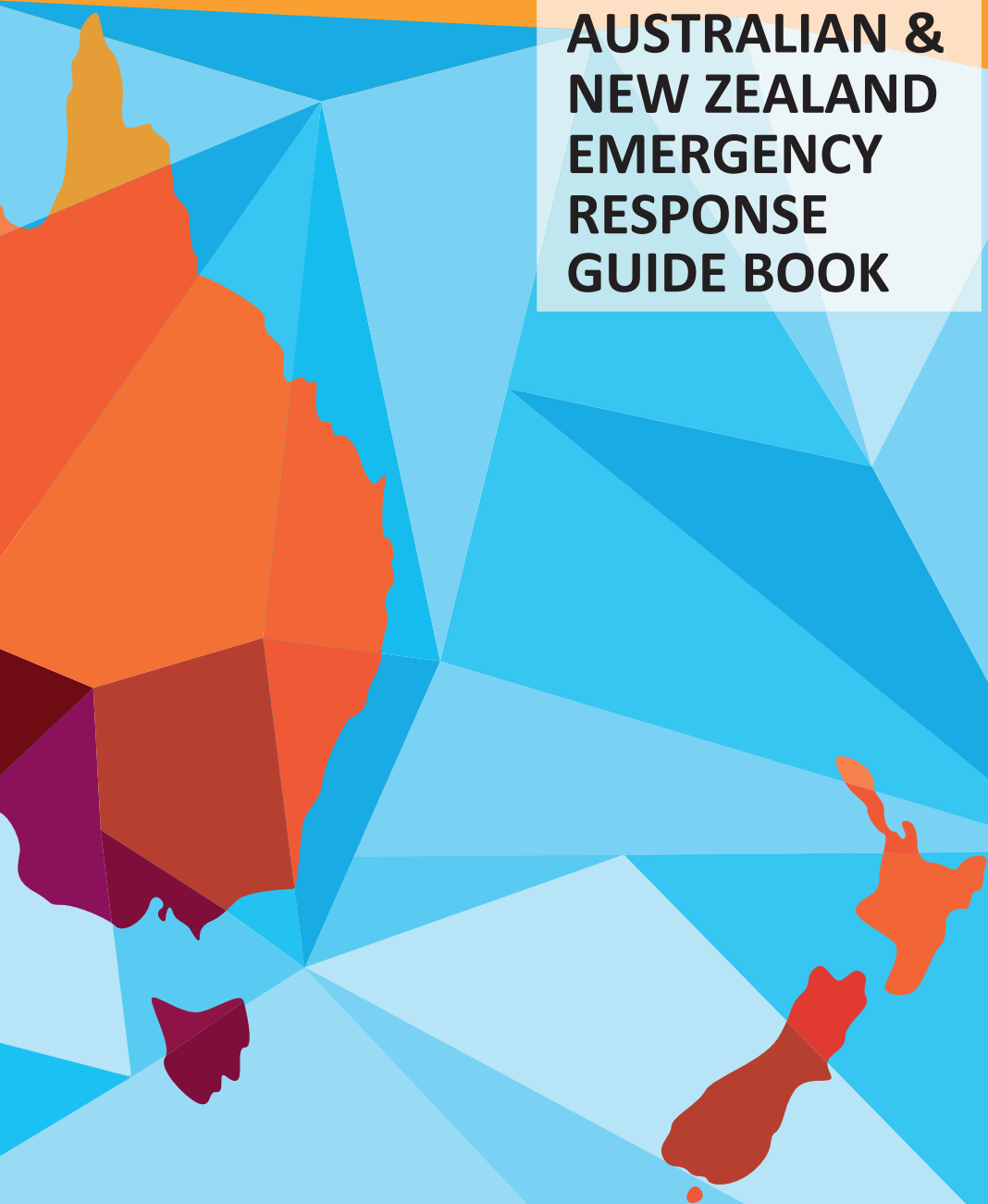


A guidebook intended for use by first responders during the initial phase of a transportation incident involving dangerous goods/hazardous materials.

2021

AUSTRALIAN & NEW ZEALAND EMERGENCY RESPONSE GUIDE BOOK



HOW TO USE THIS GUIDEBOOK

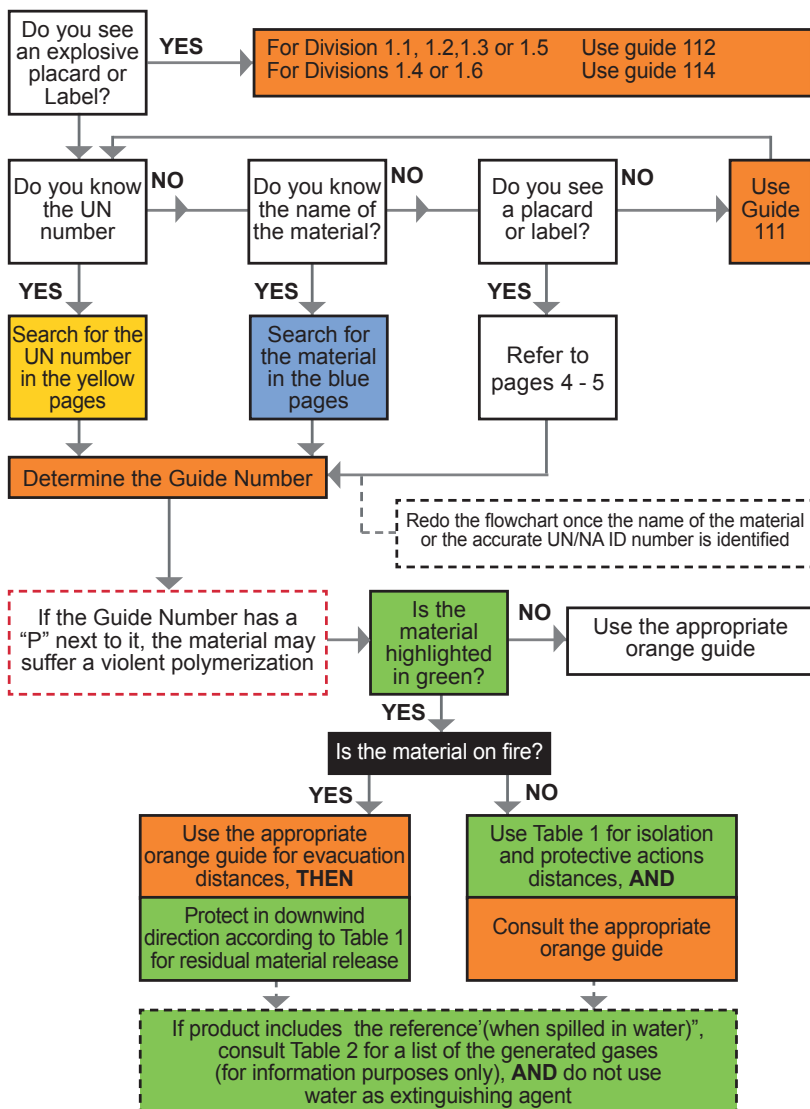
RESIST RUSHING IN!

