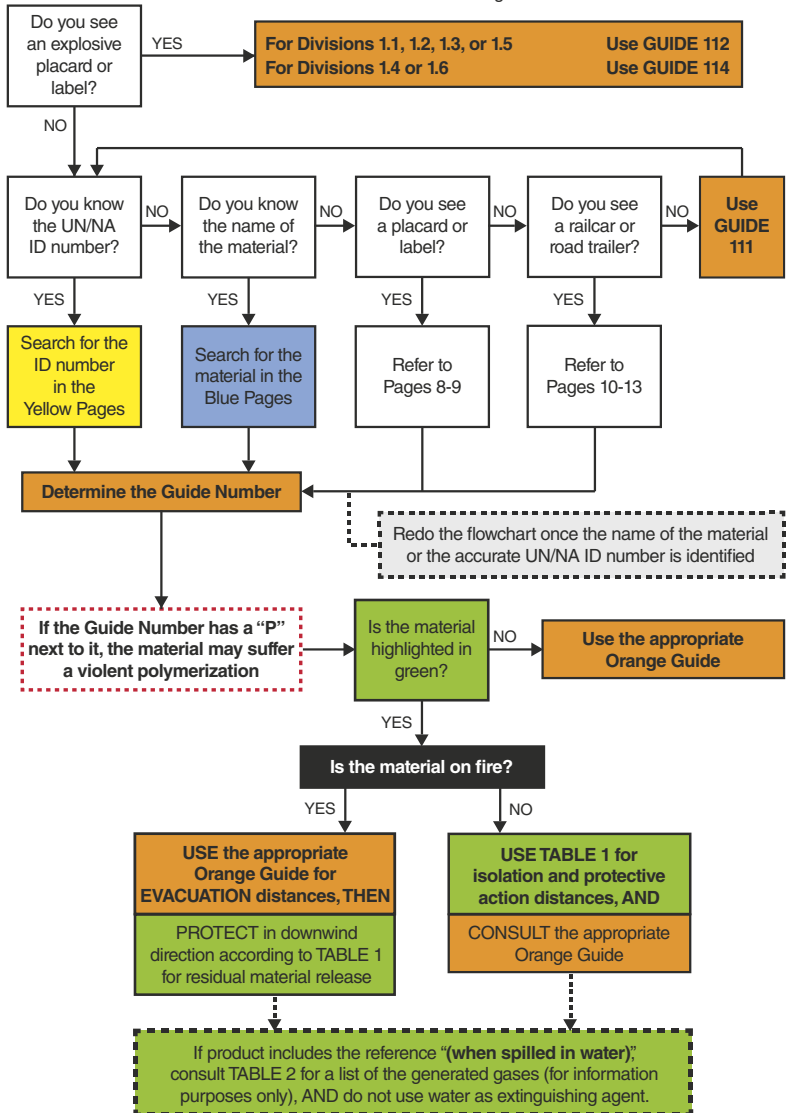
\*\*\* In the United States, a registration or contract number is required on a shipping document.

# HOW TO USE THIS GUIDEBOOK

## RESIST RUSHING IN!

**APPROACH INCIDENT FROM UPWIND, AND UPHILL 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**

---

---

---

---

---

---

**RAIL COMPANIES**

---

---

---

---

---

---

**FEDERAL/STATE/PROVINCIAL AGENCIES**

---

---

---

---

---

---

**OTHERS**

---

---

---

---

## TABLE OF CONTENTS

Shipping Documents (Papers) . . . . .	Inside front cover
How to Use this Guidebook . . . . .	1
Local Emergency Telephone Numbers . . . . .	2
Safety Precautions . . . . .	4
Notification and Request for Technical Information . . . . .	5
Hazard Classification System . . . . .	6
Introduction to the Table of Markings, Labels and Placards . . . . .	7
Table of Markings, Labels and Placards and Initial Response Guide to Use On-scene . . . . .	8
Rail Car Identification Chart . . . . .	10
Road Trailer Identification Chart . . . . .	12
Globally Harmonized System of Classification and Labeling of Chemicals (GHS) . . . . .	14
Hazard Identification Numbers Displayed on Some Intermodal Containers . . . . .	16
Pipeline Transportation . . . . .	20
ID Number Index . . . . .	26
Name of Material Index . . . . .	92
Guides . . . . .	159
Introduction to Green Tables . . . . .	289
Protective Action Decision Factors to Consider . . . . .	291
Protective Actions . . . . .	292
Background on Table 1 – Initial Isolation and Protective Action Distances . . . . .	293
Table 1 - Initial Isolation and Protective Action Distances . . . . .	294
Table 2 - Water-Reactive Materials which Produce Toxic Gases . . . . .	346
Table 3 - Initial Isolation and Protective Action Distances for Large Spills for Different Quantities of Six Common TIH (PIH in the US) Gases . . . . .	354
ERG 2016 User's Guide . . . . .	358
Guidebook Contents . . . . .	359
Toxic Inhalation Hazard (TIH) materials . . . . .	360
Isolation and Evacuation Distances . . . . .	361
Protective Clothing . . . . .	363
Fire and Spill Control . . . . .	365
BLEVE - Safety Precautions . . . . .	368
Criminal/Terrorist use of Chemical/Biological/Radiological Agents . . . . .	370
Improvised Explosive Device Safe Stand Off Distance . . . . .	374
Glossary . . . . .	376
Canada and United States National Response Centers . . . . .	390
Emergency Response Assistance Plans (ERAP) . . . . .	391
Emergency Response Telephone Numbers . . . . .	396

## SAFETY PRECAUTIONS

### RESIST RUSHING IN!

#### **APPROACH CAUTIOUSLY FROM *UPWIND, UPHILL 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 documents
- Rail Car and Road Trailer Identification Chart
- Material Safety Data Sheets (MSDS)
- 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 DOCUMENT**

- 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 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 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 document 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 blast 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 dangerous goods/hazardous materials 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 dangerous goods with the applicable reference GUIDE circled. Follow these steps:

1. **Approach scene from upwind, uphill 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



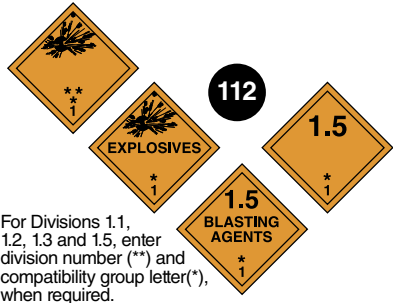
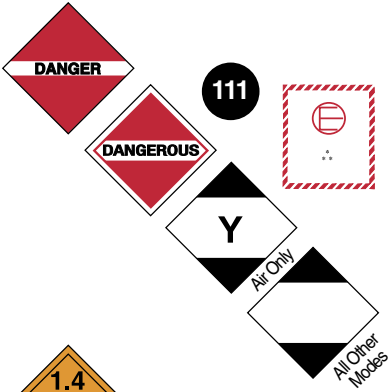
- Use GUIDE **111** when the DANGER/DANGEROUS placard is displayed or the nature of the spilled, leaking or burning material is not known. Also use this GUIDE when the presence of dangerous goods is suspected but no placards can be seen.

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).

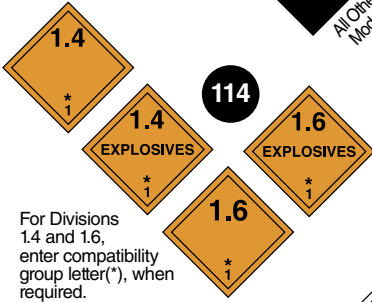
4. **Guides associated with the placards provide the most significant risk and/or hazard information.**
5. **When specific information, such as ID number or proper shipping name, becomes available, the more specific Guide recommended for that material must be consulted.**
6. **A single asterisk (\*) on orange placards represent an explosive's compatibility group letter. The asterisk must be replaced with the appropriate compatibility group letter. Refer to the Glossary (page 376).**
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

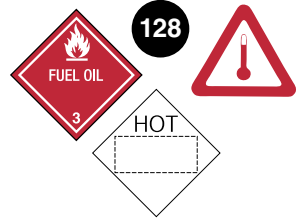
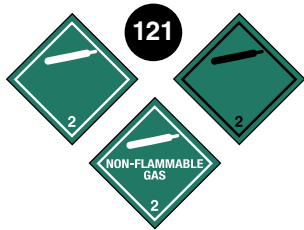
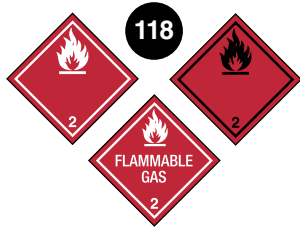
USE THIS TABLE ONLY IF MATERIALS CANNOT BE SPECIFICALLY IDENTIFIED BY



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

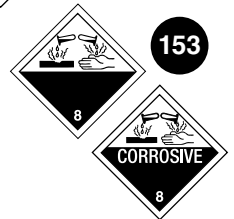
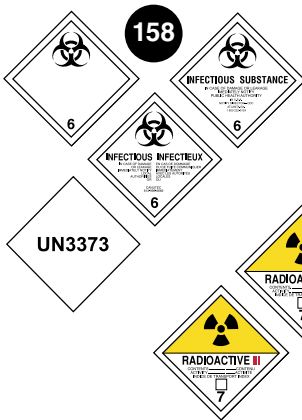
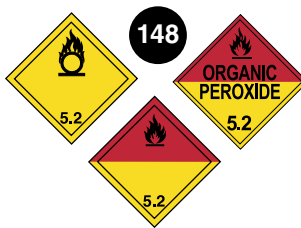
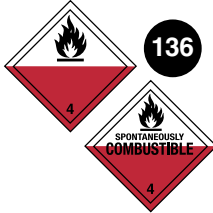
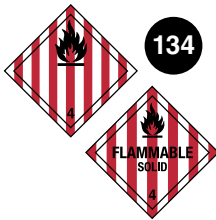


For Divisions 1.4 and 1.6, enter compatibility group letter(\*), when required.



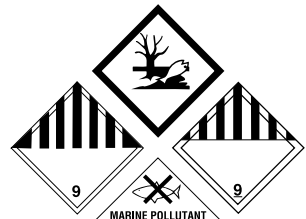
# AND INITIAL RESPONSE GUIDE TO USE ON-SCENE

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



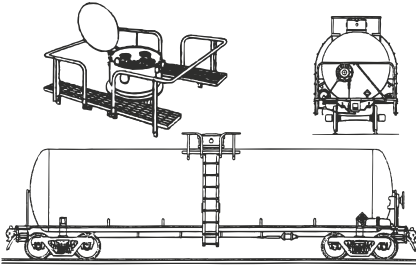
163

171



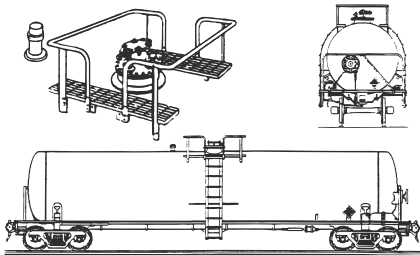
## RAIL CAR IDENTIFICATION CHART\*

### 117 Pressure tank car



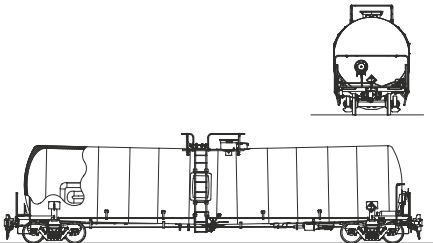
- For flammable, non-flammable, toxic and/or liquefied compressed gases
- Protective housing
- No bottom fittings
- Pressures usually above 40 psi

### 131 General service tank car (low pressure)



- 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

### 128 Low pressure tank car (TC117, DOT117)

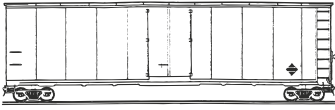


- For flammable liquids (e.g., Petroleum crude oil, ethanol)
- Protective housing separate from manway
- Bottom outlet valve
- Pressures usually below 25 psi

(Image provided as a courtesy of  
The Greenbrier Companies, Inc.)

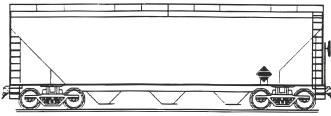
## RAIL CAR IDENTIFICATION CHART\*

### 111 Box car

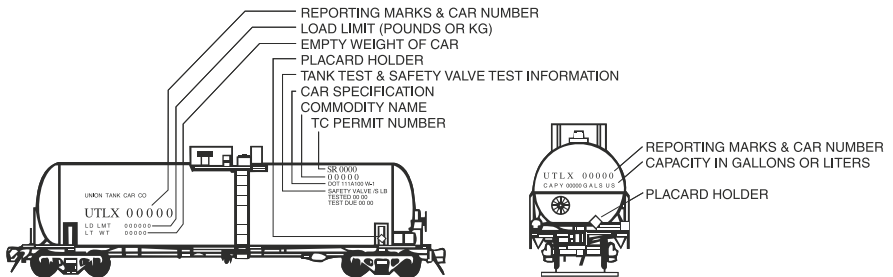


- For general freight that carry bulk or non-bulk packages
- May transport hazardous materials in small packages or "tote bins"
- Single or double sliding door

### 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



**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 documents 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 above, may be used to identify the product utilizing:

- a. the commodity name shown; or
- 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.

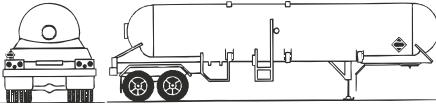
\* **The recommended guides should be considered as last resort if the material cannot be identified by any other means.**

## ROAD TRAILER IDENTIFICATION CHART\*

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

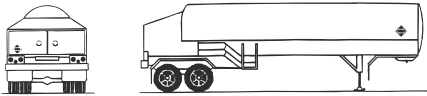
**NOTE:** An emergency shut-off valve is commonly found at the front of the tank, near the driver door.

### 117 MC331, TC331, SCT331



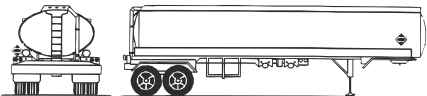
- For liquefied compressed gases (e.g., LPG, ammonia)
- Rounded heads
- Design pressure between 100-500 psi\*\*

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



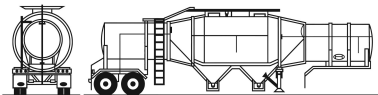
- For refrigerated liquefied gases (cryogenic liquids)
- Similar to a "giant thermo-bottle"
- Fitting compartments located in a cabinet at the rear of the tank
- MAWP between 25-500 psi\*\*

### 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\*\*

### 112 TC423



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

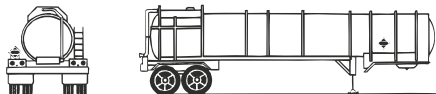
### 137 DOT407, TC407, SCT307, MC307, TC307



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

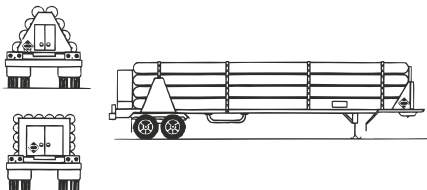
## ROAD TRAILER IDENTIFICATION CHART\*

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

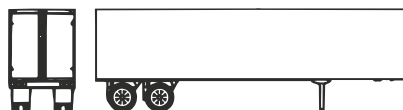


- Usually for corrosive liquids
- Circular cross-section
- External ring stiffeners
- Tank diameter is relatively small
- MAWP of at least 15 psi\*\*

### 117 Compressed Gas/Tube Trailer



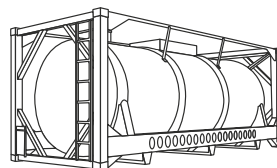
### 111 Mixed Cargo



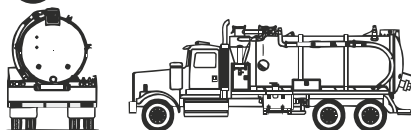
### 134 Dry Bulk Cargo Trailer



### 117 Intermodal Tank



### 137 Vacuum Tanker



**CAUTION:** This chart depicts only the most general shapes of road trailers. Emergency response personnel must be aware that there are many variations of road trailers, not illustrated above, that are used for shipping chemical products. The suggested guides are for the most hazardous products that may be transported in these trailer types.

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

\*\* MAWP: Maximum Allowable Working Pressure.

**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).

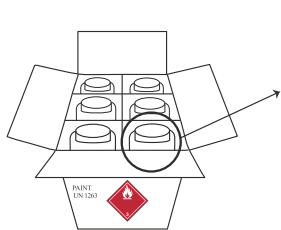
The GHS has nine symbols used to convey specific physical, health and environmental hazard information. These symbols are part of a pictogram that is diamond shaped and includes the GHS symbol in black on a white background with a red frame. The pictogram is part of the GHS label, which also includes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

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

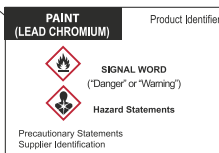
GHS pictograms are similar in shape to transport labels; however, transport labels have backgrounds of different colors.

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.

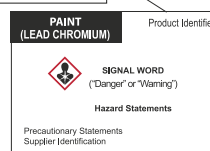
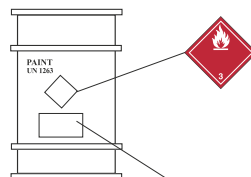
**Examples of GHS labeling:**



**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

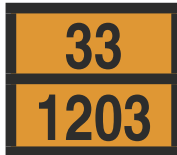


In some cases, such as on drums or international bulk containers (IBCs), which must address information for all sectors, the GHS label may be found in addition to the required transport labels and placards. Both types of labels (GHS and transport) will differ in a way that will make them easy to identify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

GHS Pictograms	Physical hazards	GHS Pictograms	Health and Environmental hazards
	Explosive; Self-reactive; Organic peroxide		Skin corrosion; Serious eye damage
	Flammable; Pyrophoric; Self-reactive; Organic peroxide; Self-heating; Emits flammable gases when in contact with water		Acute toxicity (harmful); Skin sensitizer; Irritant (skin and eye); Narcotic effect; Respiratory tract irritant; Hazardous to ozone layer (environment)
	Oxidizer		Respiratory sensitizer; Mutagen; Carcinogen; Reproductive toxicity; Target organ toxicity; 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 United Nations 4-digit identification 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 risk
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

**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)

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

66	Highly toxic substance
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
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 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 above-ground 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 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.

#### **Liquid Petroleum and Hazardous Liquids Pipelines**

##### **Liquid Petroleum Pipelines**

Crude oil, refined petroleum products, and hazardous liquids often are transported by pipelines and include gasoline, jet fuels, diesel fuel, home heating oils, carbon dioxide, anhydrous ammonia, and other hazardous liquids.

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/>

## Other Hazardous Liquids Pipelines

Some liquid pipelines transport highly volatile liquids that rapidly change from liquid to gaseous when released from a pressurized pipeline. Examples of these types of liquids include carbon dioxide, anhydrous ammonia, propane, and others.

### 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, skunk, or petroleum
- Discolored/dead vegetation or discolored snow above a pipeline right-of-way
- Oil slick or sheen on flowing/standing water



## 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.
  - **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** enter a vapor cloud in an attempt to identify the product(s) involved.
- **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) <http://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 PHMSA and the National Association of State Fire Marshals (NASFM). This training guide is available at <http://www.pipelineemergencies.com> and <http://nasfm-training.org/pipeline> and offers a thorough overview of U.S. pipeline operations and emergency response considerations. 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 <http://www.pipelineawareness.org/>

U.S. DOT, Pipeline and Hazardous Materials Safety Administration <http://phmsa.dot.gov/pipeline>

Pipeline 101 <http://pipeline101.com/>

## **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.

<http://www.cepa.com/library/maps>

## GREEN HIGHLIGHTED ENTRIES IN 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
- **IF A FIRE IS INVOLVED:**
  - Also consult the assigned orange guide
  - If applicable, apply the evacuation information shown under PUBLIC SAFETY

**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., Bromine trifluoride (UN1746), Thionyl chloride (UN1836), etc.). In these instances, two entries are provided in **Table 1** for land-based and water-based spills. If the Water Reactive material **is NOT** a TIH and this material **is NOT** spilled in water, **Table 1** and **Table 2** do **NOT** apply and safety distances will be found within the appropriate orange 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.**

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

— 112 Ammonium nitrate-fuel oil mixtures  
— 158 Biological agents  
— 112 Blasting agent, n.o.s.  
— 112 Explosives, division 1.1, 1.2, 1.3 or 1.5  
— 114 Explosives, division 1.4 or 1.6  
— 153 Toxins  
1001 116 Acetylene, dissolved  
1002 122 Air, compressed  
1003 122 Air, refrigerated liquid (cryogenic liquid)  
1003 122 Air, refrigerated liquid (cryogenic liquid), non-pressurized  
1005 125 Ammonia, anhydrous  
1005 125 Anhydrous ammonia  
1006 121 Argon  
1006 121 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  
1013 120 Carbon dioxide  
1013 120 Carbon dioxide, compressed  
1014 122 Carbon dioxide and Oxygen mixture, compressed

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

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

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

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 gas
1044	126	Fire extinguishers with liquefied gas
1045	124	Fluorine
1045	124	Fluorine, compressed
1046	121	Helium
1046	121	Helium, compressed
1048	125	Hydrogen bromide, anhydrous
1049	115	Hydrogen
1049	115	Hydrogen, compressed
1050	125	Hydrogen chloride, anhydrous
1051	117	AC
1051	117	Hydrocyanic acid, aqueous solutions, with more than 20% Hydrogen cyanide
1051	117	Hydrogen cyanide, anhydrous, stabilized
1051	117	Hydrogen cyanide, stabilized

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

1052	125	Hydrogen fluoride, anhydrous
1053	117	Hydrogen sulfide
1053	117	Hydrogen sulphide
1055	115	Isobutylene
1056	121	Krypton
1056	121	Krypton, compressed
1057	115	Lighter refills (cigarettes) (flammable gas)
1057	115	Lighters (cigarettes) (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	121	Neon
1065	121	Neon, compressed
1066	121	Nitrogen
1066	121	Nitrogen, compressed
1067	124	Dinitrogen tetroxide
1067	124	Nitrogen dioxide
1069	125	Nitrosyl chloride
1070	122	Nitrous oxide

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

1070 **122** Nitrous oxide, compressed  
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** CG  
1076 **125** DP  
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

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

1086 **116P** Vinyl chloride, stabilized  
1087 **116P** Vinyl methyl ether, stabilized  
1088 **127** Acetal  
1089 **129P** Acetaldehyde  
1090 **127** Acetone  
1091 **127** Acetone oils  
1092 **131P** Acrolein, stabilized  
1093 **131P** Acrylonitrile, stabilized  
1098 **131** Allyl alcohol  
1099 **131** Allyl bromide  
1100 **131** 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 **140** 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

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

1128	<b>129</b>	n-Butyl formate
1129	<b>129</b>	Butyraldehyde
1130	<b>128</b>	Camphor oil
1131	<b>131</b>	Carbon bisulfide
1131	<b>131</b>	Carbon bisulphide
1131	<b>131</b>	Carbon disulfide
1131	<b>131</b>	Carbon disulphide
1133	<b>128</b>	Adhesives (flammable)
1134	<b>130</b>	Chlorobenzene
1135	<b>131</b>	Ethylene chlorohydrin
1136	<b>128</b>	Coal tar distillates, flammable
1139	<b>127</b>	Coating solution
1143	<b>131P</b>	Crotonaldehyde
1143	<b>131P</b>	Crotonaldehyde, stabilized
1144	<b>128</b>	Crotonylene
1145	<b>128</b>	Cyclohexane
1146	<b>128</b>	Cyclopentane
1147	<b>130</b>	Decahydronaphthalene
1148	<b>129</b>	Diacetone alcohol
1149	<b>128</b>	Butyl ethers
1149	<b>128</b>	Dibutyl ethers
1150	<b>130P</b>	1,2-Dichloroethylene
1152	<b>130</b>	Dichloropentanes
1153	<b>127</b>	Ethylene glycol diethyl ether
1154	<b>132</b>	Diethylamine
1155	<b>127</b>	Diethyl ether
1155	<b>127</b>	Ethyl ether
1156	<b>127</b>	Diethyl ketone
1157	<b>128</b>	Diisobutyl ketone
1158	<b>132</b>	Diisopropylamine
1159	<b>127</b>	Diisopropyl ether

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

1160	<b>132</b>	Dimethylamine, aqueous solution
1160	<b>132</b>	Dimethylamine, solution
1161	<b>129</b>	Dimethyl carbonate
1162	<b>155</b>	Dimethyldichlorosilane
1163	<b>131</b>	1,1-Dimethylhydrazine
1163	<b>131</b>	Dimethylhydrazine, unsymmetrical
1164	<b>130</b>	Dimethyl sulfide
1164	<b>130</b>	Dimethyl sulphide
1165	<b>127</b>	Dioxane
1166	<b>127</b>	Dioxolane
1167	<b>128P</b>	Divinyl ether, stabilized
1169	<b>127</b>	Extracts, aromatic, liquid
1170	<b>127</b>	Ethanol
1170	<b>127</b>	Ethanol, solution
1170	<b>127</b>	Ethyl alcohol
1170	<b>127</b>	Ethyl alcohol, solution
1171	<b>127</b>	Ethylene glycol monoethyl ether
1172	<b>129</b>	Ethylene glycol monoethyl ether acetate
1173	<b>129</b>	Ethyl acetate
1175	<b>130</b>	Ethylbenzene
1176	<b>129</b>	Ethyl borate
1177	<b>130</b>	2-Ethylbutyl acetate
1177	<b>130</b>	Ethylbutyl acetate
1178	<b>130</b>	2-Ethylbutyraldehyde
1179	<b>127</b>	Ethyl butyl ether
1180	<b>130</b>	Ethyl butyrate
1181	<b>155</b>	Ethyl chloroacetate
1182	<b>155</b>	Ethyl chloroformate
1183	<b>139</b>	Ethyldichlorosilane



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

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  
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 **132P** Furaldehydes  
1199 **132P** Furfural  
1199 **132P** Furfuraldehydes  
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

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

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  
1210 **129** Printing ink related material  
1212 **129** Isobutanol  
1212 **129** Isobutyl alcohol  
1213 **129** Isobutyl acetate  
1214 **132** Isobutylamine  
1216 **128** Isooctenes  
1218 **130P** Isoprene, stabilized  
1219 **129** Isopropanol  
1219 **129** Isopropyl alcohol  
1220 **129** Isopropyl acetate  
1221 **132** Isopropylamine  
1222 **130** Isopropyl nitrate  
1223 **128** Kerosene  
1224 **127** Ketones, liquid, n.o.s.  
1228 **131** Mercaptan mixture, liquid, flammable, poisonous, n.o.s.  
1228 **131** Mercaptan mixture, liquid, flammable, toxic, n.o.s.  
1228 **131** Mercaptans, liquid, flammable, poisonous, n.o.s.  
1228 **131** Mercaptans, liquid, flammable, toxic, n.o.s.  
1229 **129** Mesityl oxide  
1230 **131** Methanol  
1230 **131** Methyl alcohol

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

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
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.

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

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>129</b>	Propionaldehyde
1276	<b>129</b>	n-Propyl acetate
1277	<b>132</b>	Propylamine
1278	<b>129</b>	1-Chloropropane
1278	<b>129</b>	Propyl chloride
1279	<b>130</b>	1,2-Dichloropropane
1280	<b>127P</b>	Propylene oxide
1281	<b>129</b>	Propyl formates
1282	<b>129</b>	Pyridine
1286	<b>127</b>	Rosin oil
1287	<b>127</b>	Rubber solution
1288	<b>128</b>	Shale oil
1289	<b>132</b>	Sodium methylate, solution in alcohol
1292	<b>129</b>	Ethyl silicate
1292	<b>129</b>	Tetraethyl silicate
1293	<b>127</b>	Tinctures, medicinal
1294	<b>130</b>	Toluene
1295	<b>139</b>	Trichlorosilane
1296	<b>132</b>	Triethylamine
1297	<b>132</b>	Trimethylamine, aqueous solution
1298	<b>155</b>	Trimethylchlorosilane
1299	<b>128</b>	Turpentine
1300	<b>128</b>	Turpentine substitute
1301	<b>129P</b>	Vinyl acetate, stabilized

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

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  
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** Ferrocerium  
1324 **133** Films, nitrocellulose base  
1325 **133** Flammable solid, organic, n.o.s.  
1325 **133** Fusee (rail 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

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

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  
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

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

1343	<b>139</b>	Phosphorus trisulphide, free from yellow and white Phosphorus
1344	<b>113</b>	Picric acid, wetted with not less than 30% water
1344	<b>113</b>	Trinitrophenol, wetted with not less than 30% water
1345	<b>133</b>	Rubber scrap, powdered or granulated
1345	<b>133</b>	Rubber shoddy, powdered or granulated
1346	<b>170</b>	Silicon powder, amorphous
1347	<b>113</b>	Silver picrate, wetted with not less than 30% water
1348	<b>113</b>	Sodium dinitro-o-cresolate, wetted with not less than 15% water
1349	<b>113</b>	Sodium picramate, wetted with not less than 20% water
1350	<b>133</b>	Sulfur
1350	<b>133</b>	Sulphur
1352	<b>170</b>	Titanium powder, wetted with not less than 25% water
1353	<b>133</b>	Fabrics impregnated with weakly nitrated Nitrocellulose, n.o.s.
1353	<b>133</b>	Fibers impregnated with weakly nitrated Nitrocellulose, n.o.s.
1353	<b>133</b>	Fibres impregnated with weakly nitrated Nitrocellulose, n.o.s.
1354	<b>113</b>	Trinitrobenzene, wetted with not less than 30% water
1355	<b>113</b>	Trinitrobenzoic acid, wetted with not less than 30% water
1356	<b>113</b>	TNT, wetted with not less than 30% water
1356	<b>113</b>	Trinitrotoluene, wetted with not less than 30% water

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

1357	<b>113</b>	Urea nitrate, wetted with not less than 20% water
1358	<b>170</b>	Zirconium powder, wetted with not less than 25% water
<b>1360</b>	<b>139</b>	<b>Calcium phosphide</b>
1361	<b>133</b>	Carbon, animal or vegetable origin
1361	<b>133</b>	Charcoal
1362	<b>133</b>	Carbon, activated
1363	<b>135</b>	Copra
1364	<b>133</b>	Cotton waste, oily
1365	<b>133</b>	Cotton
1365	<b>133</b>	Cotton, wet
1366	<b>135</b>	Diethylzinc
1369	<b>135</b>	p-Nitrosodimethylaniline
1370	<b>135</b>	Dimethylzinc
1372	<b>133</b>	Fibers, animal or vegetable, burnt, wet or damp
1372	<b>133</b>	Fibres, animal or vegetable, burnt, wet or damp
1373	<b>133</b>	Fabrics, animal or vegetable or synthetic, n.o.s. with oil
1373	<b>133</b>	Fibers, animal or vegetable or synthetic, n.o.s. with oil
1373	<b>133</b>	Fibres, animal or vegetable or synthetic, n.o.s. with oil
1374	<b>133</b>	Fish meal, unstabilized
1374	<b>133</b>	Fish scrap, unstabilized
1376	<b>135</b>	Iron oxide, spent
1376	<b>135</b>	Iron sponge, spent
1378	<b>170</b>	Metal catalyst, wetted
1379	<b>133</b>	Paper, unsaturated oil treated
<b>1380</b>	<b>135</b>	<b>Pentaborane</b>
1381	<b>136</b>	Phosphorus, white, dry or under water or in solution

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

1381 136 Phosphorus, yellow, dry or under water or in solution  
1381 136 White phosphorus, dry  
1381 136 White phosphorus, in solution  
1381 136 White phosphorus, under water  
1381 136 Yellow phosphorus, dry  
1381 136 Yellow phosphorus, in solution  
1381 136 Yellow phosphorus, under water  
1382 135 Potassium sulfide, anhydrous  
1382 135 Potassium sulfide, with less than 30% water of crystallization  
1382 135 Potassium sulphide, anhydrous  
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  
1389 138 Alkali metal amalgam, liquid  
1390 139 Alkali metal amides

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

1391 138 Alkali metal dispersion  
1391 138 Alkaline earth metal dispersion  
1392 138 Alkaline earth metal amalgam  
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  
1402 138 Calcium carbide  
1403 138 Calcium cyanamide, with more than 0.1% Calcium carbide  
1404 138 Calcium hydride  
1405 138 Calcium silicide  
1407 138 Caesium  
1407 138 Cesium  
1408 139 Ferrosilicon  
1409 138 Metal hydrides, water-reactive, n.o.s.  
1410 138 Lithium aluminum hydride  
1411 138 Lithium aluminum hydride, ethereal  
1413 138 Lithium borohydride  
1414 138 Lithium hydride  
1415 138 Lithium  
1417 138 Lithium silicon  
1418 138 Magnesium alloys powder  
1418 138 Magnesium powder

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

1419	139	Magnesium aluminum phosphide
1420	138	Potassium, metal alloys
1420	138	Potassium, metal alloys, liquid
1421	138	Alkali metal alloy, liquid, n.o.s.
1422	138	Potassium sodium alloys
1422	138	Potassium sodium alloys, liquid
1422	138	Sodium potassium alloys
1422	138	Sodium potassium alloys, liquid
1423	138	Rubidium
1423	138	Rubidium metal
1426	138	Sodium borohydride
1427	138	Sodium hydride
1428	138	Sodium
1431	138	Sodium methylate
1431	138	Sodium methylate, dry
1432	139	Sodium phosphide
1433	139	Stannic phosphides
1435	138	Zinc ashes
1435	138	Zinc dross
1435	138	Zinc residue
1435	138	Zinc skimmings
1436	138	Zinc dust
1436	138	Zinc powder
1437	138	Zirconium hydride
1438	140	Aluminum nitrate
1439	141	Ammonium dichromate
1442	143	Ammonium perchlorate
1444	140	Ammonium persulfate
1444	140	Ammonium persulphate
1445	141	Barium chlorate

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

1445	141	Barium chlorate, solid
1446	141	Barium nitrate
1447	141	Barium perchlorate
1447	141	Barium perchlorate, solid
1448	141	Barium permanganate
1449	141	Barium peroxide
1450	141	Bromates, inorganic, n.o.s.
1451	140	Caesium nitrate
1451	140	Cesium nitrate
1452	140	Calcium chlorate
1453	140	Calcium chlorite
1454	140	Calcium nitrate
1455	140	Calcium perchlorate
1456	140	Calcium permanganate
1457	140	Calcium peroxide
1458	140	Borate and Chlorate mixture
1458	140	Chlorate and Borate mixture
1459	140	Chlorate and Magnesium chloride mixture
1459	140	Chlorate and Magnesium chloride mixture, solid
1459	140	Magnesium chloride and Chlorate mixture
1459	140	Magnesium chloride and Chlorate mixture, solid
1461	140	Chlorates, inorganic, n.o.s.
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

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

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  
1492 140 Potassium persulfate  
1492 140 Potassium persulphate  
1493 140 Silver nitrate  
1494 141 Sodium bromate  
1495 140 Sodium chlorate  
1496 143 Sodium chlorite

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

1498 140 Sodium nitrate  
1499 140 Potassium nitrate and Sodium nitrate mixture  
1499 140 Sodium nitrate and Potassium nitrate mixture  
1500 140 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)  
1544 151 Alkaloid salts, solid, n.o.s. (poisonous)  
1545 155 Allyl isothiocyanate, stabilized  
1546 151 Ammonium arsenate  
1547 153 Aniline  
1548 153 Aniline hydrochloride

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

1549	157	Antimony compound, inorganic, 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	Arsenic compound, liquid, n.o.s., inorganic
1556	152	MD
1556	152	Methyldichloroarsine
1556	152	PD
1557	152	Arsenic compound, solid, n.o.s.
1557	152	Arsenic compound, solid, n.o.s., inorganic
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 less than 50% water
1572	151	Cacodylic acid
1573	151	Calcium arsenate

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

1574	151	Calcium arsenate and Calcium arsenite mixture, solid
1574	151	Calcium arsenite and Calcium arsenate mixture, solid
1575	157	Calcium cyanide
1577	153	Chlorodinitrobenzenes, liquid
1577	153	Chlorodinitrobenzenes, solid
1577	153	Dinitrochlorobenzenes
1578	152	Chloronitrobenzenes
1578	152	Chloronitrobenzenes, solid
1579	153	4-Chloro-o-toluidine hydrochloride
1579	153	4-Chloro-o-toluidine hydrochloride, solid
1580	154	Chloropicrin
1581	123	Chloropicrin and Methyl bromide mixture
1581	123	Methyl bromide and Chloropicrin mixture
1582	119	Chloropicrin and Methyl chloride mixture
1582	119	Methyl chloride and Chloropicrin 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, n.o.s.
1589	125	CK
1589	125	Cyanogen chloride, stabilized
1590	153	Dichloroanilines, liquid
1590	153	Dichloroanilines, solid
1591	152	o-Dichlorobenzene
1593	160	Dichloromethane



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

1593 160 Methylene chloride  
1594 152 Diethyl sulfate  
1594 152 Diethyl sulphate  
1595 156 Dimethyl sulfate  
1595 156 Dimethyl sulphate  
1596 153 Dinitroanilines  
1597 152 Dinitrobenzenes, liquid  
1597 152 Dinitrobenzenes, solid  
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

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

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  
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 Mercuric bromide  
1634 154 Mercurous bromide  
1634 154 Mercury bromides  
1636 154 Mercuric cyanide  
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 Mercuric oxycyanide

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

1642	151	Mercury oxycyanide, desensitized
1643	151	Mercury potassium iodide
1644	151	Mercury salicylate
1645	151	Mercuric sulfate
1645	151	Mercuric sulphate
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
1649	131	Motor fuel anti-knock mixture
1650	153	beta-Naphthylamine
1650	153	beta-Naphthylamine, solid
1650	153	Naphthylamine (beta)
1650	153	Naphthylamine (beta), solid
1651	153	Naphthylthiourea
1652	153	Naphthylurea
1653	151	Nickel cyanide
1654	151	Nicotine
1655	151	Nicotine compound, solid, n.o.s.
1655	151	Nicotine preparation, solid, n.o.s.
1656	151	Nicotine hydrochloride
1656	151	Nicotine hydrochloride, liquid
1656	151	Nicotine hydrochloride, solution
1657	151	Nicotine salicylate
1658	151	Nicotine sulfate, solid
1658	151	Nicotine sulfate, solution

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

1658	151	Nicotine sulphate, solid
1658	151	Nicotine sulphate, solution
1659	151	Nicotine tartrate
1660	124	Nitric oxide
1660	124	Nitric oxide, compressed
1661	153	Nitroanilines
1662	152	Nitrobenzene
1663	153	Nitrophenols
1664	152	Nitrotoluenes, liquid
1664	152	Nitrotoluenes, solid
1665	152	Nitroxylenes, liquid
1665	152	Nitroxylenes, solid
1669	151	Pentachloroethane
1670	157	Perchloromethyl mercaptan
1671	153	Phenol, solid
1672	151	Phenylcarbylamine chloride
1673	153	Phenylenediamines
1674	151	Phenylmercuric acetate
1677	151	Potassium arsenate
1678	154	Potassium arsenite
1679	157	Potassium cuprocyanide
1680	157	Potassium cyanide
1680	157	Potassium cyanide, solid
1683	151	Silver arsenite
1684	151	Silver cyanide
1685	151	Sodium arsenate
1686	154	Sodium arsenite, aqueous solution
1687	153	Sodium azide
1688	152	Sodium cacodylate
1689	157	Sodium cyanide

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

1689 157 Sodium cyanide, solid  
1690 154 Sodium fluoride  
1690 154 Sodium fluoride, solid  
1691 151 Strontium arsenite  
1692 151 Strychnine  
1692 151 Strychnine salts  
1693 159 Tear gas devices  
1693 159 Tear gas substance, liquid,  
n.o.s.  
1693 159 Tear gas substance, solid,  
n.o.s.  
1694 159 Bromobenzyl cyanides, liquid  
1694 159 Bromobenzyl cyanides, solid  
1694 159 CA  
1695 131 Chloroacetone, stabilized  
1697 153 Chloroacetophenone  
1697 153 Chloroacetophenone, solid  
1697 153 CN  
1698 154 Adamsite  
1698 154 Diphenylamine chloroarsine  
1698 154 DM  
1699 151 DA  
1699 151 Diphenylchloroarsine, liquid  
1699 151 Diphenylchloroarsine, solid  
1700 159 Tear gas candles  
1700 159 Tear gas grenades  
1701 152 Xylyl bromide  
1701 152 Xylyl bromide, liquid  
1702 151 1,1,2,2-Tetrachloroethane  
1702 151 Tetrachloroethane  
1704 153 Tetraethyl dithiopyrophosphate  
1707 151 Thallium compound, n.o.s.