APPROACH INCIDENTS FROM UPWIND, UPHILL OR UPSTREAM

STAY CLEAR OF SPILLS, VAPOURS, 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.



BEFORE AN EMERGENCY – BECOME FAMILIAR WITH THIS GUIDEBOOK

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

EMERGENCY PROCEDURE GUIDE EXTRACTS

Prime contractors may use extracts of the individual guides from this guide book as emergency procedure guides. If individual extracts are used, ensure the following information is extracted and carried in the vehicle:

- The relevant guides for all dangerous goods being transported
- All relevant information referred to in those guides (e.g. information from Table 1)
- The vehicle fire guide (Guide 00)

Note: the information must be in the form, or substantially in the form as presented in the guide book.

TRANSPORT DOCUMENTATION

Transport Documents can be found as follows:

- Road – kept in the cab of a motor vehicle
- Rail – kept in possession of the train driver
- Aviation – kept in possession of the aircraft pilot
- Marine – kept with the Master of the vessel

Transport Documents provide vital information regarding the hazardous materials/dangerous goods to initiate protective actions.

Information provided:

- 4-digit identification number, UN number (go to yellow pages)
- Proper shipping name (go to blue pages)
- Hazard class or division number of material, including sub-hazard
- Packing group
- Emergency response telephone number
- Information describing the hazards of the material (entered on or attached to transport document)

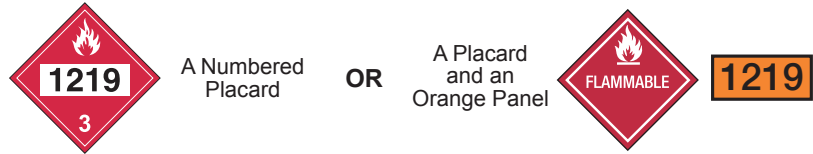
Liquid Chemical Company 123 Through Street UPTOWN 02 9876 5432		EXAMPLE OF EMERGENCY CONTACT DETAILS	Delivery to: Sparkling Pools 1 Main Road DOWNTOWN	
DANGEROUS GOODS DETAILS				
UN 1230	METHANOL	HAZARD CLASS OR DIVISION NO.	480L	12 x 40L Jerricans
UN 1824	SODIUM HYDROXIDE SOLUTION	Class 8, PG II	1200L	6 x 200L Drums
UN NUMBER	PROPER SHIPPING NAME	PACKING GROUP		

IF TRANSPORT DOCUMENTS ARE NOT AVAILABLE

The UN number may be available from other sources for example:

PLACARD AND PANEL WITH UN NUMBER

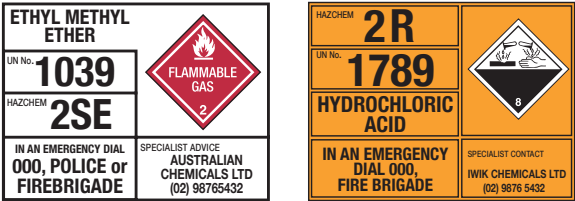
The 4-digit UN Number may be shown on the diamond-shaped placard or on an adjacent orange panel displayed on the ends and sides of a cargo tank, vehicle or rail car.



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

EMERGENCY INFORMATION PANEL (EIP)

If the goods are in bulk containers or placardable units, the UN number and proper shipping name should appear on the emergency information panel attached to the vehicle or container.



PACKAGE MARKINGS AND LABELS

All packages containing dangerous goods should be marked and labelled with a class label, UN number and proper shipping name.



IF THE UN NUMBER OR PROPER SHIPPING NAME IS NOT AVAILABLE

Placarding on the vehicle should be matched with the labels on pages 4 and 5. The appropriate guide should then be used.