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

1708 153 Toluidines, liquid  
1708 153 Toluidines, solid  
1709 151 2,4-Toluediamine, solid  
1709 151 2,4-Toluylenediamine  
1709 151 2,4-Toluylenediamine, solid  
1710 160 Trichloroethylene  
1711 153 Xylidines, liquid  
1711 153 Xylidines, solid  
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

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

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
1737	156	Benzyl bromide
1738	156	Benzyl chloride
1739	137	Benzyl chloroformate
1740	154	Hydrogendifluorides, n.o.s.
1740	154	Hydrogendifluorides, solid, n.o.s.
1741	125	Boron trichloride
1742	157	Boron trifluoride acetic acid complex
1742	157	Boron trifluoride acetic acid complex, liquid
1743	157	Boron trifluoride propionic acid complex
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

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

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 mixture)
1754	137	Chlorosulphonic acid (with or without sulphur trioxide mixture)
1755	154	Chromic acid, solution
1756	154	Chromic fluoride, solid
1757	154	Chromic fluoride, solution
1758	137	Chromium oxychloride
1759	154	Corrosive solid, n.o.s.
1759	154	Ferrous chloride, solid
1760	154	Chemical kit
1760	154	Compounds, cleaning liquid (corrosive)
1760	154	Compounds, tree or weed killing, liquid (corrosive)
1760	154	Corrosive liquid, n.o.s.
1760	154	Ferrous chloride, solution
1761	154	Cupriethylenediamine, solution
1762	156	Cyclohexenyltrichlorosilane
1763	156	Cyclohexyltrichlorosilane
1764	153	Dichloroacetic acid
1765	156	Dichloroacetyl chloride
1766	156	Dichlorophenyltrichlorosilane
1767	155	Diethyldichlorosilane

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

1768	154	Difluorophosphoric acid, anhydrous
1769	156	Diphenyldichlorosilane
1770	153	Diphenylmethyl bromide
1771	156	Dodecyltrichlorosilane
1773	157	Ferric chloride, anhydrous
1774	154	Fire extinguisher charges, corrosive liquid
1775	154	Fluoroboric acid
1776	154	Fluorophosphoric acid, anhydrous
1777	137	Fluorosulfonic acid
1777	137	Fluorosulphonic acid
1778	154	Fluorosilicic acid
1778	154	Hydrofluorosilicic acid
1779	153	Formic acid
1779	153	Formic acid, with more than 85% acid
1780	156	Fumaryl chloride
1781	156	Hexadecyltrichlorosilane
1782	154	Hexafluorophosphoric acid
1783	153	Hexamethylenediamine, solution
1784	156	Hexyltrichlorosilane
1786	157	Hydrofluoric acid and Sulfuric acid mixture
1786	157	Hydrofluoric acid and Sulphuric acid mixture
1786	157	Sulfuric acid and Hydrofluoric acid mixture
1786	157	Sulphuric acid and Hydrofluoric acid mixture
1787	154	Hydriodic acid
1788	154	Hydrobromic acid
1789	157	Hydrochloric acid

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

1789	157	Muriatic acid
1790	157	Hydrofluoric acid
1791	154	Hypochlorite solution
1791	154	Sodium hypochlorite
1792	157	Iodine monochloride, solid
1793	153	Isopropyl acid phosphate
1794	154	Lead sulfate, with more than 3% free acid
1794	154	Lead sulphate, with more than 3% free acid
1796	157	Nitrating acid mixture with more than 50% nitric acid
1796	157	Nitrating acid mixture with not more than 50% nitric acid
1798	157	Aqua regia
1798	157	Nitrohydrochloric acid
1799	156	Nonyltrichlorosilane
1800	156	Octadecyltrichlorosilane
1801	156	Octyltrichlorosilane
1802	140	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, liquid
1805	154	Phosphoric acid, solid
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 hydrogendifluoride

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

1811	154	Potassium hydrogen difluoride, solid
1812	154	Potassium fluoride
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
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

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

1830	137	Sulphuric acid, with more than 51% acid
1831	137	Sulfuric acid, fuming
1831	137	Sulfuric acid, fuming, with less than 30% free Sulfur trioxide
1831	137	Sulfuric acid, fuming, with not less than 30% free Sulfur trioxide
1831	137	Sulphuric acid, fuming
1831	137	Sulphuric acid, fuming, with less than 30% free Sulphur trioxide
1831	137	Sulphuric acid, fuming, with not less than 30% free Sulphur trioxide
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
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
1843	141	Ammonium dinitro-o-cresolate
1843	141	Ammonium dinitro-o-cresolate, solid
1845	120	Carbon dioxide, solid
1845	120	Dry ice

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

1846 **151** Carbon tetrachloride  
1847 **153** Potassium sulfide, hydrated,  
with not less than 30% water  
of crystallization  
1847 **153** Potassium sulphide, hydrated,  
with not less than 30% water  
of crystallization  
1848 **132** Propionic acid  
1848 **132** Propionic acid, with not less  
than 10% and less than 90%  
acid  
1849 **153** Sodium sulfide, hydrated, with  
not less than 30% water  
1849 **153** Sodium sulphide, hydrated, with  
not less than 30% water  
1851 **151** Medicine, liquid, poisonous,  
n.o.s.  
1851 **151** Medicine, liquid, toxic, n.o.s.  
1854 **135** Barium alloys, pyrophoric  
1855 **135** Calcium, pyrophoric  
1855 **135** Calcium alloys, pyrophoric  
1856 **133** Rags, oily  
1857 **133** Textile waste, wet  
1858 **126** Hexafluoropropylene  
1858 **126** Hexafluoropropylene, compressed  
1858 **126** Refrigerant gas R-1216  
**1859 125 Silicon tetrafluoride**  
**1859 125 Silicon tetrafluoride,**  
**compressed**  
1860 **116P** Vinyl fluoride, stabilized  
1862 **130** Ethyl crotonate  
1863 **128** Fuel, aviation, turbine engine  
1865 **131** n-Propyl nitrate  
1866 **127** Resin solution  
1868 **134** Decaborane

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

1869 **138** Magnesium  
1869 **138** Magnesium, in pellets, turnings  
or ribbons  
1869 **138** Magnesium alloys, with more  
than 50% Magnesium, in  
pellets, turnings or ribbons  
1870 **138** Potassium borohydride  
1871 **170** Titanium hydride  
1872 **141** Lead dioxide  
1873 **143** Perchloric acid, with more than  
50% but not more than 72%  
acid  
1884 **157** Barium oxide  
1885 **153** Benzidine  
1886 **156** Benzylidene chloride  
1887 **160** Bromochloromethane  
1888 **151** Chloroform  
1889 **157** Cyanogen bromide  
1891 **131** Ethyl bromide  
**1892 151 ED**  
**1892 151 Ethyldichloroarsine**  
1894 **151** Phenylmercuric hydroxide  
1895 **151** Phenylmercuric nitrate  
1897 **160** Perchloroethylene  
1897 **160** Tetrachloroethylene  
**1898 156 Acetyl iodide**  
1902 **153** Diisooctyl acid phosphate  
1903 **153** Disinfectant, liquid, corrosive,  
n.o.s.  
1905 **154** Selenic acid  
1906 **153** Acid, sludge  
1906 **153** Sludge acid  
1907 **154** Soda lime, with more than 4%  
Sodium hydroxide

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

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	135	Methyl magnesium bromide in Ethyl ether
1929	135	Potassium dithionite
1929	135	Potassium hydrosulfite
1929	135	Potassium hydrosulphite
1931	171	Zinc dithionite
1931	171	Zinc hydrosulfite
1931	171	Zinc hydrosulphite

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

1932	135	Zirconium scrap
1935	157	Cyanide solution, n.o.s.
1938	156	Bromoacetic acid
1938	156	Bromoacetic acid, solution
1939	137	Phosphorus oxybromide
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 No.	Guide No.	Name of Material
--------	-----------	------------------

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 No.	Guide No.	Name of Material
--------	-----------	------------------

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**  
**No. No.**

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	Nitric oxide and Nitrogen tetroxide mixture
1975	124	Nitrogen dioxide and Nitric oxide mixture
1975	124	Nitrogen tetroxide and Nitric oxide mixture
1976	126	Octafluorocyclobutane
1976	126	Refrigerant gas RC-318

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

1977	120	Nitrogen, refrigerated liquid (cryogenic liquid)
1978	115	Propane
1979	121	Rare gases mixture, compressed
1980	121	Oxygen and Rare gases mixture, compressed
1980	121	Rare gases and Oxygen mixture, compressed
1981	121	Nitrogen and Rare gases mixture, compressed
1981	121	Rare gases and Nitrogen mixture, compressed
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	131	Aldehydes, flammable, poisonous, n.o.s.
1988	131	Aldehydes, flammable, toxic, n.o.s.
1989	129	Aldehydes, n.o.s.
1990	129	Benzaldehyde
1991	131P	Chloroprene, stabilized

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

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	131	Iron pentacarbonyl
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
2003	135	Metal alkyls, water-reactive, n.o.s.
2003	135	Metal aryls, water-reactive, n.o.s.
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

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

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	1-Chloro-2,3-epoxypropane
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

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

2030	<b>153</b>	Hydrazine, aqueous solution, with not less than 37% but not more than 64% Hydrazine
2030	<b>153</b>	Hydrazine hydrate
2031	<b>157</b>	Nitric acid, other than red fuming, with more than 70% nitric acid
2031	<b>157</b>	Nitric acid, other than red fuming, with not more than 70% nitric acid
2032	<b>157</b>	Nitric acid, red fuming
2033	<b>154</b>	Potassium monoxide
2034	<b>115</b>	Hydrogen and Methane mixture, compressed
2034	<b>115</b>	Methane and Hydrogen mixture, compressed
2035	<b>115</b>	Refrigerant gas R-143a
2035	<b>115</b>	1,1,1-Trifluoroethane
2036	<b>121</b>	Xenon
2036	<b>121</b>	Xenon, compressed
2037	<b>115</b>	Gas cartridges
2037	<b>115</b>	Receptacles, small, containing gas
2038	<b>152</b>	Dinitrotoluenes
2038	<b>152</b>	Dinitrotoluenes, liquid
2038	<b>152</b>	Dinitrotoluenes, solid
2044	<b>115</b>	2,2-Dimethylpropane
2045	<b>130</b>	Isobutyl aldehyde
2045	<b>130</b>	Isobutyraldehyde
2046	<b>130</b>	Cymenes
2047	<b>129</b>	Dichloropropenes
2048	<b>130</b>	Dicyclopentadiene
2049	<b>130</b>	Diethylbenzene
2050	<b>128</b>	Diisobutylene, isomeric compounds
2051	<b>132</b>	2-Dimethylaminoethanol

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

2052	<b>128</b>	Dipentene
2053	<b>129</b>	Methylamyl alcohol
2053	<b>129</b>	Methyl isobutyl carbinol
2053	<b>129</b>	M.I.B.C.
2054	<b>132</b>	Morpholine
2055	<b>128P</b>	Styrene monomer, stabilized
2056	<b>127</b>	Tetrahydrofuran
2057	<b>128</b>	Tripropylene
2058	<b>129</b>	Valeraldehyde
2059	<b>127</b>	Nitrocellulose, solution, flammable
2067	<b>140</b>	Ammonium nitrate based fertilizer
2068	<b>140</b>	Ammonium nitrate fertilizers, with Calcium carbonate
2069	<b>140</b>	Ammonium nitrate fertilizers, with Ammonium sulfate
2069	<b>140</b>	Ammonium nitrate fertilizers, with Ammonium sulphate
2070	<b>143</b>	Ammonium nitrate fertilizers, with Phosphate or Potash
2071	<b>140</b>	Ammonium nitrate based fertilizer
2072	<b>140</b>	Ammonium nitrate fertilizer, n.o.s.
2073	<b>125</b>	Ammonia, solution, with more than 35% but not more than 50% Ammonia
2074	<b>153P</b>	Acrylamide
2074	<b>153P</b>	Acrylamide, solid
2075	<b>153</b>	Chloral, anhydrous, stabilized
2076	<b>153</b>	Cresols, liquid
2076	<b>153</b>	Cresols, solid
2077	<b>153</b>	alpha-Naphthylamine
2077	<b>153</b>	Naphthylamine (alpha)

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

2078	156	Toluene diisocyanate
2079	154	Diethylenetriamine
2186	125	Hydrogen chloride, refrigerated liquid
2187	120	Carbon dioxide, refrigerated liquid
2188	119	Arsine
2188	119	SA
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

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

2204	119	Carbonyl sulfide
2204	119	Carbonyl sulphide
2205	153	Adiponitrile
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	132	Formaldehyde, solution (corrosive)
2209	132	Formalin (corrosive)
2210	135	Maneb
2210	135	Maneb preparation, with not less than 60% Maneb
2211	133	Polymeric beads, expandable
2211	133	Polystyrene 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

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

2217	<b>135</b>	Seed cake, with not more than 1.5% oil and not more than 11% moisture
2218	<b>132P</b>	Acrylic acid, stabilized
2219	<b>129</b>	Allyl glycidyl ether
2222	<b>128</b>	Anisole
2224	<b>152</b>	Benzonitrile
2225	<b>156</b>	Benzenesulfonyl chloride
2225	<b>156</b>	Benzenesulphonyl chloride
2226	<b>156</b>	Benzotrithloride
2227	<b>130P</b>	n-Butyl methacrylate, stabilized
2232	<b>153</b>	Chloroacetaldehyde
2232	<b>153</b>	2-Chloroethanal
2233	<b>152</b>	Chloroanisidines
2234	<b>130</b>	Chlorobenzotrifluorides
2235	<b>153</b>	Chlorobenzyl chlorides
2235	<b>153</b>	Chlorobenzyl chlorides, liquid
2236	<b>156</b>	3-Chloro-4-methylphenyl isocyanate
2236	<b>156</b>	3-Chloro-4-methylphenyl isocyanate, liquid
2237	<b>153</b>	Chloronitroanilines
2238	<b>129</b>	Chlorotoluenes
2239	<b>153</b>	Chlorotoluidines
2239	<b>153</b>	Chlorotoluidines, solid
2240	<b>154</b>	Chromosulfuric acid
2240	<b>154</b>	Chromosulphuric acid
2241	<b>128</b>	Cycloheptane
2242	<b>128</b>	Cycloheptene
2243	<b>130</b>	Cyclohexyl acetate
2244	<b>129</b>	Cyclopentanol
2245	<b>128</b>	Cyclopentanone
2246	<b>128</b>	Cyclopentene

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

2247	<b>128</b>	n-Decane
2248	<b>132</b>	Di-n-butylamine
2249	<b>131</b>	Dichlorodimethyl ether, symmetrical
2250	<b>156</b>	Dichlorophenyl isocyanates
2251	<b>128P</b>	Bicyclo[2.2.1]hepta-2,5-diene, stabilized
2251	<b>128P</b>	2,5-Norbornadiene, stabilized
2252	<b>127</b>	1,2-Dimethoxyethane
2253	<b>153</b>	N,N-Dimethylaniline
2254	<b>133</b>	Matches, fusee
2256	<b>130</b>	Cyclohexene
2257	<b>138</b>	Potassium
2257	<b>138</b>	Potassium, metal
2258	<b>132</b>	1,2-Propylenediamine
2259	<b>153</b>	Triethylenetetramine
2260	<b>132</b>	Tripropylamine
2261	<b>153</b>	Xylenols
2261	<b>153</b>	Xylenols, solid
2262	<b>156</b>	Dimethylcarbamoyl chloride
2263	<b>128</b>	Dimethylcyclohexanes
2264	<b>132</b>	N,N-Dimethylcyclohexylamine
2264	<b>132</b>	Dimethylcyclohexylamine
2265	<b>129</b>	N,N-Dimethylformamide
2266	<b>132</b>	Dimethyl-N-propylamine
2267	<b>156</b>	Dimethyl thiophosphoryl chloride
2269	<b>153</b>	3,3'-Iminodipropylamine
2270	<b>132</b>	Ethylamine, aqueous solution, with not less than 50% but not more than 70% Ethylamine
2271	<b>128</b>	Ethyl amyl ketone
2272	<b>153</b>	N-Ethylaniline

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

2273 **153** 2-Ethylaniline  
2274 **153** N-Ethyl-N-benzylaniline  
2275 **129** 2-Ethylbutanol  
2276 **132** 2-Ethylhexylamine  
2277 **130P** Ethyl methacrylate  
2277 **130P** Ethyl methacrylate, stabilized  
2278 **128** n-Heptene  
2279 **151** Hexachlorobutadiene  
2280 **153** Hexamethylenediamine, solid  
2281 **156** Hexamethylene diisocyanate  
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** IPDI  
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

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

2302 **127** 5-Methylhexan-2-one  
2303 **128** Isopropenylbenzene  
2304 **133** Naphthalene, molten  
2305 **153** Nitrobenzenesulfonic acid  
2305 **153** Nitrobenzenesulphonic acid  
2306 **152** Nitrobenzotrifluorides  
2306 **152** Nitrobenzotrifluorides, liquid  
2307 **152** 3-Nitro-4-chlorobenzotrifluoride  
2308 **157** Nitrosylsulfuric acid, liquid  
2308 **157** Nitrosylsulfuric acid, solid  
2308 **157** Nitrosylsulphuric acid, liquid  
2308 **157** Nitrosylsulphuric acid, solid  
2309 **128P** Octadiene  
2310 **131** Pentane-2,4-dione  
2311 **153** Phenetidines  
2312 **153** Phenol, molten  
2313 **129** Picolines  
2315 **171** Articles containing  
Polychlorinated biphenyls  
(PCB)  
2315 **171** PCB  
2315 **171** Polychlorinated biphenyls  
2315 **171** Polychlorinated biphenyls,  
liquid  
2316 **157** Sodium cuprocyanide, solid  
2317 **157** Sodium cuprocyanide, solution  
2318 **135** Sodium hydrosulfide, with  
less than 25% water of  
crystallization  
2318 **135** Sodium hydrosulphide, with  
less than 25% water of  
crystallization  
2319 **128** Terpene hydrocarbons, n.o.s.  
2320 **153** Tetraethylenepentamine

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

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 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
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

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

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
2368	<b>128</b>	Pinene (alpha)
2370	<b>128</b>	1-Hexene
2371	<b>128</b>	Isopentenes
2372	<b>129</b>	1,2-Di-(dimethylamino)ethane
2373	<b>127</b>	Diethoxymethane
2374	<b>127</b>	3,3-Diethoxypropene
2375	<b>129</b>	Diethyl sulfide
2375	<b>129</b>	Diethyl sulphide
2376	<b>127</b>	2,3-Dihydropyran
2377	<b>127</b>	1,1-Dimethoxyethane
2378	<b>131</b>	2-Dimethylaminoacetonitrile
2379	<b>132</b>	1,3-Dimethylbutylamine
2380	<b>127</b>	Dimethyldiethoxysilane
2381	<b>130</b>	Dimethyl disulfide



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

2381 130 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  
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

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

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  
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  
2431 153 Anisidines, liquid  
2431 153 Anisidines, solid  
2432 153 N,N-Diethylaniline  
2433 152 Chloronitrotoluenes, liquid  
2433 152 Chloronitrotoluenes, solid  
2434 156 Dibenzylchlorosilane  
2435 156 Ethylphenylchlorosilane  
2436 129 Thioacetic acid

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

2437	156	Methylphenyldichlorosilane
2438	132	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
2445	135	Lithium alkyls
2445	135	Lithium alkyls, liquid
2446	153	Nitrocresols
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
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

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

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-triazinetriene
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.
2478	155	Isocyanates, flammable, toxic, n.o.s.
2480	155	Methyl isocyanate
2481	155	Ethyl isocyanate
2482	155	n-Propyl isocyanate
2483	155	Isopropyl isocyanate
2484	155	tert-Butyl isocyanate
2485	155	n-Butyl isocyanate

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

2486 **155** 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  
2511 **153** 2-Chloropropionic acid  
2511 **153** 2-Chloropropionic acid, solid  
2511 **153** 2-Chloropropionic acid, solution  
2512 **152** Aminophenols  
2513 **156** Bromoacetyl bromide  
2514 **130** Bromobenzene  
2515 **159** Bromoform

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

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-Cyclododecatriene  
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  
2548 **124** Chlorine pentafluoride  
2552 **151** Hexafluoroacetone hydrate  
2552 **151** Hexafluoroacetone hydrate,  
liquid  
2554 **130P** Methylallyl chloride

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

2555	113	Nitrocellulose with water, not less than 25% water
2556	113	Nitrocellulose with alcohol
2556	113	Nitrocellulose with 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
2582	154	Ferric chloride, solution

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

2583	153	Alkyl sulfuric 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 sulfuric 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 sulfuric 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 sulfuric 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 sulfuric 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 sulfuric 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 sulfuric acids, liquid, with not more than 5% free Sulfuric acid
2586	153	Alkyl sulphonic acids, liquid, with not more than 5% free Sulphuric acid

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

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, chrysolite
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
2600	119	Carbon monoxide and Hydrogen mixture, compressed
2600	119	Hydrogen and Carbon monoxide mixture, compressed
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

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

2602	126	Refrigerant gas R-500
2603	131	Cycloheptatriene
2604	132	Boron trifluoride diethyl etherate
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

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

2643	155	Methyl bromoacetate
2644	151	Methyl iodide
2645	153	Phenacyl bromide
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
2655	151	Potassium silicofluoride
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
2662	153	Hydroquinone
2664	160	Dibromomethane
2667	152	Butyltoluenes
2668	131	Chloroacetonitrile
2669	152	Chlorocresols
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

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

2672	154	Ammonium hydroxide, with more than 10% but not more than 35% Ammonia
2673	151	2-Amino-4-chlorophenol
2674	154	Sodium fluorosilicate
2674	154	Sodium silicofluoride
2676	119	Stibine
2677	154	Rubidium hydroxide, solution
2678	154	Rubidium hydroxide
2678	154	Rubidium hydroxide, solid
2679	154	Lithium hydroxide, solution
2680	154	Lithium hydroxide
2680	154	Lithium hydroxide, monohydrate
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
2684	132	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.

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

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  
2717 **133** Camphor  
2717 **133** Camphor, synthetic  
2719 **141** Barium bromate  
2720 **141** Chromium nitrate  
2721 **141** 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  
2730 **152** Nitroanisoles, solid  
2732 **152** Nitrobromobenzenes, liquid  
2732 **152** Nitrobromobenzenes, solid  
2733 **132** Amines, flammable, corrosive, n.o.s.  
2733 **132** Polyalkylamines, n.o.s.

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

2733 **132** Polyamines, flammable, corrosive, n.o.s.  
2734 **132** Amines, liquid, corrosive, flammable, n.o.s.  
2734 **132** Polyalkylamines, n.o.s.  
2734 **132** Polyamines, liquid, corrosive, flammable, n.o.s.  
2735 **153** Amines, liquid, corrosive, n.o.s.  
2735 **153** Polyalkylamines, 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.  
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

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

2753	153	N-Ethylbenzyltoluidines, solid
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
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

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

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
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



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

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  
 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

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

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 138 Lithium nitride  
 2807 171 Magnetized material  
 2809 172 Mercury  
 2809 172 Mercury metal  
 2810 153 Buzz  
 2810 153 BZ  
 2810 153 Compounds, tree or weed killing, liquid (toxic)  
 2810 153 CS  
 2810 153 DC  
 2810 153 GA  
 2810 153 GB  
 2810 153 GD  
 2810 153 GF  
 2810 153 H  
 2810 153 HD  
 2810 153 HL  
 2810 153 HN-1  
 2810 153 HN-2  
 2810 153 HN-3  
 2810 153 L (Lewisite)  
 2810 153 Lewisite  
 2810 153 Mustard  
 2810 153 Mustard Lewisite  
 2810 153 Poisonous liquid, organic, n.o.s.

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

2810	153	Sarin
2810	153	Soman
2810	153	Tabun
2810	153	Thickened GD
2810	153	Toxic liquid, organic, n.o.s.
2810	153	VX
2811	154	CX
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.
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
2823	153	Crotonic acid, liquid
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

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

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
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
2853	151	Magnesium silicofluoride
2854	151	Ammonium fluorosilicate
2854	151	Ammonium silicofluoride
2855	151	Zinc fluorosilicate
2855	151	Zinc silicofluoride
2856	151	Fluorosilicates, n.o.s.
2856	151	Silicofluorides, n.o.s.

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

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
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

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

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
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

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

2911	161	Radioactive material, excepted package, instruments or articles
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
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.

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

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.
2930	134	Toxic solid, flammable, organic, n.o.s.
2931	151	Vanadyl sulfate
2931	151	Vanadyl sulphate
2933	129	Methyl 2-chloropropionate
2934	129	Isopropyl 2-chloropropionate
2935	129	Ethyl 2-chloropropionate
2936	153	Thiolactic acid
2937	153	alpha-Methylbenzyl alcohol
2937	153	alpha-Methylbenzyl alcohol, liquid
2937	153	Methylbenzyl alcohol (alpha)
2940	135	Cyclooctadiene phosphines
2940	135	9-Phosphabicyclononanes
2941	153	Fluoroanilines

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

2942	153	2-Trifluoromethylaniline
2943	129	Tetrahydrofurfurylamine
2945	132	N-Methylbutylamine
2946	153	2-Amino-5-diethylaminopentane
2947	155	Isopropyl chloroacetate
2948	153	3-Trifluoromethylaniline
2949	154	Sodium hydrosulfide, hydrated, with not less than 25% water of crystallization
2949	154	Sodium hydrosulfide, with not less than 25% water of crystallization
2949	154	Sodium hydrosulphide, hydrated, with not less than 25% water of crystallization
2949	154	Sodium hydrosulphide, with not less than 25% water of crystallization
2950	138	Magnesium granules, coated
2956	149	5-tert-Butyl-2,4,6-trinitro-m-xylene
2956	149	Musk xylene
2965	139	Boron trifluoride dimethyl etherate
2966	153	Thioglycol
2967	154	Sulfamic acid
2967	154	Sulphamic acid
2968	135	Maneb, stabilized
2968	135	Maneb preparation, stabilized
2969	171	Castor beans, meal, pomace or flake
2977	166	Radioactive material, Uranium hexafluoride, fissile
2977	166	Uranium hexafluoride, radioactive material, fissile

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

2978	166	Radioactive material, Uranium hexafluoride, non fissile or fissile-excepted
2978	166	Uranium hexafluoride, radioactive material, non fissile or fissile-excepted
2983	129P	Ethylene oxide and Propylene oxide mixture, with not more than 30% Ethylene oxide
2983	129P	Propylene oxide and Ethylene oxide mixture, with not more than 30% Ethylene oxide
2984	140	Hydrogen peroxide, aqueous solution, with not less than 8% but less than 20% Hydrogen peroxide
2985	155	Chlorosilanes, flammable, corrosive, n.o.s.
2986	155	Chlorosilanes, corrosive, flammable, n.o.s.
2987	156	Chlorosilanes, corrosive, n.o.s.
2988	139	Chlorosilanes, water-reactive, flammable, corrosive, n.o.s.
2989	133	Lead phosphite, dibasic
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

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

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
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

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

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
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

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

- 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
- 3049 138 Metal alkyl halides, water-reactive, n.o.s.
- 3049 138 Metal aryl halides, water-reactive, n.o.s.
- 3050 138 Metal alkyl hydrides, water-reactive, n.o.s.
- 3050 138 Metal aryl hydrides, water-reactive, n.o.s.
- 3051 135 Aluminum alkyls
- 3052 135 Aluminum alkyl halides, liquid
- 3052 135 Aluminum alkyl halides, solid
- 3053 135 Magnesium alkyls

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

- 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.
- 3077 171 Hazardous waste, solid, n.o.s.
- 3077 171 Other regulated substances, solid, n.o.s.

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

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

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

3091	<b>138</b>	Lithium metal batteries contained in equipment (including lithium alloy batteries)
3091	<b>138</b>	Lithium metal batteries packed with equipment (including lithium alloy batteries)
3092	<b>129</b>	1-Methoxy-2-propanol
3093	<b>140</b>	Corrosive liquid, oxidizing, n.o.s.
3094	<b>138</b>	Corrosive liquid, water-reactive, n.o.s.
3095	<b>136</b>	Corrosive solid, self-heating, n.o.s.
3096	<b>138</b>	Corrosive solid, water-reactive, n.o.s.
3097	<b>140</b>	Flammable solid, oxidizing, n.o.s.
3098	<b>140</b>	Oxidizing liquid, corrosive, n.o.s.
3099	<b>142</b>	Oxidizing liquid, poisonous, n.o.s.
3099	<b>142</b>	Oxidizing liquid, toxic, n.o.s.
3100	<b>135</b>	Oxidizing solid, self-heating, n.o.s.
3101	<b>146</b>	Organic peroxide type B, liquid
3102	<b>146</b>	Organic peroxide type B, solid
3103	<b>146</b>	Organic peroxide type C, liquid
3104	<b>146</b>	Organic peroxide type C, solid
3105	<b>145</b>	Organic peroxide type D, liquid
3106	<b>145</b>	Organic peroxide type D, solid
3107	<b>145</b>	Organic peroxide type E, liquid
3108	<b>145</b>	Organic peroxide type E, solid
3109	<b>145</b>	Organic peroxide type F, liquid
3110	<b>145</b>	Organic peroxide type F, solid
3111	<b>148</b>	Organic peroxide type B, liquid, temperature controlled



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

- 3112 148 Organic peroxide type B, solid, temperature controlled
- 3113 148 Organic peroxide type C, liquid, temperature controlled
- 3114 148 Organic peroxide type C, solid, temperature controlled
- 3115 148 Organic peroxide type D, liquid, temperature controlled
- 3116 148 Organic peroxide type D, solid, temperature controlled
- 3117 148 Organic peroxide type E, liquid, temperature controlled
- 3118 148 Organic peroxide type E, solid, temperature controlled
- 3119 148 Organic peroxide type F, liquid, temperature controlled
- 3120 148 Organic peroxide type F, solid, temperature controlled
- 3121 144 Oxidizing solid, water-reactive, n.o.s.
- 3122 142 Poisonous liquid, oxidizing, n.o.s.
- 3122 142 Toxic liquid, oxidizing, n.o.s.
- 3123 139 Poisonous liquid, water-reactive, n.o.s.
- 3123 139 Toxic liquid, water-reactive, n.o.s.
- 3124 136 Poisonous solid, self-heating, n.o.s.
- 3124 136 Toxic solid, self-heating, n.o.s.
- 3125 139 Poisonous solid, water-reactive, n.o.s.
- 3125 139 Toxic solid, water-reactive, n.o.s.
- 3126 136 Self-heating solid, corrosive, organic, n.o.s.
- 3127 135 Self-heating solid, oxidizing, n.o.s.

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

- 3128 136 Self-heating solid, poisonous, organic, n.o.s.
- 3128 136 Self-heating solid, toxic, organic, n.o.s.
- 3129 138 Water-reactive liquid, corrosive, n.o.s.
- 3130 139 Water-reactive liquid, poisonous, n.o.s.
- 3130 139 Water-reactive liquid, toxic, n.o.s.
- 3131 138 Water-reactive solid, corrosive, n.o.s.
- 3132 138 Water-reactive solid, flammable, n.o.s.
- 3133 138 Water-reactive solid, oxidizing, n.o.s.
- 3134 139 Water-reactive solid, poisonous, n.o.s.
- 3134 139 Water-reactive solid, toxic, n.o.s.
- 3135 138 Water-reactive solid, self-heating, n.o.s.
- 3136 120 Trifluoromethane, refrigerated liquid
- 3137 140 Oxidizing solid, flammable, n.o.s.
- 3138 115 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 115 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

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

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.

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

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

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

3160 119	Liquefied gas, poisonous, flammable, n.o.s.
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)

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

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

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

3168	<b>119</b>	Gas sample, non-pressurized, toxic, flammable, n.o.s., not refrigerated liquid
3169	<b>123</b>	Gas sample, non-pressurized, poisonous, n.o.s., not refrigerated liquid
3169	<b>123</b>	Gas sample, non-pressurized, toxic, n.o.s., not refrigerated liquid
3170	<b>138</b>	Aluminum dross
3170	<b>138</b>	Aluminum remelting by-products
3170	<b>138</b>	Aluminum smelting by-products
3171	<b>154</b>	Battery-powered equipment (wet battery)
3171	<b>147</b>	Battery-powered equipment (with lithium ion batteries)
3171	<b>138</b>	Battery-powered equipment (with lithium metal batteries)
3171	<b>138</b>	Battery-powered equipment (with sodium batteries)
3171	<b>154</b>	Battery-powered vehicle (wet battery)
3171	<b>147</b>	Battery-powered vehicle (with lithium ion batteries)
3171	<b>138</b>	Battery-powered vehicle (with sodium batteries)
3171	<b>154</b>	Wheelchair, electric, with batteries
3172	<b>153</b>	Toxins, extracted from living sources, liquid, n.o.s.
3172	<b>153</b>	Toxins, extracted from living sources, solid, n.o.s.
3174	<b>135</b>	Titanium disulfide
3174	<b>135</b>	Titanium disulphide
3175	<b>133</b>	Solids containing flammable liquid, n.o.s.
3176	<b>133</b>	Flammable solid, organic, molten, n.o.s.

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

3178	<b>133</b>	Flammable solid, inorganic, n.o.s.
3178	<b>133</b>	Smokeless powder for small arms
3179	<b>134</b>	Flammable solid, poisonous, inorganic, n.o.s.
3179	<b>134</b>	Flammable solid, toxic, inorganic, n.o.s.
3180	<b>134</b>	Flammable solid, corrosive, inorganic, n.o.s.
3181	<b>133</b>	Metal salts of organic compounds, flammable, n.o.s.
3182	<b>170</b>	Metal hydrides, flammable, n.o.s.
3183	<b>135</b>	Self-heating liquid, organic, n.o.s.
3184	<b>136</b>	Self-heating liquid, poisonous, organic, n.o.s.
3184	<b>136</b>	Self-heating liquid, toxic, organic, n.o.s.
3185	<b>136</b>	Self-heating liquid, corrosive, organic, n.o.s.
3186	<b>135</b>	Self-heating liquid, inorganic, n.o.s.
3187	<b>136</b>	Self-heating liquid, poisonous, inorganic, n.o.s.
3187	<b>136</b>	Self-heating liquid, toxic, inorganic, n.o.s.
3188	<b>136</b>	Self-heating liquid, corrosive, inorganic, n.o.s.
3189	<b>135</b>	Metal powder, self-heating, n.o.s.
3190	<b>135</b>	Self-heating solid, inorganic, n.o.s.
3191	<b>136</b>	Self-heating solid, poisonous, inorganic, n.o.s.
3191	<b>136</b>	Self-heating solid, toxic, inorganic, n.o.s.

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

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.  
3203 **135** Pyrophoric organometallic compound, water-reactive, n.o.s.  
3205 **135** Alkaline earth metal alcoholates, n.o.s.  
3206 **136** Alkali metal alcoholates, self-heating, corrosive, n.o.s.  
3207 **138** Organometallic compound, water-reactive, flammable, n.o.s.  
3207 **138** Organometallic compound dispersion, water-reactive, flammable, n.o.s.  
3207 **138** Organometallic compound solution, water-reactive, flammable, n.o.s.  
3208 **138** Metallic substance, water-reactive, n.o.s.  
3209 **138** Metallic substance, water-reactive, self-heating, n.o.s.  
3210 **140** Chlorates, inorganic, aqueous solution, n.o.s.  
3211 **140** Perchlorates, inorganic, aqueous solution, n.o.s.  
3212 **140** Hypochlorites, inorganic, n.o.s.  
3213 **140** Bromates, inorganic, aqueous solution, n.o.s.  
3214 **140** Permanganates, inorganic, aqueous solution, n.o.s.  
3215 **140** Persulfates, inorganic, n.o.s.  
3215 **140** Persulphates, inorganic, n.o.s.  
3216 **140** Persulfates, inorganic, aqueous solution, n.o.s.

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

3216 **140** Persulphates, inorganic, aqueous solution, n.o.s.  
3218 **140** Nitrates, inorganic, aqueous solution, n.o.s.  
3219 **140** Nitrites, inorganic, aqueous solution, n.o.s.  
3220 **126** Pentafluoroethane  
3220 **126** Refrigerant gas R-125  
3221 **149** Self-reactive liquid type B  
3222 **149** Self-reactive solid type B  
3223 **149** Self-reactive liquid type C  
3224 **149** Self-reactive solid type C  
3225 **149** Self-reactive liquid type D  
3226 **149** Self-reactive solid type D  
3227 **149** Self-reactive liquid type E  
3228 **149** Self-reactive solid type E  
3229 **149** Self-reactive liquid type F  
3230 **149** Self-reactive solid type F  
3231 **150** Self-reactive liquid type B, temperature controlled  
3232 **150** Self-reactive solid type B, temperature controlled  
3233 **150** Self-reactive liquid type C, temperature controlled  
3234 **150** Self-reactive solid type C, temperature controlled  
3235 **150** Self-reactive liquid type D, temperature controlled  
3236 **150** Self-reactive solid type D, temperature controlled  
3237 **150** Self-reactive liquid type E, temperature controlled  
3238 **150** Self-reactive solid type E, temperature controlled  
3239 **150** Self-reactive liquid type F, temperature controlled

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

3240	150	Self-reactive solid type F, temperature controlled
3241	133	2-Bromo-2-nitropropane-1, 3-diol
3242	149	Azodicarbonamide
3243	151	Solids containing poisonous liquid, n.o.s.
3243	151	Solids containing toxic liquid, n.o.s.
3244	154	Solids containing corrosive liquid, n.o.s.
3245	171	Genetically modified micro-organisms
3245	171	Genetically modified organisms
3246	156	Methanesulfonyl chloride
3246	156	Methanesulphonyl chloride
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

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

3256	128	Elevated temperature liquid, flammable, n.o.s., with flash point above 60°C (140°F), at or above its flash point
3257	128	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.
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
3269	128	Polyester resin kit, liquid base material
3270	133	Nitrocellulose membrane filters

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

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, poisonous, n.o.s.
3276	151	Nitriles, toxic, liquid, n.o.s.
3276	151	Nitriles, toxic, n.o.s.
3277	154	Chloroformates, poisonous, corrosive, n.o.s.
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, poisonous, n.o.s.
3278	151	Organophosphorus compound, toxic, liquid, n.o.s.
3278	151	Organophosphorus compound, toxic, n.o.s.
3279	131	Organophosphorus compound, poisonous, flammable, n.o.s.
3279	131	Organophosphorus compound, toxic, flammable, n.o.s.

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

3280	151	Organoarsenic compound, liquid, n.o.s.
3280	151	Organoarsenic compound, n.o.s.
3281	151	Metal carbonyls, liquid, n.o.s.
3281	151	Metal carbonyls, 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, poisonous, n.o.s.
3282	151	Organometallic compound, toxic, liquid, n.o.s.
3282	151	Organometallic compound, toxic, n.o.s.
3283	151	Selenium compound, 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.
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.

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

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
3298	126	Pentafluoroethane and Ethylene oxide mixture, with not more than 7.9% Ethylene oxide

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

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)
3303	124	Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone C)



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

3303 124 Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone D)

3304 123 Compressed gas, poisonous, corrosive, n.o.s.

3304 123 Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone A)

3304 123 Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone B)

3304 123 Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone C)

3304 123 Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone D)

3304 123 Compressed gas, toxic, corrosive, n.o.s.

3304 123 Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone A)

3304 123 Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone B)

3304 123 Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone C)

3304 123 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)

3305 119 Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)

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

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)

3306 124 Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C)

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

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

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 123 Liquefied gas, poisonous, corrosive, n.o.s.

3308 123 Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone A)

3308 123 Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone B)

3308 123 Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone C)

3308 123 Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone D)

3308 123 Liquefied gas, toxic, corrosive, n.o.s.

3308 123 Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone A)

3308 123 Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone B)

3308 123 Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone C)

3308 123 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.

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)

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

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

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
3315	151	Chemical sample, poisonous
3315	151	Chemical sample, toxic

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

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
3328	165	Radioactive material, Type B(U) package, fissile

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

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
3344	113	Pentaerythritol tetranitrate mixture, desensitized, solid, n.o.s., with more than 10% but not more than 20% PETN

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

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
3352	151	Pyrethroid pesticide, liquid, toxic

ID No.	Guide No.	Name of Material
--------	-----------	------------------

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

ID No.	Guide No.	Name of Material
--------	-----------	------------------

3358	115	Refrigerating machines, containing flammable, non-toxic, liquefied gas
3359	171	Fumigated cargo transport unit
3359	171	Fumigated 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 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

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

3371	129	2-Methylbutanal
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	128	Desensitized explosive, liquid, n.o.s.
3380	133	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)

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

3385	139	Poisonous by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone A)
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

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

3394 **135** Organometallic substance, liquid, pyrophoric, water-reactive

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

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

3412 **153** Formic acid, with not less than 10% but not more than 85% acid

3413 **157** Potassium cyanide, solution

3414 **157** Sodium cyanide, solution

3415 **154** Sodium fluoride, solution

3416 **153** Chloroacetophenone, liquid

**3416 153 CN**

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

3433 **135** Lithium alkyls, solid

3434 **153** Nitrocresols, liquid

3435 **153** Hydroquinone, solution

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

3436	151	Hexafluoroacetone hydrate, solid
3437	152	Chlorocresols, solid
3438	153	alpha-Methylbenzyl alcohol, solid
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

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

3460	153	N-Ethylbenzyltoluidines, solid
3461	135	Aluminum alkyl halides, solid
3462	153	Toxins, extracted from living sources, solid, n.o.s.
3463	132	Propionic acid, with not less than 90% acid
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



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

3470 132 Paint related material, corrosive, flammable

3471 154 Hydrogendifluorides, solution, n.o.s.

3472 153 Crotonic acid, liquid

3473 128 Fuel cell cartridges, contained in equipment, containing flammable liquids

3473 128 Fuel cell cartridges 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 contained in equipment, containing water-reactive substances

3476 138 Fuel cell cartridges, containing water-reactive substances

3476 138 Fuel cell cartridges packed with equipment, containing water-reactive substances

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

3477 153 Fuel cell cartridges contained in equipment, containing corrosive substances

3477 153 Fuel cell cartridges, containing corrosive substances

3477 153 Fuel cell cartridges packed with equipment, containing corrosive substances

3478 115 Fuel cell cartridges contained in equipment, containing liquefied flammable gas

3478 115 Fuel cell cartridges, containing liquefied flammable gas

3478 115 Fuel cell cartridges packed with equipment, containing liquefied flammable gas

3479 115 Fuel cell cartridges contained in equipment, containing hydrogen in metal hydride

3479 115 Fuel cell cartridges, 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

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

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)
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)

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

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)
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

ID No.	Guide No.	Name of Material
--------	-----------	------------------

3507	166	Uranium hexafluoride, radioactive material, excepted package, less than 0.1 kg per package, non-fissile or fissile-excepted
3508	171	Capacitor, asymmetric
3509	171	Packaging 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)

ID No.	Guide No.	Name of Material
--------	-----------	------------------

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

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

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

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.

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

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

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

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

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

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

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

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

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

3518 173 Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s.

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

3518 173 Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone A)

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

3518 173 Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone B)

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

3518 173 Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone C)

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

3518 173 Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone D)

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

3518 173 Adsorbed gas, toxic, oxidizing, corrosive, n.o.s.

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

3518 173 Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone A)

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

3518 173 Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone B)

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

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

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.

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

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.

8000 171 Consumer commodity

9035 123 Gas identification set

9191 143 Chlorine dioxide, hydrate, frozen

9202 168 Carbon monoxide, refrigerated liquid (cryogenic liquid)

9206 137 Methyl phosphonic dichloride

9260 169 Aluminum, molten

9263 156 Chloropivaloyl chloride

9264 151 3,5-Dichloro-2,4,6-trifluoropyridine

9269 132 Trimethoxysilane

9279 115 Hydrogen absorbed in metal hydride

## GREEN HIGHLIGHTED ENTRIES IN 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

- **IF A FIRE IS INVOLVED:**

- Also consult the assigned orange guide
- If applicable, apply the evacuation information shown under PUBLIC SAFETY

**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., Bromine trifluoride (UN1746), Thionyl chloride (UN1836), etc.). In these instances, two entries are provided in **Table 1** for land-based and water-based spills. If the Water Reactive material is **NOT** a TIH and this material is **NOT** spilled in water, **Table 1** and **Table 2 do NOT** apply and safety distances will be found within the appropriate orange 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.**

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
AC	117	1051	Acrylamide	153P	2074
Acetal	127	1088	Acrylamide, solid	153P	2074
Acetaldehyde	129P	1089	Acrylamide, solution	153P	3426
Acetaldehyde ammonia	171	1841	Acrylic acid, stabilized	132P	2218
Acetaldehyde oxime	129	2332	Acrylonitrile, stabilized	131P	1093
Acetic acid, glacial	132	2789	Adamsite	154	1698
Acetic acid, solution, more than 10% but not more than 80% acid	153	2790	Adhesives (flammable)	128	1133
Acetic acid, solution, more than 80% acid	132	2789	Adiponitrile	153	2205
Acetic anhydride	137	1715	Adsorbed gas, flammable, n.o.s.	174	3510
Acetone	127	1090	Adsorbed gas, n.o.s.	174	3511
Acetone cyanohydrin, stabilized	155	1541	Adsorbed gas, oxidizing, n.o.s.	174	3513
Acetone oils	127	1091	Adsorbed gas, poisonous, corrosive, n.o.s.	173	3516
Acetonitrile	127	1648	Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone A)	173	3516
Acetyl bromide	156	1716	Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone B)	173	3516
Acetyl chloride	155	1717	Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone C)	173	3516
Acetylene, dissolved	116	1001	Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone D)	173	3516
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	Adsorbed gas, poisonous, flammable, corrosive, n.o.s.	173	3517
Acetylene, solvent free	116	3374	Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone A)	173	3517
Acetylene tetrabromide	159	2504	Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone B)	173	3517
Acetyl iodide	156	1898	Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone C)	173	3517
Acetyl methyl carbinol	127	2621	Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone B)	173	3517
Acid, sludge	153	1906	Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone C)	173	3517
Acid butyl phosphate	153	1718			
Acridine	153	2713			
Acrolein, stabilized	131P	1092			
Acrolein dimer, stabilized	129P	2607			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone D)	173	3517	Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone D)	173	3518
Adsorbed gas, poisonous, flammable, n.o.s.	173	3514	Adsorbed gas, poisonous, oxidizing, n.o.s.	173	3515
Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone A)	173	3514	Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone A)	173	3515
Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone B)	173	3514	Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone B)	173	3515
Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone C)	173	3514	Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone C)	173	3515
Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone D)	173	3514	Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone D)	173	3515
Adsorbed gas, poisonous, n.o.s.	173	3512	Adsorbed gas, toxic, corrosive, n.o.s.	173	3516
Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone A)	173	3512	Adsorbed gas, toxic, corrosive, n.o.s. (Inhalation hazard zone A)	173	3516
Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone B)	173	3512	Adsorbed gas, toxic, corrosive, n.o.s. (Inhalation hazard zone B)	173	3516
Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone C)	173	3512	Adsorbed gas, toxic, corrosive, n.o.s. (Inhalation hazard zone C)	173	3516
Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone D)	173	3512	Adsorbed gas, toxic, corrosive, n.o.s. (Inhalation hazard zone D)	173	3516
Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s.	173	3518	Adsorbed gas, toxic, flammable, corrosive, n.o.s.	173	3517
Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone A)	173	3518	Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone A)	173	3517
Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone B)	173	3518	Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone B)	173	3517
Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone C)	173	3518	Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone C)	173	3517



Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone D)	173	3517	Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone A)	173	3515
Adsorbed gas, toxic, flammable, n.o.s.	173	3514	Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone B)	173	3515
Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone A)	173	3514	Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone C)	173	3515
Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone B)	173	3514	Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone D)	173	3515
Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone C)	173	3514	Aerosols	126	1950
Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone D)	173	3514	Air, compressed	122	1002
Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone A)	173	3512	Air, refrigerated liquid (cryogenic liquid)	122	1003
Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone A)	173	3512	Air, refrigerated liquid (cryogenic liquid), non-pressurized	122	1003
Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone B)	173	3512	Air bag inflators	171	3268
Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone C)	173	3512	Air bag modules	171	3268
Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone C)	173	3512	Aircraft hydraulic power unit fuel tank	131	3165
Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone D)	173	3512	Alcoholates solution, n.o.s., in alcohol	132	3274
Adsorbed gas, toxic, oxidizing, corrosive, n.o.s.	173	3518	Alcoholic beverages	127	3065
Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone A)	173	3518	Alcohols, flammable, poisonous, n.o.s.	131	1986
Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone B)	173	3518	Alcohols, flammable, toxic, n.o.s.	131	1986
Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone C)	173	3518	Alcohols, n.o.s.	127	1987
Adsorbed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation hazard zone D)	173	3518	Aldehydes, flammable, poisonous, n.o.s.	131	1988
			Aldehydes, flammable, toxic, n.o.s.	131	1988
			Aldehydes, n.o.s.	129	1989
			Aldol	153	2839
			Alkali metal alcoholates, self-heating, corrosive, n.o.s.	136	3206

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Alkali metal alloy, liquid, n.o.s.	138	1421	Alkyl sulfonic acids, liquid, with not more than 5% free Sulfuric acid	153	2586
Alkali metal amalgam	138	1389	Alkyl sulfonic acids, solid, with more than 5% free Sulfuric acid	153	2583
Alkali metal amalgam, liquid	138	1389	Alkyl sulfonic acids, solid, with not more than 5% free Sulfuric acid	153	2585
Alkali metal amalgam, solid	138	3401	Alkylsulfuric acids	156	2571
Alkali metal amides	139	1390	Alkyl sulphonic acids, liquid, with more than 5% free Sulphuric acid	153	2584
Alkali metal dispersion	138	1391	Alkyl sulphonic acids, liquid, with not more than 5% free Sulphuric acid	153	2586
Alkali metal dispersion, flammable	138	3482	Alkyl sulphonic acids, solid, with more than 5% free Sulphuric acid	153	2583
Alkaline earth metal alcoholates, n.o.s.	135	3205	Alkyl sulphonic acids, solid, with not more than 5% free Sulphuric acid	153	2585
Alkaline earth metal alloy, n.o.s.	138	1393	Alkylsulphuric acids	156	2571
Alkaline earth metal amalgam	138	1392	Allyl acetate	131	2333
Alkaline earth metal amalgam, liquid	138	1392	Allyl alcohol	131	1098
Alkaline earth metal amalgam, solid	138	3402	Allylamine	131	2334
Alkaline earth metal dispersion	138	1391	Allyl bromide	131	1099
Alkaline earth metal dispersion, flammable	138	3482	Allyl chloride	131	1100
Alkaloids, liquid, n.o.s. (poisonous)	151	3140	Allyl chlorocarbonate	155	1722
Alkaloids, solid, n.o.s. (poisonous)	151	1544	Allyl chloroformate	155	1722
Alkaloid salts, liquid, n.o.s. (poisonous)	151	3140	Allyl ethyl ether	131	2335
Alkaloid salts, solid, n.o.s. (poisonous)	151	1544	Allyl formate	131	2336
Alkylphenols, liquid, n.o.s. (including C2-C12 homologues)	153	3145	Allyl glycidyl ether	129	2219
Alkylphenols, solid, n.o.s. (including C2-C12 homologues)	153	2430	Allyl iodide	132	1723
Alkyl sulfonic acids, liquid, with more than 5% free Sulfuric acid	153	2584	Allyl isothiocyanate, stabilized	155	1545
			Allyltrichlorosilane, stabilized	155	1724
			Aluminum, molten	169	9260
			Aluminum alkyl halides, liquid	135	3052

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Aluminum alkyl halides, solid	135	3052	2-Amino-4-chlorophenol	151	2673
Aluminum alkyl halides, solid	135	3461	2-Amino-5-diethylaminopentane	153	2946
Aluminum alkyl hydrides	138	3076	2-Amino-4,6-dinitrophenol, wetted with not less than 20% water	113	3317
Aluminum alkyls	135	3051	2-(2-Aminoethoxy)ethanol	154	3055
Aluminum borohydride	135	2870	N-Aminoethylpiperazine	153	2815
Aluminum borohydride in devices	135	2870	Aminophenols	152	2512
Aluminum bromide, anhydrous	137	1725	Aminopyridines	153	2671
Aluminum bromide, solution	154	2580	Ammonia, anhydrous	125	1005
Aluminum carbide	138	1394	Ammonia, solution, with more than 10% but not more than 35% Ammonia	154	2672
Aluminum chloride, anhydrous	137	1726	Ammonia, solution, with more than 35% but not more than 50% Ammonia	125	2073
Aluminum chloride, solution	154	2581	Ammonia solution, with more than 50% Ammonia	125	3318
Aluminum dross	138	3170	Ammonium arsenate	151	1546
Aluminum ferrosilicon powder	139	1395	Ammonium bifluoride, solid	154	1727
Aluminum hydride	138	2463	Ammonium bifluoride, solution	154	2817
Aluminum nitrate	140	1438	Ammonium dichromate	141	1439
Aluminum phosphide	139	1397	Ammonium dinitro-o-cresolate	141	1843
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			
Amines, liquid, corrosive, n.o.s.	153	2735			
Amines, solid, corrosive, n.o.s.	154	3259			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Ammonium hydroxide, with more than 10% but not more than 35% Ammonia	154	2672	Ammonium silicofluoride	151	2854
Ammonium metavanadate	154	2859	Ammonium sulfide, solution	132	2683
Ammonium nitrate, liquid (hot concentrated solution)	140	2426	Ammonium sulphide, solution	132	2683
Ammonium nitrate, with not more than 0.2% combustible substances	140	1942	Ammunition, poisonous, non-explosive	151	2016
Ammonium nitrate based fertilizer	140	2067	Ammunition, tear-producing, non-explosive	159	2017
Ammonium nitrate based fertilizer	140	2071	Ammunition, toxic, non-explosive	151	2016
Ammonium nitrate emulsion	140	3375	Amyl acetates	129	1104
Ammonium nitrate fertilizer, n.o.s.	140	2072	Amyl acid phosphate	153	2819
Ammonium nitrate fertilizers, with Ammonium sulfate	140	2069	Amylamine	132	1106
Ammonium nitrate fertilizers, with Ammonium sulphate	140	2069	Amyl butyrates	130	2620
Ammonium nitrate fertilizers, with Calcium carbonate	140	2068	Amyl chloride	129	1107
Ammonium nitrate fertilizers, with Phosphate or Potash	143	2070	n-Amylene	128	1108
Ammonium nitrate-fuel oil mixtures	112	—	Amyl formates	129	1109
Ammonium nitrate gel	140	3375	Amyl mercaptan	130	1111
Ammonium nitrate suspension	140	3375	n-Amyl methyl ketone	127	1110
Ammonium perchlorate	143	1442	Amyl nitrate	140	1112
Ammonium persulfate	140	1444	Amyl nitrite	129	1113
Ammonium persulphate	140	1444	Amyltrichlorosilane	155	1728
Ammonium picrate, wetted with not less than 10% water	113	1310	Anhydrous ammonia	125	1005
Ammonium polysulfide, solution	154	2818	Aniline	153	1547
Ammonium polysulphide, solution	154	2818	Aniline hydrochloride	153	1548
Ammonium polyvanadate	151	2861	Anisidines	153	2431
			Anisidines, liquid	153	2431
			Anisidines, solid	153	2431
			Anisole	128	2222
			Anisoyl chloride	156	1729
			Antimony compound, inorganic, liquid, n.o.s.	157	3141
			Antimony compound, inorganic, solid, n.o.s.	157	1549
			Antimony lactate	151	1550

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Antimony pentachloride, liquid	157	1730	Arsenic compound, liquid, n.o.s.	152	1556
Antimony pentachloride, solution	157	1731	Arsenic compound, liquid, n.o.s., inorganic	152	1556
Antimony pentafluoride	157	1732	Arsenic compound, solid, n.o.s.	152	1557
Antimony potassium tartrate	151	1551	Arsenic compound, solid, n.o.s., inorganic	152	1557
Antimony powder	170	2871	Arsenic pentoxide	151	1559
Antimony trichloride	157	1733	Arsenic trichloride	157	1560
Antimony trichloride, liquid	157	1733	Arsenic trioxide	151	1561
Antimony trichloride, solid	157	1733	Arsine	119	2188
Aqua regia	157	1798	Arsine, adsorbed	173	3522
Argon	121	1006	Articles containing Polychlorinated biphenyls (PCB)	171	2315
Argon, compressed	121	1006	Articles, pressurized, hydraulic (containing non-flammable gas)	126	3164
Argon, refrigerated liquid (cryogenic liquid)	120	1951	Articles, pressurized, pneumatic (containing non-flammable gas)	126	3164
Arsenic	152	1558	Aryl sulfonic acids, liquid, with more than 5% free Sulfuric acid	153	2584
Arsenic acid, liquid	154	1553	Aryl sulfonic acids, liquid, with not more than 5% free Sulfuric acid	153	2586
Arsenic acid, solid	154	1554	Aryl sulfonic acids, solid, with more than 5% free Sulfuric acid	153	2583
Arsenical dust	152	1562	Aryl sulfonic acids, solid, with not more than 5% free Sulfuric acid	153	2585
Arsenical pesticide, liquid, flammable, poisonous	131	2760	Aryl sulphonic acids, liquid, with more than 5% free Sulphuric acid	153	2584
Arsenical pesticide, liquid, flammable, toxic	131	2760			
Arsenical pesticide, liquid, poisonous	151	2994			
Arsenical pesticide, liquid, poisonous, flammable	131	2993			
Arsenical pesticide, liquid, toxic	151	2994			
Arsenical pesticide, liquid, toxic, flammable	131	2993			
Arsenical pesticide, solid, poisonous	151	2759			
Arsenical pesticide, solid, toxic	151	2759			
Arsenic bromide	151	1555			
Arsenic chloride	157	1560			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Aryl sulphonic acids, liquid, with not more than 5% free Sulphuric acid	153	2586	Barium perchlorate	141	1447
Aryl sulphonic acids, solid, with more than 5% free Sulphuric acid	153	2583	Barium perchlorate, solid	141	1447
Aryl sulphonic acids, solid, with not more than 5% free Sulphuric acid	153	2585	Barium perchlorate, solution	141	3406
Asbestos	171	2212	Barium permanganate	141	1448
Asbestos, amphibole	171	2212	Barium peroxide	141	1449
Asbestos, blue	171	2212	Batteries, containing Sodium	138	3292
Asbestos, brown	171	2212	Batteries, dry, containing Potassium hydroxide solid	154	3028
Asbestos, chrysotile	171	2590	Batteries, nickel-metal hydride	171	3496
Asbestos, white	171	2590	Batteries, wet, filled with acid	154	2794
Asphalt	130	1999	Batteries, wet, filled with alkali	154	2795
Asphalt, cut back	130	1999	Batteries, wet, non-spillable	154	2800
Aviation regulated liquid, n.o.s.	171	3334	Battery fluid, acid	157	2796
Aviation regulated solid, n.o.s.	171	3335	Battery fluid, alkali	154	2797
Azodicarbonamide	149	3242	Battery-powered equipment (wet battery)	154	3171
Barium	138	1400	Battery-powered equipment (with lithium ion batteries)	147	3171
Barium alloys, pyrophoric	135	1854	Battery-powered equipment (with lithium metal batteries)	138	3171
Barium azide, wetted with not less than 50% water	113	1571	Battery-powered equipment (with sodium batteries)	138	3171
Barium bromate	141	2719	Battery-powered vehicle (wet battery)	154	3171
Barium chlorate	141	1445	Battery-powered vehicle (with lithium ion batteries)	147	3171
Barium chlorate, solid	141	1445	Battery-powered vehicle (with sodium batteries)	138	3171
Barium chlorate, solution	141	3405	Benzaldehyde	129	1990
Barium compound, n.o.s.	154	1564	Benzene	130	1114
Barium cyanide	157	1565	Benzene phosphorus dichloride	137	2798
Barium hypochlorite, with more than 22% available Chlorine	141	2741	Benzene phosphorus thiodichloride	137	2799
Barium nitrate	141	1446	Benzenesulfonyl chloride	156	2225
Barium oxide	157	1884			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Benzenesulphonyl chloride	156	2225	Bipyridilium pesticide, liquid, toxic, flammable	131	3015
Benzidine	153	1885	Bipyridilium pesticide, solid, poisonous	151	2781
Benzonitrile	152	2224	Bipyridilium pesticide, solid, toxic	151	2781
Benzoquinone	153	2587	Bisulfates, aqueous solution	154	2837
Benzotrichloride	156	2226	Bisulfites, aqueous solution, n.o.s.	154	2693
Benzotrifluoride	127	2338	Bisulphates, aqueous solution	154	2837
Benzoyl chloride	137	1736	Bisulphites, aqueous solution, n.o.s.	154	2693
Benzyl bromide	156	1737	Blasting agent, n.o.s.	112	—
Benzyl chloride	156	1738	Bleaching powder	140	2208
Benzyl chloroformate	137	1739	Blue asbestos	171	2212
Benzyl dimethylamine	132	2619	Bombs, smoke, non-explosive, with corrosive liquid, without initiating device	153	2028
Benzylidene chloride	156	1886	Borate and Chlorate mixture	140	1458
Benzyl iodide	156	2653	Borneol	133	1312
Beryllium compound, n.o.s.	154	1566	Boron tribromide	157	2692
Beryllium nitrate	141	2464	Boron trichloride	125	1741
Beryllium powder	134	1567	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	157	1742
(Bio)Medical waste, n.o.s.	158	3291	Boron trifluoride acetic acid complex, liquid	157	1742
Bipyridilium pesticide, liquid, flammable, poisonous	131	2782	Boron trifluoride acetic acid complex, solid	157	3419
Bipyridilium pesticide, liquid, flammable, toxic	131	2782	Boron trifluoride diethyl etherate	132	2604
Bipyridilium pesticide, liquid, poisonous	151	3016	Boron trifluoride dimethyl etherate	139	2965
Bipyridilium pesticide, liquid, poisonous, flammable	131	3015			
Bipyridilium pesticide, liquid, toxic	151	3016			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Boron trifluoride propionic acid complex	157	1743	Bromomethylpropanes	130	2342
Boron trifluoride propionic acid complex, liquid	157	1743	2-Bromo-2-nitropropane-1,3-diol	133	3241
Boron trifluoride propionic acid complex, solid	157	3420	2-Bromopentane	130	2343
Bromates, inorganic, aqueous solution, n.o.s.	140	3213	Bromopropanes	129	2344
Bromates, inorganic, n.o.s.	141	1450	3-Bromopropyne	130	2345
Bromine	154	1744	Bromotrifluoroethylene	116	2419
Bromine, solution	154	1744	Bromotrifluoromethane	126	1009
Bromine, solution (Inhalation Hazard Zone A)	154	1744	Brown asbestos	171	2212
Bromine, solution (Inhalation Hazard Zone B)	154	1744	Brucine	152	1570
Bromine chloride	124	2901	Butadienes, stabilized	116P	1010
Bromine pentafluoride	144	1745	Butadienes and hydrocarbon mixture, stabilized	116P	1010
Bromine trifluoride	144	1746	Butane	115	1011
Bromoacetic acid	156	1938	Butane	115	1075
Bromoacetic acid, solid	156	3425	Butanedione	127	2346
Bromoacetic acid, solution	156	1938	Butanols	129	1120
Bromoacetone	131	1569	Butyl acetates	129	1123
Bromoacetyl bromide	156	2513	Butyl acid phosphate	153	1718
Bromobenzene	130	2514	Butyl acrylates, stabilized	129P	2348
Bromobenzyl cyanides, liquid	159	1694	n-Butylamine	132	1125
Bromobenzyl cyanides, solid	159	1694	N-Butylaniline	153	2738
Bromobenzyl cyanides, solid	159	3449	Butylbenzenes	128	2709
1-Bromobutane	130	1126	n-Butyl bromide	130	1126
2-Bromobutane	130	2339	n-Butyl chloride	130	1127
Bromochloromethane	160	1887	n-Butyl chloroformate	155	2743
1-Bromo-3-chloropropane	159	2688	sec-Butyl chloroformate	155	2742
2-Bromoethyl ethyl ether	130	2340	tert-Butylcyclohexyl chloroformate	156	2747
Bromoform	159	2515	Butylene	115	1012
1-Bromo-3-methylbutane	130	2341	Butylene	115	1075
			1,2-Butylene oxide, stabilized	127P	3022
			Butyl ethers	128	1149
			n-Butyl formate	129	1128



Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
tert-Butyl hypochlorite	135	3255	Calcium, pyrophoric	135	1855
N,n-Butylimidazole	152	2690	Calcium alloys, pyrophoric	135	1855
n-Butyl isocyanate	155	2485	Calcium arsenate	151	1573
tert-Butyl isocyanate	155	2484	Calcium arsenate and Calcium arsenite mixture, solid	151	1574
Butyl mercaptan	130	2347	Calcium arsenite and Calcium arsenate mixture, solid	151	1574
n-Butyl methacrylate, stabilized	130P	2227	Calcium carbide	138	1402
Butyl methyl ether	127	2350	Calcium chlorate	140	1452
Butyl nitrites	129	2351	Calcium chlorate, aqueous solution	140	2429
Butyl propionates	130	1914	Calcium chlorite	140	1453
Butyltoluenes	152	2667	Calcium cyanamide, with more than 0.1% Calcium carbide	138	1403
Butyltrichlorosilane	155	1747	Calcium cyanide	157	1575
5-tert-Butyl-2,4,6-trinitro-m-xylene	149	2956	Calcium dithionite	135	1923
Butyl vinyl ether, stabilized	127P	2352	Calcium hydride	138	1404
1,4-Butynediol	153	2716	Calcium hydrosulfite	135	1923
Butyraldehyde	129	1129	Calcium hydrosulphite	135	1923
Butyraldoxime	129	2840	Calcium hypochlorite, dry	140	1748
Butyric acid	153	2820	Calcium hypochlorite, dry, corrosive, with more than 39% available chlorine (8.8% available oxygen)	140	3485
Butyric anhydride	156	2739	Calcium hypochlorite, hydrated, corrosive, with not less than 5.5% but not more than 16% water	140	3487
Butyronitrile	131	2411	Calcium hypochlorite, hydrated, with not less than 5.5% but not more than 16% water	140	2880
Butyryl chloride	132	2353	Calcium hypochlorite, hydrated mixture, corrosive, with not less than 5.5% but not more than 16% water	140	3487
Buzz	153	2810	Calcium hypochlorite, hydrated mixture, with not less than 5.5% but not more than 16% water	140	2880
BZ	153	2810	Caesium	138	1407
CA	159	1694	Caesium hydroxide	157	2682
Cacodylic acid	151	1572	Caesium hydroxide, solution	154	2681
Cadmium compound	154	2570	Caesium nitrate	140	1451
Caesium	138	1407	Calcium	138	1401
Caesium hydroxide	157	2682			
Caesium hydroxide, solution	154	2681			
Caesium nitrate	140	1451			
Calcium	138	1401			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Calcium hypochlorite mixture, dry, corrosive, with more than 10% but not more than 39% available chlorine	140	3486	Carbamate pesticide, liquid, poisonous, flammable	131	2991
Calcium hypochlorite mixture, dry, corrosive, with more than 39% available chlorine (8.8% available oxygen)	140	3485	Carbamate pesticide, liquid, toxic	151	2992
Calcium hypochlorite mixture, dry, with more than 10% but not more than 39% available Chlorine	140	2208	Carbamate pesticide, liquid, toxic, flammable	131	2991
Calcium hypochlorite mixture, dry, with more than 39% available Chlorine (8.8% available Oxygen)	140	1748	Carbamate pesticide, solid, poisonous	151	2757
Calcium manganese silicon	138	2844	Carbamate pesticide, solid, toxic	151	2757
Calcium nitrate	140	1454	Carbon, activated	133	1362
Calcium oxide	157	1910	Carbon, animal or vegetable origin	133	1361
Calcium perchlorate	140	1455	Carbon bisulfide	131	1131
Calcium permanganate	140	1456	Carbon bisulphide	131	1131
Calcium peroxide	140	1457	Carbon dioxide	120	1013
Calcium phosphide	139	1360	Carbon dioxide, compressed	120	1013
Calcium resinate	133	1313	Carbon dioxide, refrigerated liquid	120	2187
Calcium resinate, fused	133	1314	Carbon dioxide, solid	120	1845
Calcium silicide	138	1405	Carbon dioxide and Ethylene oxide mixture, with more than 9% but not more than 87% Ethylene oxide	115	1041
Camphor	133	2717	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			
Carbamate pesticide, liquid, poisonous	151	2992			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Carbon monoxide, compressed	119	1016	Chemical kit	171	3316
Carbon monoxide, refrigerated liquid (cryogenic liquid)	168	9202	Chemical sample, poisonous	151	3315
Carbon monoxide and Hydrogen mixture, compressed	119	2600	Chemical sample, toxic	151	3315
Carbon tetrabromide	151	2516	Chemical under pressure, corrosive, n.o.s.	125	3503
Carbon tetrachloride	151	1846	Chemical under pressure, flammable, corrosive, n.o.s.	118	3505
Carbonyl fluoride	125	2417	Chemical under pressure, flammable, n.o.s.	115	3501
Carbonyl fluoride, compressed	125	2417	Chemical under pressure, flammable, poisonous, n.o.s.	119	3504
Carbonyl sulfide	119	2204	Chemical under pressure, flammable, toxic, n.o.s.	119	3504
Carbonyl sulphide	119	2204	Chemical under pressure, n.o.s.	126	3500
Castor beans, meal, pomace or flake	171	2969	Chemical under pressure, poisonous, n.o.s.	123	3502
Caustic alkali liquid, n.o.s.	154	1719	Chemical under pressure, toxic, n.o.s.	123	3502
Caustic potash, solid	154	1813	Chloral, anhydrous, stabilized	153	2075
Caustic potash, solution	154	1814	Chlorate and Borate mixture	140	1458
Caustic soda, solid	154	1823	Chlorate and Magnesium chloride mixture	140	1459
Caustic soda, solution	154	1824	Chlorate and Magnesium chloride mixture, solid	140	1459
Cells, containing Sodium	138	3292	Chlorate and Magnesium chloride mixture, solution	140	3407
Celluloid, in blocks, rods, rolls, sheets, tubes, etc., except scrap	133	2000	Chlorates, inorganic, aqueous solution, n.o.s.	140	3210
Celluloid, scrap	135	2002	Chlorates, inorganic, n.o.s.	140	1461
Cerium, slabs, ingots or rods	170	1333	Chloric acid, aqueous solution, with not more than 10% Chloric acid	140	2626
Cerium, turnings or gritty powder	138	3078	Chlorine	124	1017
Cesium	138	1407	Chlorine, adsorbed	173	3520
Cesium hydroxide	157	2682	Chlorine dioxide, hydrate, frozen	143	9191
Cesium hydroxide, solution	154	2681			
Cesium nitrate	140	1451			
CG	125	1076			
Charcoal	133	1361			
Chemical kit	154	1760			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Chlorine pentafluoride	124	2548	Chlorodinitrobenzenes, solid	153	1577
Chlorine trifluoride	124	1749	Chlorodinitrobenzenes, solid	153	3441
Chlorite solution	154	1908	1-Chloro-2,3-epoxypropane	131P	2023
Chlorites, inorganic, n.o.s.	143	1462	2-Chloroethanal	153	2232
Chloroacetaldehyde	153	2232	Chloroform	151	1888
Chloroacetic acid, molten	153	3250	Chloroformates, poisonous, corrosive, flammable, n.o.s.	155	2742
Chloroacetic acid, solid	153	1751	Chloroformates, poisonous, corrosive, n.o.s.	154	3277
Chloroacetic acid, solution	153	1750	Chloroformates, toxic, corrosive, flammable, n.o.s.	155	2742
Chloroacetone, stabilized	131	1695	Chloroformates, toxic, corrosive, n.o.s.	154	3277
Chloroacetonitrile	131	2668	Chloromethyl chloroformate	157	2745
Chloroacetophenone	153	1697	Chloromethyl ethyl ether	131	2354
Chloroacetophenone, liquid	153	3416	3-Chloro-4-methylphenyl isocyanate	156	2236
Chloroacetophenone, solid	153	1697	3-Chloro-4-methylphenyl isocyanate, liquid	156	2236
Chloroacetyl chloride	156	1752	3-Chloro-4-methylphenyl isocyanate, solid	156	3428
Chloroanilines, liquid	152	2019	Chloronitroanilines	153	2237
Chloroanilines, solid	152	2018	Chloronitrobenzenes	152	1578
Chloroanisidines	152	2233	Chloronitrobenzenes, liquid	152	3409
Chlorobenzene	130	1134	Chloronitrobenzenes, solid	152	1578
Chlorobenzotrifluorides	130	2234	Chloronitrotoluenes, liquid	152	2433
Chlorobenzyl chlorides	153	2235	Chloronitrotoluenes, solid	152	2433
Chlorobenzyl chlorides, liquid	153	2235	Chloronitrotoluenes, solid	152	3457
Chlorobenzyl chlorides, solid	153	3427	Chloropentafluoroethane	126	1020
Chlorobutanes	130	1127	Chloropentafluoroethane and Chlorodifluoromethane mixture	126	1973
Chlorocresols	152	2669	Chlorophenolates, liquid	154	2904
Chlorocresols, solid	152	3437	Chlorophenolates, solid	154	2905
Chlorocresols, solution	152	2669	Chlorophenols, liquid	153	2021
Chlorodifluorobromomethane	126	1974	Chlorophenols, solid	153	2020
1-Chloro-1,1-difluoroethane	115	2517			
Chlorodifluoromethane	126	1018			
Chlorodifluoromethane and Chloropentafluoroethane mixture	126	1973			
Chlorodinitrobenzenes, liquid	153	1577			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Chlorophenyltrichlorosilane	156	1753	Chlorosulfonic acid (with or without sulfur trioxide mixture)	137	1754
Chloropicrin	154	1580	Chlorosulphonic acid (with or without sulphur trioxide mixture)	137	1754
Chloropicrin and Methyl bromide mixture	123	1581	1-Chloro-1,2,2,2-tetrafluoroethane	126	1021
Chloropicrin and Methyl chloride mixture	119	1582	Chlorotetrafluoroethane and Ethylene oxide mixture, with not more than 8.8% Ethylene oxide	126	3297
Chloropicrin mixture, n.o.s.	154	1583	Chlorotoluenes	129	2238
Chloropivaloyl chloride	156	9263	4-Chloro-o-toluidine hydrochloride	153	1579
Chloroplatinic acid, solid	154	2507	4-Chloro-o-toluidine hydrochloride, solid	153	1579
Chloroprene, stabilized	131P	1991	4-Chloro-o-toluidine hydrochloride, solution	153	3410
1-Chloropropane	129	1278	Chlorotoluidines	153	2239
2-Chloropropane	129	2356	Chlorotoluidines, liquid	153	3429
3-Chloropropanol-1	153	2849	Chlorotoluidines, solid	153	2239
2-Chloropropene	130P	2456	1-Chloro-2,2,2-trifluoroethane	126	1983
2-Chloropropionic acid	153	2511	Chlorotrifluoromethane	126	1022
2-Chloropropionic acid, solid	153	2511	Chlorotrifluoromethane and Trifluoromethane azeotropic mixture with approximately 60% Chlorotrifluoromethane	126	2599
2-Chloropropionic acid, solution	153	2511	Chromic acid, solution	154	1755
2-Chloropyridine	153	2822	Chromic fluoride, solid	154	1756
Chlorosilanes, corrosive, flammable, n.o.s.	155	2986	Chromic fluoride, solution	154	1757
Chlorosilanes, corrosive, n.o.s.	156	2987	Chromium nitrate	141	2720
Chlorosilanes, flammable, corrosive, n.o.s.	155	2985	Chromium oxychloride	137	1758
Chlorosilanes, poisonous, corrosive, flammable, n.o.s.	155	3362	Chromium trioxide, anhydrous	141	1463
Chlorosilanes, poisonous, corrosive, n.o.s.	156	3361	Chromosulfuric acid	154	2240
Chlorosilanes, toxic, corrosive, flammable, n.o.s.	155	3362	Chromosulphuric acid	154	2240
Chlorosilanes, toxic, corrosive, n.o.s.	156	3361	CK	125	1589
Chlorosilanes, water-reactive, flammable, corrosive, n.o.s.	139	2988			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Clinical waste, unspecified, n.o.s.	158	3291	Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone D)	123	3304
CN	153	1697	Compressed gas, poisonous, flammable, corrosive, n.o.s.	119	3305
CN	153	3416	Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	119	3305
Coal gas	119	1023	Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	119	3305
Coal gas, compressed	119	1023	Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	119	3305
Coal tar distillates, flammable	128	1136	Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)	119	3305
Coating solution	127	1139	Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)	119	3305
Cobalt naphthenates, powder	133	2001	Compressed gas, poisonous, flammable, n.o.s.	119	1953
Cobalt resinate, precipitated	133	1318	Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)	119	1953
Combustible liquid, n.o.s.	128	1993	Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)	119	1953
Compounds, cleaning liquid (corrosive)	154	1760	Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)	119	1953
Compounds, cleaning liquid (flammable)	128	1993	Compressed gas, poisonous, n.o.s.	123	1955
Compounds, tree or weed killing, liquid (corrosive)	154	1760	Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone A)	123	1955
Compounds, tree or weed killing, liquid (flammable)	128	1993	Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone B)	123	1955
Compounds, tree or weed killing, liquid (toxic)	153	2810	Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone C)	123	1955
Compressed gas, flammable, n.o.s.	115	1954	Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone C)	119	1953
Compressed gas, n.o.s.	126	1956	Compressed gas, poisonous, n.o.s.	123	1955
Compressed gas, oxidizing, n.o.s.	122	3156	Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone D)	119	1953
Compressed gas, poisonous, corrosive, n.o.s.	123	3304	Compressed gas, poisonous, n.o.s.	123	1955
Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone A)	123	3304	Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone A)	123	1955
Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone B)	123	3304	Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone B)	123	1955
Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone C)	123	3304	Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone C)	123	1955

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

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A)	124	3306	Copper based pesticide, liquid, toxic	151	3010
Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B)	124	3306	Copper based pesticide, liquid, toxic, flammable	131	3009
Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C)	124	3306	Copper based pesticide, solid, poisonous	151	2775
Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone D)	124	3306	Copper based pesticide, solid, toxic	151	2775
Compressed gas, toxic, oxidizing, n.o.s.	124	3303	Copper chlorate	141	2721
Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone A)	124	3303	Copper chloride	154	2802
Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone B)	124	3303	Copper cyanide	151	1587
Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone C)	124	3303	Copra	135	1363
Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone D)	124	3303	Corrosive liquid, acidic, inorganic, n.o.s.	154	3264
Compressed gas and hexaethyl tetraphosphate mixture	123	1612	Corrosive liquid, acidic, organic, n.o.s.	153	3265
Consumer commodity	171	8000	Corrosive liquid, basic, inorganic, n.o.s.	154	3266
Copper acetoarsenite	151	1585	Corrosive liquid, basic, organic, n.o.s.	153	3267
Copper arsenite	151	1586	Corrosive liquid, flammable, n.o.s.	132	2920
Copper based pesticide, liquid, flammable, poisonous	131	2776	Corrosive liquid, n.o.s.	154	1760
Copper based pesticide, liquid, flammable, toxic	131	2776	Corrosive liquid, oxidizing, n.o.s.	140	3093
Copper based pesticide, liquid, poisonous	151	3010	Corrosive liquid, poisonous, n.o.s.	154	2922
Copper based pesticide, liquid, poisonous, flammable	131	3009	Corrosive liquid, self-heating, n.o.s.	136	3301
			Corrosive liquid, toxic, n.o.s.	154	2922
			Corrosive liquid, water-reactive, n.o.s.	138	3094
			Corrosive solid, acidic, inorganic, n.o.s.	154	3260
			Corrosive solid, acidic, organic, n.o.s.	154	3261
			Corrosive solid, basic, inorganic, n.o.s.	154	3262



Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Corrosive solid, basic, organic, n.o.s.	154	3263	Cresylic acid	153	2022
Corrosive solid, flammable, n.o.s.	134	2921	<b>Crotonaldehyde</b>	<b>131P</b>	<b>1143</b>
Corrosive solid, n.o.s.	154	1759	<b>Crotonaldehyde, stabilized</b>	<b>131P</b>	<b>1143</b>
Corrosive solid, oxidizing, n.o.s.	140	3084	Crotonic acid	153	2823
Corrosive solid, poisonous, n.o.s.	154	2923	Crotonic acid, liquid	153	2823
Corrosive solid, self-heating, n.o.s.	136	3095	Crotonic acid, liquid	153	3472
Corrosive solid, toxic, n.o.s.	154	2923	Crotonic acid, solid	153	2823
Corrosive solid, water-reactive, n.o.s.	138	3096	Crotonylene	128	1144
Cotton	133	1365	<b>CS</b>	<b>153</b>	<b>2810</b>
Cotton, wet	133	1365	Cumene	130	1918
Cotton waste, oily	133	1364	Cupriethylenediamine, solution	154	1761
Coumarin derivative pesticide, liquid, flammable, poisonous	131	3024	<b>CX</b>	<b>154</b>	<b>2811</b>
Coumarin derivative pesticide, liquid, flammable, toxic	131	3024	Cyanide solution, n.o.s.	157	1935
Coumarin derivative pesticide, liquid, poisonous	151	3026	Cyanides, inorganic, solid, n.o.s.	157	1588
Coumarin derivative pesticide, liquid, toxic, flammable	131	3025	<b>Cyanogen</b>	<b>119</b>	<b>1026</b>
Coumarin derivative pesticide, liquid, toxic	151	3026	Cyanogen bromide	157	1889
Coumarin derivative pesticide, solid, poisonous	151	3027	<b>Cyanogen chloride, stabilized</b>	<b>125</b>	<b>1589</b>
Coumarin derivative pesticide, liquid, toxic, flammable	131	3025	Cyanuric chloride	157	2670
Coumarin derivative pesticide, solid, toxic	151	3027	Cyclobutane	115	2601
Cresols, liquid	153	2076	Cyclobutyl chloroformate	155	2744
Cresols, solid	153	2076	1,5,9-Cyclododecatriene	153	2518
Cresols, solid	153	3455	Cycloheptane	128	2241
			Cycloheptatriene	131	2603
			Cycloheptene	128	2242
			Cyclohexane	128	1145
			Cyclohexanethiol	129	3054
			Cyclohexanone	127	1915
			Cyclohexene	130	2256
			<b>Cyclohexenyltrichlorosilane</b>	<b>156</b>	<b>1762</b>
			Cyclohexyl acetate	130	2243
			Cyclohexylamine	132	2357

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Cyclohexyl isocyanate	155	2488	Di-n-amylamine	131	2841
Cyclohexyl mercaptan	129	3054	Dibenzylidichlorosilane	156	2434
Cyclohexyltrichlorosilane	156	1763	Diborane	119	1911
Cyclooctadiene phosphines	135	2940	Diborane, compressed	119	1911
Cyclooctadienes	130P	2520	Diborane mixtures	119	1911
Cyclooctatetraene	128P	2358	1,2-Dibromobutan-3-one	154	2648
Cyclopentane	128	1146	Dibromochloropropanes	159	2872
Cyclopentanol	129	2244	Dibromodifluoromethane	171	1941
Cyclopentanone	128	2245	Dibromomethane	160	2664
Cyclopentene	128	2246	Di-n-butylamine	132	2248
Cyclopropane	115	1027	Dibutylaminoethanol	153	2873
Cymenes	130	2046	Dibutyl ethers	128	1149
DA	151	1699	Dichloroacetic acid	153	1764
Dangerous goods in apparatus	171	3363	1,3-Dichloroacetone	153	2649
Dangerous goods in machinery	171	3363	Dichloroacetyl chloride	156	1765
DC	153	2810	Dichloroanilines, liquid	153	1590
Decaborane	134	1868	Dichloroanilines, solid	153	1590
Decahydronaphthalene	130	1147	Dichloroanilines, solid	153	3442
n-Decane	128	2247	o-Dichlorobenzene	152	1591
Denatured alcohol	127	1987	2,2'-Dichlorodiethyl ether	152	1916
Desensitized explosive, liquid, n.o.s.	128	3379	Dichlorodifluoromethane	126	1028
Desensitized explosive, solid, n.o.s.	133	3380	Dichlorodifluoromethane and Difluoroethane azeotropic mixture with approximately 74% Dichlorodifluoromethane	126	2602
Deuterium	115	1957	Dichlorodifluoromethane and Ethylene oxide mixture, with not more than 12.5% Ethylene oxide	126	3070
Deuterium, compressed	115	1957	Dichlorodimethyl ether, symmetrical	131	2249
Devices, small, hydrocarbon gas powered, with release device	115	3150	1,1-Dichloroethane	130	2362
Diacetone alcohol	129	1148	1,2-Dichloroethylene	130P	1150
Diacetyl	127	2346	Dichloroethyl ether	152	1916
Diallylamine	132	2359			
Diallyl ether	131P	2360			
4,4'-Diaminodiphenylmethane	153	2651			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Dichlorofluoromethane	126	1029	Diethylchlorosilane	155	1767
Dichloroisocyanuric acid, dry	140	2465	Diethylenetriamine	154	2079
Dichloroisocyanuric acid salts	140	2465	Diethyl ether	127	1155
Dichloroisopropyl ether	153	2490	N,N-Diethylethylenediamine	132	2685
Dichloromethane	160	1593	Diethyl ketone	127	1156
1,1-Dichloro-1-nitroethane	153	2650	Diethyl sulfate	152	1594
Dichloropentanes	130	1152	Diethyl sulfide	129	2375
Dichlorophenyl isocyanates	156	2250	Diethyl sulphate	152	1594
Dichlorophenyltrichlorosilane	156	1766	Diethyl sulphide	129	2375
1,2-Dichloropropane	130	1279	Diethylthiophosphoryl chloride	155	2751
1,3-Dichloropropanol-2	153	2750	Diethylzinc	135	1366
Dichloropropenes	129	2047	Difluorochloroethanes	115	2517
Dichlorosilane	119	2189	1,1-Difluoroethane	115	1030
1,2-Dichloro-1,1,2,2-tetrafluoroethane	126	1958	Difluoroethane and Dichlorodifluoromethane azeotropic mixture with approximately 74% Dichlorodifluoromethane	126	2602
3,5-Dichloro-2,4,6-trifluoropyridine	151	9264	1,1-Difluoroethylene	116P	1959
Dicyclohexylamine	153	2565	Difluoromethane	115	3252
Dicyclohexylammonium nitrite	133	2687	Difluorophosphoric acid, anhydrous	154	1768
Dicyclopentadiene	130	2048	2,3-Dihydropyran	127	2376
1,2-Di-(dimethylamino)ethane	129	2372	Diisobutylamine	132	2361
Didymium nitrate	140	1465	Diisobutylene, isomeric compounds	128	2050
Diesel fuel	128	1202	Diisobutyl ketone	128	1157
Diesel fuel	128	1993	Diisooctyl acid phosphate	153	1902
Diethoxymethane	127	2373	Diisopropylamine	132	1158
3,3-Diethoxypropene	127	2374	Diisopropyl ether	127	1159
Diethylamine	132	1154	Diketene, stabilized	131P	2521
2-Diethylaminoethanol	132	2686	1,1-Dimethoxyethane	127	2377
3-Diethylaminopropylamine	132	2684	1,2-Dimethoxyethane	127	2252
Diethylaminopropylamine	132	2684	Dimethylamine, anhydrous	118	1032
N,N-Diethylaniline	153	2432			
Diethylbenzene	130	2049			
Diethyl carbonate	128	2366			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Dimethylamine, aqueous solution	132	1160	Dimethyl thiophosphoryl chloride	156	2267
Dimethylamine, solution	132	1160	Dimethylzinc	135	1370
2-Dimethylaminoacetonitrile	131	2378	Dinitroanilines	153	1596
2-Dimethylaminoethanol	132	2051	Dinitrobenzenes, liquid	152	1597
2-Dimethylaminoethyl acrylate	152	3302	Dinitrobenzenes, solid	152	1597
2-Dimethylaminoethyl methacrylate	153P	2522	Dinitrobenzenes, solid	152	3443
N,N-Dimethylaniline	153	2253	Dinitrochlorobenzenes	153	1577
2,3-Dimethylbutane	128	2457	Dinitro-o-cresol	153	1598
1,3-Dimethylbutylamine	132	2379	Dinitrogen tetroxide	124	1067
Dimethylcarbamoyl chloride	156	2262	Dinitrogen tetroxide and Nitric oxide mixture	124	1975
Dimethyl carbonate	129	1161	Dinitrophenol, solution	153	1599
Dimethylcyclohexanes	128	2263	Dinitrophenol, wetted with not less than 15% water	113	1320
N,N-Dimethylcyclohexylamine	132	2264	Dinitrophenolates, wetted with not less than 15% water	113	1321
Dimethylcyclohexylamine	132	2264	Dinitroresorcinol, wetted with not less than 15% water	113	1322
Dimethyldichlorosilane	155	1162	Dinitrotoluenes	152	2038
Dimethyldiethoxysilane	127	2380	Dinitrotoluenes, liquid	152	2038
Dimethyldioxanes	127	2707	Dinitrotoluenes, molten	152	1600
Dimethyl disulfide	130	2381	Dinitrotoluenes, solid	152	2038
Dimethyl disulphide	130	2381	Dinitrotoluenes, solid	152	3454
Dimethyl ether	115	1033	Dioxane	127	1165
N,N-Dimethylformamide	129	2265	Dioxolane	127	1166
1,1-Dimethylhydrazine	131	1163	Dipentene	128	2052
Dimethylhydrazine, symmetrical	131	2382	Diphenylamine chloroarsine	154	1698
Dimethylhydrazine, unsymmetrical	131	1163	Diphenylchloroarsine, liquid	151	1699
2,2-Dimethylpropane	115	2044	Diphenylchloroarsine, solid	151	1699
Dimethyl-N-propylamine	132	2266	Diphenylchloroarsine, solid	151	3450
Dimethyl sulfate	156	1595	Diphenyldichlorosilane	156	1769
Dimethyl sulfide	130	1164	Diphenylmethyl bromide	153	1770
Dimethyl sulphate	156	1595			
Dimethyl sulphide	130	1164			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Dipicryl sulfide, wetted with not less than 10% water	113	2852	Dye intermediate, liquid, toxic, n.o.s.	151	1602
Dipicryl sulphide, wetted with not less than 10% water	113	2852	Dye intermediate, solid, corrosive, n.o.s.	154	3147
Dipropylamine	132	2383	Dye intermediate, solid, poisonous, n.o.s.	151	3143
Di-n-propyl ether	127	2384	Dye intermediate, solid, toxic, n.o.s.	151	3143
Dipropyl ketone	128	2710	<b>ED</b>	151	1892
Disinfectant, liquid, corrosive, n.o.s.	153	1903	Elevated temperature liquid, flammable, n.o.s., with flash point above 37.8°C (100°F), at or above its flash point	128	3256
Disinfectant, liquid, poisonous, n.o.s.	151	3142	Elevated temperature liquid, flammable, n.o.s., with flash point above 60°C (140°F), at or above its flash point	128	3256
Disinfectant, liquid, toxic, n.o.s.	151	3142	Elevated temperature liquid, n.o.s., at or above 100°C (212°F), and below its flash point	128	3257
Disinfectant, solid, poisonous, n.o.s.	151	1601	Elevated temperature solid, n.o.s., at or above 240°C (464°F)	171	3258
Disinfectant, solid, toxic, n.o.s.	151	1601	Engine, fuel cell, flammable gas powered	115	3166
Disodium trioxosilicate	154	3253	Engine, fuel cell, flammable gas powered	115	3529
Dispersant gas, n.o.s.	126	1078	Engine, fuel cell, flammable liquid powered	128	3166
Dispersant gases, n.o.s. (flammable)	115	1954	Engine, fuel cell, flammable liquid powered	128	3528
Divinyl ether, stabilized	128P	1167	Engine, internal combustion	128	3166
<b>DM</b>	154	1698	Engine, internal combustion	171	3530
<b>Dodecyltrichlorosilane</b>	156	1771	Engine, internal combustion flammable gas powered	115	3529
<b>DP</b>	125	1076	Engine, internal combustion flammable liquid powered	128	3528
Dry ice	120	1845	Engines, internal combustion, flammable gas powered	115	3166
Dye, liquid, corrosive, n.o.s.	154	2801			
Dye, liquid, poisonous, n.o.s.	151	1602			
Dye, liquid, toxic, n.o.s.	151	1602			
Dye, solid, corrosive, n.o.s.	154	3147			
Dye, solid, poisonous, n.o.s.	151	3143			
Dye, solid, toxic, n.o.s.	151	3143			
Dye intermediate, liquid, corrosive, n.o.s.	154	2801			
Dye intermediate, liquid, poisonous, n.o.s.	151	1602			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Engines, internal combustion, flammable liquid powered	128	3166	Ethylamine, aqueous solution, with not less than 50% but not more than 70% Ethylamine	132	2270
Environmentally hazardous substance, liquid, n.o.s.	171	3082	Ethyl amyl ketone	128	2271
Environmentally hazardous substance, solid, n.o.s.	171	3077	2-Ethylaniline	153	2273
Epibromohydrin	131	2558	N-Ethylaniline	153	2272
Epichlorohydrin	131P	2023	Ethylbenzene	130	1175
1,2-Epoxy-3-ethoxypropane	127	2752	N-Ethyl-N-benzylaniline	153	2274
Esters, n.o.s.	127	3272	N-Ethylbenzyltoluidines, liquid	153	2753
Ethane	115	1035	N-Ethylbenzyltoluidines, solid	153	2753
Ethane, compressed	115	1035	N-Ethylbenzyltoluidines, solid	153	3460
Ethane, refrigerated liquid	115	1961	Ethyl borate	129	1176
Ethane-Propane mixture, refrigerated liquid	115	1961	Ethyl bromide	131	1891
Ethanol	127	1170	Ethyl bromoacetate	155	1603
Ethanol and gasoline mixture, with more than 10% ethanol	127	3475	2-Ethylbutanol	129	2275
Ethanol and motor spirit mixture, with more than 10% ethanol	127	3475	2-Ethylbutyl acetate	130	1177
Ethanol and petrol mixture, with more than 10% ethanol	127	3475	Ethylbutyl acetate	130	1177
Ethanol, solution	127	1170	Ethyl butyl ether	127	1179
Ethanolamine	153	2491	2-Ethylbutyraldehyde	130	1178
Ethanolamine, solution	153	2491	Ethyl butyrate	130	1180
Ethers, n.o.s.	127	3271	Ethyl chloride	115	1037
Ethyl acetate	129	1173	Ethyl chloroacetate	155	1181
Ethylacetylene, stabilized	116P	2452	Ethyl chloroformate	155	1182
Ethyl acrylate, stabilized	129P	1917	Ethyl 2-chloropropionate	129	2935
Ethyl alcohol	127	1170	Ethyl chlorothioformate	155	2826
Ethyl alcohol, solution	127	1170	Ethyl crotonate	130	1862
Ethylamine	118	1036	Ethylidichloroarsine	151	1892
			Ethylidichlorosilane	139	1183
			Ethylene	116P	1962

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
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 oxide and Chlorotetrafluoroethane mixture, with not more than 8.8% Ethylene oxide	126	3297
Ethylene, compressed	116P	1962	Ethylene oxide and Dichlorodifluoromethane mixture, with not more than 12.5% Ethylene oxide	126	3070
Ethylene, refrigerated liquid (cryogenic liquid)	115	1038	Ethylene oxide and Pentafluoroethane mixture, with not more than 7.9% Ethylene oxide	126	3298
Ethylene chlorohydrin	131	1135	Ethylene oxide and Propylene oxide mixture, with not more than 30% Ethylene oxide	129P	2983
Ethylenediamine	132	1604	Ethylene oxide and Tetrafluoroethane mixture, with not more than 5.6% Ethylene oxide	126	3299
Ethylene dibromide	154	1605	Ethylene oxide with Nitrogen	119P	1040
Ethylene dibromide and Methyl bromide mixture, liquid	151	1647	Ethyl ether	127	1155
Ethylene dichloride	131	1184	Ethyl fluoride	115	2453
Ethylene glycol diethyl ether	127	1153	Ethyl formate	129	1190
Ethylene glycol monoethyl ether	127	1171	Ethylhexaldehydes	129	1191
Ethylene glycol monoethyl ether acetate	129	1172	2-Ethylhexylamine	132	2276
Ethylene glycol monomethyl ether	127	1188	2-Ethylhexyl chloroformate	156	2748
Ethylene glycol monomethyl ether acetate	129	1189	Ethyl isobutyrate	129	2385
Ethyleneimine, stabilized	131P	1185	Ethyl isocyanate	155	2481
Ethylene oxide	119P	1040	Ethyl lactate	129	1192
Ethylene oxide and Carbon dioxide mixture, with more than 9% but not more than 87% Ethylene oxide	115	1041	Ethyl mercaptan	129	2363
Ethylene oxide and Carbon dioxide mixture, with more than 87% Ethylene oxide	119P	3300	Ethyl methacrylate	130P	2277
Ethylene oxide and Carbon dioxide mixtures, with not more than 9% Ethylene oxide	126	1952	Ethyl methacrylate, stabilized	130P	2277
			Ethyl methyl ether	115	1039
			Ethyl methyl ketone	127	1193
			Ethyl nitrite, solution	131	1194
			Ethyl orthoformate	129	2524
			Ethyl oxalate	156	2525
			Ethylphenyldichlorosilane	156	2435