INTRODUCTION TO THE TABLE OF MARKINGS, LABELS AND PLACARDS

USE THIS TABLE ONLY WHEN THE UN 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 MIXED / 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 UN 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.**
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 AND INITIAL RESPONSE GUIDE TO USE ON-SCENE

While not all of these labels are permitted for use in Australia or New Zealand, they may be seen on imported containers

111



112



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

114



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

118



121



122



123



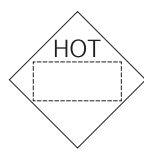
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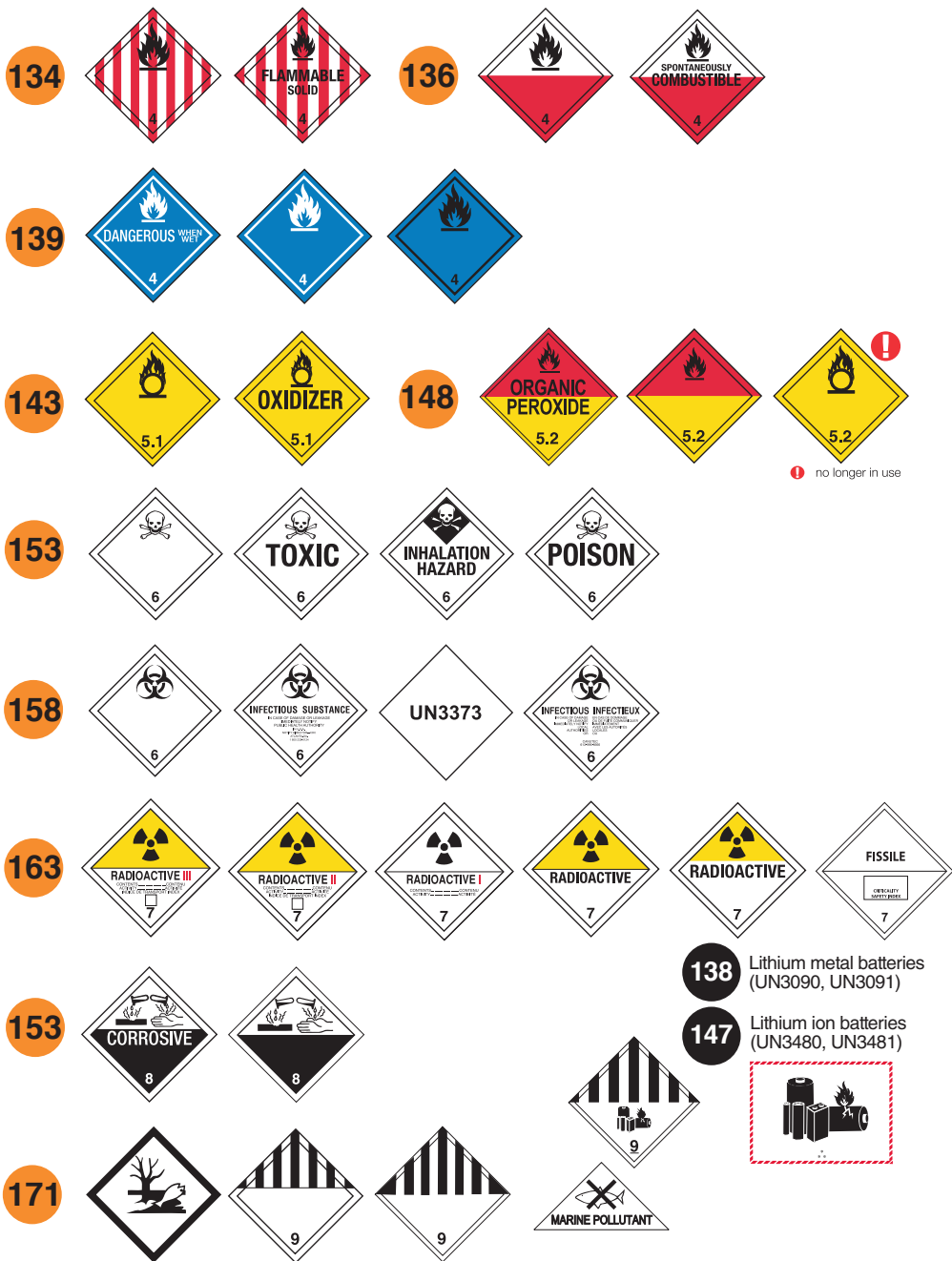


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FOREWORD

The Australian & New Zealand Emergency Response Guidebook 2021 (ANZ-ERG2021) is published by the Competent Authorities Panel (CAP), a national body comprising state and territory Competent Authorities for the transport of dangerous goods by road and rail in Australia. CAP is established under state and territory legislation derived from the national Model Legislation – Transport of Dangerous Goods by Road or Rail.

ANZ-ERG2021 is made available free of charge and approved by CAP as emergency information satisfying the requirements of Chapter 11.2 of the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code).

ANZ-ERG2021 is substantially based on the CANUTEC 2020 Emergency Response Guidebook developed jointly by Transport Canada (TC), the U.S. Department of Transportation (DOT), the Secretariat of Transport and Communications of Mexico (SCT) and with the collaboration of CIQUIME (Centro de Información Química para Emergencias) of Argentina.

While the basic structure of the CANUTEC 2020 ERG has been retained, the following modifications have been made to ensure an appropriate fit for the Australian and New Zealand context:

- Modify spelling and measurements to suit Australia and New Zealand
- Inclusion of a guide for responding to a vehicle fire
- Removal or modification of technical information specific to Canada, North America and South America

ANZ-ERG2021 is primarily a guide to aid transport operators and first responders in quickly identifying the specific or generic hazards of the material involved in the incident, and protecting themselves and the general public during the initial response phase of the incident.

This guidebook will assist transport operators and responders in making decisions at the scene of a dangerous goods incident. It should not be considered as a substitute for emergency response training, knowledge or sound judgment. ANZ-ERG2021 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. The ANZ-ERG2021 is not intended for responding to incidents at fixed facility locations.

ACKNOWLEDGEMENTS

I wish to acknowledge the efforts of the CAP Working Party and to thank the following organisations:

- National Transport Commission
- Environmental Protection Authority NSW
- Waka Kotahi - NZ Transport Agency and Responsible Care NZ
- Australasian Fire and Emergency Services Authorities Council
- Department of Mines, Industry Regulation and Safety WA

The CAP Working Party also thanks CANUTEC for the generous provision of the original ERG2020 materials and permission to use this material for the ANZ-ERG2021

Peter Xanthis

Chair - Australian & New Zealand Emergency Response Guidebook Working Party

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SAFETY PRECAUTIONS – RESIST RUSHING IN!