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Ethyl phosphonothioic dichloride, anhydrous	154	2927	Fertilizer, ammoniating solution, with free Ammonia	125	1043
Ethyl phosphonous dichloride, anhydrous	135	2845	Fibers, animal or vegetable, burnt, wet or damp	133	1372
Ethyl phosphorodichloridate	154	2927	Fibers, animal or vegetable or synthetic, n.o.s. with oil	133	1373
1-Ethylpiperidine	132	2386	Fibers, vegetable, dry	133	3360
Ethyl propionate	129	1195	Fibers impregnated with weakly nitrated Nitrocellulose, n.o.s.	133	1353
Ethyl propyl ether	127	2615	Fibres, animal or vegetable, burnt, wet or damp	133	1372
Ethyl silicate	129	1292	Fibres, animal or vegetable or synthetic, n.o.s. with oil	133	1373
N-Ethyltoluidines	153	2754	Fibres, vegetable, dry	133	3360
Ethyltrichlorosilane	155	1196	Fibres impregnated with weakly nitrated Nitrocellulose, n.o.s.	133	1353
Explosives, division 1.1, 1.2, 1.3 or 1.5	112	—	Films, nitrocellulose base	133	1324
Explosives, division 1.4 or 1.6	114	—	Fire extinguisher charges, corrosive liquid	154	1774
Extracts, aromatic, liquid	127	1169	Fire extinguishers with compressed gas	126	1044
Extracts, flavoring, liquid	127	1197	Fire extinguishers with liquefied gas	126	1044
Extracts, flavouring, liquid	127	1197	Firelighters, solid, with flammable liquid	133	2623
Fabrics, animal or vegetable or synthetic, n.o.s. with oil	133	1373	First aid kit	171	3316
Fabrics impregnated with weakly nitrated Nitrocellulose, n.o.s.	133	1353	Fish meal, stabilized	171	2216
Ferric arsenate	151	1606	Fish meal, unstabilized	133	1374
Ferric arsenite	151	1607	Fish scrap, stabilized	171	2216
Ferric chloride, anhydrous	157	1773	Fish scrap, unstabilized	133	1374
Ferric chloride, solution	154	2582	Flammable liquid, corrosive, n.o.s	132	2924
Ferric nitrate	140	1466	Flammable liquid, n.o.s.	128	1993
Ferrocerium	170	1323	Flammable liquid, poisonous, corrosive, n.o.s.	131	3286
Ferrosilicon	139	1408			
Ferrous arsenate	151	1608			
Ferrous chloride, solid	154	1759			
Ferrous chloride, solution	154	1760			
Ferrous metal borings, shavings, turnings or cuttings	170	2793			



Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Flammable liquid, poisonous, n.o.s.	131	1992	Fluorotoluenes	130	2388
Flammable liquid, toxic, corrosive, n.o.s.	131	3286	Formaldehyde, solution (corrosive)	132	2209
Flammable liquid, toxic, n.o.s.	131	1992	Formaldehyde, solution, flammable	132	1198
Flammable solid, corrosive, inorganic, n.o.s.	134	3180	Formalin (corrosive)	132	2209
Flammable solid, corrosive, organic, n.o.s.	134	2925	Formalin (flammable)	132	1198
Flammable solid, inorganic, n.o.s.	133	3178	Formic acid	153	1779
Flammable solid, organic, molten, n.o.s.	133	3176	Formic acid, with more than 85% acid	153	1779
Flammable solid, organic, n.o.s.	133	1325	Formic acid, with not less than 5% but less than 10% acid	153	3412
Flammable solid, oxidizing, n.o.s.	140	3097	Formic acid, with not less than 10% but not more than 85% acid	153	3412
Flammable solid, poisonous, inorganic, n.o.s.	134	3179	Fuel, aviation, turbine engine	128	1863
Flammable solid, poisonous, organic, n.o.s.	134	2926	Fuel cell cartridges contained in equipment, containing corrosive substances	153	3477
Flammable solid, toxic, inorganic, n.o.s.	134	3179	Fuel cell cartridges contained in equipment, containing flammable liquids	128	3473
Flammable solid, toxic, organic, n.o.s.	134	2926	Fuel cell cartridges contained in equipment, containing hydrogen in metal hydride	115	3479
<b>Fluorine</b>	<b>124</b>	<b>1045</b>	Fuel cell cartridges contained in equipment, containing liquefied flammable gas	115	3478
<b>Fluorine, compressed</b>	<b>124</b>	<b>1045</b>	Fuel cell cartridges contained in equipment, containing water-reactive substances	138	3476
Fluoroacetic acid	154	2642	Fuel cell cartridges, containing corrosive substances	153	3477
Fluoroanilines	153	2941	Fuel cell cartridges, containing flammable liquids	128	3473
Fluorobenzene	130	2387	Fuel cell cartridges, containing hydrogen in metal hydride	115	3479
Fluoroboric acid	154	1775			
Fluorophosphoric acid, anhydrous	154	1776			
Fluorosilicates, n.o.s.	151	2856			
Fluorosilicic acid	154	1778			
<b>Fluorosulfonic acid</b>	<b>137</b>	<b>1777</b>			
<b>Fluorosulphonic acid</b>	<b>137</b>	<b>1777</b>			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Fuel cell cartridges, containing liquefied flammable gas	115	3478	Gas, refrigerated liquid, n.o.s.	120	3158
Fuel cell cartridges, containing water-reactive substances	138	3476	Gas, refrigerated liquid, oxidizing, n.o.s.	122	3311
Fuel cell cartridges packed with equipment, containing corrosive substances	153	3477	Gas cartridges	115	2037
Fuel cell cartridges packed with equipment, containing flammable liquids	128	3473	Gas identification set	123	9035
Fuel cell cartridges packed with equipment, containing hydrogen in metal hydride	115	3479	Gasohol	128	1203
Fuel cell cartridges packed with equipment, containing liquefied flammable gas	115	3478	Gas oil	128	1202
Fuel cell cartridges packed with equipment, containing water-reactive substances	138	3476	Gasoline	128	1203
Fuel oil	128	1202	Gasoline and ethanol mixture, with more than 10% ethanol	127	3475
Fuel oil	128	1993	Gas sample, non-pressurized, flammable, n.o.s., not refrigerated liquid	115	3167
Fumaryl chloride	156	1780	Gas sample, non-pressurized, poisonous, flammable, n.o.s., not refrigerated liquid	119	3168
Fumigated cargo transport unit	171	3359	Gas sample, non-pressurized, poisonous, n.o.s., not refrigerated liquid	123	3169
Fumigated unit	171	3359	Gas sample, non-pressurized, toxic, flammable, n.o.s., not refrigerated liquid	119	3168
Furaldehydes	132P	1199	Gas sample, non-pressurized, toxic, n.o.s., not refrigerated liquid	123	3169
Furan	128	2389	GB	153	2810
Furfural	132P	1199	GD	153	2810
Furfuraldehydes	132P	1199	Genetically modified micro-organisms	171	3245
Furfuryl alcohol	153	2874	Genetically modified organisms	171	3245
Furfurylamine	132	2526	Germane	119	2192
Fusee (rail or highway)	133	1325	Germane, adsorbed	173	3523
Fusel oil	127	1201	GF	153	2810
GA	153	2810	Glycerol alpha-monochlorohydrin	153	2689
Gallium	172	2803	Glycidaldehyde	131P	2622
Gas, refrigerated liquid, flammable, n.o.s.	115	3312			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Guanidine nitrate	143	1467	Hexafluoroacetone	125	2420
H	153	2810	Hexafluoroacetone hydrate	151	2552
Hafnium powder, dry	135	2545	Hexafluoroacetone hydrate, liquid	151	2552
Hafnium powder, wetted with not less than 25% water	170	1326	Hexafluoroacetone hydrate, solid	151	3436
Halogenated monomethyldiphenylmethanes, liquid	171	3151	Hexafluoroethane	126	2193
Halogenated monomethyldiphenylmethanes, solid	171	3152	Hexafluoroethane, compressed	126	2193
Hay, wet, damp or contaminated with oil	133	1327	Hexafluorophosphoric acid	154	1782
Hazardous waste, liquid, n.o.s.	171	3082	Hexafluoropropylene	126	1858
Hazardous waste, solid, n.o.s.	171	3077	Hexafluoropropylene, compressed	126	1858
HD	153	2810	Hexaldehyde	130	1207
Heating oil, light	128	1202	Hexamethylenediamine, solid	153	2280
Helium	121	1046	Hexamethylenediamine, solution	153	1783
Helium, compressed	121	1046	Hexamethylene diisocyanate	156	2281
Helium, refrigerated liquid (cryogenic liquid)	120	1963	Hexamethyleneimine	132	2493
Heptafluoropropane	126	3296	Hexamethylenetetramine	133	1328
n-Heptaldehyde	129	3056	Hexanes	128	1208
Heptanes	128	1206	Hexanoic acid	153	2829
n-Heptene	128	2278	Hexanols	129	2282
Hexachloroacetone	153	2661	1-Hexene	128	2370
Hexachlorobenzene	152	2729	Hexyltrichlorosilane	156	1784
Hexachlorobutadiene	151	2279	HL	153	2810
Hexachlorocyclopentadiene	151	2646	HN-1	153	2810
Hexachlorophene	151	2875	HN-2	153	2810
Hexadecyltrichlorosilane	156	1781	HN-3	153	2810
Hexadiene	130	2458	Hydrazine, anhydrous	132	2029
Hexaethyl tetraphosphate	151	1611	Hydrazine aqueous solution, flammable, with more than 37% hydrazine, by mass	132	3484
Hexaethyl tetraphosphate and compressed gas mixture	123	1612	Hydrazine, aqueous solution, with more than 37% Hydrazine	153	2030

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Hydrazine, aqueous solution, with not less than 37% but not more than 64% Hydrazine	153	2030	Hydrogen in a metal hydride storage system	115	3468
Hydrazine, aqueous solution, with not more than 37% Hydrazine	152	3293	Hydrogen in a metal hydride storage system contained in equipment	115	3468
Hydrazine hydrate	153	2030	Hydrogen in a metal hydride storage system packed with equipment	115	3468
Hydriodic acid	154	1787	Hydrogen, refrigerated liquid (cryogenic liquid)	115	1966
Hydrobromic acid	154	1788	Hydrogen and Carbon monoxide mixture, compressed	119	2600
Hydrocarbon and butadienes mixture, stabilized	116P	1010	Hydrogen and Methane mixture, compressed	115	2034
Hydrocarbon gas mixture, compressed, n.o.s.	115	1964	Hydrogen bromide, anhydrous	125	1048
Hydrocarbon gas mixture, liquefied, n.o.s.	115	1965	Hydrogen chloride, anhydrous	125	1050
Hydrocarbon gas refills for small devices, with release device	115	3150	Hydrogen chloride, refrigerated liquid	125	2186
Hydrocarbons, liquid, n.o.s.	128	3295	Hydrogen cyanide, anhydrous, stabilized	117	1051
Hydrochloric acid	157	1789	Hydrogen cyanide, aqueous solution, with not more than 20% Hydrogen cyanide	154	1613
Hydrocyanic acid, aqueous solution, with less than 5% Hydrogen cyanide	154	1613	Hydrogen cyanide, solution in alcohol, with not more than 45% Hydrogen cyanide	131	3294
Hydrocyanic acid, aqueous solution, with not more than 20% Hydrogen cyanide	154	1613	Hydrogen cyanide, stabilized	117	1051
Hydrocyanic acid, aqueous solutions, with more than 20% Hydrogen cyanide	117	1051	Hydrogen cyanide, stabilized (absorbed)	152	1614
Hydrofluoric acid	157	1790	Hydrogendifluorides, n.o.s.	154	1740
Hydrofluoric acid and Sulfuric acid mixture	157	1786	Hydrogendifluorides, solid, n.o.s.	154	1740
Hydrofluoric acid and Sulphuric acid mixture	157	1786	Hydrogendifluorides, solution, n.o.s.	154	3471
Hydrofluorosilicic acid	154	1778	Hydrogen fluoride, anhydrous	125	1052
Hydrogen	115	1049	Hydrogen iodide, anhydrous	125	2197
Hydrogen absorbed in metal hydride	115	9279			
Hydrogen, compressed	115	1049			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Hydrogen peroxide, aqueous solution, stabilized, with more than 60% Hydrogen peroxide	143	2015	Ink, printer's, flammable	129	1210
Hydrogen peroxide, aqueous solution, with not less than 8% but less than 20% Hydrogen peroxide	140	2984	Insecticide gas, flammable, n.o.s.	115	3354
Hydrogen peroxide, aqueous solution, with not less than 20% but not more than 60% Hydrogen peroxide (stabilized as necessary)	140	2014	Insecticide gas, n.o.s.	126	1968
Hydrogen peroxide, stabilized	143	2015	Insecticide gas, poisonous, flammable, n.o.s.	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 A)	119	3355
Hydrogen selenide, adsorbed	173	3526	Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)	119	3355
Hydrogen selenide, anhydrous	117	2202	Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)	119	3355
Hydrogen sulfide	117	1053	Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D)	119	3355
Hydrogen sulphide	117	1053	Insecticide gas, poisonous, n.o.s.	123	1967
Hydroquinone	153	2662	Insecticide gas, toxic, flammable, n.o.s.	119	3355
Hydroquinone, solution	153	3435	Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)	119	3355
1-Hydroxybenzotriazole, anhydrous, wetted with not less than 20% water	113	3474	Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)	119	3355
1-Hydroxybenzotriazole, monohydrate	113	3474	Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)	119	3355
Hydroxylamine sulfate	154	2865	Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)	119	3355
Hydroxylamine sulphate	154	2865	Insecticide gas, toxic, n.o.s.	123	1967
Hypochlorite solution	154	1791	Iodine	154	3495
Hypochlorites, inorganic, n.o.s.	140	3212	Iodine monochloride, liquid	157	3498
3,3'-Iminodipropylamine	153	2269	Iodine monochloride, solid	157	1792
Infectious substance, affecting animals only	158	2900	Iodine pentafluoride	144	2495
Infectious substance, affecting humans	158	2814	2-Iodobutane	129	2390

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Iodomethylpropanes	129	2391	Isocyanate solution, poisonous, flammable, n.o.s.	155	3080
Iodopropanes	129	2392	Isocyanate solution, poisonous, n.o.s.	155	2206
IPDI	156	2290	Isocyanate solution, toxic, flammable, n.o.s.	155	3080
Iron oxide, spent	135	1376	Isocyanate solution, toxic, n.o.s.	155	2206
Iron pentacarbonyl	131	1994	Isocyanates, flammable, poisonous, n.o.s.	155	2478
Iron sponge, spent	135	1376	Isocyanates, flammable, toxic, n.o.s.	155	2478
Isobutane	115	1075	Isocyanates, poisonous, flammable, n.o.s.	155	3080
Isobutane	115	1969	Isocyanates, poisonous, n.o.s.	155	2206
Isobutanol	129	1212	Isocyanates, toxic, flammable, n.o.s.	155	3080
Isobutyl acetate	129	1213	Isocyanates, toxic, n.o.s.	155	2206
Isobutyl acrylate, stabilized	129P	2527	Isocyanatobenzotrifluorides	156	2285
Isobutyl alcohol	129	1212	Isoheptenes	128	2287
Isobutyl aldehyde	130	2045	Isohexenes	128	2288
Isobutylamine	132	1214	Isooctane	128	1262
Isobutyl chloroformate	155	2742	Isooctenes	128	1216
Isobutylene	115	1055	Isopentane	128	1265
Isobutylene	115	1075	Isopentenes	128	2371
Isobutyl formate	129	2393	Isophoronediamine	153	2289
Isobutyl isobutyrate	130	2528	Isophorone diisocyanate	156	2290
Isobutyl isocyanate	155	2486	Isoprene, stabilized	130P	1218
Isobutyl methacrylate, stabilized	130P	2283	Isopropanol	129	1219
Isobutyl propionate	129	2394	Isopropenyl acetate	129P	2403
Isobutyraldehyde	130	2045	Isopropenylbenzene	128	2303
Isobutyric acid	132	2529	Isopropyl acetate	129	1220
Isobutyronitrile	131	2284	Isopropyl acid phosphate	153	1793
Isobutyryl chloride	132	2395	Isopropyl alcohol	129	1219
Isocyanate solution, flammable, poisonous, n.o.s.	155	2478	Isopropylamine	132	1221
Isocyanate solution, flammable, toxic, n.o.s.	155	2478			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Isopropylbenzene	130	1918	Lead sulphate, with more than 3% free acid	154	1794
Isopropyl butyrate	129	2405	Lewisite	153	2810
Isopropyl chloroacetate	155	2947	Life-saving appliances, not self-inflating	171	3072
Isopropyl chloroformate	155	2407	Life-saving appliances, self-inflating	171	2990
Isopropyl 2-chloropropionate	129	2934	Lighter refills (cigarettes) (flammable gas)	115	1057
Isopropyl isobutyrate	127	2406	Lighters (cigarettes) (flammable gas)	115	1057
Isopropyl isocyanate	155	2483	Lighters, non-pressurized, containing flammable liquid	128	1057
Isopropyl nitrate	130	1222	Liquefied gas, flammable, n.o.s.	115	3161
Isopropyl propionate	129	2409	Liquefied gas, n.o.s.	126	3163
Isosorbide dinitrate mixture	133	2907	Liquefied gas, oxidizing, n.o.s.	122	3157
Isosorbide-5-mononitrate	133	3251	Liquefied gas, poisonous, corrosive, n.o.s.	123	3308
Kerosene	128	1223	Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone A)	123	3308
Ketones, liquid, n.o.s.	127	1224	Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone B)	123	3308
Krill meal	133	3497	Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone C)	123	3308
Krypton	121	1056	Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone D)	123	3308
Krypton, compressed	121	1056	Liquefied gas, poisonous, flammable, corrosive, n.o.s.	119	3309
Krypton, refrigerated liquid (cryogenic liquid)	120	1970	Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	119	3309
L (Lewisite)	153	2810	Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	119	3309
Lead acetate	151	1616	Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)	119	3309
Lead arsenates	151	1617	Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)	119	3309
Lead arsenites	151	1618	Liquefied gas, poisonous, n.o.s.	119	3309
Lead compound, soluble, n.o.s.	151	2291	Liquefied gas, poisonous, n.o.s.	119	3309
Lead cyanide	151	1620	Liquefied gas, poisonous, n.o.s.	119	3309
Lead dioxide	141	1872	Liquefied gas, poisonous, n.o.s.	119	3309
Lead nitrate	141	1469	Liquefied gas, poisonous, n.o.s.	119	3309
Lead perchlorate	141	1470	Liquefied gas, poisonous, n.o.s.	119	3309
Lead perchlorate, solid	141	1470	Liquefied gas, poisonous, n.o.s.	119	3309
Lead perchlorate, solution	141	3408	Liquefied gas, poisonous, n.o.s.	119	3309
Lead phosphite, dibasic	133	2989	Liquefied gas, poisonous, n.o.s.	119	3309
Lead sulfate, with more than 3% free acid	154	1794	Liquefied gas, poisonous, n.o.s.	119	3309

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)	119	3309	Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C)	124	3310
Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)	119	3309	Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone D)	124	3310
Liquefied gas, poisonous, flammable, n.o.s.	119	3160	Liquefied gas, poisonous, oxidizing, n.o.s.	124	3307
Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)	119	3160	Liquefied gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone A)	124	3307
Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)	119	3160	Liquefied gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone B)	124	3307
Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)	119	3160	Liquefied gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone C)	124	3307
Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D)	119	3160	Liquefied gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone D)	124	3307
Liquefied gas, poisonous, n.o.s.	123	3162	Liquefied gas, toxic, corrosive, n.o.s.	123	3308
Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone A)	123	3162	Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone A)	123	3308
Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone B)	123	3162	Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone B)	123	3308
Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone C)	123	3162	Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone C)	123	3308
Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone D)	123	3162	Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone D)	123	3308
Liquefied gas, poisonous, oxidizing, corrosive, n.o.s.	124	3310	Liquefied gas, toxic, flammable, corrosive, n.o.s.	119	3309
Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A)	124	3310	Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	119	3309
Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B)	124	3310	Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	119	3309



Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)	119	3309	Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone D)	124	3310
Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)	119	3309	Liquefied gas, toxic, oxidizing, n.o.s.	124	3307
Liquefied gas, toxic, flammable, n.o.s.	119	3160	Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone A)	124	3307
Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)	119	3160	Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone B)	124	3307
Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)	119	3160	Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone C)	124	3307
Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)	119	3160	Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone D)	124	3307
Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)	119	3160	Liquefied gases, non-flammable, charged with Nitrogen, Carbon dioxide or Air	120	1058
Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone A)	123	3162	Liquefied natural gas (cryogenic liquid)	115	1972
Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone B)	123	3162	Liquefied petroleum gas	115	1075
Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone C)	123	3162	Lithium	138	1415
Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone D)	123	3162	Lithium alkyls	135	2445
Liquefied gas, toxic, oxidizing, corrosive, n.o.s.	124	3310	Lithium alkyls, liquid	135	2445
Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A)	124	3310	Lithium alkyls, solid	135	3433
Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B)	124	3310	Lithium aluminum hydride	138	1410
Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C)	124	3310	Lithium aluminum hydride, ethereal	138	1411
Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone D)	124	3310	Lithium batteries	138	3090
			Lithium batteries contained in equipment	138	3091
			Lithium batteries packed with equipment	138	3091
			Lithium borohydride	138	1413
			Lithium ferrosilicon	139	2830
			Lithium hydride	138	1414

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Lithium hydride, fused solid	138	2805	Machinery, fuel cell, flammable liquid powered	128	3528
Lithium hydroxide	154	2680	Machinery, internal combustion	171	3530
Lithium hydroxide, monohydrate	154	2680	Machinery, internal combustion, flammable gas powered	115	3529
Lithium hydroxide, solution	154	2679	Machinery, internal combustion, flammable liquid powered	128	3528
Lithium hypochlorite, dry	140	1471	Magnesium	138	1869
Lithium hypochlorite mixture	140	1471	Magnesium, in pellets, turnings or ribbons	138	1869
Lithium hypochlorite mixtures, dry	140	1471	Magnesium alkyls	135	3053
Lithium ion batteries (including lithium ion polymer batteries)	147	3480	Magnesium alloys, with more than 50% Magnesium, in pellets, turnings or ribbons	138	1869
Lithium ion batteries contained in equipment (including lithium ion polymer batteries)	147	3481	Magnesium alloys powder	138	1418
Lithium ion batteries packed with equipment (including lithium ion polymer batteries)	147	3481	Magnesium aluminum phosphide	139	1419
Lithium metal batteries (including lithium alloy batteries)	138	3090	Magnesium arsenate	151	1622
Lithium metal batteries contained in equipment (including lithium alloy batteries)	138	3091	Magnesium bromate	140	1473
Lithium metal batteries packed with equipment (including lithium alloy batteries)	138	3091	Magnesium chlorate	140	2723
Lithium nitrate	140	2722	Magnesium chloride and Chlorate mixture	140	1459
Lithium nitride	138	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
			Magnesium nitrate	140	1474
			Magnesium perchlorate	140	1475
			Magnesium peroxide	140	1476

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Magnesium phosphide	139	2011	Mercaptan mixture, liquid, flammable, poisonous, n.o.s.	131	1228
Magnesium powder	138	1418	Mercaptan mixture, liquid, flammable, toxic, n.o.s.	131	1228
Magnesium silicide	138	2624	Mercaptan mixture, liquid, poisonous, flammable, n.o.s.	131	3071
Magnesium silicofluoride	151	2853	Mercaptan mixture, liquid, toxic, flammable, n.o.s.	131	3071
Magnetized material	171	2807	Mercaptans, liquid, flammable, n.o.s.	130	3336
Maleic anhydride	156	2215	Mercaptans, liquid, flammable, poisonous, n.o.s.	131	1228
Maleic anhydride, molten	156	2215	Mercaptans, liquid, flammable, toxic, n.o.s.	131	1228
Malononitrile	153	2647	Mercaptans, liquid, poisonous, flammable, n.o.s.	131	3071
Maneb	135	2210	Mercaptans, liquid, flammable, toxic, n.o.s.	131	1228
Maneb, stabilized	135	2968	Mercaptans, liquid, flammable, toxic, n.o.s.	131	1228
Maneb preparation, stabilized	135	2968	Mercaptans, liquid, flammable, toxic, n.o.s.	131	1228
Maneb preparation, with not less than 60% Maneb	135	2210	Mercaptans, liquid, flammable, toxic, n.o.s.	131	1228
Manganese nitrate	140	2724	Mercaptans, liquid, flammable, toxic, n.o.s.	131	3071
Manganese resinate	133	1330	Mercaptans, liquid, toxic, flammable, n.o.s.	131	3071
Matches, fusee	133	2254	Mercuric arsenate	151	1623
Matches, safety	133	1944	Mercuric bromide	154	1634
Matches, "strike anywhere"	133	1331	Mercuric chloride	154	1624
Matches, wax "vesta"	133	1945	Mercuric cyanide	154	1636
MD	152	1556	Mercuric nitrate	141	1625
Medical waste, n.o.s.	158	3291	Mercuric oxycyanide	151	1642
Medicine, liquid, flammable, poisonous, n.o.s.	131	3248	Mercuric potassium cyanide	157	1626
Medicine, liquid, flammable, toxic, n.o.s.	131	3248	Mercuric sulfate	151	1645
Medicine, liquid, poisonous, n.o.s.	151	1851	Mercuric sulphate	151	1645
Medicine, liquid, toxic, n.o.s.	151	1851	Mercurous bromide	154	1634
Medicine, solid, poisonous, n.o.s.	151	3249	Mercurous nitrate	141	1627
Medicine, solid, toxic, n.o.s.	151	3249	Mercury	172	2809
Mercaptan mixture, liquid, flammable, n.o.s.	130	3336	Mercury acetate	151	1629
			Mercury ammonium chloride	151	1630
			Mercury based pesticide, liquid, flammable, poisonous	131	2778

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Mercury based pesticide, liquid, flammable, toxic	131	2778	Mesityl oxide	129	1229
Mercury based pesticide, liquid, poisonous	151	3012	Metal alkyl halides, water-reactive, n.o.s.	138	3049
Mercury based pesticide, liquid, poisonous, flammable	131	3011	Metal alkyl hydrides, water-reactive, n.o.s.	138	3050
Mercury based pesticide, liquid, toxic	151	3012	Metal alkyls, water-reactive, n.o.s.	135	2003
Mercury based pesticide, liquid, toxic, flammable	131	3011	Metal aryl halides, water-reactive, n.o.s.	138	3049
Mercury based pesticide, solid, poisonous	151	2777	Metal aryl hydrides, water-reactive, n.o.s.	138	3050
Mercury based pesticide, solid, toxic	151	2777	Metal aryls, water-reactive, n.o.s.	135	2003
Mercury benzoate	154	1631	Metal carbonyls, liquid, n.o.s.	151	3281
Mercury bromides	154	1634	Metal carbonyls, n.o.s.	151	3281
Mercury compound, liquid, n.o.s.	151	2024	Metal carbonyls, solid, n.o.s.	151	3466
Mercury compound, solid, n.o.s.	151	2025	Metal catalyst, dry	135	2881
Mercury contained in manufactured articles	172	3506	Metal catalyst, wetted	170	1378
Mercury cyanide	154	1636	Metaldehyde	133	1332
Mercury gluconate	151	1637	Metal hydrides, flammable, n.o.s.	170	3182
Mercury iodide	151	1638	Metal hydrides, water-reactive, n.o.s.	138	1409
Mercury metal	172	2809	Metallic substance, water-reactive, n.o.s.	138	3208
Mercury nucleate	151	1639	Metallic substance, water-reactive, self-heating, n.o.s.	138	3209
Mercury oleate	151	1640	Metal powder, flammable, n.o.s.	170	3089
Mercury oxide	151	1641	Metal powder, self-heating, n.o.s.	135	3189
Mercury oxycyanide, desensitized	151	1642	Metal salts of organic compounds, flammable, n.o.s.	133	3181
Mercury potassium iodide	151	1643	Methacrylaldehyde, stabilized	131P	2396
Mercury salicylate	151	1644	Methacrylic acid, stabilized	153P	2531
Mercury sulfate	151	1645	Methacrylonitrile, stabilized	131P	3079
Mercury sulphate	151	1645	Methallyl alcohol	129	2614
Mercury thiocyanate	151	1646			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Methane	115	1971	Methyl bromide and Chloropicrin mixture	123	1581
Methane, compressed	115	1971	Methyl bromide and Ethylene dibromide mixture, liquid	151	1647
Methane, refrigerated liquid (cryogenic liquid)	115	1972	Methyl bromoacetate	155	2643
Methane and Hydrogen mixture, compressed	115	2034	2-Methylbutanal	129	3371
Methanesulfonyl chloride	156	3246	3-Methylbutan-2-one	127	2397
Methanesulphonyl chloride	156	3246	2-Methyl-1-butene	128	2459
Methanol	131	1230	2-Methyl-2-butene	128	2460
Methoxymethyl isocyanate	155	2605	3-Methyl-1-butene	128	2561
4-Methoxy-4-methylpentan-2-one	128	2293	N-Methylbutylamine	132	2945
1-Methoxy-2-propanol	129	3092	Methyl tert-butyl ether	127	2398
Methyl acetate	129	1231	Methyl butyrate	129	1237
Methylacetylene and Propadiene mixture, stabilized	116P	1060	Methyl chloride	115	1063
Methyl acrylate, stabilized	129P	1919	Methyl chloride and Chloropicrin mixture	119	1582
Methylal	127	1234	Methyl chloride and Methylene chloride mixture	115	1912
Methyl alcohol	131	1230	Methyl chloroacetate	155	2295
Methylallyl chloride	130P	2554	Methyl chloroformate	155	1238
Methylamine, anhydrous	118	1061	Methyl chloromethyl ether	131	1239
Methylamine, aqueous solution	132	1235	Methyl 2-chloropropionate	129	2933
Methylamyl acetate	130	1233	Methylchlorosilane	119	2534
Methylamyl alcohol	129	2053	Methylcyclohexane	128	2296
Methyl amyl ketone	127	1110	Methylcyclohexanols	129	2617
N-Methylaniline	153	2294	Methylcyclohexanone	128	2297
alpha-Methylbenzyl alcohol	153	2937	Methylcyclopentane	128	2298
alpha-Methylbenzyl alcohol, liquid	153	2937	Methyl dichloroacetate	155	2299
alpha-Methylbenzyl alcohol, solid	153	3438	Methyldichloroarsine	152	1556
Methylbenzyl alcohol (alpha)	153	2937	Methyldichlorosilane	139	1242
Methyl bromide	123	1062	Methylene chloride	160	1593
			Methylene chloride and Methyl chloride mixture	115	1912
			Methyl ethyl ether	115	1039

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Methyl ethyl ketone	127	1193	Methyl propyl ketone	127	1249
2-Methyl-5-ethylpyridine	153	2300	Methyltetrahydrofuran	127	2536
Methyl fluoride	115	2454	Methyl trichloroacetate	156	2533
Methyl formate	129	1243	Methyltrichlorosilane	155	1250
2-Methylfuran	128	2301	alpha-Methylvaleraldehyde	130	2367
2-Methyl-2-heptanethiol	131	3023	Methyl valeraldehyde (alpha)	130	2367
5-Methylhexan-2-one	127	2302	Methyl vinyl ketone, stabilized	131P	1251
Methylhydrazine	131	1244	M.I.B.C.	129	2053
Methyl iodide	151	2644	Molten sulfur	133	2448
Methyl isobutyl carbinol	129	2053	Molten sulphur	133	2448
Methyl isobutyl ketone	127	1245	Molybdenum pentachloride	156	2508
Methyl isocyanate	155	2480	Monoethanolamine	153	2491
Methyl isopropenyl ketone, stabilized	127P	1246	Mononitrotoluidines	153	2660
Methyl isothiocyanate	131	2477	Morpholine	132	2054
Methyl isovalerate	130	2400	Motor fuel anti-knock mixture	131	1649
Methyl magnesium bromide in Ethyl ether	135	1928	Motor fuel anti-knock mixture, flammable	131	3483
Methyl mercaptan	117	1064	Motor spirit	128	1203
Methyl methacrylate monomer, stabilized	129P	1247	Motor spirit and ethanol mixture, with more than 10% ethanol	127	3475
4-Methylmorpholine	132	2535	Muriatic acid	157	1789
N-Methylmorpholine	132	2535	Musk xylene	149	2956
Methyl nitrite	116	2455	Mustard	153	2810
Methyl orthosilicate	155	2606	Mustard Lewisite	153	2810
Methylpentadiene	128	2461	Naphthalene, crude	133	1334
2-Methylpentan-2-ol	129	2560	Naphthalene, molten	133	2304
Methylphenyldichlorosilane	156	2437	Naphthalene, refined	133	1334
Methyl phosphonic dichloride	137	9206	alpha-Naphthylamine	153	2077
Methyl phosphonous dichloride	135	2845	beta-Naphthylamine	153	1650
1-Methylpiperidine	132	2399	beta-Naphthylamine, solid	153	1650
Methyl propionate	129	1248	beta-Naphthylamine, solution	153	3411
Methyl propyl ether	127	2612	Naphthylamine (alpha)	153	2077

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Naphthylamine (beta)	153	1650	Nicotine sulfate, solid	151	3445
Naphthylamine (beta), solid	153	1650	Nicotine sulfate, solution	151	1658
Naphthylamine (beta), solution	153	3411	Nicotine sulphate, solid	151	1658
Naphthylthiourea	153	1651	Nicotine sulphate, solid	151	3445
Naphthylurea	153	1652	Nicotine sulphate, solution	151	1658
Natural gas, compressed	115	1971	Nicotine tartrate	151	1659
Natural gas, refrigerated liquid (cryogenic liquid)	115	1972	Nitrates, inorganic, aqueous solution, n.o.s.	140	3218
Neohexane	128	1208	Nitrates, inorganic, n.o.s.	140	1477
Neon	121	1065	Nitrating acid mixture with more than 50% nitric acid	157	1796
Neon, compressed	121	1065	Nitrating acid mixture with not more than 50% nitric acid	157	1796
Neon, refrigerated liquid (cryogenic liquid)	120	1913	Nitrating acid mixture, spent, with more than 50% nitric acid	157	1826
Nickel carbonyl	131	1259	Nitrating acid mixture, spent, with not more than 50% nitric acid	157	1826
Nickel catalyst, dry	135	2881	Nitric acid, other than red fuming, with more than 70% nitric acid	157	2031
Nickel cyanide	151	1653	Nitric acid, other than red fuming, with not more than 70% nitric acid	157	2031
Nickel nitrate	140	2725	Nitric acid, red fuming	157	2032
Nickel nitrite	140	2726	Nitric oxide	124	1660
Nicotine	151	1654	Nitric oxide, compressed	124	1660
Nicotine compound, liquid, n.o.s.	151	3144	Nitric oxide and Dinitrogen tetroxide mixture	124	1975
Nicotine compound, solid, n.o.s.	151	1655	Nitric oxide and Nitrogen dioxide mixture	124	1975
Nicotine hydrochloride	151	1656	Nitric oxide and Nitrogen tetroxide mixture	124	1975
Nicotine hydrochloride, liquid	151	1656	Nitriles, flammable, poisonous, n.o.s.	131	3273
Nicotine hydrochloride, solid	151	3444	Nitriles, flammable, toxic, n.o.s.	131	3273
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	1658			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Nitriles, liquid, poisonous, n.o.s.	151	3276	Nitrocellulose mixture, without pigment	133	2557
Nitriles, liquid, toxic, n.o.s.	151	3276	Nitrocellulose mixture, without plasticizer	133	2557
Nitriles, poisonous, flammable, n.o.s.	131	3275	Nitrocellulose mixture, with pigment	133	2557
Nitriles, poisonous, liquid, n.o.s.	151	3276	Nitrocellulose mixture, with plasticizer	133	2557
Nitriles, poisonous, n.o.s.	151	3276	Nitrocellulose, solution, flammable	127	2059
Nitriles, poisonous, solid, n.o.s.	151	3439	Nitrocellulose with alcohol	113	2556
Nitriles, solid, poisonous, n.o.s.	151	3439	Nitrocellulose with not less than 25% alcohol	113	2556
Nitriles, solid, toxic, n.o.s.	151	3439	Nitrocellulose with water, not less than 25% water	113	2555
Nitriles, toxic, flammable, n.o.s.	131	3275	3-Nitro-4-chlorobenzotrifluoride	152	2307
Nitriles, toxic, liquid, n.o.s.	151	3276	Nitrocresols	153	2446
Nitriles, toxic, n.o.s.	151	3276	Nitrocresols, liquid	153	3434
Nitriles, toxic, solid, n.o.s.	151	3439	Nitrocresols, solid	153	2446
Nitrites, inorganic, aqueous solution, n.o.s.	140	3219	Nitroethane	129	2842
Nitrites, inorganic, n.o.s.	140	2627	Nitrogen	121	1066
Nitroanilines	153	1661	Nitrogen, compressed	121	1066
Nitroanisoles, liquid	152	2730	Nitrogen, refrigerated liquid (cryogenic liquid)	120	1977
Nitroanisoles, solid	152	2730	Nitrogen and Rare gases mixture, compressed	121	1981
Nitroanisoles, solid	152	3458	Nitrogen dioxide	124	1067
Nitrobenzene	152	1662	Nitrogen dioxide and Nitric oxide mixture	124	1975
Nitrobenzenesulfonic acid	153	2305	Nitrogen tetroxide and Nitric oxide mixture	124	1975
Nitrobenzenesulphonic acid	153	2305	Nitrogen trifluoride	122	2451
Nitrobenzotrifluorides	152	2306	Nitrogen trifluoride, compressed	122	2451
Nitrobenzotrifluorides, liquid	152	2306	Nitrogen trioxide	124	2421
Nitrobenzotrifluorides, solid	152	3431			
Nitrobromobenzenes, liquid	152	2732			
Nitrobromobenzenes, solid	152	2732			
Nitrobromobenzenes, solid	152	3459			
Nitrocellulose membrane filters	133	3270			



Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Nitroglycerin, solution in alcohol, with more than 1% but not more than 5% Nitroglycerin	127	3064	Nitrotoluenes, solid	152	1664
Nitroglycerin, solution in alcohol, with not more than 1% Nitroglycerin	127	1204	Nitrotoluenes, solid	152	3446
Nitroglycerin mixture, desensitized, liquid, flammable, n.o.s., with not more than 30% Nitroglycerin	113	3343	Nitrotoluidines (mono)	153	2660
Nitroglycerin mixture, desensitized, liquid, n.o.s., with not more than 30% Nitroglycerin	113	3357	Nitrous oxide	122	1070
Nitroglycerin mixture, desensitized, solid, n.o.s., with more than 2% but not more than 10% Nitroglycerin	113	3319	Nitrous oxide, compressed	122	1070
Nitroguanidine, wetted with not less than 20% water	113	1336	Nitrous oxide, refrigerated liquid	122	2201
Nitrohydrochloric acid	157	1798	Nitrous oxide and Carbon dioxide mixture	126	1015
Nitromethane	129	1261	Nitroxylenes, liquid	152	1665
Nitronaphthalene	133	2538	Nitroxylenes, solid	152	1665
Nitrophenols	153	1663	Nitroxylenes, solid	152	3447
4-Nitrophenylhydrazine, with not less than 30% water	113	3376	Nonanes	128	1920
Nitropropanes	129	2608	Nonyltrichlorosilane	156	1799
p-Nitrosodimethylaniline	135	1369	2,5-Norbornadiene, stabilized	128P	2251
Nitrostarch, wetted with not less than 20% water	113	1337	Octadecyltrichlorosilane	156	1800
Nitrosyl chloride	125	1069	Octadiene	128P	2309
Nitrosylsulfuric acid, liquid	157	2308	Octafluorobut-2-ene	126	2422
Nitrosylsulfuric acid, solid	157	2308	Octafluorocyclobutane	126	1976
Nitrosylsulfuric acid, solid	157	3456	Octafluoropropane	126	2424
Nitrosylsulphuric acid, liquid	157	2308	Octanes	128	1262
Nitrosylsulphuric acid, solid	157	2308	Octyl aldehydes	129	1191
Nitrosylsulphuric acid, solid	157	3456	Octyltrichlorosilane	156	1801
Nitrotoluenes, liquid	152	1664	Oil, petroleum	128	1270
			Oil gas	119	1071
			Oil gas, compressed	119	1071
			Organic peroxide type B, liquid	146	3101
			Organic peroxide type B, liquid, temperature controlled	148	3111
			Organic peroxide type B, solid	146	3102
			Organic peroxide type B, solid, temperature controlled	148	3112

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Organic peroxide type C, liquid	146	3103	Organic pigments, self-heating	135	3313
Organic peroxide type C, liquid, temperature controlled	148	3113	Organoarsenic compound, liquid, n.o.s.	151	3280
Organic peroxide type C, solid	146	3104	Organoarsenic compound, n.o.s.	151	3280
Organic peroxide type C, solid, temperature controlled	148	3114	Organoarsenic compound, solid, n.o.s.	151	3465
Organic peroxide type D, liquid	145	3105	Organochlorine pesticide, liquid, flammable, poisonous	131	2762
Organic peroxide type D, liquid, temperature controlled	148	3115	Organochlorine pesticide, liquid, flammable, toxic	131	2762
Organic peroxide type D, solid	145	3106	Organochlorine pesticide, liquid, poisonous	151	2996
Organic peroxide type D, solid, temperature controlled	148	3116	Organochlorine pesticide, liquid, poisonous, flammable	131	2995
Organic peroxide type E, liquid	145	3107	Organochlorine pesticide, liquid, toxic	151	2996
Organic peroxide type E, liquid, temperature controlled	148	3117	Organochlorine pesticide, liquid, toxic, flammable	131	2995
Organic peroxide type E, solid	145	3108	Organochlorine pesticide, solid, poisonous	151	2761
Organic peroxide type E, solid, temperature controlled	148	3118	Organochlorine pesticide, solid, toxic	151	2761
Organic peroxide type F, liquid	145	3109	Organometallic compound, liquid, poisonous, n.o.s.	151	3282
Organic peroxide type F, liquid, temperature controlled	148	3119	Organometallic compound, liquid, toxic, n.o.s.	151	3282
Organic peroxide type F, solid	145	3110	Organometallic compound, poisonous, liquid, n.o.s.	151	3282
Organic peroxide type F, solid, temperature controlled	148	3120	Organometallic compound, poisonous, solid, n.o.s.	151	3467
Organic phosphate compound mixed with compressed gas	123	1955	Organometallic compound, solid, poisonous, n.o.s.	151	3467
Organic phosphate mixed with compressed gas	123	1955	Organometallic compound, solid, toxic, n.o.s.	151	3467
Organic phosphorus compound mixed with compressed gas	123	1955			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Organometallic compound, toxic, liquid, n.o.s.	151	3282	Organophosphorus compound, liquid, toxic, n.o.s.	151	3278
Organometallic compound, toxic, n.o.s.	151	3282	Organophosphorus compound, poisonous, flammable, n.o.s.	131	3279
Organometallic compound, toxic, solid, n.o.s.	151	3467	Organophosphorus compound, poisonous, liquid, n.o.s.	151	3278
Organometallic compound, water-reactive, flammable, n.o.s.	138	3207	Organophosphorus compound, poisonous, n.o.s.	151	3278
Organometallic compound dispersion, water-reactive, flammable, n.o.s.	138	3207	Organophosphorus compound, poisonous, solid, n.o.s.	151	3464
Organometallic compound solution, water-reactive, flammable, n.o.s.	138	3207	Organophosphorus compound, solid, poisonous, n.o.s.	151	3464
Organometallic substance, liquid, pyrophoric	135	3392	Organophosphorus compound, solid, toxic, n.o.s.	151	3464
Organometallic substance, liquid, pyrophoric, water-reactive	135	3394	Organophosphorus compound, toxic, flammable, n.o.s.	131	3279
Organometallic substance, liquid, water-reactive	135	3398	Organophosphorus compound, toxic, liquid, n.o.s.	151	3278
Organometallic substance, liquid, water-reactive, flammable	138	3399	Organophosphorus compound, toxic, n.o.s.	151	3278
Organometallic substance, solid, pyrophoric	135	3391	Organophosphorus compound, toxic, solid, n.o.s.	151	3464
Organometallic substance, solid, pyrophoric, water-reactive	135	3393	Organophosphorus pesticide, liquid, flammable, poisonous	131	2784
Organometallic substance, solid, self-heating	138	3400	Organophosphorus pesticide, liquid, flammable, toxic	131	2784
Organometallic substance, solid, water-reactive	135	3395	Organophosphorus pesticide, liquid, poisonous, flammable	152	3018
Organometallic substance, solid, water-reactive, flammable	138	3396	Organophosphorus pesticide, liquid, toxic	131	3017
Organometallic substance, solid, water-reactive, self-heating	138	3397	Organophosphorus pesticide, liquid, toxic, flammable	152	3018
Organophosphorus compound, liquid, poisonous, n.o.s.	151	3278	Organophosphorus pesticide, solid, poisonous	131	3017
			Organophosphorus pesticide, solid, toxic	152	2783
			Organophosphorus pesticide, solid, toxic	152	2783