RAISE THE ALARM

- Move upwind and get help
- If you are alone, raise the alarm before you take any action
- Help will arrive sooner and you will not be on your own, should you get into difficulties

APPROACH CAUTIOUSLY FROM UPWIND, UPHILL OR UPSTREAM:

- Stay clear of **Vapour, 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
- Transport Documentation (Shipping documents)
- Rail Car and Road Trailer Identification Chart
- Safety Data Sheets (SDS)
- Knowledge of persons on scene
- Consult applicable guide page

ASSESS THE SITUATION:

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

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 vapours are harmless because of lack of a smell – odourless gases or vapours may be harmful. Use **CAUTION** when handling empty containers because they may still present hazards until they are cleaned and purged of all residues.

Refer to Isolation Information starting page 296.

NOTIFICATION AND REQUEST FOR TECHNICAL INFORMATION

Follow the steps outlined in your organisation's local Transport Emergency Response Plan (TERP) 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 ORGANISATION/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 Transport Emergency Response Plan
- Ensure that local fire and police departments have been notified

2. CALL THE EMERGENCY RESPONSE TELEPHONE NUMBER ON THE TRANSPORT DOCUMENTATION (SHIPPING DOCUMENT) OR EMERGENCY INFORMATION PANEL

- If transport documentation is not available, notify the emergency services

3. 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 UN 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

POINTS TO CONSIDER IN THE MANAGEMENT OF AN EMERGENCY

To manage a dangerous goods emergency effectively, many different questions need to be addressed by the first responder. Consider the following when at an incident site involving dangerous goods.

- a) Identify the products involved from any available documents. If not possible, identify the hazards from the vehicle or container placards.
- b) Minimise exposure to chemicals by working upwind (blowing from you to the incident). If possible, also approach from uphill. Wear appropriate protective clothing and avoid inhaling gases, fumes, and smoke.
- c) Use the information on the physical and chemical properties of the product to judge response
- d) Many chemicals lack colour or odour. Do not assume they are harmless.
- e) Remember that many gases are heavier than air.
- f) Decontaminate equipment, clothing and personnel on site if safe to do so.
- g) Dispose of contaminated equipment and materials only after receiving specialist advice
- h) Replenish used equipment
- i) If human exposure occurs, obtain medical assistance, ensuring full exposure details are advised.

HAZCHEM CODES (Emergency Action Codes)

The Hazchem Code is fully titled “Hazchem Emergency Action Code”. In European publications, it is now frequently referred to simply as “Emergency Action Code” or “EAC”.

The Hazchem Code advises on:

- Firefighting media
- Personal protection requirements
- Risk of violent reaction
- Spillage handling
- Evacuation consideration

A Hazchem Code offers guidance on appropriate initial emergency response in a potentially dangerous situation such as leakage, spillage or fire involving the dangerous goods to which it relates.

The Hazchem Code is composed of a number, followed by one or more letters

EXTINGUISHING MEDIA

The firefighting extinguishing media is determined by reference to the first character of the Hazchem Code as follows:

1	Indicates coarse water spray
2	Indicates fine water spray
•2	Indicates alcohol resistant foam is the preferred firefighting medium but, if not available, fine water spray can be used
3	Indicates normal foam (i.e. protein based foam that is not alcohol resistant)
•3	Indicates alcohol resistant foam is preferred firefighting medium but, if not available normal foam can be used
4	Indicates dry agent (water must not be allowed to come in contact with substance)

NOTE: Any higher number than the one shown can be used, but a lower number must not be used.

A bullet ‘•’ sometimes precedes the number 2 or 3.

•2 and •3, have the following meanings:

•2 denotes that alcohol resistant foam is the preferred firefighting medium but, if it is not available, fine water spray can be used.

•3 denotes that alcohol resistant foam is the preferred firefighting medium but, if it is not available, normal foam can be used.

For example, the Hazchem Code assigned to UN 1193 Ethyl Methyl Ketone is •2YE. The ‘•’ here indicates to the emergency services that alcohol resistant foam is the preferred firefighting medium. However, if such foam is not available, fine water spray, as the next most effective medium, should be used.

Meaning of Second Character of Hazchem Code

Letter	Risk or violent reaction or explosion	Recommended personal protection	Appropriate measures
P	Yes	Liquid-tight chemical protective clothing and breathing apparatus	Dilute Due care must be taken to avoid unnecessary pollution of water courses
R	No		
S	Yes	Full fire kit and breathing apparatus	
T	No		
W	Yes	Liquid-tight chemical protective clothing and breathing apparatus	Contain Prevent by any means available, spillage from entering drains and water course
X	No		
Y	Yes	Full fire kit and breathing apparatus	
Z	No		
E	PUBLIC SAFETY HAZARD. People should be warned to stay indoors with all doors and windows closed, but evacuation may need to be considered. Consult Control, Police, and product experts.		

Where the second character of the Hazchem Code is S, T, Y or Z, normal firefighting clothing is appropriate, i.e. self-contained open circuit positive pressure compressed air breathing apparatus, worn in combination with fire kit, firefighters' gloves and firefighters' boots.

Where the second character of the Hazchem Code is P, R, W or X, liquid-tight chemical protective clothing in combination with breathing apparatus specified.

Violent Reaction

Where the second character of a Hazchem Code is a P, S, W or Y there is a danger that the substance can be violently or explosively reactive. This danger may be present due to one of the following:

- Violent or explosive decomposition of the material involved, including ignition or friction.
- The ignition of a flammable gas or vapour cloud (this danger exists for all flammable gases and flammable liquids with a flash point below 60 °C)
- The rapid acceleration of combustion due to the involvement of an oxidiser.
- A reaction with water which is itself violent, and may also evolve flammable gases.

Contain/dilute

Where the second character of a Hazchem Code is W, X, Y or Z spillages and decontamination run-off should be prevented from entering drains and watercourses. Where the second character of the code is P, R, S or T spillages and decontamination run-off may be washed to drains with large quantities of water. Due care must however still be exercised to avoid unnecessary pollution of watercourses.

E “Public Safety Hazard”

An ‘E’ following the first two characters of a Hazchem Code indicates that there may be a public safety hazard outside the immediate area of the incident, and that the following actions should be considered. People should be warned to stay indoors with all doors and windows closed, but evacuation may need to be considered. Consult Incident Control, Police, and product experts.

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. The hazard class or division number and subsidiary hazard classes or division numbers placed in parentheses (when applicable), must appear on the transport documentation.

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)

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, solid desensitized explosives and polymerising substances. |
| 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 substances including environmentally hazardous substances

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

Desensitised explosive

A desensitised explosive is an explosive substance that has had its explosive properties suppressed by:

- wetting the substance with water or alcohol, or
- diluting the substance by mixing with another non-explosive substance. or
- dissolving the substance in water, alcohol or other liquid; and
- packing the substance in such a way to be excluded from Class 1 by virtue of test results

Subsidiary hazards

Many dangerous goods present more than one hazard. These goods are classified according to their primary hazard, and their additional hazards are called subsidiary hazards.

A subsidiary hazard is identified on transport documentation and by the presence of more than one class or division label. All primary and sub-hazards must be considered when determining emergency response.

Packing Group (PG) = Degree of danger

Most dangerous goods of classes 3, 4, 8 and 9 and divisions 5.1 and 6.1 have been divided into three packing groups indicating the degree of danger presented by the substance. This information is shown on documentation in roman numerals. It is not required to be displayed on packaging and substance labels, but it is permitted and is common practice in New Zealand.

Packing Group I (PG I)	High danger – substances that pose an immediate threat to life, health or property whenever there is a leak, spill or fire, even in very small quantities.
Packing Group II (PG II)	Medium danger – substances that pose a significant threat in a fire or larger spill or leak. Flammable substances of PG II will ignite readily at ambient temperatures.
Packing Group III (PG III)	Low danger – substances that are similar in hazard to many found in domestic situations. Flammable substances of PG III will usually be difficult to ignite at ambient temperatures. Generally, PG III substances pose a significant threat to health or property in open areas only when involved in a large fire or in a major spill or leak

Note – Packing Groups are not assigned to self-reactive substances of Division 4.1 and articles of any class or division

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 characterised by the rapid onset of medical symptoms (minutes to hours) and easily observed signatures (coloured residue, dead foliage, pungent odour, dead insects and animals).

Biological Incidents are characterised by the onset of symptoms in hours to days. Typically, there will be no characteristic signatures because biological agents are usually odourless and colourless. 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 odourless and colourless. 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.

The most probable sources would not generate enough radiation to kill people or cause severe illness. In a radiological incident generated by a dirty bomb, or Radiological Dispersal Device (RDD), in which a conventional explosive is detonated to spread radioactive contamination, the primary hazard is from the explosion. However, certain radioactive materials dispersed in the air could contaminate up to several city blocks, creating fear and possibly panic, and 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)

Unexplained odours	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 odour is completely out of character with its surroundings.
Unusual numbers of dying or sick people (mass casualties)	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.
Pattern of casualties	Casualties will likely be distributed downwind, or if indoors, by the air ventilation system.
Blisters/rashes	Numerous individuals experiencing unexplained waterlike blisters, weals (like bee stings), and/or rashes.
Illness in confined area	Different casualty rates for people working indoors versus outdoors dependent on where the agent was released.
Unusual liquid droplets	Numerous surfaces exhibit oily droplets/film; numerous water surfaces have an oily film. No recent rain.)
Different-looking areas	Not just a patch of dead weeds, but trees, shrubs, bushes, food crops, and/or lawns that are dead, discoloured, or withered. (No current drought.)
Low-lying clouds	Low-lying cloud/fog-like condition that is not consistent with its surroundings.
Unusual metal debris	Unexplained bomb/munitions-like material, especially if it contains a liquid.

INDICATORS OF A POSSIBLE BIOLOGICAL INCIDENT

Unusual numbers of sick or dying people or animals	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.
Unscheduled and unusual spray being disseminated	Especially if outdoors during periods of darkness.
Abandoned spray devices	Devices may not have distinct odours.

INDICATORS OF A POSSIBLE RADIOLOGICAL INCIDENT

Radiation Symbols	Containers may display a “propeller” radiation symbol.
Unusual metal debris	Unexplained bomb/munitions-like material.
Heat-emitting material	Material that is hot or seems to emit heat without any sign of an external heat source.
Glowing material	Strongly radioactive material may emit or cause radioluminescence.
Sick people/animals	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. Use protective clothing and respiratory protection of an appropriate level of safety.

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.

- Minimise exposure time.
- Maximise the distance between you and the item that is likely to harm you.
- Use cover as protection.
- Wear appropriate personal protective equipment as respiratory protection.
- Identify and estimate the hazard by using the indicated above.
- Isolate and secure the area.
- Isolate and decontaminate potentially contaminated people as soon as possible.
- To the extent possible, take measures to limit the spread of contamination

In the event of a chemical incident, the fading of chemical odours does not necessarily indicate reduced vapour concentrations. Some chemicals deaden the senses, giving you the false perception that the chemical is no longer present. If there is any indication that an area may be contaminated with radioactive materials, including the site of any non-accidental explosion, 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 metres (300 feet) of a suspect device
- NOTIFY your local police by calling 000 in Australia or 111 in New Zealand.
- 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.