<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>
Organotin compound, liquid, n.o.s.	153	2788	Oxidizing solid, self-heating, n.o.s.	135	3100
Organotin compound, solid, n.o.s.	153	3146	Oxidizing solid, toxic, n.o.s.	141	3087
Organotin pesticide, liquid, flammable, poisonous	131	2787	Oxidizing solid, water-reactive, n.o.s.	144	3121
Organotin pesticide, liquid, flammable, toxic	131	2787	Oxygen	122	1072
Organotin pesticide, liquid, poisonous	153	3020	Oxygen, compressed	122	1072
Organotin pesticide, liquid, poisonous, flammable	131	3019	Oxygen, refrigerated liquid (cryogenic liquid)	122	1073
Organotin pesticide, liquid, toxic	153	3020	Oxygen and Carbon dioxide mixture, compressed	122	1014
Organotin pesticide, liquid, toxic, flammable	131	3019	Oxygen and Rare gases mixture, compressed	121	1980
Organotin pesticide, solid, poisonous	153	2786	Oxygen difluoride	124	2190
Organotin pesticide, solid, toxic	153	2786	Oxygen difluoride, compressed	124	2190
Osmium tetroxide	154	2471	Oxygen generator, chemical	140	3356
Other regulated substances, liquid, n.o.s.	171	3082	Oxygen generator, chemical, spent	140	3356
Other regulated substances, solid, n.o.s.	171	3077	Packaging discarded, empty, uncleaned	171	3509
Oxidizing liquid, corrosive, n.o.s.	140	3098	Paint (corrosive)	153	3066
Oxidizing liquid, n.o.s.	140	3139	Paint, corrosive, flammable	132	3470
Oxidizing liquid, poisonous, n.o.s.	142	3099	Paint (flammable)	128	1263
Oxidizing liquid, toxic, n.o.s.	142	3099	Paint, flammable, corrosive	132	3469
Oxidizing solid, corrosive, n.o.s.	140	3085	Paint related material (corrosive)	153	3066
Oxidizing solid, flammable, n.o.s.	140	3137	Paint related material, corrosive, flammable	132	3470
Oxidizing solid, n.o.s.	140	1479	Paint related material (flammable)	128	1263
Oxidizing solid, poisonous, n.o.s.	141	3087	Paint related material, flammable, corrosive	132	3469
			Paper, unsaturated oil treated	133	1379
			Paraformaldehyde	133	2213
			Paraldehyde	129	1264

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Parathion and compressed gas mixture	123	1967	Perchloryl fluoride	124	3083
PCB	171	2315	Perfluoro(ethyl vinyl ether)	115	3154
PD	152	1556	Perfluoro(methyl vinyl ether)	115	3153
Pentaborane	135	1380	Perfumery products, with flammable solvents	127	1266
Pentachloroethane	151	1669	Permanganates, inorganic, aqueous solution, n.o.s.	140	3214
Pentachlorophenol	154	3155	Permanganates, inorganic, n.o.s.	140	1482
Pentaerythrite tetranitrate mixture, desensitized, solid, n.o.s., with more than 10% but not more than 20% PETN	113	3344	Peroxides, inorganic, n.o.s.	140	1483
Pentaerythritol tetranitrate mixture, desensitized, solid, n.o.s., with more than 10% but not more than 20% PETN	113	3344	Peroxyacetic acid and hydrogen peroxide mixture, with acid(s), water and not more than 5% Peroxyacetic acid, stabilized	140	3149
Pentafluoroethane	126	3220	Persulfates, inorganic, aqueous solution, n.o.s.	140	3216
Pentafluoroethane and Ethylene oxide mixture, with not more than 7.9% Ethylene oxide	126	3298	Persulfates, inorganic, n.o.s.	140	3215
Pentamethylheptane	128	2286	Persulphates, inorganic, aqueous solution, n.o.s.	140	3216
Pentane-2,4-dione	131	2310	Persulphates, inorganic, n.o.s.	140	3215
Pentanes	128	1265	Pesticide, liquid, flammable, poisonous, n.o.s.	131	3021
Pentanol	129	1105	Pesticide, liquid, flammable, toxic, n.o.s.	131	3021
1-Pentene	128	1108	Pesticide, liquid, poisonous, flammable, n.o.s.	131	2903
1-Pentol	153P	2705	Pesticide, liquid, poisonous, n.o.s.	151	2902
Perchlorates, inorganic, aqueous solution, n.o.s.	140	3211	Pesticide, liquid, toxic, flammable, n.o.s.	131	2903
Perchlorates, inorganic, n.o.s.	140	1481	Pesticide, liquid, toxic, n.o.s.	151	2902
Perchloric acid, with more than 50% but not more than 72% acid	143	1873	Pesticide, solid, poisonous, n.o.s.	151	2588
Perchloric acid, with not more than 50% acid	140	1802	Pesticide, solid, toxic, n.o.s.	151	2588
Perchloroethylene	160	1897	PETN mixture, desensitized, solid, n.o.s., with more than 10% but not more than 20% PETN	113	3344
Perchloromethyl mercaptan	157	1670			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Petrol	128	1203	Phenoxyacetic acid derivative pesticide, solid, poisonous	153	3345
Petrol and ethanol mixture, with more than 10% ethanol	127	3475	Phenoxyacetic acid derivative pesticide, solid, toxic	153	3345
Petroleum crude oil	128	1267	Phenylacetonitrile, liquid	152	2470
Petroleum distillates, n.o.s.	128	1268	Phenylacetyl chloride	156	2577
Petroleum gases, liquefied	115	1075	Phenylcarbylamine chloride	151	1672
Petroleum oil	128	1270	Phenyl chloroformate	156	2746
Petroleum products, n.o.s.	128	1268	Phenylenediamines	153	1673
Petroleum sour crude oil, flammable, poisonous	131	3494	Phenylhydrazine	153	2572
Petroleum sour crude oil, flammable, toxic	131	3494	Phenyl isocyanate	155	2487
Phenacyl bromide	153	2645	Phenyl mercaptan	131	2337
Phenetidines	153	2311	Phenylmercuric acetate	151	1674
Phenol, molten	153	2312	Phenylmercuric compound, n.o.s.	151	2026
Phenol, solid	153	1671	Phenylmercuric hydroxide	151	1894
Phenol solution	153	2821	Phenylmercuric nitrate	151	1895
Phenolates, liquid	154	2904	Phenylphosphorus dichloride	137	2798
Phenolates, solid	154	2905	Phenylphosphorus thiodichloride	137	2799
Phenolsulfonic acid, liquid	153	1803	Phenyltrichlorosilane	156	1804
Phenolsulphonic acid, liquid	153	1803	Phenyl urea pesticide, liquid, poisonous	151	3002
Phenoxyacetic acid derivative pesticide, liquid, flammable, poisonous	131	3346	Phenyl urea pesticide, liquid, toxic	151	3002
Phenoxyacetic acid derivative pesticide, liquid, flammable, toxic	131	3346	Phosgene	125	1076
Phenoxyacetic acid derivative pesticide, liquid, poisonous	153	3348	9-Phosphabicyclononanes	135	2940
Phenoxyacetic acid derivative pesticide, liquid, poisonous, flammable	131	3347	Phosphine	119	2199
Phenoxyacetic acid derivative pesticide, liquid, toxic	153	3348	Phosphine, adsorbed	173	3525
Phenoxyacetic acid derivative pesticide, liquid, toxic, flammable	131	3347	Phosphoric acid, liquid	154	1805
			Phosphoric acid, solid	154	1805
			Phosphoric acid, solid	154	3453
			Phosphoric acid, solution	154	1805
			Phosphorous acid	154	2834

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Phosphorus, amorphous	133	1338	Phosphorus trioxide	157	2578
Phosphorus, white, dry or under water or in solution	136	1381	Phosphorus trisulfide, free from yellow and white Phosphorus	139	1343
Phosphorus, white, molten	136	2447	Phosphorus trisulphide, free from yellow and white Phosphorus	139	1343
Phosphorus, yellow, dry or under water or in solution	136	1381	Phthalic anhydride	156	2214
Phosphorus heptasulfide, free from yellow and white Phosphorus	139	1339	Picolines	129	2313
Phosphorus heptasulphide, free from yellow and white Phosphorus	139	1339	Picric acid, wetted with not less than 10% water	113	3364
Phosphorus oxybromide	137	1939	Picric acid, wetted with not less than 30% water	113	1344
Phosphorus oxybromide, molten	137	2576	Picrite, wetted with not less than 20% water	113	1336
Phosphorus oxybromide, solid	137	1939	Picryl chloride, wetted with not less than 10% water	113	3365
Phosphorus oxychloride	137	1810	alpha-Pinene	128	2368
Phosphorus pentabromide	137	2691	Pinene (alpha)	128	2368
Phosphorus pentachloride	137	1806	Pine oil	129	1272
Phosphorus pentafluoride	125	2198	Piperazine	153	2579
Phosphorus pentafluoride, adsorbed	173	3524	Piperidine	132	2401
Phosphorus pentafluoride, compressed	125	2198	Plastic molding compound	171	3314
Phosphorus pentasulfide, free from yellow and white Phosphorus	139	1340	Plastics moulding compound	171	3314
Phosphorus pentasulphide, free from yellow and white Phosphorus	139	1340	Plastics, nitrocellulose-based, self-heating, n.o.s.	135	2006
Phosphorus pentoxide	137	1807	Poisonous by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone A)	131	3492
Phosphorus sesquisulfide, free from yellow and white Phosphorus	139	1341	Poisonous by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone B)	131	3493
Phosphorus sesquisulphide, free from yellow and white Phosphorus	139	1341	Poisonous by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone A)	154	3389
Phosphorus tribromide	137	1808	Poisonous by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone B)	154	3390
Phosphorus trichloride	137	1809			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Poisonous by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	131	3488	Poisonous liquid, inorganic, n.o.s.	151	3287
Poisonous by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	131	3489	Poisonous liquid, organic, n.o.s.	153	2810
Poisonous by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone A)	131	3383	Poisonous liquid, oxidizing, n.o.s.	142	3122
Poisonous by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone B)	131	3384	Poisonous liquid, water-reactive, n.o.s.	139	3123
Poisonous by inhalation liquid, n.o.s. (Inhalation Hazard Zone A)	151	3381	Poisonous solid, corrosive, inorganic, n.o.s.	154	3290
Poisonous by inhalation liquid, n.o.s. (Inhalation Hazard Zone B)	151	3382	Poisonous solid, corrosive, organic, n.o.s.	154	2928
Poisonous by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone A)	142	3387	Poisonous solid, flammable, organic, n.o.s.	134	2930
Poisonous by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone B)	142	3388	Poisonous solid, inorganic, n.o.s.	151	3288
Poisonous by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone A)	155	3490	Poisonous solid, organic, n.o.s.	154	2811
Poisonous by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone B)	155	3491	Poisonous solid, oxidizing, n.o.s.	141	3086
Poisonous by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone A)	139	3385	Poisonous solid, self-heating, n.o.s.	136	3124
Poisonous by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone B)	139	3386	Poisonous solid, water-reactive, n.o.s.	139	3125
Poisonous liquid, corrosive, inorganic, n.o.s.	154	3289	Polyalkylamines, n.o.s.	132	2733
Poisonous liquid, corrosive, organic, n.o.s.	154	2927	Polyalkylamines, n.o.s.	132	2734
Poisonous liquid, flammable, organic, n.o.s.	131	2929	Polyalkylamines, n.o.s.	153	2735
			Polyamines, flammable, corrosive, n.o.s.	132	2733
			Polyamines, liquid, corrosive, flammable, n.o.s.	132	2734
			Polyamines, liquid, corrosive, n.o.s.	153	2735
			Polyamines, solid, corrosive, n.o.s.	154	3259
			Polychlorinated biphenyls	171	2315
			Polychlorinated biphenyls, liquid	171	2315



Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Polychlorinated biphenyls, solid	171	3432	Potassium chlorate, aqueous solution	140	2427
Polyester resin kit	128	3269	Potassium cuprocyanide	157	1679
Polyester resin kit, liquid base material	128	3269	Potassium cyanide	157	1680
Polyester resin kit, solid base material	128P	3527	Potassium cyanide, solid	157	1680
Polyhalogenated biphenyls, liquid	171	3151	Potassium cyanide, solution	157	3413
Polyhalogenated biphenyls, solid	171	3152	Potassium dithionite	135	1929
Polyhalogenated terphenyls, liquid	171	3151	Potassium fluoride	154	1812
Polyhalogenated terphenyls, solid	171	3152	Potassium fluoride, solid	154	1812
Polyhalogenated terphenyls, liquid	171	3151	Potassium fluoride, solution	154	3422
Polyhalogenated terphenyls, solid	171	3152	Potassium fluoroacetate	151	2628
Polymeric beads, expandable	133	2211	Potassium fluorosilicate	151	2655
Polymerizing substance, liquid, stabilized, n.o.s.	149P	3532	Potassium hydrogendifluoride	154	1811
Polymerizing substance, liquid, temperature controlled, n.o.s.	150P	3534	Potassium hydrogen difluoride, solid	154	1811
Polymerizing substance, solid, stabilized, n.o.s.	149P	3531	Potassium hydrogen difluoride, solution	154	3421
Polymerizing substance, solid, temperature controlled, n.o.s.	150P	3533	Potassium hydrogen sulfate	154	2509
Polystyrene beads, expandable	133	2211	Potassium hydrogen sulphate	154	2509
Potassium	138	2257	Potassium hydrosulfite	135	1929
Potassium, metal	138	2257	Potassium hydrosulphite	135	1929
Potassium, metal alloys	138	1420	Potassium hydroxide, solid	154	1813
Potassium, metal alloys, liquid	138	1420	Potassium hydroxide, solution	154	1814
Potassium, metal alloys, solid	138	3403	Potassium metavanadate	151	2864
Potassium arsenate	151	1677	Potassium monoxide	154	2033
Potassium arsenite	154	1678	Potassium nitrate	140	1486
Potassium borohydride	138	1870	Potassium nitrate and Sodium nitrate mixture	140	1499
Potassium bromate	140	1484	Potassium nitrate and Sodium nitrite mixture	140	1487
Potassium chlorate	140	1485	Potassium nitrite	140	1488
			Potassium perchlorate	140	1489
			Potassium permanganate	140	1490
			Potassium peroxide	144	1491

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Potassium persulfate	140	1492	Propionic acid	132	1848
Potassium persulphate	140	1492	Propionic acid, with not less than 10% and less than 90% acid	132	1848
Potassium phosphide	139	2012	Propionic acid, with not less than 90% acid	132	3463
Potassium silicofluoride	151	2655	Propionic anhydride	156	2496
Potassium sodium alloys	138	1422	Propionitrile	131	2404
Potassium sodium alloys, liquid	138	1422	Propionyl chloride	132	1815
Potassium sodium alloys, solid	138	3404	n-Propyl acetate	129	1276
Potassium sulfide, anhydrous	135	1382	Propyl alcohol, normal	129	1274
Potassium sulfide, hydrated, with not less than 30% water of crystallization	153	1847	Propylamine	132	1277
Potassium sulfide, with less than 30% water of crystallization	135	1382	n-Propyl benzene	128	2364
Potassium sulphide, anhydrous	135	1382	Propyl chloride	129	1278
Potassium sulphide, hydrated, with not less than 30% water of crystallization	153	1847	n-Propyl chloroformate	155	2740
Potassium sulphide, with less than 30% water of crystallization	135	1382	Propylene	115	1075
Potassium superoxide	143	2466	Propylene	115	1077
Printing ink, flammable	129	1210	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
Printing ink related material	129	1210	Propylene chlorohydrin	131	2611
Propadiene, stabilized	116P	2200	1,2-Propylenediamine	132	2258
Propadiene and Methylacetylene mixture, stabilized	116P	1060	Propyleneimine, stabilized	131P	1921
Propane	115	1075	Propylene oxide	127P	1280
Propane	115	1978	Propylene oxide and Ethylene oxide mixture, with not more than 30% Ethylene oxide	129P	2983
Propane-Ethane mixture, refrigerated liquid	115	1961	Propylene tetramer	128	2850
Propanethiols	130	2402	Propyl formates	129	1281
n-Propanol	129	1274	n-Propyl isocyanate	155	2482
Propionaldehyde	129	1275	n-Propyl nitrate	131	1865
			Propyltrichlorosilane	155	1816

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Pyrethroid pesticide, liquid, flammable, poisonous	131	3350	Radioactive material, excepted package, articles manufactured from natural Thorium	161	2909
Pyrethroid pesticide, liquid, flammable, toxic	131	3350	Radioactive material, excepted package, articles manufactured from natural Uranium	161	2909
Pyrethroid pesticide, liquid, poisonous	151	3352	Radioactive material, excepted package, empty packaging	161	2908
Pyrethroid pesticide, liquid, poisonous, flammable	131	3351	Radioactive material, excepted package, instruments or articles	161	2911
Pyrethroid pesticide, liquid, toxic	151	3352	Radioactive material, low specific activity (LSA-I), non fissile or fissile-excepted	162	2912
Pyrethroid pesticide, liquid, toxic, flammable	131	3351	Radioactive material, low specific activity (LSA-II), fissile	165	3324
Pyrethroid pesticide, solid, poisonous	151	3349	Radioactive material, low specific activity (LSA-II), non fissile or fissile-excepted	162	3321
Pyrethroid pesticide, solid, toxic	151	3349	Radioactive material, low specific activity (LSA-III), fissile	165	3325
Pyridine	129	1282	Radioactive material, low specific activity (LSA-III), non fissile or fissile-excepted	162	3322
Pyrophoric alloy, n.o.s.	135	1383	Radioactive material, surface contaminated objects (SCO-I), fissile	165	3326
Pyrophoric liquid, inorganic, n.o.s.	135	3194	Radioactive material, surface contaminated objects (SCO-I), non fissile or fissile-excepted	162	2913
Pyrophoric liquid, organic, n.o.s.	135	2845	Radioactive material, surface contaminated objects (SCO-I), non fissile or fissile-excepted	165	3326
Pyrophoric metal, n.o.s.	135	1383	Radioactive material, surface contaminated objects (SCO-II), fissile	165	3326
Pyrophoric organometallic compound, water-reactive, n.o.s.	135	3203			
Pyrophoric solid, inorganic, n.o.s.	135	3200			
Pyrophoric solid, organic, n.o.s.	135	2846			
Pyrosulfuryl chloride	137	1817			
Pyrosulphuryl chloride	137	1817			
Pyrrolidine	132	1922			
Quinoline	154	2656			
Radioactive material, excepted package, articles manufactured from depleted Uranium	161	2909			

<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>
Radioactive material, surface contaminated objects (SCO-II), non fissile or fissile-excepted	<b>162</b>	2913	Rags, oily	<b>133</b>	1856
Radioactive material, transported under special arrangement, fissile	<b>165</b>	3331	Rare gases and Nitrogen mixture, compressed	<b>121</b>	1981
Radioactive material, transported under special arrangement, non fissile or fissile-excepted	<b>163</b>	2919	Rare gases and Oxygen mixture, compressed	<b>121</b>	1980
Radioactive material, Type A package, fissile, non-special form	<b>165</b>	3327	Rare gases mixture, compressed	<b>121</b>	1979
Radioactive material, Type A package, non-special form, non fissile or fissile-excepted	<b>163</b>	2915	Receptacles, small, containing gas	<b>115</b>	2037
Radioactive material, Type A package, special form, fissile	<b>165</b>	3333	Red phosphorus	<b>133</b>	1338
Radioactive material, Type A package, special form, non fissile or fissile-excepted	<b>164</b>	3332	Refrigerant gas, n.o.s.	<b>126</b>	1078
Radioactive material, Type B(M) package, fissile	<b>165</b>	3329	Refrigerant gases, n.o.s. (flammable)	<b>115</b>	1954
Radioactive material, Type B(M) package, non fissile or fissile-excepted	<b>163</b>	2917	Refrigerant gas R-12	<b>126</b>	1028
Radioactive material, Type B(U) package, fissile	<b>165</b>	3328	Refrigerant gas R-12B1	<b>126</b>	1974
Radioactive material, Type B(U) package, non fissile or fissile-excepted	<b>163</b>	2916	Refrigerant gas R-12B2	<b>171</b>	1941
Radioactive material, Type C package, fissile	<b>165</b>	3330	Refrigerant gas R-13	<b>126</b>	1022
Radioactive material, Type C package, non fissile or fissile excepted	<b>163</b>	3323	Refrigerant gas R-13B1	<b>126</b>	1009
Radioactive material, Uranium hexafluoride, fissile	<b>166</b>	2977	Refrigerant gas R-14	<b>126</b>	1982
Radioactive material, Uranium hexafluoride, non fissile or fissile-excepted	<b>166</b>	2978	Refrigerant gas R-14, compressed	<b>126</b>	1982
			Refrigerant gas R-21	<b>126</b>	1029
			Refrigerant gas R-22	<b>126</b>	1018
			Refrigerant gas R-23	<b>126</b>	1984
			Refrigerant gas R-32	<b>115</b>	3252
			Refrigerant gas R-40	<b>115</b>	1063
			Refrigerant gas R-41	<b>115</b>	2454
			Refrigerant gas R-114	<b>126</b>	1958
			Refrigerant gas R-115	<b>126</b>	1020
			Refrigerant gas R-116	<b>126</b>	2193
			Refrigerant gas R-116, compressed	<b>126</b>	2193
			Refrigerant gas R-124	<b>126</b>	1021
			Refrigerant gas R-125	<b>126</b>	3220
			Refrigerant gas R-133a	<b>126</b>	1983

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Refrigerant gas R-134a	126	3159	Resin solution	127	1866
Refrigerant gas R-142b	115	2517	Resorcinol	153	2876
Refrigerant gas R-143a	115	2035	Rosin oil	127	1286
Refrigerant gas R-152a	115	1030	Rubber scrap, powdered or granulated	133	1345
Refrigerant gas R-161	115	2453	Rubber shoddy, powdered or granulated	133	1345
Refrigerant gas R-218	126	2424	Rubber solution	127	1287
Refrigerant gas R-227	126	3296	Rubidium	138	1423
Refrigerant gas R-404A	126	3337	Rubidium hydroxide	154	2678
Refrigerant gas R-407A	126	3338	Rubidium hydroxide, solid	154	2678
Refrigerant gas R-407B	126	3339	Rubidium hydroxide, solution	154	2677
Refrigerant gas R-407C	126	3340	Rubidium metal	138	1423
Refrigerant gas R-500	126	2602	SA	119	2188
Refrigerant gas R-502	126	1973	Safety devices	171	3268
Refrigerant gas R-503	126	2599	Sarin	153	2810
Refrigerant gas R-1113	119P	1082	Seat-belt pre-tensioners	171	3268
Refrigerant gas R-1132a	116P	1959	Seed cake, with more than 1.5% oil and not more than 11% moisture	135	1386
Refrigerant gas R-1216	126	1858	Seed cake, with not more than 1.5% oil and not more than 11% moisture	135	2217
Refrigerant gas R-1318	126	2422	Selenates	151	2630
Refrigerant gas RC-318	126	1976	Selenic acid	154	1905
Refrigerating machines, containing Ammonia solutions (UN2672)	126	2857	Selenites	151	2630
Refrigerating machines, containing flammable, non-poisonous, liquefied gas	115	3358	Selenium compound, liquid, n.o.s.	151	3440
Refrigerating machines, containing flammable, non-toxic, liquefied gas	115	3358	Selenium compound, n.o.s.	151	3283
Refrigerating machines, containing non-flammable, non-poisonous gases	126	2857	Selenium compound, solid, n.o.s.	151	3283
Refrigerating machines, containing non-flammable, non-toxic gases	126	2857	Selenium disulfide	153	2657
Regulated medical waste, n.o.s.	158	3291	Selenium disulphide	153	2657
			Selenium hexafluoride	125	2194
			Selenium oxychloride	157	2879

<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>
Self-defense spray, non-pressurized	171	3334	Self-reactive liquid type C, temperature controlled	150	3233
Self-heating liquid, corrosive, inorganic, n.o.s.	136	3188	Self-reactive liquid type D	149	3225
Self-heating liquid, corrosive, organic, n.o.s.	136	3185	Self-reactive liquid type D, temperature controlled	150	3235
Self-heating liquid, inorganic, n.o.s.	135	3186	Self-reactive liquid type E	149	3227
Self-heating liquid, organic, n.o.s.	135	3183	Self-reactive liquid type E, temperature controlled	150	3237
Self-heating liquid, poisonous, inorganic, n.o.s.	136	3187	Self-reactive liquid type F	149	3229
Self-heating liquid, poisonous, organic, n.o.s.	136	3184	Self-reactive liquid type F, temperature controlled	150	3239
Self-heating liquid, toxic, inorganic, n.o.s.	136	3187	Self-reactive solid type B	149	3222
Self-heating liquid, toxic, organic, n.o.s.	136	3184	Self-reactive solid type B, temperature controlled	150	3232
Self-heating solid, corrosive, inorganic, n.o.s.	136	3192	Self-reactive solid type C	149	3224
Self-heating solid, corrosive, organic, n.o.s.	136	3126	Self-reactive solid type C, temperature controlled	150	3234
Self-heating solid, inorganic, n.o.s.	135	3190	Self-reactive solid type D	149	3226
Self-heating solid, organic, n.o.s.	135	3088	Self-reactive solid type D, temperature controlled	150	3236
Self-heating solid, oxidizing, n.o.s.	135	3127	Self-reactive solid type E	149	3228
Self-heating solid, poisonous, inorganic, n.o.s.	136	3191	Self-reactive solid type E, temperature controlled	150	3238
Self-heating solid, poisonous, organic, n.o.s.	136	3128	Self-reactive solid type F	149	3230
Self-heating solid, toxic, inorganic, n.o.s.	136	3191	Self-reactive solid type F, temperature controlled	150	3240
Self-heating solid, toxic, organic, n.o.s.	136	3128	Shale oil	128	1288
Self-reactive liquid type B	149	3221	Silane	116	2203
Self-reactive liquid type B, temperature controlled	150	3231	Silane, compressed	116	2203
Self-reactive liquid type C	149	3223	Silicofluorides, n.o.s.	151	2856
			Silicon powder, amorphous	170	1346
			Silicon tetrachloride	157	1818
			Silicon tetrafluoride	125	1859
			Silicon tetrafluoride, adsorbed	173	3521
			Silicon tetrafluoride, compressed	125	1859

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
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	157	1689
Soda lime, with more than 4% Sodium hydroxide	154	1907	Sodium cyanide, solid	157	1689
Sodium	138	1428	Sodium cyanide, solution	157	3414
Sodium aluminate, solid	154	2812	Sodium dichloroisocyanurate	140	2465
Sodium aluminate, solution	154	1819	Sodium dichloro-s-triazinetriene	140	2465
Sodium aluminum hydride	138	2835	Sodium dinitro-o-cresolate, wetted with not less than 10% water	113	3369
Sodium ammonium vanadate	154	2863	Sodium dinitro-o-cresolate, wetted with not less than 15% water	113	1348
Sodium arsanilate	154	2473	Sodium dithionite	135	1384
Sodium arsenate	151	1685	Sodium fluoride	154	1690
Sodium arsenite, aqueous solution	154	1686	Sodium fluoride, solid	154	1690
Sodium arsenite, solid	151	2027	Sodium fluoride, solution	154	3415
Sodium azide	153	1687	Sodium fluoroacetate	151	2629
Sodium, batteries containing	138	3292	Sodium fluorosilicate	154	2674
Sodium bisulfate, solution	154	2837	Sodium hydride	138	1427
Sodium bisulphate, solution	154	2837	Sodium hydrogendifluoride	154	2439
Sodium borohydride	138	1426	Sodium hydrosulfide, hydrated, with not less than 25% water of crystallization	154	2949
Sodium borohydride and Sodium hydroxide solution, with not more than 12% Sodium borohydride and not more than 40% Sodium hydroxide	157	3320	Sodium hydrosulfide, with less than 25% water of crystallization	135	2318
Sodium bromate	141	1494	Sodium hydrosulfide, with not less than 25% water of crystallization	154	2949
Sodium cacodylate	152	1688	Sodium hydrosulfite	135	1384
Sodium carbonate peroxyhydrate	140	3378			
Sodium chlorate	140	1495			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Sodium hydrosulphide, hydrated, with not less than 25% water of crystallization	154	2949	Sodium potassium alloys	138	1422
Sodium hydrosulphide, with less than 25% water of crystallization	135	2318	Sodium potassium alloys, liquid	138	1422
Sodium hydrosulphide, with not less than 25% water of crystallization	154	2949	Sodium potassium alloys, solid	138	3404
<b>Sodium hydrosulphite</b>	<b>135</b>	<b>1384</b>	Sodium silicofluoride	154	2674
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	138	1431	Sodium sulphide, anhydrous	135	1385
Sodium methylate, dry	138	1431	Sodium sulphide, hydrated, with not less than 30% water	153	1849
Sodium methylate, solution in alcohol	132	1289	Sodium sulphide, with less than 30% water of crystallization	135	1385
Sodium monoxide	157	1825	Sodium superoxide	143	2547
Sodium nitrate	140	1498	Solids containing corrosive liquid, n.o.s.	154	3244
Sodium nitrate and Potassium nitrate mixture	140	1499	Solids containing flammable liquid, n.o.s.	133	3175
Sodium nitrite	140	1500	Solids containing poisonous liquid, n.o.s.	151	3243
Sodium nitrite and Potassium nitrate mixture	140	1487	Solids containing toxic liquid, n.o.s.	151	3243
Sodium pentachlorophenate	154	2567	<b>Soman</b>	<b>153</b>	<b>2810</b>
Sodium perborate monohydrate	140	3377	Stannic chloride, anhydrous	137	1827
Sodium perchlorate	140	1502	Stannic chloride, pentahydrate	154	2440
Sodium permanganate	140	1503	Stannic phosphides	139	1433
Sodium peroxide	144	1504	<b>Stibine</b>	<b>119</b>	<b>2676</b>
Sodium peroxoborate, anhydrous	140	3247	Straw, wet, damp or contaminated with oil	133	1327
Sodium persulfate	140	1505	Strontium arsenite	151	1691
Sodium persulphate	140	1505	Strontium chlorate	143	1506
<b>Sodium phosphide</b>	<b>139</b>	<b>1432</b>	Strontium nitrate	140	1507
Sodium picramate, wetted with not less than 20% water	113	1349	Strontium perchlorate	140	1508



Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Strontium peroxide	143	1509	Sulfuric acid, fuming, with not less than 30% free Sulfur trioxide	137	1831
Strontium phosphide	139	2013	Sulfuric acid, spent	137	1832
Strychnine	151	1692	Sulfuric acid, with more than 51% acid	137	1830
Strychnine salts	151	1692	Sulfuric acid, with not more than 51% acid	157	2796
Styrene monomer, stabilized	128P	2055	Sulfuric acid and Hydrofluoric acid mixture	157	1786
Substituted nitrophenol pesticide, liquid, flammable, poisonous	131	2780	Sulfurous acid	154	1833
Substituted nitrophenol pesticide, liquid, flammable, toxic	131	2780	Sulfur tetrafluoride	125	2418
Substituted nitrophenol pesticide, liquid, poisonous	153	3014	Sulfur trioxide, stabilized	137	1829
Substituted nitrophenol pesticide, liquid, poisonous, flammable	131	3013	Sulfonyl chloride	137	1834
Substituted nitrophenol pesticide, liquid, toxic	153	3014	Sulfonyl fluoride	123	2191
Substituted nitrophenol pesticide, liquid, toxic, flammable	131	3013	Sulphamic acid	154	2967
Substituted nitrophenol pesticide, solid, poisonous	153	2779	Sulphur	133	1350
Substituted nitrophenol pesticide, solid, toxic	153	2779	Sulphur, molten	133	2448
Sulfamic acid	154	2967	Sulphur chlorides	137	1828
Sulfur	133	1350	Sulphur dioxide	125	1079
Sulfur, molten	133	2448	Sulphur hexafluoride	126	1080
Sulfur chlorides	137	1828	Sulphuric acid	137	1830
Sulfur dioxide	125	1079	Sulphuric acid, fuming	137	1831
Sulfur hexafluoride	126	1080	Sulphuric acid, fuming, with less than 30% free Sulphur trioxide	137	1831
Sulfuric acid	137	1830	Sulphuric acid, fuming, with not less than 30% free Sulphur trioxide	137	1831
Sulfuric acid, fuming	137	1831	Sulphuric acid, spent	137	1832
Sulfuric acid, fuming, with less than 30% free Sulfur trioxide	137	1831	Sulphuric acid, with more than 51% acid	137	1830
			Sulphuric acid, with not more than 51% acid	157	2796
			Sulphuric acid and Hydrofluoric acid mixture	157	1786
			Sulphurous acid	154	1833

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Sulphur tetrafluoride	125	2418	Tetrafluoromethane, compressed	126	1982
Sulphur trioxide, stabilized	137	1829	1,2,3,6-Tetrahydrobenzaldehyde	129	2498
Sulphuryl chloride	137	1834	Tetrahydrofuran	127	2056
Sulphuryl fluoride	123	2191	Tetrahydrofurfurylamine	129	2943
Tabun	153	2810	Tetrahydrophthalic anhydrides	156	2698
Tars, liquid	130	1999	1,2,3,6-Tetrahydropyridine	129	2410
Tear gas candles	159	1700	Tetrahydrothiophene	130	2412
Tear gas devices	159	1693	Tetramethylammonium hydroxide	153	1835
Tear gas grenades	159	1700	Tetramethylammonium hydroxide, solid	153	3423
Tear gas substance, liquid, n.o.s.	159	1693	Tetramethylammonium hydroxide, solution	153	1835
Tear gas substance, solid, n.o.s.	159	1693	Tetramethylsilane	130	2749
Tear gas substance, solid, n.o.s.	159	3448	<b>Tetranitromethane</b>	<b>143</b>	<b>1510</b>
Tellurium compound, n.o.s.	151	3284	Tetrapropyl orthotitanate	128	2413
<b>Tellurium hexafluoride</b>	<b>125</b>	<b>2195</b>	Textile waste, wet	133	1857
Terpene hydrocarbons, n.o.s.	128	2319	Thallium chlorate	141	2573
Terpinolene	128	2541	Thallium compound, n.o.s.	151	1707
Tetrabromoethane	159	2504	Thallium nitrate	141	2727
1,1,2,2-Tetrachloroethane	151	1702	4-Thiapentanal	152	2785
Tetrachloroethane	151	1702	<b>Thickened GD</b>	<b>153</b>	<b>2810</b>
Tetrachloroethylene	160	1897	Thioacetic acid	129	2436
Tetraethyl dithiopyrophosphate	153	1704	Thiocarbamate pesticide, liquid, flammable, poisonous	131	2772
Tetraethylenepentamine	153	2320	Thiocarbamate pesticide, liquid, flammable, toxic	131	2772
Tetraethyl silicate	129	1292	Thiocarbamate pesticide, liquid, poisonous	151	3006
1,1,1,2-Tetrafluoroethane	126	3159	Thiocarbamate pesticide, liquid, poisonous, flammable	131	3005
Tetrafluoroethane and Ethylene oxide mixture, with not more than 5.6% Ethylene oxide	126	3299	Thiocarbamate pesticide, liquid, toxic	151	3006
Tetrafluoroethylene, stabilized	116P	1081			
Tetrafluoromethane	126	1982			

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

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Toxic by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone A)	142	3387	Toxic solid, self-heating, n.o.s.	136	3124
Toxic by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone B)	142	3388	Toxic solid, water-reactive, n.o.s.	139	3125
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	3172
Toxic by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone B)	139	3386	Toxins, extracted from living sources, solid, n.o.s.	153	3462
Toxic liquid, corrosive, inorganic, n.o.s.	154	3289	Triallylamine	132	2610
Toxic liquid, corrosive, organic, n.o.s.	154	2927	Triallyl borate	156	2609
Toxic liquid, flammable, organic, n.o.s.	131	2929	Triazine pesticide, liquid, flammable, poisonous	131	2764
Toxic liquid, inorganic, n.o.s.	151	3287	Triazine pesticide, liquid, flammable, toxic	131	2764
Toxic liquid, organic, n.o.s.	153	2810	Triazine pesticide, liquid, poisonous	151	2998
Toxic liquid, oxidizing, n.o.s.	142	3122	Triazine pesticide, liquid, poisonous, flammable	131	2997
Toxic liquid, water-reactive, n.o.s.	139	3123	Triazine pesticide, liquid, toxic	151	2998
Toxic solid, corrosive, inorganic, n.o.s.	154	3290	Triazine pesticide, liquid, toxic, flammable	131	2997
Toxic solid, corrosive, organic, n.o.s.	154	2928	Triazine pesticide, solid, poisonous	151	2763
Toxic solid, flammable, organic, n.o.s.	134	2930	Triazine pesticide, solid, toxic	151	2763
Toxic solid, inorganic, n.o.s.	151	3288	Tributylamine	153	2542
Toxic solid, organic, n.o.s.	154	2811	Tributylphosphane	135	3254
Toxic solid, oxidizing, n.o.s.	141	3086	Trichloroacetic acid	153	1839
			Trichloroacetic acid, solution	153	2564
			<b>Trichloroacetyl chloride</b>	<b>156</b>	<b>2442</b>
			Trichlorobenzenes, liquid	153	2321
			Trichlorobutene	152	2322
			1,1,1-Trichloroethane	160	2831
			Trichloroethylene	160	1710

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Trichloroisocyanuric acid, dry	140	2468	Trimethyl phosphite	130	2329
Trichlorosilane	139	1295	Trinitrobenzene, wetted with not less than 10% water	113	3367
Tricresyl phosphate	151	2574	Trinitrobenzene, wetted with not less than 30% water	113	1354
Triethylamine	132	1296	Trinitrobenzoic acid, wetted with not less than 10% water	113	3368
Triethylenetetramine	153	2259	Trinitrobenzoic acid, wetted with not less than 30% water	113	1355
Triethyl phosphite	130	2323	Trinitrochlorobenzene, wetted with not less than 10% water	113	3365
Trifluoroacetic acid	154	2699	Trinitrophenol, wetted with not less than 10% water	113	3364
Trifluoroacetyl chloride	125	3057	Trinitrophenol, wetted with not less than 30% water	113	1344
Trifluorochloroethylene, stabilized	119P	1082	Trinitrotoluene, wetted with not less than 10% water	113	3366
1,1,1-Trifluoroethane	115	2035	Trinitrotoluene, wetted with not less than 30% water	113	1356
Trifluoromethane	126	1984	Tripopylamine	132	2260
Trifluoromethane, refrigerated liquid	120	3136	Tripopylene	128	2057
Trifluoromethane and Chlorotrifluoromethane azeotropic mixture with approximately 60% Chlorotrifluoromethane	126	2599	Tris-(1-aziridinyl)phosphine oxide, solution	152	2501
2-Trifluoromethylaniline	153	2942	Tungsten hexafluoride	125	2196
3-Trifluoromethylaniline	153	2948	Turpentine	128	1299
Triisobutylene	128	2324	Turpentine substitute	128	1300
Triisopropyl borate	129	2616	Undecane	128	2330
Trimethoxysilane	132	9269	Uranium hexafluoride, radioactive material, excepted package, less than 0.1 kg per package, non-fissile or fissile-excepted	166	3507
Trimethylacetyl chloride	132	2438	Uranium hexafluoride, radioactive material, fissile	166	2977
Trimethylamine, anhydrous	118	1083	Uranium hexafluoride, radioactive material, non fissile or fissile-excepted	166	2978
Trimethylamine, aqueous solution	132	1297	Urea hydrogen peroxide	140	1511
1,3,5-Trimethylbenzene	129	2325	Urea nitrate, wetted with not less than 10% water	113	3370
Trimethyl borate	129	2416			
Trimethylchlorosilane	155	1298			
Trimethylcyclohexylamine	153	2326			
Trimethylhexamethylenediamines	153	2327			
Trimethylhexamethylene diisocyanate	156	2328			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Urea nitrate, wetted with not less than 20% water	113	1357	Water-reactive liquid, corrosive, n.o.s.	138	3129
Valeraldehyde	129	2058	Water-reactive liquid, n.o.s.	138	3148
Valeryl chloride	132	2502	Water-reactive liquid, poisonous, n.o.s.	139	3130
Vanadium compound, n.o.s.	151	3285	Water-reactive liquid, toxic, n.o.s.	139	3130
Vanadium oxytrichloride	137	2443	Water-reactive solid, corrosive, n.o.s.	138	3131
Vanadium pentoxide	151	2862	Water-reactive solid, flammable, n.o.s.	138	3132
Vanadium tetrachloride	137	2444	Water-reactive solid, n.o.s.	138	2813
Vanadium trichloride	157	2475	Water-reactive solid, oxidizing, n.o.s.	138	3133
Vanadyl sulfate	151	2931	Water-reactive solid, n.o.s.	138	2813
Vanadyl sulphate	151	2931	Water-reactive solid, oxidizing, n.o.s.	138	3133
Vehicle, flammable gas powered	115	3166	Water-reactive solid, poisonous, n.o.s.	139	3134
Vehicle, flammable liquid powered	128	3166	Water-reactive solid, self-heating, n.o.s.	138	3135
Vehicle, fuel cell, flammable gas powered	115	3166	Water-reactive solid, toxic, n.o.s.	139	3134
Vehicle, fuel cell, flammable liquid powered	128	3166	Wheelchair, electric, with batteries	154	3171
Vinyl acetate, stabilized	129P	1301	White asbestos	171	2590
Vinyl bromide, stabilized	116P	1085	White phosphorus, dry	136	1381
Vinyl butyrate, stabilized	129P	2838	White phosphorus, in solution	136	1381
Vinyl chloride, stabilized	116P	1086	White phosphorus, molten	136	2447
Vinyl chloroacetate	155	2589	White phosphorus, under water	136	1381
Vinyl ethyl ether, stabilized	127P	1302	Wood preservatives, liquid	129	1306
Vinyl fluoride, stabilized	116P	1860	Wool waste, wet	133	1387
Vinylidene chloride, stabilized	130P	1303	Xanthates	135	3342
Vinyl isobutyl ether, stabilized	127P	1304	Xenon	121	2036
Vinyl methyl ether, stabilized	116P	1087	Xenon, compressed	121	2036
Vinylpyridines, stabilized	131P	3073	Xenon, refrigerated liquid (cryogenic liquid)	120	2591
Vinyltoluenes, stabilized	130P	2618	Xylenes	130	1307
Vinyltrichlorosilane	155P	1305	Xylenols	153	2261
Vinyltrichlorosilane, stabilized	155P	1305			
VX	153	2810			

Name of Material	Guide No.	ID No.	Name of Material	Guide No.	ID No.
Xylenols, liquid	153	3430	Zinc peroxide	143	1516
Xylenols, solid	153	2261	Zinc phosphide	139	1714
Xylidines, liquid	153	1711	Zinc powder	138	1436
Xylidines, solid	153	1711	Zinc residue	138	1435
Xylidines, solid	153	3452	Zinc resinate	133	2714
Xylyl bromide	152	1701	Zinc silicofluoride	151	2855
Xylyl bromide, liquid	152	1701	Zinc skimmings	138	1435
Xylyl bromide, solid	152	3417	Zirconium, dry, coiled wire, finished metal sheets or strip	170	2858
Yellow phosphorus, dry	136	1381	Zirconium, dry, finished sheets, strips or coiled wire	135	2009
Yellow phosphorus, in solution	136	1381	Zirconium hydride	138	1437
Yellow phosphorus, under water	136	1381	Zirconium nitrate	140	2728
Zinc ammonium nitrite	140	1512	Zirconium picramate, wetted with not less than 20% water	113	1517
Zinc arsenate	151	1712	Zirconium powder, dry	135	2008
Zinc arsenate and Zinc arsenite mixture	151	1712	Zirconium powder, wetted with not less than 25% water	170	1358
Zinc arsenite	151	1712	Zirconium scrap	135	1932
Zinc arsenite and Zinc arsenate mixture	151	1712	Zirconium suspended in a flammable liquid	170	1308
Zinc ashes	138	1435	Zirconium suspended in a liquid (flammable)	170	1308
Zinc bromate	140	2469	Zirconium tetrachloride	137	2503
Zinc chlorate	140	1513			
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			





# GUIDES

### 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 may cause pollution.

### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- 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 limited protection in fire situations ONLY; it may not be effective in spill situations.

#### EVACUATION

##### 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.
- Move containers from fire area if you can do it without risk.

**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 in 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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.

### 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- Isolate spill or leak area immediately for at least 500 meters (1/3 mile) in all directions.
- 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.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

#### EVACUATION

##### 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 document and/or the ERAP Program Section (page 391).

**\* 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 hose holders 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 in 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.

### 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, swallowed or absorbed through skin.
- 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 pollution.

### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- Isolate spill or leak area immediately for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

#### EVACUATION

##### 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 document and/or the ERAP Program Section (page 391).

## 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 hose holders 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 in 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 flooding quantities 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

- MAY EXPLODE AND THROW FRAGMENTS 500 METERS (1/3 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- Isolate spill or leak area immediately for at least 100 meters (330 feet) in all directions.
- 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.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

### EVACUATION

#### 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 500 meters (1/3 mile) in all directions**; also initiate evacuation including emergency responders for 500 meters (1/3 mile) in all directions.



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

**\* 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 500 meters (1/3 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 hose holders 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 in 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.

## SUPPLEMENTAL INFORMATION

- 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.
- 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. Fight fire with normal precautions from a reasonable distance.

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

## 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) and Methane (UN1971) 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).

### PROTECTIVE CLOTHING

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

### EVACUATION

#### 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 368)



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

EMERGENCY RESPONSE

**FIRE**

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

**CAUTION:** Hydrogen (UN1049), Deuterium (UN1957) and Hydrogen, refrigerated liquid (UN1966) burn with an invisible flame. Hydrogen and Methane mixture, compressed (UN2034) may burn with an invisible flame.

**Small Fire**

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

**Large Fire**

- Water spray or fog.
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders 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 in 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.
- 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.
- 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

### EVACUATION

#### 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 document 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 or CO<sub>2</sub>.

**Large Fire**

- Water spray or fog.
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders 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 in 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.

## 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 may cause pollution.

## 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.
- 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

## PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

## EVACUATION

## 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 document 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.
- Move containers from fire area if you can do it without risk.
- Damaged cylinders should be handled only by specialists.

**Fire involving Tanks**

- Fight fire from maximum distance or use unmanned hose holders 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 in immediate area).
- All equipment used when handling the product must be grounded.
- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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 may cause pollution.

**PUBLIC SAFETY**

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

**PROTECTIVE CLOTHING**

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

**EVACUATION****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 document 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 or CO<sub>2</sub>.

**Large Fire**

- Water spray, fog or regular foam.
- Move containers from fire area if you can do it without risk.
- Damaged cylinders should be handled only by specialists.