For chemical and biological agents: Emergency responders should follow standard decontamination procedures (flush-strip-flush). Mass casualty decontamination should begin as soon as possible by stripping (all clothing) and flushing (soap and water).

For persons contaminated with radioactive material:

Take care to minimize the spread of contamination to the extent possible. Move them to a low radiation area if necessary and if it can be done safely. Remove their clothing and place it in a clearly marked and sealed receptacle, such as a plastic bag, for later testing. Use decontamination methods described above, but avoid breaking the skin, e.g., 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, prioritise medical stabilisation for a contaminated individual.

Note: The above information was developed in part by the Department of National Defence (Canada), the U.S. Department of the Army, Aberdeen Proving Ground and the Federal Bureau of Investigation (FBI).

CLEAR COMMUNICATION

It is absolutely vital that the communication of incident details is accurate. The names of a number of chemicals can vary by only one or two letters, and they may sound similar, but their hazards may be widely different. To avoid confusion, the key item for transmitting chemical details should always be the UN number, which should be available from the transport documents. All information available should be transmitted. Whenever it is necessary to transmit names, it is strongly advised that the phonetic alphabet is used to avoid errors and ensure accurate spelling of product names.

PHONETIC ALPHABET

A Alpha	H Hotel	O Oscar	V Victor
B Bravo	I India	P Papa	W Whisky
C Charlie	J Juliet	Q Quebec	X X-ray
D Delta	K Kilo	R Romeo	Y Yankee
E Echo	L Lima	S Sierra	Z Zulu
F Foxtrot	M Mike	T Tango	
G Golf	N November	U Uniform	

Example – Chemical name NITRIC ACID would be spelled out as:

N	November	A	Alpha
I	India	C	Charlie
T	Tango	I	India
R	Romeo	D	Delta
I	India		
C	Charlie		











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

In some cases, such as on drums or intermediate 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.

The GHS is a system used to classify and communicate chemical hazards using internationally consistent terms and information on chemical labels and Safety Data Sheet (SDS). While the GHS provides for a single system, it is intended for users of chemicals and is specific to workplace legislation; **it does not replace dangerous goods classification and labelling requirements for transport.**

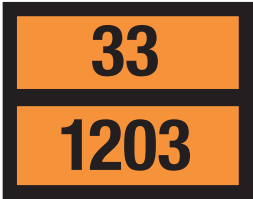
In the GHS, hazards are communicated to chemical users through a combination of symbols (pictograms) as well as words, in the form of signal words, hazard statements and precautionary statements. These are intended to appear on labels and in SDS.

Dangerous goods markings and labels are aimed at preventing and mitigating incidents related to the transport of dangerous goods and provide information for preventing and responding to emergencies that occur in transit.

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.



ADR EXPLANATION

The upper half contains the ADR Hazard Identification Number (or Kemler Code) which indicates the properties of the substance involved.

The ADR Hazard Identification Number consists of two or three digits. The first digit indicates the primary hazard, the second and third digit generally indicate secondary hazards.

- 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 figure, this 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)

The first digit/letter indicates the primary hazard

The second and third digits generally secondary hazards

2	Emission of gas due to pressure or chemical reaction	0	the hazard is adequately described by the first digit
3	Flammability of liquids (vapours) and gases or self-heating liquid	2	(flammable) gas may be given off
4	Flammability of solids or self-heating solid	3	fire risk
5	Oxidising (fire-intensifying) effect	4	fire risk
6	Toxicity	5	oxidising risk
7	Radioactivity	6	toxic risk
8	Corrosivity	8	corrosive risk
9	Risk of spontaneous violent reaction	9	risk of spontaneous violent reaction
X	reacts dangerously with water		

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 UN number and name of material
 - Identify initial isolation and protective action distances
- **IF A FIRE IS INVOLVED:**
 - Use the appropriate Orange Guide for **EVACUATION** distances
 - Also protect in downwind direction according to Table 1 for residual material release

Note 1: If the name in **Table 1** is shown with “*(when spilled in water)*”, these materials produce large amounts of Toxic Inhalation Hazard (TIH) (PIH in the US) gases when spilled in water. Some Water Reactive materials are also TIH materials themselves (e.g., 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 UN number because in an emergency situation, the response will be based only on the division of the explosive, not on the individual explosive.

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

For divisions 1.4 and 1.6, refer to GUIDE 114.

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

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
—	112	Ammonium nitrate-fuel oil mixtures	1015	126	Carbon dioxide and Nitrous oxide mixture
—	158	Biological agents	1015	126	Nitrous oxide and Carbon dioxide mixture
—	112	Blasting agent, n.o.s.	1016	119	Carbon monoxide
—	112	Explosives, division 1.1, 1.2, 1.3 or 1.5	1016	119	Carbon monoxide, compressed
—	114	Explosives, division 1.4 or 1.6	1017	124	Chlorine
—	153	Toxins	1018	126	Chlorodifluoromethane
1001	116	Acetylene, dissolved	1018	126	Refrigerant gas R-22
1002	122	Air, compressed	1020	126	Chloropentafluoroethane
1003	122	Air, refrigerated liquid (cryogenic liquid)	1020	126	Refrigerant gas R-115
1003	122	Air, refrigerated liquid (cryogenic liquid), non-pressurised	1021	126	1-Chloro-1,2,2,2-tetrafluoroethane
1005	125	Ammonia, anhydrous	1021	126	Refrigerant gas R-124
1005	125	Anhydrous ammonia	1022	126	Chlorotrifluoromethane
1006	120	Argon	1022	126	Refrigerant gas R-13
1006	120	Argon, compressed	1023	119	Coal gas
1008	125	Boron trifluoride	1023	119	Coal gas, compressed
1008	125	Boron trifluoride, compressed	1026	119	Cyanogen
1009	126	Bromotrifluoromethane	1027	115	Cyclopropane
1009	126	Refrigerant gas R-13B1	1028	126	Dichlorodifluoromethane
1010	116P	Butadienes, stabilised	1028	126	Refrigerant gas R-12
1010	116P	Butadienes and hydrocarbon mixture, stabilised	1029	126	Dichlorofluoromethane
1010	116P	Hydrocarbon and butadienes mixture, stabilised	1029	126	Refrigerant gas R-21
1011	115	Butane	1030	115	1,1-Difluoroethane
1012	115	Butylene	1030	115	Refrigerant gas R-152a
1013	120	Carbon dioxide	1032	118	Dimethylamine, anhydrous
1013	120	Carbon dioxide, compressed	1033	115	Dimethyl ether
1014	122	Carbon dioxide and Oxygen mixture, compressed	1035	115	Ethane
1014	122	Oxygen and Carbon dioxide mixture, compressed	1035	115	Ethane, compressed
			1036	118	Ethylamine
			1037	115	Ethyl chloride
			1038	115	Ethylene, refrigerated liquid (cryogenic liquid)