**Fire involving Tanks**

- Fight fire from maximum distance or use unmanned hose holders 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 in immediate area).
- All equipment used when handling the product must be grounded.
- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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.**
- 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 may cause pollution.

## FIRE OR EXPLOSION

- Flammable; may be ignited by heat, sparks or flames.
- May form explosive mixtures with 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

## PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

## EVACUATION

## Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

## 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 document 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 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.
- Move containers from fire area if you can do it without risk.
- Damaged cylinders should be handled only by specialists.

## Fire involving Tanks

- Fight fire from maximum distance or use unmanned hose holders 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 in immediate area).
- All equipment used when handling the product must be grounded.
- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air. • Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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

#### 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

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

#### EVACUATION

##### 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.
- Move containers from fire area if you can do it without risk.
- Damaged cylinders should be handled only by specialists.

**Fire involving Tanks**

- Fight fire from maximum distance or use unmanned hose holders 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.

### POTENTIAL HAZARDS

#### HEALTH

- Vapors may cause dizziness or asphyxiation without warning.
- Vapors from liquefied gas are initially heavier than air and spread along ground.

#### FIRE OR EXPLOSION

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

### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

#### EVACUATION

##### 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.
- Move containers from fire area if you can do it without risk.
- Damaged cylinders should be handled only by specialists.

**Fire involving Tanks**

- Fight fire from maximum distance or use unmanned hose holders 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.

**FIRST AID**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Keep victim calm and warm.

### 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

#### EVACUATION

##### 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 document and/or the ERAP Program Section (page 391).



## 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.
- Move containers from fire area if you can do it without risk.
- Damaged cylinders should be handled only by specialists.

**Fire involving Tanks**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.
- 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 may cause pollution.

#### 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).

## 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.
- Move containers from fire area if you can do it without risk.
- Damaged cylinders should be handled only by specialists.

**Fire involving Tanks**

- Fight fire from maximum distance or use unmanned hose holders 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

- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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 may cause pollution.

#### 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### 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 document and/or the ERAP Program Section (page 391).

## 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.
- Move containers from fire area if you can do it without risk.
- Damaged cylinders should be handled only by specialists.

## Fire involving Tanks

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

## SPILL OR LEAK

- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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 may cause pollution.

#### 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).

## EMERGENCY RESPONSE

## FIRE

**Small Fire**

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

**Large Fire**

- Water spray, fog or regular foam.
- Move containers from fire area if you can do it without risk.
- 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 hose holders 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

- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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 contact with Hydrogen fluoride, anhydrous (UN1052),** flush with large amounts of water. For skin contact, if calcium gluconate gel is available, rinse 5 minutes, then apply gel. Otherwise, continue rinsing until medical treatment is available. For eyes, flush with water or a saline solution for 15 minutes.
- Keep victim calm and warm.
- Keep victim under observation.
- Effects of contact or inhalation may be delayed.

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- Some may burn but none ignite readily.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

#### 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing will only provide limited protection.

#### EVACUATION

##### 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.
- Move containers from fire area if you can do it without risk.
- Damaged cylinders should be handled only by specialists.

**Fire involving Tanks**

- Fight fire from maximum distance or use unmanned hose holders 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.

### 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 ground and collect in low or confined areas (sewers, basements, tanks).
- 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 are lighter than 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 suffocation.
- Runoff from fire control may cause pollution.

#### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

#### EVACUATION

##### 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 document and/or the ERAP Program Section (page 391).

## EMERGENCY RESPONSE

## FIRE

**CAUTION:** All 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.

**Small Fire**

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

**Large Fire**

- Water spray, fog or alcohol-resistant foam.
- **Do not use straight streams.**
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders 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 in 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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 ground and collect in low or confined areas (sewers, basements, tanks).
- 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 are lighter than 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

- 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 suffocation.
- Runoff from fire control or dilution water may cause pollution.

#### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

#### EVACUATION

##### 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 document and/or the ERAP Program Section (page 391).

## EMERGENCY RESPONSE

## FIRE

**CAUTION:** All 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.
- **Do not use straight streams.**
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders 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 in 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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 ground and collect in low or confined areas (sewers, basements, tanks).
- 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 are lighter than 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 suffocation.
- Runoff from fire control or dilution water may cause pollution.

## PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

### EVACUATION

#### 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 document and/or the ERAP Program Section (page 391).

## EMERGENCY RESPONSE

## FIRE

**CAUTION:** All 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.
- **Do not use straight streams.**
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders 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 in 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.

### 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 ground and collect in low or confined areas (sewers, basements, tanks).
- 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 are lighter than 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 suffocation.
- Runoff from fire control or dilution water may cause pollution.

#### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

#### EVACUATION

##### 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 document and/or the ERAP Program Section (page 391).



## EMERGENCY RESPONSE

## FIRE

**CAUTION:** All 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.
- **Do not use straight streams.**
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders 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 in 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.

### 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 suffocation.
- Runoff from fire control or dilution water may cause pollution.

#### 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 ground and collect in low or confined areas (sewers, basements, tanks).
- 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 are lighter than water.

### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).

## EMERGENCY RESPONSE

### FIRE

**CAUTION: All 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.

#### Large Fire

- Water spray, fog or alcohol-resistant foam.
- Move containers from fire area if you can do it without risk.
- Dike fire-control water for later disposal; do not scatter the material.
- Use water spray or fog; do not use straight streams.

#### Fire involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

### SPILL OR LEAK

- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air. • Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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.

### 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 ground and collect in low or confined areas (sewers, basements, tanks).
- 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 are lighter than water.

#### HEALTH

- May cause toxic effects if inhaled or ingested/swallowed.
- 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 suffocation.
- Runoff from fire control or dilution water may cause pollution.

#### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

- See [Table 1 - Initial Isolation and Protective Action Distances](#) for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).

## 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.
- Move containers from fire area if you can do it without risk.
- Dike fire-control water for later disposal; do not scatter the material.
- Do not get water inside containers.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

## SPILL OR LEAK

- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in 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 and transfer to containers (except for Hydrazine).
- 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air. • Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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 may cause pollution.

## PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

### EVACUATION

#### 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 document and/or the ERAP Program Section (page 391).

## 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.
- Move containers from fire area if you can do it without risk.

**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, G-1® or Met-L-X® powder.

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 hose holders 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 in 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.

### 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 pollution.

### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions.
- Stay upwind, uphill and/or upstream.
- Keep unauthorized personnel away.
- Ventilate enclosed areas.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### 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 document and/or the ERAP Program Section (page 391).



## 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.
- Move containers from fire area if you can do it without risk.
- Use water spray or fog; do not use straight streams.
- Do not get water inside containers.
- Dike fire-control water for later disposal; do not scatter the material.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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

- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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.

### 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 may cause pollution.

### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- 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. It may provide little or no thermal protection.
- Structural firefighters' protective clothing will only provide limited protection.

#### EVACUATION

##### Spill

- See [Table 1 - Initial Isolation and Protective Action Distances](#) for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).

## 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.

**EXCEPTION:** 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.
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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

- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.

**Small Spill**

**EXCEPTION:** 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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

- 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 may be corrosive and/or toxic and cause pollution.

### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- 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. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
- **For Phosphorus (UN1381): Special aluminized protective clothing should be worn when direct contact with the substance is possible.**

#### EVACUATION

##### 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 document and/or the ERAP Program Section (page 391).

## 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.**
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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**

- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.

### 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 pollution.

#### 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate enclosed areas.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).

## 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>.
- Move containers from fire area if you can do it without risk.

## Large Fire

- Flood fire area with large quantities of water, while knocking down vapors with water fog. If insufficient water supply: knock down vapors only.

## 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

- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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.

### 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 may cause pollution.

### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate the area before entry.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).



## 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.
- Move containers from fire area if you can do it without risk.

**Fire Involving Metals or Powders (Aluminum, Lithium, Magnesium, etc.)**

- Use dry chemical, DRY sand, sodium chloride powder, graphite powder or Met-L-X® powder; 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 hose holders 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 in 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.

### 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 may cause pollution.

#### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate the area before entry.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).

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.
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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**

- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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 pollution.

### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing will only provide limited protection.

#### EVACUATION

##### 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 document and/or the ERAP Program Section (page 391).

## 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.
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders 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.
- **Following product recovery, flush area with water.**

**FIRST AID**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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 pollution.

### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing will only provide limited protection.

#### EVACUATION

##### 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 document and/or the ERAP Program Section (page 391).

**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.
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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 pollution.

### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

- See [Table 1 - Initial Isolation and Protective Action Distances](#) for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).



**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.
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders 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.
- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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.

### 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 pollution.

### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

- See [Table 1 - Initial Isolation and Protective Action Distances](#) for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).

**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.
- Move containers from fire area if you can do it without risk.
- 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 fire-control water for later disposal.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders 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 flooding quantities of water.

**Large Spill**

- **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

**FIRST AID**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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

- 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 pollution.

## PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

### EVACUATION

#### Spill

- See [Table 1 - Initial Isolation and Protective Action Distances](#) for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

#### 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 document and/or the ERAP Program Section (page 391).

**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.
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 in 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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.

## 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 pollution.

## PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- 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. It may provide little or no thermal protection.
- Structural firefighters' protective clothing will only provide limited protection.

## EVACUATION

## 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; do not use straight streams.
- Do not move cargo or vehicle if cargo has been exposed to heat.
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders 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 in 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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

- 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 pollution.

## PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- 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. It may provide little or no thermal protection.
- Structural firefighters' protective clothing will only provide limited protection.

## EVACUATION

## 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 document and/or the ERAP Program Section (page 391).



## 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; do not use straight streams.
- Do not move cargo or vehicle if cargo has been exposed to heat.
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders 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 in 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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 suffocation.

## PUBLIC SAFETY

- **CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

### EVACUATION

#### 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.
- Move containers from fire area if you can do it without risk.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.

## 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 pollution.

## PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- **DO NOT allow the substance to warm up. Obtain liquid nitrogen (wear thermal protective clothing, see GUIDE 120), dry ice or ice for cooling. If this is not possible or none can be obtained, evacuate the area immediately.**

## PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing will only provide limited protection.

## EVACUATION

## 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 document and/or the ERAP Program Section (page 391).

## 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; do not use straight streams.
- Do not move cargo or vehicle if cargo has been exposed to heat.
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders 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 in 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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

- **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 may cause pollution.

### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- 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. It may provide little or no thermal protection.
- Structural firefighters' protective clothing will only provide limited protection.

### EVACUATION

#### 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 document and/or the ERAP Program Section (page 391).

**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.
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks or Car/Trailer Loads****• BEWARE OF POSSIBLE CONTAINER EXPLOSION.**

- Fight fire from maximum distance or use unmanned hose holders 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 in 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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 may cause pollution.

### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- **DO NOT allow the substance to warm up. Obtain liquid nitrogen (wear thermal protective clothing, see GUIDE 120), dry ice or ice for cooling. If this is not possible or none can be obtained, evacuate the area immediately.**

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing will only provide limited protection.

#### EVACUATION

##### 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 document and/or the ERAP Program Section (page 391).



## 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.
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks or Car/Trailer Loads**

- **BEWARE OF POSSIBLE CONTAINER EXPLOSION.**
- Fight fire from maximum distance or use unmanned hose holders 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 in 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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

- **Highly toxic**, may be fatal if inhaled, swallowed 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 pollution.

#### 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- 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. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).

## EMERGENCY RESPONSE

## FIRE

**Small Fire**

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

**Large Fire**

- Water spray, fog or regular foam.
- Move containers from fire area if you can do it without risk.
- Dike fire-control water for later disposal; do not scatter the material.
- Use water spray or fog; do not use straight streams.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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.

### POTENTIAL HAZARDS

#### HEALTH

- **Highly toxic**, may be fatal if inhaled, swallowed 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 pollution.

#### 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- 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. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).

## EMERGENCY RESPONSE

## FIRE

**Small Fire**

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

**Large Fire**

- Water spray, fog or regular foam.
- Move containers from fire area if you can do it without risk.
- Dike fire-control water for later disposal; do not scatter the material.
- Use water spray or fog; do not use straight streams.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders 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 in 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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.

### 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 pollution.

#### 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate enclosed areas.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).

## 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.
- Move containers from fire area if you can do it without risk.
- Dike fire-control water for later disposal; do not scatter the material.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 in 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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.

### 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 pollution.

#### 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate enclosed areas.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).



## 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.
- Move containers from fire area if you can do it without risk.
- Dike fire-control water for later disposal; do not scatter the material.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 in 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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.

### 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 ground and collect in low or confined areas (sewers, basements, tanks).
- 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.**
- 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 pollution.

#### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate enclosed areas.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).

## 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.
- Move containers from fire area if you can do it without risk.
- Use water spray or fog; do not use straight streams.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 in 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air. • Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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.

### 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 ground and collect in low or confined areas (sewers, basements, tanks).
- 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 pollution.

#### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate enclosed areas.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

- See [Table 1 - Initial Isolation and Protective Action Distances](#) for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).

## 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.
- Move containers from fire area if you can do it without risk.
- Use water spray or fog; do not use straight streams.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 in 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air. • Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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.

### 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 pollution.

#### FIRE OR EXPLOSION

- Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
- For UN1796, UN1826, UN2031 at high concentrations and for UN2032, these 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate enclosed areas.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).

## 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.
- Move containers from fire area if you can do it without risk.
- Use water spray or fog; do not use straight streams.
- Dike fire-control water for later disposal; do not scatter the material.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 in 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air. • Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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 Hydrofluoric acid (UN1790)**, flush with large amounts of water. For skin contact, if calcium gluconate gel is available, rinse 5 minutes, then apply gel. Otherwise, continue rinsing until medical treatment is available. For eyes, flush with water or a saline solution for 15 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.

### POTENTIAL HAZARDS

#### HEALTH

- Inhalation or contact with substance may cause infection, disease or death.
- Category A Infections Substances (UN2814 or UN2900) 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 may cause environmental contamination.
- **Note: Damaged packages containing solid CO<sub>2</sub> as a refrigerant may produce water or frost from condensation of air. Do not touch this solid or 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Identify the substance involved.

#### PROTECTIVE CLOTHING

- Wear 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 an appropriate 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 will only provide limited protection.



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



## 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.
- Move containers from fire area if you can do it without risk.

**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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to a safe isolated area.

**CAUTION: Victim may be a source of contamination.**

- Call 911 or emergency medical service.
- 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.
- 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.**

### POTENTIAL HAZARDS

#### HEALTH

- Inhalation of vapors or dust is extremely irritating.
- May cause burning of eyes and 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 pollution.

#### FIRE OR EXPLOSION

- Some of these materials may burn, but none ignite readily.
- Containers may explode when heated.

### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

- See **Table 1 - Initial Isolation and Protective Action Distances** for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

##### 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 document and/or the ERAP Program Section (page 391).

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

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

**Large Fire**

- Water spray, fog or regular foam.
- Move containers from fire area if you can do it without risk.
- Dike fire-control water for later disposal; do not scatter the material.

**Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders 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.
- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.

**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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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.

### POTENTIAL HAZARDS

#### HEALTH

- Toxic by ingestion.
- Vapors may cause dizziness or suffocation.
- 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 pollution.

#### 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer.
- Structural firefighters' protective clothing will only provide limited protection.

#### EVACUATION

##### 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.
- Move containers from fire area if you can do it without risk.
- Dike fire-control water for later disposal; do not scatter the material.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders 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 in 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. 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.
- As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions.
- 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

##### 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.
- Move containers from fire area if you can do it without risk.
- 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**

- Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.
- Call 911 or emergency medical service.
- 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.

## 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. 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.
- As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions.
- 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

#### 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 document and/or the ERAP Program Section (page 391).



**EMERGENCY RESPONSE**

**FIRE**

- Presence of radioactive material will not influence the fire control processes and should not influence selection of techniques.
- Move containers from fire area if you can do it without risk.
- 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 fire-control water 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**

- Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves.
- Call 911 or emergency medical service.
- 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.

### 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. 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.
- As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions.     • 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

##### 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.
- Move containers from fire area if you can do it without risk.
- 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 fire-control water 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**

- Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves.
- Call 911 or emergency medical service.
- 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.

### 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. 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.
- As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions.
- 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

##### 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.
- Move containers from fire area if you can do it without risk.
- 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**

- Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves.
- Call 911 or emergency medical service.
- 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.

## 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 gas 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. 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.
- As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions. • 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

#### 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 document and/or the ERAP Program Section (page 391).

**EMERGENCY RESPONSE**

**FIRE**

- Presence of radioactive material will not influence the fire control processes and should not influence selection of techniques.
- Move containers from fire area if you can do it without risk.
- 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**

- Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves.
- Call 911 or emergency medical service.
- 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.

### 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** 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. 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.
- As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions.
- 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. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### 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 document and/or the ERAP Program Section (page 391).



## EMERGENCY RESPONSE

### FIRE

- DO NOT USE WATER OR FOAM ON MATERIAL ITSELF.
- Move containers from fire area if you can do it without risk.

#### 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

- Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves.
- Call 911 or emergency medical service.
- Medical problems take priority over radiological concerns.
- Use first aid treatment according to the nature of the injury.
- **In case of contact with Hydrofluoric acid (UN1790)**, flush with large amounts of water. For skin contact, if calcium gluconate gel is available, rinse 5 minutes, then apply gel. Otherwise, continue rinsing until medical treatment is available. For eyes, flush with water or a saline solution for 15 minutes.
- 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.

Page intentionally left blank

Page intentionally left blank

### 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.**
- May be ignited by heat, sparks or flames.
- Flame may be invisible.
- 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

#### EVACUATION

##### 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**

- **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.
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks**

- Fight fire from maximum distance or use unmanned hose holders 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 in immediate area).
- All equipment used when handling the product must be grounded.
- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.

### 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Stay upwind, uphill and/or upstream.
- Keep unauthorized personnel away.
- Ventilate closed spaces before entering.

#### 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.

**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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.

### 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 pollution.

### PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- Stay upwind, uphill and/or upstream.
- Keep unauthorized personnel away.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

#### EVACUATION

##### 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 document and/or the ERAP Program Section (page 391).



## 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, G-1® or Met-L-X® powder.
- Confining and smothering metal fires is preferable rather than applying water.
- Move containers from fire area if you can do it without risk.

**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 in 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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

- Some may burn but none ignite readily.
- Containers may explode when heated.
- Some may be transported hot.
- For UN3508, be aware of possible short circuiting as this product is transported in a charged state.

### 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 suffocation.
- Runoff from fire control may cause pollution.

## PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an 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.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

### EVACUATION

#### Spill

- See [Table 1 - Initial Isolation and Protective Action Distances](#) for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

#### 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.
- Move containers from fire area if you can do it without risk.
- Dike fire-control water 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.
- Avoid inhalation of asbestos dust.

**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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.

### 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 EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Stay upwind, uphill and/or upstream.
- Keep unauthorized personnel away.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

#### EVACUATION

##### 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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 may cause pollution.

#### FIRE OR EXPLOSION

- Some gases may burn or be ignited by heat, sparks or flames but NOT readily due to low transportation pressures.
- 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 Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

#### EVACUATION

##### Spill

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

##### Fire

- If several small packages (rail 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 document and/or the ERAP Program Section (page 391).

**\* 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.
- Move containers from fire area if you can do it without risk.
- Damaged cylinders should be handled only by specialists.

## Fire involving Several Small Packages (rail or trailer)

- Fight fire from maximum distance or use unmanned hose holders 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.
- Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
- 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air. • Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of 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.

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

- Some gases will be ignited by heat, sparks or flames but NOT readily due to low transportation pressure.
- 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 Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Ventilate closed spaces before entering.

#### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

#### EVACUATION

##### Large Spill

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

##### Fire

- If several small packages (rail 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.



## 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.
- Move containers from fire area if you can do it without risk.
- Damaged cylinders should be handled only by specialists.

**Fire involving Several Small Packages (rail or trailer)**

- Fight fire from maximum distance or use unmanned hose holders 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 hose holders 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**

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- 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.

## NOTES

## INTRODUCTION TO GREEN TABLES - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

**Table 1** - Initial Isolation and Protective Action Distances suggests distances useful to protect people from vapors resulting from spills involving dangerous goods that are considered toxic by inhalation (TIH) (PIH in the US). This list includes certain chemical warfare agents and materials that produce toxic gases upon contact with water. Table 1 provides first responders with initial guidance until technically qualified emergency response personnel are available.

The **Initial Isolation Zone** defines an area SURROUNDING the incident in which persons 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 persons 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 and should be made only by personnel technically qualified to make such adjustments. 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

The **orange-bordered guide for a material** clearly indicates under the section EVACUATION – Fire, the evacuation distance required to protect against fragmentation hazard of a large container. If the material becomes involved in a **FIRE**, the toxic hazard may be less than the fire or explosion hazard. In these cases, the **Fire** hazard distance should be used.

Initial isolation and protective action distances in this guidebook 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 of the initial isolation and protective action distances is appropriate in absence of other information.

If more than one tank car containing TIH materials involved in the incident is leaking, LARGE SPILL distances may need to be increased.

For a material with a protective action distance of 11.0+ km (7.0+ miles), the actual distance can be larger in certain atmospheric conditions. If the dangerous goods vapor plume is channeled in a valley or between many tall buildings, distances may be larger than shown in Table 1 due to less mixing of the plume with the atmosphere. Daytime spills in regions with known strong inversions or snow cover, or occurring near sunset, 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 distance may be more appropriate. In addition, protective action distances may be larger for liquid spills when either the material or outdoor temperature exceeds 30°C (86°F).

Materials which react with water to produce large amounts of toxic gases are included in Table 1 - Initial Isolation and Protective Action Distances. Note that some water-reactive materials (WRM) which are also TIH (PIH in the US) (e.g., Bromine trifluoride (UN1746), Thionyl chloride (UN1836), etc.) produce additional TIH materials when spilled in water. For these materials, two entries are provided in Table 1 - Initial Isolation and Protective Action Distances (i.e., for spills on land and for spills in water). **If it is not clear whether the spill is on land or in water, or in cases where the spill occurs both on land and in water, choose the larger Protective Action Distance.**

Following Table 1, **Table 2** – Water-Reactive Materials Which Produce Toxic Gases lists materials that produce large amounts of Toxic Inhalation Hazard gases (TIH) when spilled in water as well as the toxic gases that are produced when spilled in water.

When a water-reactive TIH-producing material is spilled into a river or stream, the source of the toxic gas may move with the current and stretch from the spill point downstream for a substantial distance.

Finally, **Table 3** lists Initial Isolation and Protective Action Distances for Toxic Inhalation Hazard materials that may be more commonly encountered.

The selected materials are:

- Ammonia, anhydrous (UN1005)
- Chlorine (UN1017)
- Ethylene oxide (UN1040)
- Hydrogen chloride, anhydrous (UN1050) and Hydrogen chloride, refrigerated liquid (UN2186)
- Hydrogen fluoride, anhydrous (UN1052)
- Sulfur dioxide/Sulphur dioxide (UN1079)

The materials are presented in alphabetical order 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) for day time and night time situations and for different wind speeds.

## **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 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

### **Weather Conditions**

- Effect on vapor and cloud movement
- Potential for change
- Effect on evacuation or shelter in-place

## PROTECTIVE ACTIONS

**Protective Actions** are those steps taken to preserve the health and safety of emergency responders and the public during an incident involving releases of dangerous goods. Table 1 - Initial Isolation and Protective Action Distances (green-bordered pages) predicts the size of downwind areas which 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 first to establish control over the area of operations. This is the first step for any protective actions that may follow. See Table 1 - Initial Isolation and Protective Action Distances (green-bordered pages) for more detailed information on specific materials.

**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, to get ready, and to leave an area. If there is enough time, evacuation is the best protective action. Begin evacuating people nearby and those 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 congregate 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. **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.** Direct the people inside to **close all doors and windows** and to **shut off all ventilating, heating and cooling systems.** 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.

**It is vital to maintain communications with competent persons inside the building** so that they are advised about changing conditions. **Persons protected-in-place should be warned to stay far from windows** because of the danger from glass and projected metal fragments in a fire and/or explosion.

Every dangerous goods incident is different. Each will have special problems and concerns. Action to protect the public must be selected carefully. 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.

## **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 was statistical in nature and utilized state-of-the-art emission rate and dispersion models; statistical release data from the U.S. DOT HMIS (Hazardous Materials Information System) database; meteorological observations from over 120 locations in United States, Canada and Mexico; and the most current toxicological exposure guidelines.

For each chemical, thousands of hypothetical releases were modeled to account for the statistical variation in both release amount and atmospheric conditions. Based on this statistical sample, the 90<sup>th</sup> percentile Protective Action Distance for each chemical and category was selected to appear in the Table. A brief description of the analysis is provided below. A detailed report outlining the methodology and data used in the generation of the Initial Isolation and Protective Action Distances may be obtained from the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration.

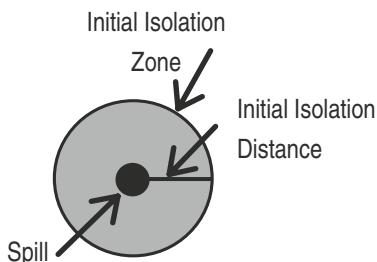
**Release amounts and emission rates** into the atmosphere were statistically modeled based on (1) data from the U.S. DOT HMIS database; (2) container types and sizes authorized for transport as specified in 49 CFR §172.101 and Part 173; (3) physical properties of the individual materials, and (4) atmospheric data from a historical database. The emission model calculated the release of vapor due to evaporation of pools on the ground, direct release of vapors from the container, or a combination of both, as would occur for liquefied gases which can flash to form both a vapor/aerosol mixture and an evaporating pool. In addition, the emission model also calculated the emission of toxic vapor by-products generated from spilling water-reactive materials in water. Spills that involve releases of approximately 208 liters for liquids (55 US gallons) and 300 kg for solids (660 lbs) or less are considered Small Spills, while spills that involve greater quantities are considered Large Spills. An exception to this is certain chemical warfare agents where Small Spills include releases up to 2 kg (4.4 lbs), and Large Spills include releases up to 25 kg (55 lbs). These agents are BZ, CX, GA, GB, GD, GF, HD, HL, HN1, HN2, HN3, L and VX.

**Downwind dispersion** of the vapor was estimated for each case modeled. Atmospheric parameters affecting the dispersion, and the emission rate, were selected in a statistical fashion from a database containing hourly meteorological data from 120 cities in the United States, Canada and Mexico. The dispersion calculation accounted for the time-dependent emission rate from the source as well as the 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 Table 1, "Day" refers to time periods after sunrise and before sunset, while "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 persons may become incapacitated and unable to take protective action or may incur serious health effects after a once-in-a-lifetime, or rare, exposure. When available, toxicological exposure guidelines were chosen from AEGL-2 or ERPG-2 emergency response guidelines, with AEGL-2 values being the first choice. For materials that do not have AEGL-2 or ERPG-2 values, emergency response guidelines estimated from lethal concentration limits derived from animal studies were used, as 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 an ID Number cannot be found, use the Name of Material index in the blue-bordered pages to locate that number.)
  - Found the three-digit guide for that material in order to consult the emergency actions recommended jointly with this table;
  - **Noted the wind direction.**
- (2) Look in Table 1 (the green-bordered pages) for the ID Number and Name of the Material involved in the incident. Some ID Numbers have more than one shipping name listed - look for the specific name of the material. (If the shipping name is not known and Table 1 lists more than one name for the same ID Number, use the entry with the largest protective action distances.)
- (3) Determine if the incident involves a SMALL or LARGE spill and if DAY or NIGHT. A SMALL SPILL consists of a release of less than 208 liters (55 US gallons). This generally corresponds to a spill from a single small package (e.g. 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. Within this zone, all public should be evacuated (protective clothing and respiratory protection is required in this zone). Persons should be directed to move out of the zone in a direction perpendicular to wind direction (crosswind), and away from the spill, to a minimum distance as prescribed by the Initial Isolation Distance.



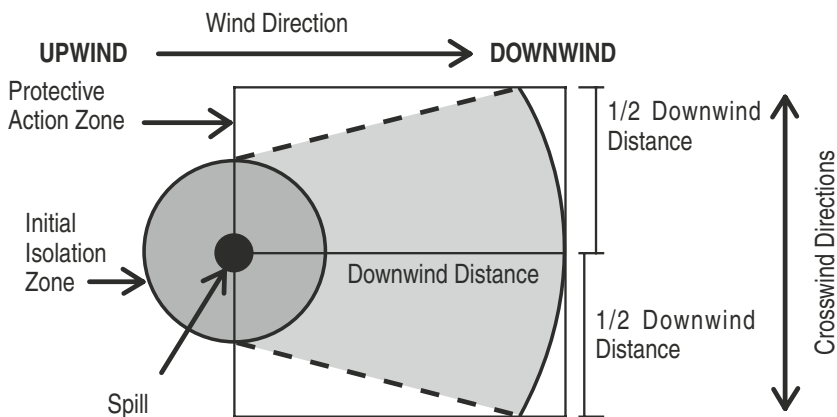
- (5) Look up the initial PROTECTIVE ACTION DISTANCE. For a given material, spill size, and whether day or night, Table 1 gives the downwind distance—in kilometers and miles—from the spill/leak source for which protective actions should be considered. For practical purposes, the Protective Action Zone (i.e., the area in which people are at risk of harmful exposure) is a square, whose length and width are the same as the downwind



distance shown in Table 1. Protective actions are those steps taken to preserve the health and safety of emergency responders and the public. People in this area should be evacuated and/or sheltered-in-place.

- (6) Initiate Protective Actions to the extent possible, beginning with those closest to the spill site and working away from the site in the 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 substantial distance.

The shape of the area in which protective actions should be taken (the Protective Action Zone) is shown in this figure. The spill is located at the center of the small circle. The larger circle represents the INITIAL ISOLATION zone around the spill.



**NOTE 1:** See “Introduction To Green Tables - Initial Isolation And Protective Action Distances” under “Factors That May Change the Protective Action Distances” (page 289)

**NOTE 2:** When a product in Table 1 has the mention “(when spilled in water)”, refer to Table 2 – Water-Reactive Materials which Produce Toxic Gases for the list of gases produced when these materials are spilled in water.

Call the emergency response telephone number listed on the shipping paper or the appropriate response agency as soon as possible for additional information on the material, safety precautions and mitigation procedures.

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	
1005	125	Ammonia, anhydrous	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	Refer to table 3				
1005	125	Anhydrous ammonia	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	Refer to table 3				
1008	125	Boron trifluoride	30 m (100 ft)	0.1 km (0.1 mi)	0.7 km (0.4 mi)	400 m (1250 ft)	2.2 km (1.4 mi)	4.8 km (3.0 mi)		
1008	125	Boron trifluoride, 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)	4.4 km (2.8 mi)		
1016	119	Carbon monoxide	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	Refer to table 3				
1016	119	Carbon monoxide, compressed	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)	Refer to table 3				
1017	124	Chlorine	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)		
1026	119	Cyanogen	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	Refer to table 3				
1040	119P	Ethylene oxide	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	Refer to table 3				
1040	119P	Ethylene oxide with Nitrogen	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)	2.2 km (1.4 mi)		
1045	124	Fluorine	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	150 m (500 ft)	0.9 km (0.6 mi)	2.6 km (1.6 mi)		
1045	124	Fluorine, compressed	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	Refer to table 3				
1048	125	Hydrogen bromide, anhydrous	30 m (100 ft)	0.1 km (0.1 mi)	1.0 km (0.6 mi)	1000 m (3000 ft)	3.7 km (2.3 mi)	8.4 km (5.3 mi)		
1050	125	Hydrogen chloride, anhydrous	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	Refer to table 3				
1051	117	AC (when used as a weapon)	60 m (200 ft)	0.3 km (0.2 mi)	1.0 km (0.6 mi)	Refer to table 3				
1051	117	Hydrocyanic acid, aqueous solutions, with more than 20% Hydrogen cyanide	60 m (200 ft)	0.2 km (0.2 mi)	0.9 km (0.6 mi)	300 m (1000 ft)	1.1 km (0.7 mi)	2.4 km (1.5 mi)		
1051	117	Hydrogen cyanide, anhydrous, stabilized								
1051	117	Hydrogen cyanide, stabilized								

1052	125	Hydrogen fluoride, anhydrous	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	Refer to table 3		
1053	117	Hydrogen sulfide	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	400 m (1250 ft)	2.1 km (1.3 mi)	5.4 km (3.4 mi)
1053	117	Hydrogen sulphide	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	200 m (600 ft)	0.6 km (0.4 mi)	1.9 km (1.2 mi)
1061	118	Methylamine, anhydrous	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	150 m (500 ft)	0.3 km (0.2 mi)	0.7 km (0.4 mi)
1062	123	Methyl bromide	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	200 m (600 ft)	1.1 km (0.7 mi)	3.1 km (1.9 mi)
1064	117	Methyl mercaptan	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	400 m (1250 ft)	1.2 km (0.8 mi)	3.0 km (1.9 mi)
1067	124	Dinitrogen tetroxide	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	500 m (1500 ft)	3.4 km (2.1 mi)	8.3 km (5.2 mi)
1067	124	Nitrogen dioxide	30 m (100 ft)	0.2 km (0.2 mi)	1.0 km (0.6 mi)	1000 m (3000 ft)	7.5 km (4.7 mi)	11.0+ km (7.0+ mi)
1069	125	Nitrosyl chloride	30 m (100 ft)	0.2 km (0.2 mi)	1.0 km (0.6 mi)	200 m (600 ft)	1.0 km (0.7 mi)	2.4 km (1.5 mi)
1076	125	CG (when used as a weapon)	150 m (500 ft)	0.8 km (0.5 mi)	3.2 km (2.0 mi)	500 m (1500 ft)	3.0 km (1.9 mi)	9.0 km (5.6 mi)
1076	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)
1076	125	Phosgene	100 m (300 ft)	0.6 km (0.4 mi)	2.5 km (1.5 mi)	500 m (1500 ft)	3.0 km (1.9 mi)	9.0 km (5.6 mi)
1079	125	Sulfur dioxide	100 m (300 ft)	0.7 km (0.4 mi)	2.2 km (1.4 mi)	Refer to table 3		
1079	125	Sulphur dioxide	100 m (300 ft)	0.7 km (0.4 mi)	2.2 km (1.4 mi)	Refer to table 3		
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)	0.3 km (0.2 mi)	0.7 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)	0.3 km (0.2 mi)	0.7 km (0.5 mi)
1092	131P	Acrolein, stabilized	100 m (300 ft)	1.3 km (0.8 mi)	3.4 km (2.1 mi)	500 m (1500 ft)	6.1 km (3.8 mi)	11.0 km (6.8 mi)
1093	131P	Acrylonitrile, stabilized	30 m (100 ft)	0.2 km (0.2 mi)	0.5 km (0.4 mi)	100 m (300 ft)	1.1 km (0.7 mi)	2.1 km (1.3 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 (0.7 mi)
1135	131	Ethylene chlorohydrin	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)	0.6 km (0.4 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)	0.8 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)	0.8 km (0.5 mi)
1162	155	Dimethyldichlorosilane (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 (0.4 mi)	1.7 km (1.1 mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
1163	131	1,1-Dimethylhydrazine	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)		
1163	131	Dimethylhydrazine, unsymmetrical	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)	0.5 km (0.3 mi)		
1182	155	Ethyl chloroformate	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)	2.0 km (1.2 mi)		
1183	139	Ethylchlorosilane (when spilled in water)	30 m (100 ft)	0.2 km (0.1 mi)	0.4 km (0.3 mi)	150 m (500 ft)	0.9 km (0.6 mi)	1.7 km (1.1 mi)		
1185	131P	Ethyleneimine, stabilized	30 m (100 ft)	0.2 km (0.1 mi)	0.7 km (0.4 mi)	150 m (500 ft)	1.9 km (1.2 mi)	5.6 km (3.5 mi)		
1196	155	Ethyltrichlorosilane (when spilled in water)	30 m (100 ft)	0.2 km (0.2 mi)	0.6 km (0.4 mi)	150 m (500 ft)	1.1 km (0.7 mi)	2.1 km (1.3 mi)		
1238	155	Methyl chloroformate	30 m (100 ft)	0.5 km (0.3 mi)	1.4 km (0.9 mi)	300 m (1000 ft)	3.0 km (1.9 mi)	5.6 km (3.5 mi)		
1239	131	Methyl chloromethyl ether	60 m (200 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	60 m (200 ft)	0.7 km (0.5 mi)	2.2 km (1.4 mi)		
1242	139	Methyldichlorosilane (when spilled in water)	30 m (100 ft)	0.3 km (0.2 mi)	0.6 km (0.4 mi)	100 m (300 ft)	1.3 km (0.8 mi)	2.1 km (1.3 mi)		
1244	131	Methylhydrazine	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	60 m (200 ft)	0.8 km (0.5 mi)	2.4 km (1.5 mi)		
1250	155	Methyltrichlorosilane (when spilled in water)	30 m (100 ft)	0.3 km (0.2 mi)	0.7 km (0.4 mi)	800 m (2500 ft)	1.5 km (0.9 mi)	2.6 km (1.6 mi)		
1251	131P	Methyl vinyl ketone, stabilized	100 m (300 ft)	1.4 km (0.9 mi)	4.9 km (3.0 mi)	1000 m (3000 ft)	11.0+ km (7.0+ mi)	11.0+ km (7.0+ mi)		
1259	131	Nickel carbonyl	100 m (300 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	60 m (200 ft)	0.6 km (0.4 mi)	2.0 km (1.3 mi)		
1295	139	Trichlorosilane (when spilled in water)	30 m (100 ft)							

1298	155	Trimethylchlorosilane <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)	0.5 km (0.3 mi)	1.4 km (0.9 mi)
1305	155P	Vinyltrichlorosilane <b>(when spilled in water)</b>						
1305	155P	Vinyltrichlorosilane, stabilized <b>(when spilled in water)</b>	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 (1.2 mi)
1340	139	Phosphorus pentasulfide, free from yellow and white Phosphorus						
1340	139	<b>(when spilled in water)</b> Phosphorus pentasulphide, free from yellow and white Phosphorus <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)	0.3 km (0.2 mi)	1.3 km (0.8 mi)
1360	139	Calcium phosphide <b>(when spilled in water)</b>	30 m (100 ft)	0.2 km (0.1 mi)	0.6 km (0.4 mi)	300 m (1000 ft)	1.0 km (0.7 mi)	3.7 km (2.3 mi)
1380	135	Pentaborane	60 m (200 ft)	0.5 km (0.4 mi)	1.9 km (1.2 mi)	150 m (500 ft)	2.0 km (1.3 mi)	4.7 km (3.0 mi)
1384	135	Sodium dithionite <b>(when spilled in water)</b>						
1384	135	Sodium hydrosulfite <b>(when spilled in water)</b>	30 m (100 ft)	0.2 km (0.1 mi)	0.5 km (0.3 mi)	60 m (200 ft)	0.6 km (0.4 mi)	2.2 km (1.4 mi)
1384	135	Sodium hydrosulphite <b>(when spilled in water)</b>						
1397	139	Aluminum phosphide <b>(when spilled in water)</b>	60 m (200 ft)	0.2 km (0.2 mi)	0.9 km (0.6 mi)	500 m (1500 ft)	2.0 km (1.2 mi)	7.1 km (4.4 mi)
1419	139	Magnesium aluminum phosphide <b>(when spilled in water)</b>	60 m (200 ft)	0.2 km (0.1 mi)	0.8 km (0.5 mi)	500 m (1500 ft)	1.8 km (1.2 mi)	6.2 km (3.9 mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
1432	139	Sodium phosphide (when spilled in water)	30 m (100 ft)	0.2 km (0.1 mi)	0.6 km (0.4 mi)	300 m (1000 ft)	1.3 km (0.8 mi)	4.0 km (2.5 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 (0.5 mi)		
1541	155	Acetone cyanohydrin, stabilized (when spilled in water)	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)	1.0 km (0.7 mi)		
1556	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)		
1556	152	Methylchloroarsine	100 m (300 ft)	1.3 km (0.8 mi)	2.0 km (1.3 mi)	300 m (1000 ft)	3.2 km (2.0 mi)	4.2 km (2.6 mi)		
1556	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)		
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)	1.4 km (0.9 mi)		
1560	157	Arsenic trichloride	30 m (100 ft)	0.4 km (0.3 mi)	1.2 km (0.8 mi)	150 m (500 ft)	1.8 km (1.1 mi)	3.4 km (2.1 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 (2.2 mi)		
1580	154	Chloropicrin	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 (2.2 mi)		
1581	123	Chloropicrin and Methyl bromide mixture	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	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 (2.2 mi)		

1589	125	CK (when used as a weapon)	800 m (2500 ft)	5.3 km (3.2 mi)	11.0+ km (7.0+ mi)	1000 m (3000 ft)	11.0+ km (7.0+ mi)	11.0+ km (7.0+ mi)
1589	125	Cyanogen chloride, stabilized	300 m (1000 ft)	1.8 km (1.1 mi)	6.2 km (3.9 mi)	1000 m (3000 ft)	9.4 km (5.8 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	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)
1612	123	Compressed gas and hexaethyl tetraphosphate mixture						
1612	123	Hexaethyl tetraphosphate and compressed gas mixture	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)
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	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)
1614	152	Hydrogen cyanide, stabilized (absorbed)	60 m (200 ft)	0.2 km (0.1 mi)	0.6 km (0.4 mi)	150 m (500 ft)	0.5 km (0.4 mi)	1.6 km (1.0 mi)
1647	151	Ethylene dibromide and Methyl bromide mixture, liquid						
1647	151	Methyl bromide and Ethylene dibromide 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)	0.7 km (0.4 mi)
1660	124	Nitric oxide	30 m (100 ft)	0.1 km (0.1 mi)	0.5 km (0.4 mi)	100 m (300 ft)	0.5 km (0.4 mi)	2.2 km (1.4 mi)
1660	124	Nitric oxide, compressed	30 m (100 ft)	0.2 km (0.2 mi)	0.3 km (0.2 mi)	100 m (300 ft)	0.6 km (0.4 mi)	1.1 km (0.7 mi)
1670	157	Perchloromethyl mercaptan	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)
1672	151	Phenylcarbamylamine chloride	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)
1680	157	Potassium cyanide						
1680	157	(when spilled in water) Potassium cyanide, solid (when spilled in water)	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)	1.2 km (0.8 mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS				LARGE SPILLS			
			(From a small package or small leak from a large package)		(From a large package or from many small packages)		First ISOLATE		Then PROTECT	
			ISOLATE in all Directions Meters (Feet)	persons Downwind during DAY Kilometers (Miles)	persons Downwind during NIGHT Kilometers (Miles)	ISOLATE in all Directions Meters (Feet)	persons Downwind during DAY Kilometers (Miles)	persons Downwind during NIGHT Kilometers (Miles)		
1689	157	Sodium cyanide (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	100 m (300 ft)	0.4 km (0.2 mi)	1.4 km (0.9 mi)		
1689	157	Sodium cyanide, solid (when spilled in water)	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)		
1694	159	CA (when used as a weapon)	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)		
1695	131	Chloroacetone, stabilized	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)		
1697	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)	1.4 km (0.9 mi)		
1698	154	Adamsite	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)		
1698	154	DM (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)		
1699	151	DA (when used as a weapon)	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)	0.9 km (0.6 mi)		
1716	156	Acetyl bromide (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	100 m (300 ft)	0.9 km (0.6 mi)	2.5 km (1.6 mi)		
1717	155	Acetyl chloride (when spilled in water)	30 m (100 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	100 m (300 ft)	0.3 km (0.2 mi)	0.8 km (0.5 mi)	60 m (200 ft)	0.5 km (0.4 mi)	1.7 km (1.1 mi)		
1722	155	Allyl chloroformate	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)		
1724	155	Allyltrichlorosilane, stabilized (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)		
1725	137	Aluminum bromide, anhydrous (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)	0.4 km (0.3 mi)		



1726	137	Aluminum chloride, anhydrous (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	60 m (200 ft)	0.5 km (0.3 mi)	2.0 km (1.2 mi)
1728	155	Amyltri-chlorosilane (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)	1.7 km (1.1 mi)
1732	157	Antimony pentafluoride (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.5 km (0.3 mi)	100 m (300 ft)	1.0 km (0.7 mi)	3.8 km (2.4 mi)
1741	125	Boron trichloride (when spilled on land)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	100 m (300 ft)	0.6 km (0.4 mi)	1.3 km (0.8 mi)
1741	125	Boron trichloride (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	100 m (300 ft)	1.1 km (0.7 mi)	3.5 km (2.2 mi)
1744	154	Bromine						
1744	154	Bromine, solution	60 m (200 ft)	0.8 km (0.5 mi)	2.3 km (1.5 mi)	300 m (1000 ft)	3.7 km (2.3 mi)	7.5 km (4.7 mi)
1744	154	Bromine, solution (Inhalation Hazard Zone A)						
1744	154	Bromine, solution (Inhalation Hazard Zone B)	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)
1745	144	Bromine pentafluoride (when spilled on land)	60 m (200 ft)	0.8 km (0.5 mi)	2.4 km (1.5 mi)	400 m (1250 ft)	4.9 km (3.1 mi)	10.2 km (6.4 mi)
1745	144	Bromine pentafluoride (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.5 km (0.4 mi)	100 m (300 ft)	1.1 km (0.7 mi)	3.9 km (2.5 mi)
1746	144	Bromine trifluoride (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)
1746	144	Bromine trifluoride (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.5 km (0.3 mi)	100 m (300 ft)	1.0 km (0.6 mi)	3.7 km (2.3 mi)
1747	155	Butyltri-chlorosilane (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)	1.6 km (1.0 mi)
1749	124	Chlorine trifluoride	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)	300 m (1000 ft)	1.4 km (0.9 mi)	4.1 km (2.6 mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
1752	156	Chloroacetyl chloride (when spilled on land)	30 m (100 ft)	0.3 km (0.2 mi)	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 (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)	0.8 km (0.5 mi)	
1753	156	Chlorophenyltrichlorosilane (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)	
1754	137	Chlorosulfonic acid (with or without sulfur trioxide mixture) (when spilled on land)	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	Chlorosulfonic acid (with or without sulfur trioxide mixture) (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)	0.7 km (0.4 mi)	2.2 km (1.4 mi)	
1754	137	Chlorosulphonic acid (with or without sulphur trioxide mixture) (when spilled on land)	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 mixture) (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)	0.7 km (0.4 mi)	2.2 km (1.4 mi)	
1758	137	Chromium oxychloride (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)	0.7 km (0.5 mi)	

1762	156	Cyclohexyltrichlorosilane (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)	30 m (100 ft)	0.4 km (0.3 mi)	1.2 km (0.8 mi)
1763	156	Cyclohexyltrichlorosilane (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)	30 m (100 ft)	0.4 km (0.3 mi)	1.3 km (0.8 mi)
1765	156	Dichloroacetyl chloride (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)
1766	156	Dichlorophenyltrichlorosilane (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	0.2 km (0.2 mi)	60 m (200 ft)	0.6 km (0.4 mi)	1.9 km (1.2 mi)
1767	155	Diethylchlorosilane (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)	1.0 km (0.6 mi)
1769	156	Diphenyldichlorosilane (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)	30 m (100 ft)	0.4 km (0.2 mi)	1.2 km (0.8 mi)
1771	156	Dodecyltrichlorosilane (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)	1.3 km (0.8 mi)
1777	137	Fluorosulfonic acid (when spilled in water)							
1777	137	Fluorosulphonic acid (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 (0.2 mi)	0.7 km (0.5 mi)
1781	156	Hexadecyltrichlorosilane (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)	0.6 km (0.4 mi)
1784	156	Hexyltrichlorosilane (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)	30 m (100 ft)	0.4 km (0.3 mi)	1.4 km (0.9 mi)
1799	156	Nonyltrichlorosilane (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)	1.4 km (0.9 mi)
1800	156	Octadecyltrichlorosilane (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)	30 m (100 ft)	0.4 km (0.3 mi)	1.4 km (0.9 mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
1801	156	Octyltrichlorosilane (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)	1.5 km (0.9 mi)	
1804	156	Phenyltrichlorosilane (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)	30 m (100 ft)	0.4 km (0.3 mi)	1.4 km (0.9 mi)	
1806	137	Phosphorus pentachloride (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.4 km (0.3 mi)	1.4 km (0.9 mi)	
1808	137	Phosphorus tribromide (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.4 km (0.3 mi)	1.3 km (0.9 mi)	
1809	137	Phosphorus trichloride (when spilled on land)	30 m (100 ft)	0.2 km (0.1 mi)	0.5 km (0.4 mi)	0.2 km (0.1 mi)	100 m (300 ft)	1.1 km (0.7 mi)	2.2 km (1.4 mi)	
1809	137	Phosphorus trichloride (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	0.1 km (0.1 mi)	60 m (200 ft)	0.7 km (0.5 mi)	2.3 km (1.4 mi)	
1810	137	Phosphorus oxychloride (when spilled on land)	30 m (100 ft)	0.3 km (0.2 mi)	0.6 km (0.4 mi)	0.3 km (0.2 mi)	100 m (300 ft)	1.0 km (0.6 mi)	1.8 km (1.1 mi)	
1810	137	Phosphorus oxychloride (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	0.1 km (0.1 mi)	60 m (200 ft)	0.6 km (0.4 mi)	2.0 km (1.3 mi)	
1815	132	Propionyl chloride (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)	0.7 km (0.4 mi)	
1816	155	Propyltrichlorosilane (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	0.1 km (0.1 mi)	60 m (200 ft)	0.6 km (0.4 mi)	1.8 km (1.1 mi)	
1818	157	Silicon tetrachloride (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	0.1 km (0.1 mi)	60 m (200 ft)	0.8 km (0.5 mi)	2.5 km (1.6 mi)	

1828	137	Sulfur chlorides (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 (when spilled in water)	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)	1.1 km (0.7 mi)
1828	137	Sulphur chlorides (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 (when spilled in water)	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)	1.1 km (0.7 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)	5.7 km (3.6 mi)
1831	137	Sulfuric acid, fuming						
1831	137	Sulfuric acid, fuming, with not less than 30% free Sulfur trioxide	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)	5.7 km (3.6 mi)
1831	137	Sulphuric acid, fuming						
1831	137	Sulphuric acid, fuming, with not less than 30% free Sulphur trioxide						
1834	137	Sulfuryl chloride (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 (1.0 mi)
1834	137	Sulfuryl chloride (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)
1834	137	Sulphuryl chloride (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 (1.0 mi)
1834	137	Sulphuryl chloride (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)
1836	137	Thionyl chloride (when spilled on land)	30 m (100 ft)	0.2 km (0.2 mi)	0.6 km (0.4 mi)	60 m (200 ft)	0.7 km (0.5 mi)	1.5 km (0.9 mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
1836	137	Thionyl chloride (when spilled in water)	100 m (300 ft)	0.9 km (0.6 mi)	2.4 km (1.5 mi)	600 m (2000 ft)	7.9 km (4.9 mi)	11.0+ km (7.0+ mi)		
1838	137	Titanium tetrachloride (when spilled on land)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)		
1838	137	Titanium tetrachloride (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)		
1859	125	Silicon tetrafluoride	30 m (100 ft)	0.2 km (0.1 mi)	0.7 km (0.5 mi)	100 m (300 ft)	0.5 km (0.3 mi)	1.8 km (1.1 mi)		
1859	125	Silicon tetrafluoride, compressed	30 m (100 ft)	0.2 km (0.1 mi)	0.7 km (0.5 mi)	100 m (300 ft)	0.5 km (0.3 mi)	1.8 km (1.1 mi)		
1892	151	ED (when used as a weapon)	150 m (500 ft)	2.0 km (1.2 mi)	2.9 km (1.8 mi)	1000 m (3000 ft)	10.4 km (6.5 mi)	11.0+ km (7.0+ mi)		
1892	151	Ethylchloroarsine	150 m (500 ft)	1.4 km (0.9 mi)	2.1 km (1.3 mi)	400 m (1250 ft)	4.6 km (2.9 mi)	6.3 km (3.9 mi)		
1898	156	Acetyl iodide (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	30 m (100 ft)	0.4 km (0.3 mi)	1.0 km (0.7 mi)		
1911	119	Diborane	60 m (200 ft)	0.3 km (0.2 mi)	1.0 km (0.6 mi)	200 m (600 ft)	1.3 km (0.8 mi)	4.0 km (2.5 mi)		
1911	119	Diborane, compressed	60 m (200 ft)	0.3 km (0.2 mi)	1.0 km (0.6 mi)	200 m (600 ft)	1.3 km (0.8 mi)	4.0 km (2.5 mi)		
1911	119	Diborane mixtures	60 m (200 ft)	0.3 km (0.2 mi)	1.0 km (0.6 mi)	200 m (600 ft)	1.3 km (0.8 mi)	4.0 km (2.5 mi)		
1923	135	Calcium dithionite (when spilled in water)	30 m (100 ft)	0.2 km (0.1 mi)	0.5 km (0.4 mi)	60 m (200 ft)	0.6 km (0.4 mi)	2.2 km (1.4 mi)		
1923	135	Calcium hydrosulfite (when spilled in water)	30 m (100 ft)	0.2 km (0.1 mi)	0.5 km (0.4 mi)	60 m (200 ft)	0.6 km (0.4 mi)	2.2 km (1.4 mi)		
1923	135	Calcium hydrosulphite (when spilled in water)	30 m (100 ft)	0.2 km (0.1 mi)	0.5 km (0.4 mi)	60 m (200 ft)	0.6 km (0.4 mi)	2.2 km (1.4 mi)		

1929	135	Potassium dithionite (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.5 km (0.3 mi)	60 m (200 ft)	0.6 km (0.4 mi)	2.0 km (1.2 mi)
1929	135	Potassium hydrosulfite (when spilled in water)						
1929	135	Potassium hydrosulphite (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.5 km (0.3 mi)	60 m (200 ft)	0.6 km (0.4 mi)	2.0 km (1.3 mi)
1931	171	Zinc dithionite (when spilled in water)						
1931	171	Zinc hydrosulfite (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.5 km (0.3 mi)	(60 m)	0.6 km (0.4 mi)	2.0 km (1.3 mi)
1931	171	Zinc hydrosulphite (when spilled in water)						
1953	119	Compressed gas, poisonous, flammable, n.o.s.						
1953	119	Compressed 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)	5.6 km (3.5 mi)	10.2 km (6.3 mi)
1953	119	Compressed 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)	200 m (600 ft)	1.2 km (0.8 mi)	2.6 km (1.6 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)	0.9 km (0.6 mi)	2.4 km (1.5 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)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 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)	5.6 km (3.5 mi)	10.2 km (6.3 mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
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)	200 m (600 ft)	1.2 km (0.8 mi)	2.6 km (1.6 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)	0.9 km (0.6 mi)	2.4 km (1.5 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)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 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)	5.6 km (3.5 mi)	10.2 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)	0.8 km (0.5 mi)	300 m (1000 ft)	1.4 km (0.9 mi)	4.1 km (2.6 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)	0.9 km (0.6 mi)	2.4 km (1.5 mi)		
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)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 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)	5.6 km (3.5 mi)	10.2 km (6.3 mi)
1955	123	Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone A)	30 m (100 ft)	0.2 km (0.1 mi)	0.8 km (0.5 mi)	300 m (1000 ft)	1.4 km (0.9 mi)	4.1 km (2.6 mi)
1955	123	Compressed gas, toxic, 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)	0.9 km (0.6 mi)	2.4 km (1.5 mi)
1955	123	Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone C)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 mi)
1955	123	Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone D)						
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)	0.5 km (0.4 mi)	100 m (300 ft)	0.5 km (0.4 mi)	2.2 km (1.4 mi)
1975	124	Nitric oxide and Nitrogen tetroxide mixture						
1975	124	Nitrogen dioxide and Nitric oxide mixture						
1975	124	Nitrogen tetroxide and Nitric oxide mixture						

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
1994	131	Iron pentacarbonyl	100 m (300 ft)	0.9 km (0.6 mi)	2.0 km (1.2 mi)	400 m (1250 ft)	4.5 km (2.8 mi)	7.4 km (4.6 mi)		
2004	135	Magnesium diamide (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.5 km (0.3 mi)	60 m (200 ft)	0.6 km (0.4 mi)	2.1 km (1.4 mi)		
2011	139	Magnesium phosphide (when spilled in water)	60 m (200 ft)	0.2 km (0.1 mi)	0.8 km (0.5 mi)	400 m (1250 ft)	1.7 km (1.1 mi)	5.7 km (3.6 mi)		
2012	139	Potassium phosphide (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.6 km (0.4 mi)	300 m (1000 ft)	1.2 km (0.7 mi)	3.8 km (2.4 mi)		
2013	139	Strontium phosphide (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.5 km (0.4 mi)	300 m (1000 ft)	1.1 km (0.7 mi)	3.7 km (2.3 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)	0.2 km (0.2 mi)	0.4 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)		Refer to table 3			
2188	119	Arsine	150 m (500 ft)	1.0 km (0.6 mi)	3.8 km (2.4 mi)	1000 m (3000 ft)	5.6 km (3.5 mi)	10.2 km (6.3 mi)		
2188	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)		
2189	119	Dichlorosilane	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.2 mi)	200 m (600 ft)	1.2 km (0.8 mi)	2.6 km (1.6 mi)		
2190	124	Oxygen difluoride	300 m (1000 ft)	1.6 km (1.0 mi)	6.7 km (4.2 mi)	1000 m (3000 ft)	9.8 km (6.1 mi)	11.0+ km (7.0+ mi)		
2190	124	Oxygen difluoride, compressed	300 m (1000 ft)	1.6 km (1.0 mi)	6.7 km (4.2 mi)	1000 m (3000 ft)	9.8 km (6.1 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)	300 m (1000 ft)	1.9 km (1.2 mi)	4.4 km (2.7 mi)		
2191	123	Sulphuryl fluoride	30 m (100 ft)	0.1 km (0.1 mi)	0.5 km (0.3 mi)	300 m (1000 ft)	1.9 km (1.2 mi)	4.4 km (2.7 mi)		
2192	119	Germane	150 m (500 ft)	0.7 km (0.5 mi)	3.0 km (1.9 mi)	500 m (1500 ft)	2.9 km (1.8 mi)	6.7 km (4.2 mi)		

2194	125	Selenium hexafluoride	200 m (600 ft)	1.1 km (0.7 mi)	3.4 km (2.1 mi)	600 m (2000 ft)	3.4 km (2.1 mi)	7.8 km (4.9 mi)
2195	125	Tellurium hexafluoride	600 m (2000 ft)	3.6 km (2.2 mi)	8.6 km (5.4 mi)	1000 m (3000 ft)	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)	0.7 km (0.5 mi)	150 m (500 ft)	0.9 km (0.6 mi)	2.8 km (1.8 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)	0.9 km (0.6 mi)	2.4 km (1.5 mi)
2198	125	Phosphorus pentafluoride	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)	2.9 km (1.8 mi)
2198	125	Phosphorus pentafluoride, compressed	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)	2.9 km (1.8 mi)
2199	119	Phosphine	60 m (200 ft)	0.2 km (0.2 mi)	1.0 km (0.6 mi)	300 m (1000 ft)	1.3 km (0.8 mi)	3.8 km (2.4 mi)
2202	117	Hydrogen selenide, anhydrous	300 m (1000 ft)	1.7 km (1.1 mi)	5.9 km (3.7 mi)	1000 m (3000 ft)	11.0+ km (7.0+ 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)	1.3 km (0.8 mi)	3.2 km (2.0 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)	1.3 km (0.8 mi)	3.2 km (2.0 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)
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)
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)
2308	157	Nitrosulfuric acid, liquid (when spilled in water)						
2308	157	Nitrosulfuric acid, solid						
2308	157	Nitrosylsulphuric acid, liquid (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	300 m (1000 ft)	1.0 km (0.6 mi)	2.8 km (1.8 mi)
2308	157	Nitrosylsulphuric acid, solid (when spilled in water)						
2334	131	Allylamine	30 m (100 ft)	0.2 km (0.1 mi)	0.5 km (0.3 mi)	150 m (500 ft)	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)
2353	132	Butyryl 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)	0.9 km (0.6 mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
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	Isobutyl 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 (0.2 mi)	0.6 km (0.4 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 (0.5 mi)		
2417	125	Carbonyl fluoride	100 m (300 ft)	0.6 km (0.4 mi)	2.2 km (1.4 mi)	600 m (2000 ft)	3.6 km (2.2 mi)	8.1 km (5.1 mi)		
2417	125	Carbonyl fluoride, compressed	100 m (300 ft)	0.5 km (0.3 mi)	2.4 km (1.5 mi)	400 m (1250 ft)	2.1 km (1.3 mi)	6.0 km (3.8 mi)		
2418	125	Sulfur tetrafluoride	100 m (300 ft)	0.6 km (0.4 mi)	2.6 km (1.6 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)	1.1 km (0.7 mi)	150 m (500 ft)	0.9 km (0.6 mi)	3.0 km (1.9 mi)		
2420	125	Hexafluoroacetone	60 m (200 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)		
2421	124	Nitrogen trioxide	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.3 km (0.2 mi)	1.0 km (0.6 mi)		
2434	156	Dibenzylidichlorosilane (when spilled in water)	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)	1.3 km (0.8 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)	1.0 km (0.6 mi)		
2437	156	Methylphenyldichlorosilane (when spilled in water)	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)	1.3 km (0.8 mi)		
2438	132	Trimethylacetyl chloride	60 m (200 ft)	0.5 km (0.3 mi)	1.0 km (0.6 mi)	150 m (500 ft)	2.0 km (1.3 mi)	3.2 km (2.0 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)	0.6 km (0.4 mi)	1.0 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)	2.2 km (1.4 mi)	4.1 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)	0.2 km (0.2 mi)	0.3 km (0.2 mi)
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)	4.3 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	155	Methyl isocyanate	150 m (500 ft)	1.5 km (1.0 mi)	4.4 km (2.8 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	155	n-Propyl isocyanate	100 m (300 ft)	1.3 km (0.8 mi)	2.7 km (1.7 mi)	600 m (2000 ft)	7.1 km (4.4 mi)	10.8 km (6.7 mi)
2483	155	isopropyl isocyanate	100 m (300 ft)	1.4 km (0.9 mi)	3.0 km (1.9 mi)	800 m (2500 ft)	8.4 km (5.2 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)	4.3 km (2.7 mi)	7.0 km (4.3 mi)
2485	155	n-Butyl isocyanate	60 m (200 ft)	0.6 km (0.4 mi)	1.2 km (0.7 mi)	200 m (600 ft)	2.6 km (1.6 mi)	4.0 km (2.5 mi)
2486	155	isobutyl isocyanate	60 m (200 ft)	0.6 km (0.4 mi)	1.1 km (0.7 mi)	200 m (600 ft)	2.5 km (1.6 mi)	4.0 km (2.5 mi)
2487	155	Phenyl isocyanate	60 m (200 ft)	0.8 km (0.5 mi)	1.3 km (0.8 mi)	300 m (1000 ft)	3.1 km (1.9 mi)	4.6 km (2.9 mi)
2488	155	Cyclohexyl isocyanate	30 m (100 ft)	0.3 km (0.2 mi)	0.4 km (0.2 mi)	100 m (300 ft)	0.9 km (0.6 mi)	1.3 km (0.8 mi)
2495	144	Iodine pentafluoride (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.5 km (0.4 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)	0.1 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)
2534	119	Methylchlorosilane	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	100 m (300 ft)	0.6 km (0.4 mi)	1.4 km (0.9 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)	5.2 km (3.3 mi)	11.0+ km (7.0+ mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
2600	119	Carbon monoxide and Hydrogen mixture, 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)	4.4 km (2.8 mi)		
2605	155	Methoxymethyl isocyanate	30 m (100 ft)	0.3 km (0.2 mi)	0.5 km (0.3 mi)	100 m (300 ft)	1.0 km (0.7 mi)	1.5 km (1.0 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)	0.6 km (0.4 mi)	0.9 km (0.6 mi)		
2644	151	Methyl iodide	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)	0.6 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)	0.4 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)	1.2 km (0.8 mi)	4.2 km (2.6 mi)		
2691	137	Phosphorus pentabromide (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)	0.7 km (0.4 mi)		
2692	157	Boron tribromide (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 (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	60 m (200 ft)	0.5 km (0.3 mi)	1.7 km (1.1 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)	0.5 km (0.4 mi)	1.0 km (0.6 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, corrosive, flammable, n.o.s.	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 (0.4 mi)
2742	155	Chloroformates, toxic, corrosive, flammable, n.o.s.	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.3 km (0.2 mi)	0.4 km (0.3 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)	0.4 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	138	Lithium nitride (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)	1.9 km (1.2 mi)
2810	153	Buzz	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)
2810	153	BZ (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)
2810	153	CS (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)
2810	153	DC (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)
2810	153	GA (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)
2810	153	GB (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)
2810	153	GD (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)
2810	153	GF (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)
2810	153	H (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)
2810	153	HD (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)
2810	153	HL (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)
2810	153	HN-1 (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)
2810	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)
2810	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)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS				LARGE SPILLS			
			(From a small package or small leak from a large package)		(From a large package or from many small packages)		First ISOLATE		Then PROTECT	
			First ISOLATE in all Directions Meters (Feet)	persons Downwind during DAY Kilometers (Miles)	persons Downwind during NIGHT Kilometers (Miles)	ISOLATE in all Directions Meters (Feet)	persons Downwind during DAY Kilometers (Miles)	persons Downwind during NIGHT Kilometers (Miles)		
2810	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)		
2810	153	Lewisite (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)		
2810	153	Mustard (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)		
2810	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)		
2810	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)		
2810	153	Soman (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)		
2810	153	Tabun (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)		
2810	153	Thickened 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)		
2810	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)		
2811	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)		
2826	155	Ethyl 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 (0.4 mi)		
2845	135	Ethyl phosphonous dichloride, 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 (1.4 mi)		



2845	135	Methyl phosphonous dichloride	30 m (100 ft)	0.4 km (0.2 mi)	1.0 km (0.7 mi)	150 m (500 ft)	1.9 km (1.2 mi)	3.5 km (2.2 mi)
2901	124	Bromine chloride	100 m (300 ft)	0.5 km (0.3 mi)	1.8 km (1.1 mi)	800 m (2500 ft)	4.5 km (2.8 mi)	10.0 km (6.2 mi)
2927	154	Ethyl phosphonoic 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)
2977	166	Radioactive material, Uranium hexafluoride, fissile <b>(when spilled in water)</b>						
2977	166	Uranium hexafluoride, fissile radioactive material, fissile <b>(when spilled in water)</b>	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	60 m (200 ft)	0.5 km (0.3 mi)	2.1 km (1.4 mi)
2978	166	Radioactive material, Uranium hexafluoride, non fissile or fissile-excepted <b>(when spilled in water)</b>						
2978	166	Uranium hexafluoride, radioactive material, non fissile or fissile-excepted <b>(when spilled in water)</b>	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	60 m (200 ft)	0.5 km (0.3 mi)	2.1 km (1.4 mi)
2985	155	Chlorosilanes, flammable, corrosive, n.o.s. <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)	0.5 km (0.3 mi)	1.6 km (1.0 mi)
2986	155	Chlorosilanes, corrosive, flammable, n.o.s. <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)	0.5 km (0.3 mi)	1.6 km (1.0 mi)
2987	156	Chlorosilanes, corrosive, n.o.s. <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)	0.5 km (0.3 mi)	1.6 km (1.0 mi)
2988	139	Chlorosilanes, water-reactive, flammable, corrosive, n.o.s. <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)	0.5 km (0.3 mi)	1.6 km (1.0 mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
3023	131	2-Methyl-2-heptanethiol	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)	0.7 km (0.4 mi)	
3048	157	Aluminum phosphide pesticide (when spilled in water)	60 m (200 ft)	0.2 km (0.2 mi)	0.9 km (0.6 mi)		500 m (1500 ft)	2.0 km (1.2 mi)	7.0 km (4.4 mi)	
3049	138	Metal alkyl halides, water-reactive, n.o.s. (when spilled in water)								
3049	138	Metal aryl halides, water-reactive, 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)	0.4 km (0.3 mi)	1.3 km (0.8 mi)	
3052	135	Aluminum alkyl halides, liquid (when spilled in water)								
3052	135	Aluminum alkyl halides, solid (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)		60 m (200 ft)	0.4 km (0.3 mi)	1.3 km (0.8 mi)	
3057	125	Trifluoroacetyl chloride	30 m (100 ft)	0.2 km (0.1 mi)	0.9 km (0.6 mi)		600 m (2000 ft)	4.0 km (2.5 mi)	9.5 km (5.9 mi)	
3079	131P	Methacrylonitrile, stabilized	30 m (100 ft)	0.3 km (0.2 mi)	0.7 km (0.4 mi)		150 m (500 ft)	1.4 km (0.9 mi)	2.5 km (1.6 mi)	
3083	124	Perchloryl fluoride	30 m (100 ft)	0.2 km (0.2 mi)	1.1 km (0.7 mi)		800 m (2500 ft)	4.5 km (2.8 mi)	9.6 km (6.0 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)	5.6 km (3.5 mi)	10.2 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)	200 m (600 ft)	1.2 km (0.8 mi)	2.6 km (1.6 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)	0.9 km (0.6 mi)	2.4 km (1.5 mi)
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)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 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)	5.6 km (3.5 mi)	10.2 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)	200 m (600 ft)	1.2 km (0.8 mi)	2.6 km (1.6 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)	0.9 km (0.6 mi)	2.4 km (1.5 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)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 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)	5.6 km (3.5 mi)	10.2 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)	0.8 km (0.5 mi)	300 m (1000 ft)	1.4 km (0.9 mi)	4.1 km (2.6 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)	0.9 km (0.6 mi)	2.4 km (1.5 mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	DAY Kilometers (Miles)	Meters (Feet)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	DAY Kilometers (Miles)
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)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 mi)		
3162	123	Liquefied gas, toxic, n.o.s.								
3162	123	Liquefied gas, toxic, 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)	5.6 km (3.5 mi)	10.2 km (6.3 mi)		
3162	123	Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.2 km (0.1 mi)	0.8 km (0.5 mi)	300 m (1000 ft)	1.4 km (0.9 mi)	4.1 km (2.6 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)	0.9 km (0.6 mi)	2.4 km (1.5 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)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 mi)		
3246	156	Meithanesulfonyl chloride	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)	0.8 km (0.5 mi)		
3246	156	Meithanesulphonyl chloride	30 m (100 ft)	0.2 km (0.1 mi)	0.3 km (0.2 mi)	150 m (500 ft)	1.4 km (0.9 mi)	2.5 km (1.6 mi)		
3275	131	Nitriles, poisonous, flammable, n.o.s.	30 m (100 ft)	0.3 km (0.2 mi)	0.7 km (0.4 mi)					
3275	131	Nitriles, toxic, flammable, n.o.s.	30 m (100 ft)	0.3 km (0.2 mi)	0.7 km (0.4 mi)	150 m (500 ft)	1.4 km (0.9 mi)	2.5 km (1.6 mi)		
3276	151	Nitriles, liquid, poisonous, n.o.s.								
3276	151	Nitriles, liquid, toxic, n.o.s.								
3276	151	Nitriles, poisonous, liquid, n.o.s.	30 m (100 ft)	0.3 km (0.2 mi)	0.7 km (0.4 mi)	150 m (500 ft)	1.4 km (0.9 mi)	2.5 km (1.6 mi)		
3276	151	Nitriles, poisonous, n.o.s.								
3276	151	Nitriles, toxic, liquid, n.o.s.								
3276	151	Nitriles, toxic, n.o.s.								

3278	151	Organophosphorus compound, liquid, poisonous, n.o.s.	30 m (100 ft)	0.4 km (0.2 mi)	1.0 km (0.7 mi)	150 m (500 ft)	1.9 km (1.2 mi)	3.5 km (2.2 mi)
3278	151	Organophosphorus compound, liquid, toxic, n.o.s.						
3278	151	Organophosphorus compound, poisonous, liquid, n.o.s.						
3278	151	Organophosphorus compound, poisonous, n.o.s.						
3278	151	Organophosphorus compound, toxic, liquid, n.o.s.						
3278	151	Organophosphorus compound, toxic, n.o.s.						
3279	131	Organophosphorus compound, poisonous, flammable, n.o.s.	30 m (100 ft)	0.4 km (0.2 mi)	1.0 km (0.7 mi)	150 m (500 ft)	1.9 km (1.2 mi)	3.5 km (2.2 mi)
3279	131	Organophosphorus compound, toxic, flammable, n.o.s.						
3280	151	Organoarsenic compound, liquid, n.o.s.	30 m (100 ft)	0.2 km (0.1 mi)	0.7 km (0.5 mi)	150 m (500 ft)	1.5 km (1.0 mi)	3.5 km (2.2 mi)
3280	151	Organoarsenic compound, n.o.s.						
3281	151	Metal carbonyls, liquid, n.o.s.	100 m (300 ft)	1.4 km (0.9 mi)	4.9 km (3.0 mi)	1000 m (3000 ft)	11.0+ km (7.0+ mi)	11.0+ km (7.0+ mi)
3281	151	Metal carbonyls, n.o.s.						
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						
3300	119P	Ethylene oxide and Carbon dioxide mixture, with more than 87% Ethylene oxide	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
3303	124	Compressed 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)	5.2 km (3.3 mi)	11.0+ km (7.0+ mi)		
3303	124	Compressed 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)	800 m (2500 ft)	4.5 km (2.8 mi)	9.6 km (6.0 mi)		
3303	124	Compressed 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)	0.9 km (0.6 mi)	2.4 km (1.5 mi)		
3303	124	Compressed 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)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 mi)		
3303	124	Compressed gas, poisonous, 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)	5.2 km (3.3 mi)	11.0+ km (7.0+ mi)		
3303	124	Compressed gas, toxic, oxidizing, n.o.s.	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)	800 m (2500 ft)	4.5 km (2.8 mi)	9.6 km (6.0 mi)		
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)								

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)	0.9 km (0.6 mi)	2.4 km (1.5 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)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 mi)
3304	<b>123</b>	Compressed gas, poisonous, corrosive, n.o.s.						
3304	<b>123</b>	Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone A)	100 m (300 ft)	0.6 km (0.4 mi)	2.5 km (1.5 mi)	500 m (1500 ft)	3.0 km (1.9 mi)	9.0 km (5.6 mi)
3304	<b>123</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 (0.6 mi)	400 m (1250 ft)	2.2 km (1.4 mi)	4.8 km (3.0 mi)
3304	<b>123</b>	Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone C)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	150 m (500 ft)	0.9 km (0.6 mi)	2.6 km (1.6 mi)
3304	<b>123</b>	Compressed gas, poisonous, 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)	0.7 km (0.5 mi)	1.9 km (1.2 mi)
3304	<b>123</b>	Compressed gas, toxic, corrosive, n.o.s.						
3304	<b>123</b>	Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone A)	100 m (300 ft)	0.6 km (0.4 mi)	2.5 km (1.5 mi)	500 m (1500 ft)	3.0 km (1.9 mi)	9.0 km (5.6 mi)
3304	<b>123</b>	Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.2 km (0.2 mi)	1.0 km (0.6 mi)	400 m (1250 ft)	2.2 km (1.4 mi)	4.8 km (3.0 mi)
3304	<b>123</b>	Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone C)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	150 m (500 ft)	0.9 km (0.6 mi)	2.6 km (1.6 mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
3304	123	Compressed 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)	0.1 km (0.1 mi)	150 m (500 ft)	0.7 km (0.5 mi)	1.9 km (1.2 mi)	
3305	119	Compressed gas, poisonous, flammable, corrosive, n.o.s.								
3305	119	Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	150 m (500 ft)	1.0 km (0.6 mi)	3.8 km (2.4 mi)	1.0 km (0.6 mi)	1000 m (3000 ft)	5.6 km (3.5 mi)	10.2 km (6.3 mi)	
3305	119	Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.2 mi)	0.1 km (0.1 mi)	200 m (600 ft)	1.2 km (0.8 mi)	2.6 km (1.6 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)	0.3 km (0.2 mi)	0.1 km (0.1 mi)	150 m (500 ft)	0.9 km (0.6 mi)	2.4 km (1.5 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)	0.1 km (0.1 mi)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 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)	150 m (500 ft)	1.0 km (0.6 mi)	3.8 km (2.4 mi)	1.0 km (0.6 mi)	1000 m (3000 ft)	5.6 km (3.5 mi)	10.2 km (6.3 mi)	



3305	119	Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.2 mi)	200 m (600 ft)	1.2 km (0.8 mi)	2.6 km (1.6 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)	0.3 km (0.2 mi)	150 m (500 ft)	0.9 km (0.6 mi)	2.4 km (1.5 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)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 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)	800 m (2500 ft)	5.2 km (3.3 mi)	11.0+ km (7.0+ mi)
3306	124	Compressed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B)	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)	800 m (2500 ft)	4.5 km (2.8 mi)	9.6 km (6.0 mi)
3306	124	Compressed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	150 m (500 ft)	0.9 km (0.6 mi)	2.4 km (1.5 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)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 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)	800 m (2500 ft)	5.2 km (3.3 mi)	11.0+ km (7.0+ mi)
3306	124	Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B)	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)	800 m (2500 ft)	4.5 km (2.8 mi)	9.6 km (6.0 mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
3306	124	Compressed gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	150 m (500 ft)	0.9 km (0.6 mi)	2.4 km (1.5 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)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 mi)		
3307	124	Liquefied gas, poisonous, oxidizing, n.o.s.								
3307	124	Liquefied gas, poisonous, 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)	5.2 km (3.3 mi)	11.0+ km (7.0+ mi)		
3307	124	Liquefied gas, poisonous, oxidizing, n.o.s. (Inhalation Hazard Zone B)	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)	800 m (2500 ft)	4.5 km (2.8 mi)	9.6 km (6.0 mi)		
3307	124	Liquefied 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)	0.9 km (0.6 mi)	2.4 km (1.5 mi)		
3307	124	Liquefied 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)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 mi)		

3307	124	Liquefied gas, toxic, oxidizing, n.o.s.	100 m (300 ft)	0.5 km (0.3 mi)	2.5 km (1.6 mi)	800 m (2500 ft)	5.2 km (3.3 mi)	11.0+ km (7.0+ mi)
3307	124	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)	800 m (2500 ft)	4.5 km (2.8 mi)	9.6 km (6.0 mi)
3307	124	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)	0.9 km (0.6 mi)	2.4 km (1.5 mi)
3307	124	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)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 mi)
3308	123	Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone D)	100 m (300 ft)	0.6 km (0.4 mi)	2.5 km (1.5 mi)	500 m (1500 ft)	3.0 km (1.9 mi)	9.0 km (5.6 mi)
3308	123	Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone A)	30 m (100 ft)	0.2 km (0.2 mi)	1.0 km (0.6 mi)	400 m (1250 ft)	2.2 km (1.4 mi)	4.8 km (3.0 mi)
3308	123	Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	150 m (500 ft)	0.9 km (0.6 mi)	2.6 km (1.6 mi)
3308	123	Liquefied gas, poisonous, corrosive, 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)	0.7 km (0.5 mi)	1.9 km (1.2 mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
3308	123	Liquefied gas, toxic, corrosive, n.o.s.	100 m (300 ft)	0.6 km (0.4 mi)	2.5 km (1.5 mi)	500 m (1500 ft)	3.0 km (1.9 mi)	9.0 km (5.6 mi)		
3308	123	Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone A)	30 m (100 ft)	0.2 km (0.2 mi)	1.0 km (0.6 mi)	400 m (1250 ft)	2.2 km (1.4 mi)	4.8 km (3.0 mi)		
3308	123	Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	150 m (500 ft)	0.9 km (0.6 mi)	2.6 km (1.6 mi)		
3308	123	Liquefied gas, toxic, corrosive, 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)	0.7 km (0.5 mi)	1.9 km (1.2 mi)		
3309	119	Liquefied gas, poisonous, flammable, corrosive, n.o.s.	150 m (500 ft)	1.0 km (0.6 mi)	3.8 km (2.4 mi)	1000 m (3000 ft)	5.6 km (3.5 mi)	10.2 km (6.3 mi)		
3309	119	Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.2 mi)	200 m (600 ft)	1.2 km (0.8 mi)	2.6 km (1.6 mi)		

3309	119	Liquefied gas, poisonous, flammable, corrosive, 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)	0.9 km (0.6 mi)	2.4 km (1.5 mi)
3309	119	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)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 mi)
3309	119	Liquefied gas, toxic, flammable, corrosive, 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)	5.6 km (3.5 mi)	10.2 km (6.3 mi)
3309	119	Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.2 mi)	200 m (600 ft)	1.2 km (0.8 mi)	2.6 km (1.6 mi)
3309	119	Liquefied gas, toxic, flammable, corrosive, 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)	0.9 km (0.6 mi)	2.4 km (1.5 mi)
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)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 mi)
3310	124	Liquefied gas, poisonous, oxidizing, corrosive, n.o.s.	100 m (300 ft)	0.5 km (0.3 mi)	2.5 km (1.6 mi)	800 m (2500 ft)	5.2 km (3.3 mi)	11.0+ km (7.0+ mi)
3310	124	Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A)	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)	800 m (2500 ft)	4.5 km (2.8 mi)	9.6 km (6.0 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)	0.3 km (0.2 mi)	150 m (500 ft)	0.9 km (0.6 mi)	2.4 km (1.5 mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
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)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 mi)		
3310	124	Liquefied gas, toxic, oxidizing, corrosive, n.o.s.	100 m (300 ft)	0.5 km (0.3 mi)	2.5 km (1.6 mi)	800 m (2500 ft)	5.2 km (3.3 mi)	11.0+ km (7.0+ mi)		
3310	124	Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A)	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)	800 m (2500 ft)	4.5 km (2.8 mi)	9.6 km (6.0 mi)		
3310	124	Liquefied gas, toxic, oxidizing, corrosive, 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)	0.9 km (0.6 mi)	2.4 km (1.5 mi)		
3310	124	Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone C)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	100 m (300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 mi)		
3318	125	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)	0.7 km (0.5 mi)	1.9 km (1.2 mi)		
3355	119	Insecticide gas, poisonous, flammable, n.o.s.								
3355	119	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)	5.6 km (3.5 mi)	10.2 km (6.3 mi)		

3355	119	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)	200 m	600 ft	1.2 km (0.8 mi)	2.6 km (1.6 mi)
3355	119	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)	0.9 km (0.6 mi)	2.4 km (1.5 mi)
3355	119	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)	100 m	(300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 mi)
3355	119	Insecticide gas, toxic, flammable, n.o.s.							
3355	119	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)	5.6 km (3.5 mi)	10.2 km (6.3 mi)
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)	200 m	(600 ft)	1.2 km (0.8 mi)	2.6 km (1.6 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)	0.9 km (0.6 mi)	2.4 km (1.5 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)	100 m	(300 ft)	0.7 km (0.5 mi)	1.9 km (1.2 mi)
3361	156	Chlorosilanes, poisonous, corrosive, n.o.s. (when spilled in water)							
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)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
3362	155	Chlorosilanes, poisonous, corrosive, flammable, n.o.s. <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)	0.5 km (0.3 mi)	1.6 km (1.0 mi)		
3362	155	Chlorosilanes, toxic, corrosive, flammable, n.o.s. <b>(when spilled in water)</b>								
3381	151	Poisonous by inhalation liquid, n.o.s. (Inhalation Hazard Zone A)	30 m (100 ft)	0.4 km (0.3 mi)	1.2 km (0.8 mi)	200 m (600 ft)	2.5 km (1.6 mi)	4.0 km (2.5 mi)		
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)	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 (0.4 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)	1.4 km (0.9 mi)	150 m (500 ft)	2.0 km (1.3 mi)	4.7 km (3.0 mi)		
3383	131	Toxic by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone A)								



3384	<b>131</b>	Poisonous by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone B)	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)	0.8 km (0.5 mi)
3384	<b>131</b>	Toxic by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.2 km (0.1 mi)	0.2 km (0.1 mi)	200 m (600 ft)	2.5 km (1.6 mi)	4.0 km (2.5 mi)
3385	<b>139</b>	Poisonous by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone A)	30 m (100 ft)	0.4 km (0.3 mi)	1.2 km (0.8 mi)	60 m (200 ft)	0.5 km (0.3 mi)	0.7 km (0.4 mi)
3385	<b>139</b>	Toxic by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone A)	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 (0.4 mi)
3386	<b>139</b>	Poisonous by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.4 km (0.3 mi)	1.2 km (0.8 mi)	200 m (600 ft)	2.5 km (1.6 mi)	4.0 km (2.5 mi)
3386	<b>139</b>	Toxic by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone B)	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)
3387	<b>142</b>	Poisonous by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone A)	30 m (100 ft)	0.4 km (0.3 mi)	1.2 km (0.8 mi)	200 m (600 ft)	2.5 km (1.6 mi)	4.0 km (2.5 mi)
3387	<b>142</b>	Toxic by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone A)	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)
3388	<b>142</b>	Poisonous by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone B)	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)
3388	<b>142</b>	Toxic by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone B)	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)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions Meters (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Meters (Feet)	Then PROTECT persons Downwind during			
				DAY Kilometers (Miles)	NIGHT Kilometers (Miles)		DAY Kilometers (Miles)	NIGHT Kilometers (Miles)		
3389	154	Poisonous by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone A)	60 m (200 ft)	0.3 km (0.2 mi)	0.7 km (0.4 mi)	300 m (1000 ft)	1.5 km (0.9 mi)	2.6 km (1.6 mi)		
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)	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)	0.6 km (0.4 mi)		
3416	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)		
3456	157	Nitrosylsulfuric acid, solid (when spilled in water)								
3456	157	Nitrosylsulphuric acid, solid (when spilled in water)	60 m (200 ft)	0.2 km (0.1 mi)	0.6 km (0.4 mi)	300 m (1000 ft)	0.8 km (0.5 mi)	2.8 km (1.8 mi)		
3461	135	Aluminum alkyl halides; solid (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	60 m (200 ft)	0.4 km (0.3 mi)	1.3 km (0.8 mi)		

3488	131	Poisonous by inhalation liquid, flammable, corrosive, 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)	4.5 km (2.8 mi)	7.4 km (4.6 mi)
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)	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)	0.8 km (0.5 mi)
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)	60 m (200 ft)	0.5 km (0.3 mi)	1.4 km (0.9 mi)	150 m (500 ft)	2.0 km (1.3 mi)	4.7 km (3.0 mi)
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)	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)	0.8 km (0.5 mi)
3491	155	Toxic by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone B)						

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT 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)	4.5 km (2.8 mi)	7.4 km (4.6 mi)		
3492	131	Toxic by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone A)	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)	0.8 km (0.5 mi)		
3493	131	Poisonous by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone B)	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 (0.4 mi)		
3494	131	Petroleum sour crude oil, flammable, poisonous	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 (0.4 mi)		
3494	131	Petroleum sour crude oil, flammable, toxic	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 (0.4 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	Absorbed gas, poisonous, n.o.s.	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.2 mi)		
3512	173	Absorbed gas, poisonous, n.o.s. (Inhalation hazard zone A)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 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)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 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)	0.1 km (0.1 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)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 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)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.2 mi)
3514	173	Adsorbed gas, poisonous, flammable, 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)
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)	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)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
3514	173	Adsorbed gas, toxic, flammable, n.o.s.	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.4 km (0.2 mi)
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)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.4 km (0.2 mi)
3514	173	Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone B)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.4 km (0.2 mi)
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)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.4 km (0.2 mi)
3514	173	Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone D)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.4 km (0.2 mi)
3515	173	Adsorbed gas, poisonous, oxidizing, n.o.s.	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.4 km (0.2 mi)
3515	173	Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone A)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.4 km (0.2 mi)
3515	173	Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone B)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.4 km (0.2 mi)
3515	173	Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone C)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.4 km (0.2 mi)
3515	173	Adsorbed gas, poisonous, oxidizing, n.o.s. (Inhalation hazard zone D)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.4 km (0.2 mi)

3515	173	Adsorbed gas, toxic, oxidizing, n.o.s.	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.4 km (0.2 mi)
3515	173	Adsorbed gas, toxic, oxidizing, 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)	0.1 km (0.1 mi)	0.4 km (0.2 mi)
3515	173	Adsorbed gas, toxic, oxidizing, 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)	0.4 km (0.2 mi)
3515	173	Adsorbed gas, toxic, oxidizing, 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)	0.4 km (0.2 mi)
3515	173	Adsorbed gas, toxic, oxidizing, 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)	0.1 km (0.1 mi)	0.4 km (0.2 mi)
3516	173	Adsorbed gas, poisonous, corrosive, n.o.s.	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.4 km (0.2 mi)
3516	173	Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone A)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.4 km (0.2 mi)
3516	173	Adsorbed gas, poisonous, corrosive, 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)	0.4 km (0.2 mi)
3516	173	Adsorbed gas, poisonous, 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)	0.4 km (0.2 mi)
3516	173	Adsorbed gas, poisonous, corrosive, 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)	0.1 km (0.1 mi)	0.4 km (0.2 mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)			LARGE SPILLS (From a large package or from many small packages)		
			First ISOLATE in all Directions Meters (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Meters (Feet)	Then PROTECT persons Downwind during	
				DAY Kilometers (Miles)	NIGHT Kilometers (Miles)		DAY Kilometers (Miles)	NIGHT Kilometers (Miles)
3516	173	Adsorbed gas, toxic, corrosive, n.o.s.	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 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)	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 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)
3516	173	Adsorbed gas, toxic, 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)
3516	173	Adsorbed 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)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.2 mi)
3517	173	Adsorbed gas, poisonous, flammable, corrosive, n.o.s.	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 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)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.2 mi)



3517	173	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)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.1 km (0.1 mi)
3517	173	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)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.1 km (0.1 mi)
3517	173	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)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.1 km (0.1 mi)
3517	173	Adsorbed gas, toxic, flammable, corrosive, n.o.s.	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.4 km (0.2 mi)
3517	173	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)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.1 km (0.1 mi)
3517	173	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)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.1 km (0.1 mi)
3517	173	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)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.1 km (0.1 mi)
3517	173	Adsorbed 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)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.4 km (0.2 mi)

"+" means distance can be larger in certain atmospheric conditions

**TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES**

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)						
			First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during				
			Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	Kilometers (Miles)	DAY Kilometers (Miles)	NIGHT 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)	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)	0.1 km (0.1 mi)	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)	0.2 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 (0.2 mi)	0.4 km (0.2 mi)	0.4 km (0.2 mi)	0.4 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)	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)	0.1 km (0.1 mi)	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)	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)	0.1 km (0.1 mi)	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)	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)	0.1 km (0.1 mi)	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)	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)	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)	0.2 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)	0.4 km (0.2 mi)	0.4 km (0.2 mi)	0.4 km (0.2 mi)

3523	173	Germane, adsorbed	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 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)	0.1 km (0.1 mi)	30 m (100 ft)	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)	0.1 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)
3526	173	Hydrogen selenide, adsorbed	30 m (100 ft)	0.1 km (0.1 mi)	0.2 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)
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)	0.1 km (0.1 mi)	30 m (100 ft)	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)	0.1 km (0.1 mi)	200 m (600 ft)	1.2 km (0.7 mi)	4.4 km (2.8 mi)
9206	137	Methyl phosphonic dichloride	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.4 km (0.2 mi)	0.5 km (0.3 mi)
9263	156	Chloroacetaldehyde	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)
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)	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)	0.1 km (0.1 mi)	100 m (300 ft)	1.3 km (0.8 mi)	2.4 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

## HOW TO USE TABLE 2 – WATER-REACTIVE MATERIALS WHICH PRODUCE TOXIC GASES

Table 2 lists materials which 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 ID number order.

These Water Reactive materials are easily identified in Table 1 as their name is immediately followed by “(when spilled in water)”.

**Note 1:** Some Water Reactive materials are also TIH materials themselves (e.g., Bromine trifluoride (UN1746), Thionyl chloride (UN1836), etc.). In these instances, two entries are provided in **Table 1** for land-based and water-based spills. If the Water Reactive material **is NOT** a TIH and this material **is NOT** spilled in water, **Table 1** and **Table 2 do NOT** apply and safety distances will be found within the appropriate orange guide.