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
1039	115	Ethyl methyl ether	1056	120	Krypton
1039	115	Methyl ethyl ether	1056	120	Krypton, compressed
1040	119P	Ethylene oxide	1057	115	Lighter refills (cigarettes) (flammable gas)
1040	119P	Ethylene oxide with Nitrogen	1057	115	Lighters (cigarettes) (flammable gas)
1041	115	Carbon dioxide and Ethylene oxide mixture, with more than 9% but not more than 87% Ethylene oxide	1057	128	Lighters, non-pressurised, containing flammable liquid
1041	115	Ethylene oxide and Carbon dioxide mixture, with more than 9% but not more than 87% Ethylene oxide	1058	120	Liquefied gases, non-flammable, charged with Nitrogen, Carbon dioxide or Air
1043	125	Fertilizer, ammoniating solution, with free Ammonia	1060	116P	Methylacetylene and Propadiene mixture, stabilised
1044	126	Fire extinguishers with compressed gas	1060	116P	Propadiene and Methylacetylene mixture, stabilised
1044	126	Fire extinguishers with liquefied gas	1061	118	Methylamine, anhydrous
1045	124	Fluorine	1062	123	Methyl bromide
1045	124	Fluorine, compressed	1063	115	Methyl chloride
1046	120	Helium	1063	115	Refrigerant gas R-40
1046	120	Helium, compressed	1064	117	Methyl mercaptan
1048	125	Hydrogen bromide, anhydrous	1065	120	Neon
1049	115	Hydrogen	1065	120	Neon, compressed
1049	115	Hydrogen, compressed	1066	120	Nitrogen
1050	125	Hydrogen chloride, anhydrous	1066	120	Nitrogen, compressed
1051	117	AC	1067	124	Dinitrogen tetroxide
1051	117P	Hydrocyanic acid, aqueous solutions, with more than 20% Hydrogen cyanide	1067	124	Nitrogen dioxide
1051	117P	Hydrogen cyanide, anhydrous, stabilised	1069	125	Nitrosyl chloride
1051	117P	Hydrogen cyanide, stabilised	1070	122	Nitrous oxide
1052	125	Hydrogen fluoride, anhydrous	1070	122	Nitrous oxide, compressed
1053	117	Hydrogen sulfide	1071	119	Oil gas
1053	117	Hydrogen sulphide	1071	119	Oil gas, compressed
1055	115	Isobutylene	1072	122	Oxygen
			1072	122	Oxygen, compressed

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
1073	122	Oxygen, refrigerated liquid (cryogenic liquid)	1092	131P	Acrolein, stabilised
1075	115	Butane	1093	131P	Acrylonitrile, stabilised
1075	115	Butylene	1098	131	Allyl alcohol
1075	115	Isobutane	1099	131P	Allyl bromide
1075	115	Isobutylene	1100	131P	Allyl chloride
1075	115	Liquefied petroleum gas	1104	129	Amyl acetates
1075	115	LPG	1105	129	Pentanols
1075	115	Petroleum gases, liquefied	1106	132	Amylamine
1075	115	Propane	1107	129	Amyl chloride
1075	115	Propylene	1108	128	n-Amylene
1076	125	CG	1108	128	1-Pentene
1076	125	DP	1109	129	Amyl formates
1076	125	Phosgene	1110	127	n-Amyl methyl ketone
1077	115	Propylene	1110	127	Methyl amyl ketone
1078	126	Dispersant gas, n.o.s.	1111	130	Amyl mercaptan
1078	126	Refrigerant gas, n.o.s.	1112	128	Amyl nitrate
1079	125	Sulfur dioxide	1113	129	Amyl nitrite
1079	125	Sulphur dioxide	1114	130	Benzene
1080	126	Sulfur hexafluoride	1120	129	Butanols
1080	126	Sulphur hexafluoride	1123	129	Butyl acetates
1081	116P	Tetrafluoroethylene, stabilised	1125	132	n-Butylamine
1082	119P	Refrigerant gas R-1113	1126	130	1-Bromobutane
1082	119P	Trifluorochloroethylene, stabilised	1126	130	n-Butyl bromide
1083	118	Trimethylamine, anhydrous	1127	130	n-Butyl chloride
1085	116P	Vinyl bromide, stabilised	1127	130	Chlorobutanes
1086	116P	Vinyl chloride, stabilised	1128	129	n-Butyl formate
1087	116P	Vinyl methyl ether, stabilised	1129	129P	Butyraldehyde
1088	127	Acetal	1130	128	Camphor oil
1089	129P	Acetaldehyde	1131	131	Carbon bisulfide
1090	127	Acetone	1131	131	Carbon bisulphide
1091	127	Acetone oils	1131	131	Carbon disulfide
			1131	131	Carbon disulphide