**Note 2:** 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**

ID No.	Guide No.	Name of Material	TIH Gas(es) Produced
1162	155	Dimethyldichlorosilane	HCl
1183	139	Ethylchlorosilane	HCl
1196	155	Ethyltrichlorosilane	HCl
1242	139	Methylchlorosilane	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>
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	HCN
1680	157	Potassium cyanide, solid	HCN
1689	157	Sodium cyanide	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 - 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**

ID No.	Guide No.	Name of Material	TIH Gas(es) Produced
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 mixture)	HCl
1754	137	Chlorosulphonic acid (with or without sulphur trioxide mixture)	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	Diphenyldichlorosilane	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*

ID No.	Guide No.	Name of Material	TIH Gas(es) Produced
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>

#### 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**

ID No.	Guide No.	Name of Material	TIH Gas(es) Produced
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	Nitrosylsulfuric acid, solid	NO <sub>2</sub>
2308	157	Nitrosylsulphuric acid, liquid	NO <sub>2</sub>
2308	157	Nitrosylsulphuric acid, solid	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

**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>
2692	157	Boron tribromide	HBr
2806	138	Lithium nitride	NH <sub>3</sub>
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>
3049	138	Metal alkyl halides, water-reactive, n.o.s	HCl
3049	138	Metal aryl halides, water-reactive, n.o.s	HCl
3052	135	Aluminum alkyl halides, liquid	HCl
3052	135	Aluminum alkyl halides, solid	HCl
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>

**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

ID No.	Guide No.	Name of Material	TIH Gas(es) Produced
3461	135	Aluminum alkyl halides, solid	HCl
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>

#### 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		

## NOTES

**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 materials that may be more commonly encountered.

The selected materials are:

- Ammonia, anhydrous (UN1005)
- Chlorine (UN1017)
- Ethylene oxide (UN1040)
- Hydrogen chloride, anhydrous (UN1050) and Hydrogen chloride, refrigerated liquid (UN2186)
- Hydrogen fluoride, anhydrous (UN1052)
- Sulfur dioxide/Sulphur dioxide (UN1079)

The materials are presented in alphabetical order 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) for day time and night time situations and different wind speeds.

**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

**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 <b>PROTECT</b> persons Downwind during							
		DAY				NIGHT			
		Low wind (< 6 mph = < 10 km/h) km (Miles)	Moderate wind (6-12 mph = 10 - 20 km/h) km (Miles)	High wind (> 12 mph = > 20 km/h) km (Miles)	Low wind (< 6 mph = < 10 km/h) km (Miles)	Moderate wind (6-12 mph = 10 - 20 km/h) km (Miles)	High wind (> 12 mph = > 20 km/h) km (Miles)		
<b>UN1005 Ammonia, anhydrous: Large Spills</b>									
TRANSPORT CONTAINER	Meters (Feet)	Low wind (< 6 mph = < 10 km/h) km (Miles)	Moderate wind (6-12 mph = 10 - 20 km/h) km (Miles)	High wind (> 12 mph = > 20 km/h) km (Miles)	Low wind (< 6 mph = < 10 km/h) km (Miles)	Moderate wind (6-12 mph = 10 - 20 km/h) km (Miles)	High wind (> 12 mph = > 20 km/h) km (Miles)		
Rail tank car	300 (1000)	1.7 (1.1)	1.3 (0.8)	1.0 (0.6)	4.3 (2.7)	2.3 (1.4)	1.3 (0.8)		
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)	1.3 (0.8)	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>UN1017 Chlorine: Large Spills</b>									
TRANSPORT CONTAINER	Meters (Feet)	Low wind (< 6 mph = < 10 km/h) km (Miles)	Moderate wind (6-12 mph = 10 - 20 km/h) km (Miles)	High wind (> 12 mph = > 20 km/h) km (Miles)	Low wind (< 6 mph = < 10 km/h) km (Miles)	Moderate wind (6-12 mph = 10 - 20 km/h) km (Miles)	High wind (> 12 mph = > 20 km/h) km (Miles)		
Rail tank car	1000 (3000)	9.9 (6.2)	6.4 (4.0)	5.1 (3.2)	11+ (7+)	9.0 (5.6)	6.7 (4.2)		
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)		

"+" 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 PROTECT persons Downwind during					
		DAY			NIGHT		
		First ISOLATE in all Directions	Low wind (< 6 mph = < 10 km/h) km (Miles)	Moderate wind (6-12 mph = 10 - 20 km/h) km (Miles)	High wind (> 12 mph = > 20 km/h) km (Miles)	Low wind (< 6 mph = < 10 km/h) km (Miles)	Moderate wind (6-12 mph = 10 - 20 km/h) km (Miles)
Meters (Feet)							
<b>UN1040 Ethylene oxide: Large Spills</b>							
TRANSPORT CONTAINER							
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>UN1050 Hydrogen chloride, anhydrous: Large Spills</b>							
TRANSPORT CONTAINER							
Rail tank car	500 (1500)	3.7 (2.3)	2.0 (1.2)	1.7 (1.1)	9.9 (6.2)	3.4 (2.1)	2.3 (1.5)
Highway tank truck or trailer	200 (600)	1.5 (0.9)	0.8 (0.5)	0.6 (0.4)	3.8 (2.4)	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)
<b>UN2186 Hydrogen chloride, refrigerated liquid: Large Spills</b>							
Rail tank car	500 (1500)	3.7 (2.3)	2.0 (1.2)	1.7 (1.1)	9.9 (6.2)	3.4 (2.1)	2.3 (1.5)
Highway tank truck or trailer	200 (600)	1.5 (0.9)	0.8 (0.5)	0.6 (0.4)	3.8 (2.4)	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 <b>PROTECT</b> persons Downwind during					
		DAY			NIGHT		
		Low wind (< 6 mph = < 10 km/h) km (Miles)	Moderate wind (6-12 mph = 10 - 20 km/h) km (Miles)	High wind (> 12 mph = > 20 km/h) km (Miles)	Low wind (< 6 mph = < 10 km/h) km (Miles)	Moderate wind (6-12 mph = 10 - 20 km/h) km (Miles)	High wind (> 12 mph = > 20 km/h) km (Miles)
<b>UN1052 Hydrogen fluoride, anhydrous: Large Spills</b>							
<b>TRANSPORT CONTAINER</b>							
Rail tank car	400 (1250)	3.1 (1.9)	1.9 (1.2)	1.6 (1.0)	6.1 (3.8)	2.9 (1.8)	1.9 (1.2)
Highway tank truck or trailer	200 (700)	1.9 (1.2)	1.0 (0.7)	0.9 (0.6)	3.4 (2.2)	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)	1.6 (1.0)	0.5 (0.3)	0.3 (0.2)
<b>UN1079 Sulfur dioxide/Sulphur dioxide: Large Spills</b>							
<b>TRANSPORT CONTAINER</b>							
Rail tank car	1000 (3000)	11+ (7+)	11+ (7+)	7.0 (4.4)	11+ (7+)	11+ (7+)	9.8 (6.1)
Highway tank truck or trailer	1000 (3000)	11+ (7+)	5.8 (3.6)	5.0 (3.1)	11+ (7+)	8.0 (5.0)	6.1 (3.8)
Multiple ton cylinders	500 (1500)	5.2 (3.2)	2.4 (1.5)	1.8 (1.1)	7.5 (4.7)	4.0 (2.5)	2.8 (1.7)
Multiple small cylinders or single ton cylinder	200 (600)	3.1 (1.9)	1.5 (0.9)	1.1 (0.7)	5.6 (3.5)	2.4 (1.5)	1.5 (0.9)

"+" means distance can be larger in certain atmospheric conditions

## **ERG2016 USER'S GUIDE**

The 2016 Emergency Response Guidebook (ERG2016) was developed jointly by Transport Canada (TC), the U.S. Department of Transportation (DOT), the Secretariat of Communications and Transport of Mexico (SCT) and with the collaboration of CIQUIME (Centro de Información Química para Emergencias) of Argentina, for use by fire fighters, police, and other emergency services personnel who may be the first to arrive at the scene of a transportation incident involving dangerous goods. **It is primarily a guide to aid first responders in quickly identifying the specific or generic hazards of the material(s) involved in the incident, and protecting themselves and the general public during the initial response phase of the incident.** For the purposes of this guidebook, the “initial response phase” is that period following arrival at the scene of an incident during which the presence and/or identification of dangerous goods is confirmed, protective actions and area securement are initiated, and assistance of qualified personnel is requested. It is not intended to provide information on the physical or chemical properties of dangerous goods.

This guidebook will assist responders in making initial decisions upon arriving at the scene of a dangerous goods incident. It should not be considered as a substitute for emergency response training, knowledge or sound judgment. ERG2016 does not address all possible circumstances that may be associated with a dangerous goods incident. It is primarily designed for use at a dangerous goods incident occurring on a highway or railroad. Be mindful that there may be limited value in its application at fixed facility locations.

ERG2016 incorporates dangerous goods lists from the most recent United Nations Recommendations as well as from other international and national regulations. Explosives are not listed individually by either proper shipping name or ID Number. They do, however, appear under the general heading “Explosives” on the first page of the ID Number index (yellow-bordered pages) and alphabetically in the Name of Material index (blue-bordered pages). Also, the letter **(P)** following the guide number in the yellow-bordered and blue-bordered pages identifies those materials which present a polymerization hazard under certain conditions, for example: Acrolein, stabilized **131P**.

First responders at the scene of a dangerous goods incident should seek additional specific information about any material in question as soon as possible. The information received by contacting the appropriate emergency response agency, by calling the emergency response telephone number on the shipping document, or by consulting the information on or accompanying the shipping document, may be more specific and accurate than this guidebook in providing guidance for the materials involved.

**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 regarding the use of this guidebook.



## Guidebook Contents

**1-Yellow-bordered pages:** Index list of dangerous goods in numerical order of ID number. This section quickly identifies the guide to be consulted from the ID Number of the material involved. This list displays the 4-digit ID number of the material followed by its assigned emergency response guide and the 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. This section quickly identifies the guide to be consulted from the name of the material involved. This list displays the name of the material 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:** This section is the most important section of the guidebook because it is where all safety recommendations are provided. It comprises a total of 63 individual guides, presented in a two-page format. Each guide provides safety recommendations and emergency response information to protect yourself and the public. The left-hand page provides safety-related information whereas the right-hand page provides emergency response guidance and activities for fire situations, spill or leak incidents and first aid. Each guide is designed to cover a group of materials which possess similar chemical and toxicological characteristics.

The guide title identifies the general hazards of the dangerous goods covered.

**For example:**     **GUIDE 124** - Gases-Toxic and/or Corrosive-Oxidizing.

Each guide is divided into three main sections: the first section describes **potential hazards** that the material may display in terms of fire/explosion and health effects upon exposure. The highest potential is listed first. The emergency responder should consult this section first. This allows the responder to make decisions regarding the protection of the emergency response team as well as the surrounding population.

The second section outlines suggested **public safety** measures based on the situation at hand. It provides general information regarding immediate isolation of the incident site, recommended type of protective clothing and respiratory protection. Suggested evacuation distances are listed for small and large spills and for fire situations (fragmentation hazard). It also directs the reader to consult the tables listing Toxic Inhalation Hazard (TIH) (PIH in the US) materials, chemical warfare agents and water-reactive materials (green-bordered pages) when the material is highlighted in the yellow-bordered and blue-bordered pages.

The third section covers **emergency response** actions, including first aid. It outlines special precautions for incidents which involve fire, spill or chemical exposure. Several recommendations are listed under each part which will further assist in the decision making process. The information on first aid is general guidance prior to seeking medical care.

**4-Green-bordered pages:** This section contains three tables.

**Table 1** lists, by ID number order, TIH (PIH in the US) materials, including certain chemical warfare agents, and water-reactive materials which produce toxic gases upon contact with water. This table provides two different types of recommended safe distances which are "Initial isolation distances" and "Protective action distances". The materials are highlighted in green for easy identification in both numeric (yellow-bordered pages) and alphabetic (blue-bordered pages) lists of the guidebook. This table provides distances for both small (approximately 208 liters (55 US gallons) or less for liquids and 300 kilograms (660 pounds) or less for solids when spilled in water) and large spills (more than 208 liters (55 US gallons) for liquids and more than 300 kilograms (660 pounds) for solids when spilled in water) for all highlighted materials. The list is further subdivided into daytime and nighttime situations. This is necessary due to varying atmospheric conditions which greatly affect the size of the hazardous area. The distances change from daytime to nighttime due to different mixing and dispersion conditions in the air. During the night, the air is generally calmer and this causes the material to disperse less and therefore create a toxic zone which is greater than would usually occur during the day. During the day, a more active atmosphere will cause a greater dispersion of the material resulting in a lower concentration of the material in the surrounding air. The actual area where toxic levels are reached will be smaller (due to increased dispersion). In fact, it is the quantity or concentration of the material vapor that poses problems not its mere presence.

The "Initial Isolation Distance" is a distance within which all persons should be considered for evacuation in all directions from the actual spill/leak source. It is a distance (radius) which defines a circle (Initial Isolation Zone) within which persons may be exposed to dangerous concentrations upwind of the source and may be exposed to life-threatening concentrations downwind of the source. For example, in the case of Compressed gas, toxic, n.o.s., UN1955, Inhalation Hazard Zone A, the isolation distance for small spills is 100 meters (300 feet), therefore, representing an evacuation circle of 200 meters (600 feet) in diameter.

For the same material, the "Protective Action Distance" for a small spill is 0.5 kilometers (0.3 miles) for a daytime incident and 2.5 kilometers (1.6 miles) for a nighttime incident, these distances represent a downwind distance from the spill/leak source within which Protective Actions could be implemented. Protective Actions are those steps taken to preserve the health and safety of emergency responders and the public. People in this area could be evacuated and/or sheltered in-place. For more information, consult pages 289 to 295.

### **Toxic Inhalation Hazard (TIH) Materials**

A TIH (PIH in the US) material is a gas or volatile liquid which is known to be so toxic to humans as to pose a hazard to health during transportation, or in the absence of adequate data on human toxicity, is presumed to be toxic to humans because when tested on laboratory animals it has a Lethal Concentration 50 (LC50) value of not more than 5000 ppm.

It is important to note that even though the term zone is used, the hazard zones do not represent any actual area or distance. The assignment of the zones is strictly a function of

their Lethal Concentration 50 (LC50); for example, TIH Zone A is more toxic than Zone D. All distances which are listed in the green-bordered pages are calculated by the use of mathematical models for each TIH material. For the assignment of hazard zones refer to the glossary.

**Table 2** lists, by ID number order, materials that produce large amounts of Toxic Inhalation Hazard (TIH) gases when spilled in water and identifies the TIH gases produced. These Water Reactive materials are easily identified in **Table 1** as their name is immediately followed by **(when spilled in water)**. Some Water Reactive materials are also TIH materials themselves (e.g., Bromine trifluoride (UN1746), Thionyl chloride (UN1836), etc.). In these instances, two entries are provided in **Table 1** for land-based and water-based spills. If the Water Reactive material is NOT a TIH, and this material is NOT spilled in water, **Table 1** and **Table 2** do not apply and safety distances will be found within the appropriate orange-bordered guide.

**Table 3** provides, by alphabetical order of material name, initial isolation and protective action distances for six Toxic Inhalation Hazard materials that may be more commonly encountered. The selected materials are:

- Ammonia, anhydrous (UN1005)
- Chlorine (UN1017)
- Ethylene oxide (UN1040)
- Hydrogen chloride, anhydrous (UN1050) and Hydrogen chloride, refrigerated liquid (UN2186)
- Hydrogen fluoride, anhydrous (UN1052)
- Sulfur dioxide/Sulphur dioxide (UN1079)

The 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 day-time and night-time situations and different wind speeds.

### **Isolation and Evacuation Distances**

Isolation or evacuation distances are shown in the guides (orange-bordered pages) and in the Table 1 - Initial Isolation and Protective Action Distances (green-bordered pages). This may confuse users not thoroughly familiar with ERG2016.

It is important to note that some guides refer only to non-TIH (PIH in the US) materials (37 guides), some refer to both TIH and non-TIH materials (21 guides) and some (5 guides) refer only to TIH or Water-reactive materials (WRM). A guide refers to both TIH and non-TIH materials (for example see GUIDE 131) when the following sentence appears under the title EVACUATION-Spill: "See Table 1 - Initial Isolation and Protective Action Distances for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under 'PUBLIC SAFETY.'" A guide refers only to TIH

or WRM materials (for example see GUIDE 124) when the following sentence appears under the title EVACUATION-Spill: "See Table 1 - Initial Isolation and Protective Action Distances". If the previous sentences do not appear in a guide, then this particular guide refers only to non-TIH materials (for example see GUIDE 128).

In order to identify appropriate isolation and protective action distances, use the following:

If you are dealing with a **TIH/WRM/Chemical warfare** material (highlighted entries in the index lists), the isolation and evacuation distances are found directly in the green-bordered pages. The guides (orange-bordered pages) also remind the user to refer to the green-bordered pages for evacuation-specific information involving highlighted materials.

If you are dealing with a **non-TIH material but the guide refers to both TIH and non-TIH materials**, an immediate isolation distance is provided under the heading PUBLIC SAFETY as a precautionary measure to prevent injuries. It applies to the non-TIH materials only. In addition, for evacuation purposes, the guide informs the user under the title EVACUATION-Spill to increase, for non-highlighted materials, in the downwind direction, if necessary, the immediate isolation distance listed under "PUBLIC SAFETY". For example, GUIDE 131 – Flammable Liquids-Toxic, instructs the user to: "As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions." In case of a large spill, the isolation area could be expanded from 50 meters (150 feet) to a distance deemed as safe by the on-scene commander and emergency responders.

If you are dealing with a **non-TIH material and the guide refers only to non-TIH materials**, the immediate isolation and evacuation distances are specified as actual distances in the guide (orange-bordered pages) and are not referenced in the green-bordered pages.

**Note 1:** If an entry is highlighted in green in either the yellow-bordered or blue-bordered pages AND THERE IS NO FIRE, go directly to Table 1 - Initial Isolation and Protective Action Distances (green-bordered pages) and look up the ID number and name of material to obtain initial isolation and protective action distances. IF A FIRE IS INVOLVED, ALSO CONSULT the assigned guide (orange-bordered pages) and apply as appropriate the evacuation information shown under PUBLIC SAFETY.

**Note 2:** If the name in **Table 1** is shown with "**(when spilled in water)**", these materials produce large amounts of Toxic Inhalation Hazard (TIH) gases when spilled in water. Some Water Reactive materials are also TIH materials themselves (e.g., Bromine trifluoride (UN1746), Thionyl chloride (UN1836), etc.). In these instances, two entries are provided in **Table 1** for land-based and water-based spills. If the Water Reactive material is **NOT** a TIH and this material is **NOT** spilled in water, **Table 1** and **Table 2** do not apply and safety distances will be found within the appropriate orange-bordered guide.

## 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 dangerous goods.

**Structural Fire Fighters' Protective Clothing (SFPC).** This category of clothing, often called turnout or bunker gear, means the protective clothing normally worn by fire fighters during structural fire fighting operations. It includes a helmet, coat, pants, boots, gloves and a hood to cover parts of the head not protected by the helmet and facepiece. This clothing must be used with full-facepiece positive pressure self-contained breathing apparatus (SCBA). This protective clothing should, at a minimum, meet the OSHA Fire Brigades Standard (29 CFR 1910.156). Structural fire fighters' protective clothing provides limited protection from heat and cold, but may not provide adequate protection from the harmful vapors or liquids that are encountered during dangerous goods incidents. Each guide includes a statement about the use of SFPC in incidents involving those 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 an expedient, that is, 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 perform this operation only if an overriding benefit can be gained (i.e., perform an immediate rescue, turn off a valve to control a leak, etc.). 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, even if one inhales deeply while doing heavy work. Use apparatus certified by NIOSH and the Department of Labor/Mine Safety and Health Administration in accordance with 42 CFR Part 84. Use it in accordance with the requirements for respiratory protection specified in OSHA 29 CFR 1910.134 (Respiratory Protection) and/or 29 CFR 1910.156 (f) (Fire Brigades Standard). Chemical-cartridge respirators or other filtering masks are not acceptable substitutes for positive pressure self-contained breathing apparatus. Demand-type SCBA does not meet the OSHA 29 CFR 1910.156 (f)(1)(i) of the Fire Brigades Standard. If it is suspected that a Chemical Warfare Agent (CW) is involved, the use of NIOSH-certified respirators with CBRN protection are highly recommended.

**Respirators.** N95 respirator is 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 provide protection against gas and vapor exposures. PAPR (Powered Air-Purifying Respirator) is an air-purifying respirator that uses a blower to force ambient air through the air-purifying cartridge or filter into the facepiece. A PAPR is not a supplied-air respirator. A PAPR does not supply oxygen or air from a separate source (i.e., cylinders).

**Chemical Protective Clothing and Equipment.** Safe use of this type of protective clothing and equipment requires specific skills developed through training and experience. It is generally not available to, or used by, first responders. This type of special clothing may protect against one chemical, yet be readily permeated by chemicals for which it was not designed. Therefore, protective clothing should not be used unless it is compatible with the released material. This type of special clothing 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 (TECP) Suits or Level A\* protection (OSHA 29 CFR 1910.120, Appendix A & B), and (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 (2011). No single protective clothing material will protect you from all dangerous goods. Do not assume any protective clothing is resistant to cold and/or heat or flame exposure unless it is so certified by the manufacturer (NFPA 1991 5-3 Flammability Resistance Test and 5-6 Cold Temperature Performance Test).

\* Consult glossary for additional protection levels under the heading “Protective Clothing”.

## FIRE AND SPILL CONTROL

### **FIRE CONTROL**

Water is the most common and generally most available fire extinguishing agent. Exercise caution in selecting a fire extinguishing method since there are many factors to be considered in an incident. Water may be ineffective in fighting fires involving some materials; its effectiveness depends greatly on the method of application.

Fires involving a spill of flammable liquids are generally controlled by applying a fire fighting foam to the surface of the burning material. Fighting flammable liquid fires requires foam concentrate which is chemically compatible with the burning material, correct mixing of the foam concentrate with water and air, and careful application and maintenance of the foam blanket. There are two general types of fire fighting foam: regular and alcohol-resistant. Examples of regular foam are protein-base, fluoroprotein, and aqueous film-forming foam (AFFF). Some flammable liquids, including many petroleum products, can be controlled by applying regular foam. Other flammable liquids, including polar solvents (flammable liquids which are water soluble) such as alcohols and ketones, have different chemical properties. A fire involving these materials cannot be easily controlled with regular foam and requires application of alcohol-resistant foam. Polar solvent fires may be difficult to control and require a higher foam application rate than other flammable liquid fires (see NFPA/ANSI Standards 11 and 11A for further information). Refer to the appropriate guide to determine which type of foam is recommended. Although it is impossible to make specific recommendations for flammable liquids which have subsidiary corrosive or toxic hazards, alcohol-resistant foam may be effective for many of these materials. The emergency response telephone number on the shipping document, or the appropriate emergency response agency, should be contacted as soon as possible for guidance on the proper fire extinguishing agent to use. The final selection of the agent and method depends on many factors such as incident location, exposure hazards, size of the fire, environmental concerns, as well as the availability of extinguishing agents and equipment at the scene.

### **WATER REACTIVE MATERIALS**

Water is sometimes used to flush spills and to reduce or direct vapors in spill situations. Some of the materials covered by the 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 additional technical advice can be obtained. The applicable guides clearly warn you of these potentially dangerous reactions. These materials require technical advice since:

- (1) water getting inside a ruptured or leaking container may cause an explosion;
- (2) water may be needed to cool adjoining containers to prevent their rupturing (exploding) or further spread of the fires;

- (3) water may be effective in mitigating an incident involving a water-reactive material only if it can be applied at a sufficient flooding rate for an extended period; and
- (4) the products from the reaction with water may be more toxic, corrosive, or otherwise more undesirable than the product of the fire without water applied.

When responding to an incident involving water-reactive materials, take into account the existing conditions such as wind, precipitation, location and accessibility to the incident, as well as the availability of the agents to control the fire or spill. Because there are variables to consider, the decision to use water on fires or spills involving water-reactive materials should be based on information from an authoritative source; for example, a producer of the material, who can be contacted through the emergency response telephone number or the appropriate emergency response agency.

### **VAPOR CONTROL**

Limiting the amount of vapor released from a pool of flammable or corrosive liquids is an operational concern. It requires the use of proper protective clothing, specialized equipment, appropriate chemical agents, and skilled personnel. Before engaging in vapor control, get advice from an authoritative source as to the proper tactics.

There are several ways to minimize the amount of vapors escaping from pools of spilled liquids, such as special foams, adsorbing agents, absorbing agents, and neutralizing agents. To be effective, these vapor control methods must be selected for the specific material involved and performed in a manner that will mitigate, not worsen, the incident.

Where specific materials are known, such as at manufacturing or storage facilities, it is desirable for the dangerous goods response team to prearrange with the facility operators to select and stockpile these control agents in advance of a spill. In the field, first responders may not have the most effective vapor control agent for the material available. They are likely to have only water and only one type of fire fighting foam on their vehicles. If the available foam is inappropriate for use, they are likely to use water spray. Because the 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 to suppress ignition, obtain technical advice, based on specific chemical name identification.

### **BLEVE (Boiling Liquid Expanding Vapor Explosion)**

The following section presents, in a two-page format, background information on BLEVEs and includes a chart that provides important safety-related information to consider when confronted with this type of situation involving Liquefied Petroleum Gases (LPG), UN1075. LPGs include the following flammable gases: Butane, UN1011; Butylene, UN1012; Isobutylene, UN1055; Propylene, UN1077; Isobutane, UN1969; and Propane, UN1978.



### **What are the main hazards from a BLEVE?**

The main hazards from a propane or LPG BLEVE are:

- fire
- thermal radiation from the fire
- blast
- projectiles

The danger from these decreases as you move away from the BLEVE centre. The furthest reaching hazard is projectiles.

This information was prepared for Transport Canada, the Canadian Association of Fire Chiefs and the Propane Gas Association of Canada Inc. by Dr. A. M. Birk, Queen's University, Kingston (Ontario) Canada.

For a video with information on critical safety issues concerning BLEVEs, please visit <http://www.tc.gc.ca/eng/tdg/publications-menu-1238.html>. This video can be viewed directly on the website. To order a DVD copy of the video, contact us by email at: [TDG-RD-TMD@tc.gc.ca](mailto:TDG-RD-TMD@tc.gc.ca).

## **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  $5 (\sqrt{\text{capacity (USgal)}}) = \text{USgal/min}$  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 (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)	94.6	25
400 (106)	0.61 (2)	1.5 (4.9)	160 (353)	4	12	16 (53)	90 (295)	244 (801)	488 (1601)	189.3	50
2000 (528)	0.96 (3.2)	3 (9.8)	800 (1764)	5	18	28 (92)	111 (364)	417 (1368)	834 (2736)	424	112
4000 (1057)	1 (3.3)	4.9 (16.1)	1600 (3527)	5	20	35 (115)	140 (459)	525 (1722)	1050 (3445)	588	158
8000 (2113)	1.25 (4.1)	6.5 (21.3)	3200 (7055)	6	22	44 (144)	176 (577)	661 (2169)	1323 (4341)	848	224
22000 (5812)	2.1 (6.9)	6.7 (22)	8800 (19400)	7	28	62 (203)	247 (810)	926 (3038)	1852 (6076)	1404	371
42000 (11095)	2.1 (6.9)	11.8 (38.7)	16800 (37037)	7	32	77 (253)	306 (1004)	1149 (3770)	2200 (7218)	1938	512
82000 (21662)	2.75 (9)	13.7 (45)	32800 (72310)	8	40	96 (315)	383 (1257)	1435 (4708)	2200 (7218)	2710	716
140000 (36984)	3.3 (10.8)	17.2 (56.4)	56000 (123457)	9	45	114 (374)	457 (1499)	1715 (5627)	2200 (7218)	3539	935

## **CRIMINAL/TERRORIST USE OF CHEMICAL/BIOLOGICAL/RADIOLOGICAL AGENTS**

The following is intended to supply information to first responders for use in making a preliminary assessment of a situation that they suspect involves criminal/terrorist use of chemical, biological agents and/or radioactive materials (CBRN). To aid in the assessment, a list of observable indicators of the use and/or presence of a CB agent or radioactive material is provided in the following paragraphs. This section ends with a Safe Standoff Distance Chart for various threats when Improvised Explosive Devices 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, 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 (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 in a biological incident, the area affected may be greater due to the movement of infected individuals.

**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 required to determine the size of the affected area, and whether the level of radioactivity presents an immediate or long-term health hazard. Because radioactivity is not detectable without special equipment, the affected area may be greater due to the migration of contaminated individuals.

At the levels created by most probable sources, not enough radiation would be generated 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 requiring potentially costly cleanup.

### **INDICATORS OF A POSSIBLE CHEMICAL INCIDENT**

#### **Dead animals/birds/fish**

Not just an occasional road kill, but numerous animals (wild and domestic, small and large), birds, and fish in the same area.

#### **Lack of insect life**

If normal insect activity (ground, air, and/or water) is missing, check the ground/water surface/shore line for dead insects. If near water, check for dead fish/aquatic birds.

## **INDICATORS OF A POSSIBLE CHEMICAL INCIDENT (Continued)**

<b>Unexplained odors</b>	Smells may range from fruity to flowery to sharp/pungent to garlic/horseradish-like to bitter almonds/peach kernels to newly mown hay. It is important to note that the particular 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/nerve agent symptoms), erythema (reddening of skin/vesicant symptoms) and death.
<b>Pattern of casualties</b>	Casualties will likely be distributed downwind, or if indoors, by the air ventilation system.
<b>Blisters/rashes</b>	Numerous individuals 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 exhibit oily droplets/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/fog-like condition that is not consistent with its surroundings.
<b>Unusual metal debris</b>	Unexplained bomb/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 used.
<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/munitions-like material.

## **INDICATORS OF A POSSIBLE RADIOLOGICAL INCIDENT (continued)**

<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 approaching a scene that may involve CB agents or radioactive materials, the most critical consideration is the safety of oneself and other responders. Protective clothing and respiratory protection of appropriate level of safety must be used. In incidents where it is suspected that CBRN materials have been used as weapons, NIOSH-certified respirators with CBRN protection are highly recommended. Be aware that the presence and identification of CB agents or radioactive materials may not be verifiable, especially in the case of biological or radiological agents. The following actions/measures to be considered are applicable to either a chemical, biological or radiological incident. The guidance is general in nature, not all encompassing, and its applicability should be evaluated on a case-by-case basis.

**Approach and response strategies.** Protect yourself and use a safe approach (minimize any exposure time, maximize the distance between you and the item that is likely to harm you, use cover as protection and wear appropriate personal protective equipment and respiratory protection). Identify and estimate the hazard by using indicators as provided above. Isolate the area and secure the scene; potentially contaminated people should be isolated and decontaminated 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 is not necessarily an indication of reduced vapor concentrations. Some chemicals deaden the senses giving 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, responder personnel should be equipped with radiation detection equipment that would alert them if they are entering a radiologically compromised environment, and should have received adequate training in its use. This equipment should be designed in such a way that it can also alert the responders when an unacceptable ambient dose rate or ambient dose has been reached.

**Initial actions** to consider in a potential CBRN/Hazmat 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/containers.
- Be cautious regarding 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 individuals potentially exposed to dangerous goods/hazardous materials.
- Isolate contaminated areas and secure the scene for analysis of material.

**Decontamination measures.** 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 (soap and water). **If biological agents are involved or suspected**, careful washing and use of a brush are more effective. **If chemical agents are suspected**, the most important and effective decontamination will be the one done within the first one or two minutes. If possible, further decontamination should be performed using a 0.5% hypochlorite solution (1 part household bleach mixed with 9 parts water). **If biological agents are suspected**, a contact time of 10 to 15 minutes should be allowed before rinsing. The solution can be used on soft tissue wounds, but must not be used in eyes or open wounds of the abdomen, chest, head, or spine. For further information contact the agencies listed in this guidebook.

**For persons contaminated with radioactive material**, remove them to a low radiation area if necessary. 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., from shaving, or overly vigorous brushing. External radiological contamination on intact skin surface rarely causes a high enough dose to be a hazard to either the contaminated person or the first responders. For this reason, except in very unusual circumstances, an injured person who is also radiologically contaminated should be medically stabilized, taking care to minimize the spread of the contamination to the extent possible, before decontamination measures are initiated.

**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) 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 2.3 kg	70 ft 21 m	71 - 1,199 ft 22 - 365 m	+1,200 ft 366 m
 Suicide Bomber	20 lbs 9 kg	110 ft 34 m	111 - 1,699 ft 35 - 518 m	+1,700 ft 519 m
 Briefcase/Suitcase	50 lbs 23 kg	150 ft 46 m	151 - 1,849 ft 47 - 563 m	+1,850 ft 564 m
 Car	500 lbs 227 kg	320 ft 98 m	321 - 1,899 ft 99 - 579 m	+1,900 ft 580 m
 SUV/Van	1,000 lbs 454 kg	400 ft 122 m	401 - 2,399 ft 123 - 731 m	+2,400 ft 732 m
 Small Delivery Truck	4,000 lbs 1,814 kg	640 ft 195 m	641 - 3,799 ft 196 - 1,158 m	+3,800 ft 1,159 m
 Container/Water Truck	10,000 lbs 4,536 kg	860 ft 263 m	861 - 5,099 ft 264 - 1,554 m	+5,100 ft 1,555 m
 Semi-Trailer	60,000 lbs 27,216 kg	1,570 ft 475 m	1,571 - 9,299 ft 476 - 2,834 m	+9,300 ft 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</sup>
Small LPG Tank	20 lbs / 5 gal 9 kg / 19 L	40 ft 12 m	160 ft 48 m
Large LPG Tank	100 lbs / 25 gal 45 kg / 95 L	69 ft 21 m	276 ft 84 m
Commercial/Residential LPG Tank	2,000 lbs / 500 gal 907 kg / 1,893 L	184 ft 56 m	736 ft 224 m
Small LPG Truck	8,000 lbs / 2,000 gal 3,630 kg / 7,570 L	292 ft 89 m	1,168 ft 356 m
Semitanker LPG	40,000 lbs / 10,000 gal 18,144 kg / 37,850 L	499 ft 152 m	1,996 ft 608 m

<sup>1</sup> Based on the maximum amount of material 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. 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>Adsorption</b>	In this guidebook, means a process by which a gas adheres to the surface of a solid but does not penetrate it, such as in adsorption of gases by activated carbon (charcoal).
<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>	Living organisms that cause disease, sickness and mortality in humans. Anthrax and Ebola are examples of biological agents. <b>Refer to GUIDE 158.</b>
<b>Blister agents (vesicants)</b>	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. <b>Symptoms:</b> Red eyes, skin irritation, burning of skin, blisters, upper respiratory damage, cough, hoarseness.

## GLOSSARY

<b>Blood agents</b>	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. <b>Symptoms:</b> Respiratory distress, headache, unresponsiveness, seizures, coma.
<b>Burn</b>	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.
<b>Carcinogen</b>	A substance or mixture which induces cancer or increases its incidence.
<b>Category A</b>	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.
<b>Category B</b>	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.
<b>CBRN</b>	Chemical, biological, radiological or nuclear warfare agent.
<b>Choking agents</b>	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. <b>Symptoms:</b> Irritation to eyes/nose/throat, respiratory distress, nausea and vomiting, burning of exposed skin.
<b>CO<sub>2</sub></b>	Carbon dioxide gas.
<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.

## GLOSSARY

### **Compatibility Group**

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 dangerous goods/hazardous materials 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.

- A Substances which are expected to mass detonate very soon after fire reaches them.
- B Articles which are expected to mass detonate very soon after fire reaches them.
- C Substances or articles which may be readily ignited and burn violently without necessarily exploding.
- D Substances or articles which may mass detonate (with blast and/or fragment hazard) when exposed to fire.
- E&F Articles which may mass detonate in a fire.
- G Substances and articles which may mass explode and give off smoke or toxic gases.
- H Articles which in a fire may eject hazardous projectiles and dense white smoke.
- J Articles which may mass explode.
- K Articles which in a fire may eject hazardous projectiles and toxic gases.
- L Substances and articles which present a special risk and could be activated by exposure to air or water.
- 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.

## GLOSSARY

<b>Control zones</b>	Designated areas at 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.
<b>Decomposition products</b>	Products of a chemical or thermal break-down of a substance.
<b>Decontamination</b>	The removal of dangerous goods from personnel and equipment to the extent necessary to prevent potential adverse health effects. Always avoid direct or indirect contact with dangerous goods; however, if contact occurs, personnel should be decontaminated as soon as possible. Since the methods used to decontaminate personnel and equipment differ from one chemical to another, contact the chemical manufacturer, through the agencies listed on the inside back cover, to determine the appropriate procedure. Contaminated clothing and equipment should be removed after use and stored in a controlled area (warm/contamination reduction/yellow/limited access zone) until cleanup procedures can be initiated. In some cases, protective clothing and equipment cannot be decontaminated and must be disposed of in a proper manner.
<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.

## GLOSSARY

<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.
<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>Hazard zones (Inhalation Hazard Zones)</b>	<b>HAZARD ZONE A:</b> Gases: LC50 of less than or equal to 200 ppm, Liquids: V equal to or greater than 500 LC50 and LC50 less than or equal to 200 ppm,
	<b>HAZARD ZONE B:</b> Gases: LC50 greater than 200 ppm and less than or equal to 1000 ppm, Liquids: V equal to or greater than 10 LC50; LC50 less than or equal to 1000 ppm and criteria for Hazard Zone A are not met.
	<b>HAZARD ZONE C:</b> LC50 greater than 1000 ppm and less than or equal to 3000 ppm,
	<b>HAZARD ZONE D:</b> LC50 greater than 3000 ppm and less than or equal to 5000 ppm.

## GLOSSARY

<b>Hot zone</b>	Area immediately surrounding a dangerous goods incident which extends far enough to prevent adverse effects from released dangerous goods 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”.
<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) for liquids and greater than 300 kilograms (660 pounds) for solids.
<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.

## GLOSSARY

<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>	<p>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.</p> <p><b>Symptoms:</b> Pinpoint pupils, extreme headache, severe tightness in the chest, dyspnea, runny nose, coughing, salivation, unresponsiveness, seizures.</p>
<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>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>	<p>The Packing Group (PG) is assigned based on the degree of danger presented by the hazardous material:</p> <p>PG I : Great danger PG II : Medium danger PG III : Minor danger</p>
<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.



## GLOSSARY

<b>PIH</b>	Poison Inhalation Hazard. Term used to describe gases and volatile liquids that are toxic when inhaled. (Same as 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. 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.
<b>ppm</b>	Parts per million. (1 ppm equals 1 mL/m <sup>3</sup> ).
<b>Protective clothing</b>	<p>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 with no respiratory protection.</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.

## GLOSSARY

<b>Radioactivity</b>	The property of some substances to emit invisible and potentially harmful radiation.
<b>Refrigerated liquid</b>	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.
<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 less than 208 liters (55 US gallons) for liquids and less than 300 kilograms (660 pounds) for solids.
<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.

## GLOSSARY

<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).
<b>V</b>	Saturated vapor concentration in air of a material in mL/m <sup>3</sup> (volatility) 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>	For the purpose of this guidebook, produces 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 2016 Emergency Response Guidebook (ERG2016) 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. The original authors of the ERG are Transport Canada's Michel Cloutier and U.S. DOT's George Cushmac. Printing and publication services are provided through U.S. DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA), Outreach, Training, and Grants Division.

ERG2016 is based on earlier Transport Canada, U.S. DOT, and Secretariat of Communications and Transport emergency response guidebooks. ERG2016 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 ERG2016 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 ERG2016 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 <http://phmsa.dot.gov/hazmat/outreach-training/erg> or call 202-366-4900. In Canada, contact CANUTEC at 613-992-4624 or via the website at <http://www.tc.gc.ca/canutec> for information. In Mexico, call SCT at 50-11-92-20, 50-11-92-40 or 50-11-92-70 or via email at [iflores@sct.gob.mx](mailto:iflores@sct.gob.mx). In Argentina, call CIQUIME at 011-4611-2007, or via the website at <http://www.ciquime.org.ar>, or via email at [gre2016@ciquime.org.ar](mailto:gre2016@ciquime.org.ar).

## **REPRODUCTION AND RESALE**

Copies of this document which are provided free-of-charge to fire, police and other emergency services may not be resold. ERG2016 (PHH50-ERG2016) 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 ERG2016 are solicited; in particular, comments concerning its use in handling incidents involving 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, Training, 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:**

Secretariat of Communications and Transportation  
Federal Motor Carrier General Direction  
Deputy General Director for Standards, Technical  
Specifications and Motor Carrier Safety  
Calz. de las Bombas No. 411 2nd floor  
Col. Los Girasoles  
Del. Coyoacan  
C.P.04920  
Mexico D.F.

Phone: (+52) (55) 50-11-92-20, (55) 50-11-92-40 and (55) 50-11-92-70

**In Argentina:**

Centro de Información Química para Emergencias (CIQUIME)  
Juan Bautista Alberdi 2986  
C1406GSS Buenos Aires, Argentina  
Phone: +54-11-4611-2007 Fax +54-11-4613-3707  
Email: [gre2016@ciquime.org.ar](mailto:gre2016@ciquime.org.ar)

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**

<http://phmsa.dot.gov/hazmat/outreach-training/erg>

**TRANSPORT CANADA**

<https://www.tc.gc.ca/eng/canutec/menu.htm>

**CIQUIME**

<http://www.ciquime.org.ar>

*This guidebook incorporates changes dated:*

---

---

---

## CANADA AND UNITED STATES NATIONAL RESPONSE CENTERS

### **CANADA**

#### **1. CANUTECH**

**CANUTECH** is the **Canadian Transport Emergency Centre** operated by the Transportation of Dangerous Goods Directorate of Transport Canada.

**CANUTECH** 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, CANUTECH may be called at 1-888-CANUTECH (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 **CANUTECH**, 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 1-800-272-9600 or 780-422-9600
British Columbia .....	Local Police and Provincial Authorities 1-800-663-3456
Manitoba.....	Provincial Authority 204-945-4888 and 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 documents 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 document. 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**

## **UNITED STATES**

### **NATIONAL RESPONSE CENTER (NRC)**

The NRC, which is operated by the U.S. Coast Guard, receives reports required when dangerous goods and hazardous substances 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 substance (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.

## NOTES

## NOTES

## NOTES

## **EMERGENCY RESPONSE TELEPHONE NUMBERS**

### **MEXICO**

1. **CENACOM**

**01-800-00-413-00** toll free in the Mexican Republic

For calls originating in Mexico City and the Metropolitan Area: **5128-0000**

For calls originating elsewhere, call: **01-55-5128-0000**

**exts. 36469, 36470, 36471, 36472, 37807, 37808, 37809, 37810, 37811, 37812**

2. **CONASENUSA**

**01-800-11-131-68** toll free in the Mexican Republic

**24 hours, 365 days**

3. **SETIQ**

**01-800-00-214-00** in the Mexican Republic

For calls originating in Mexico City and the Metropolitan Area: **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: **+54-11-4611-2007**

(Collect calls are accepted)

### **BRAZIL**

1. **PRÓ-QUÍMICA**

**0-800-118270**

(Toll-free in Brazil)

For calls originating elsewhere, call: **+55-19-3833-5310**

(Collect calls are accepted)

### **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**

# EMERGENCY RESPONSE TELEPHONE NUMBERS

## CANADA

1. **CANUTEC**, provides a 24 hour national bilingual (French and English) emergency response advisory service:

**1-888-CANUTEC (226-8832) or 613-996-6666\***

**\*666 (STAR 666) cellular** (in Canada only)

## UNITED STATES

1. **CHEMTREC®**, a 24 hour emergency response communication service:

**1-800-424-9300 \***

(Toll-free in the U.S., Canada and the U.S. Virgin Islands)

**703-527-3887** For calls originating elsewhere

2. **CHEMTEL, INC.**, a 24 hour emergency response communication service:

**1-888-255-3924 \***

(Toll-free in the U.S., Canada, Puerto Rico and the U.S. Virgin Islands)

**813-248-0585** For calls originating elsewhere

3. **INFOTRAC**, a 24 hour emergency response communication service:

**1-800-535-5053 \***

(Toll-free in the U.S., Canada and the U.S. Virgin Islands)

**352-323-3500** For calls originating elsewhere

4. **3E COMPANY**, a 24 hour emergency response communication service:

**1-800-451-8346 \***

(Toll-free in the U.S., Canada and the U.S. Virgin Islands)

**760-602-8703** For calls originating elsewhere

The emergency response information services shown above have requested to be listed as providers of emergency response information and have agreed to provide emergency response information to all callers. They 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 (24 hours):

**703-697-0218 \*** - Explosives/ammunition incidents

(U.S. Army Operations Center)

**1-800-851-8061** (Toll-free in the U.S.) - All other dangerous goods incidents

(Defense Logistics Agency)

6. **NATIONWIDE POISON CONTROL CENTER** (United States only)

**1-800-222-1222** (Toll-free in the U.S.)

\* Collect calls are accepted

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

**THIS DOCUMENT SHOULD NOT BE USED TO DETERMINE COMPLIANCE WITH THE DANGEROUS GOODS/HAZARDOUS MATERIALS REGULATIONS OR TO CREATE WORKER SAFETY DOCUMENTS FOR SPECIFIC CHEMICALS**

## **NOT FOR SALE**

**This document is intended for distribution free of charge to Public Safety Organizations by the US Department of Transportation or Transport Canada. This copy may not be resold by commercial distributors.**



U.S. Department of Transportation  
**Pipeline and Hazardous Materials  
Safety Administration**

<http://phmsa.dot.gov/hazmat>



Transport  
Canada

Transports  
Canada

<http://www.tc.gc.ca/TDG>

**SCT**

SECRETARÍA DE  
COMUNICACIONES  
Y TRANSPORTES



<http://www.sct.gob.mx>