UN Guide No. Name of Material

1133 **128** Adhesives (flammable)
 1134 **130** Chlorobenzene
 1135 **131** Ethylene chlorohydrin
 1136 **128** Coal tar distillates, flammable
 1139 **127** Coating solution
 1143 **131P** Crotonaldehyde
 1143 **131P** Crotonaldehyde, stabilised
 1144 **128** Crotonylene
 1145 **128** Cyclohexane
 1146 **128** Cyclopentane
 1147 **130** Decahydronaphthalene
 1148 **129** Diacetone alcohol
 1149 **128** Butyl ethers
 1149 **128** Dibutyl ethers
 1150 **130P** 1,2-Dichloroethylene
 1152 **130** Dichloropentanes
 1153 **127** Ethylene glycol diethyl ether
 1154 **132** Diethylamine
 1155 **127** Diethyl ether
 1155 **127** Ethyl ether
 1156 **127** Diethyl ketone
 1157 **128** Diisobutyl ketone
 1158 **132** Diisopropylamine
 1159 **127** Diisopropyl ether
 1160 **132** Dimethylamine, aqueous solution
 1160 **132** Dimethylamine, solution
 1161 **129** Dimethyl carbonate
 1162 **155** Dimethyldichlorosilane
 1163 **131** 1,1-Dimethylhydrazine
 1163 **131** Dimethylhydrazine, unsymmetrical
 1164 **130** Dimethyl sulfide

UN Guide No. Name of Material

1164 **130** Dimethyl sulphide
 1165 **127** Dioxane
 1166 **127** Dioxolane
 1167 **128P** Divinyl ether, stabilised
 1169 **127** Extracts, aromatic, liquid
 1170 **127** Ethanol
 1170 **127** Ethanol, solution
 1170 **127** Ethyl alcohol
 1170 **127** Ethyl alcohol, solution
 1171 **127** Ethylene glycol monoethyl ether
 1172 **129** Ethylene glycol monoethyl ether acetate
 1173 **129** Ethyl acetate
 1175 **130** Ethylbenzene
 1176 **129** Ethyl borate
 1177 **130** 2-Ethylbutyl acetate
 1177 **130** Ethylbutyl acetate
 1178 **130** 2-Ethylbutyraldehyde
 1179 **127** Ethyl butyl ether
 1180 **130** Ethyl butyrate
 1181 **155** Ethyl chloroacetate
 1182 **155** Ethyl chloroformate
 1183 **139** Ethyldichlorosilane
 1184 **131** Ethylene dichloride
 1185 **131P** Ethyleneimine, stabilised
 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

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
1193	127	Ethyl methyl ketone	1212	129	Isobutyl alcohol
1193	127	Methyl ethyl ketone	1213	129	Isobutyl acetate
1194	131	Ethyl nitrite, solution	1214	132	Isobutylamine
1195	129	Ethyl propionate	1216	128	Isooctenes
1196	155	Ethyltrichlorosilane	1218	130P	Isoprene, stabilised
1197	127	Extracts, flavoring, liquid	1219	129	Isopropanol
1197	127	Extracts, flavouring, liquid	1219	129	Isopropyl alcohol
1198	132	Formaldehyde, solution, flammable	1220	129	Isopropyl acetate
1198	132	Formalin (flammable)	1221	132	Isopropylamine
1199	153P	Furaldehydes	1222	130	Isopropyl nitrate
1199	153P	Furfural	1223	128	Kerosene
1199	153P	Furfuraldehydes	1224	127	Ketones, liquid, n.o.s.
1201	127	Fusel oil	1228	131	Mercaptan mixture, liquid, flammable, poisonous, n.o.s.
1202	128	Diesel fuel	1228	131	Mercaptan mixture, liquid, flammable, toxic, n.o.s.
1202	128	Fuel oil	1228	131	Mercaptans, liquid, flammable, poisonous, n.o.s.
1202	128	Gas oil	1228	131	Mercaptans, liquid, flammable, toxic, n.o.s.
1202	128	Heating oil, light	1229	129	Mesityl oxide
1203	128	Gasohol	1230	131	Methanol
1203	128	Gasoline	1230	131	Methyl alcohol
1203	128	Motor spirit	1231	129	Methyl acetate
1203	128	Petrol	1233	130	Methylamyl acetate
1204	127	Nitroglycerin, solution in alcohol, with not more than 1% Nitroglycerin	1234	127	Methylal
1206	128	Heptanes	1235	132	Methylamine, aqueous solution
1207	130	Hexaldehyde	1237	129	Methyl butyrate
1208	128	Hexanes	1238	155	Methyl chloroformate
1208	128	Neohexane	1239	131	Methyl chloromethyl ether
1210	129	Ink, printer's, flammable	1242	139	Methyldichlorosilane
1210	129	Printing ink, flammable	1243	129	Methyl formate
1210	129	Printing ink related material	1244	131	Methylhydrazine
1212	129	Isobutanol	1245	127	Methyl isobutyl ketone

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
1246	127P	Methyl isopropenyl ketone, stabilised	1280	127P	Propylene oxide
1247	129P	Methyl methacrylate monomer, stabilised	1281	129	Propyl formates
1248	129	Methyl propionate	1282	129	Pyridine
1249	127	Methyl propyl ketone	1286	127	Rosin oil
1250	155	Methyltrichlorosilane	1287	127	Rubber solution
1251	131P	Methyl vinyl ketone, stabilised	1288	128	Shale oil
1259	131	Nickel carbonyl	1289	132	Sodium methylate, solution in alcohol
1261	129	Nitromethane	1292	129	Ethyl silicate
1262	128	Isooctane	1292	129	Tetraethyl silicate
1262	128	Octanes	1293	127	Tinctures, medicinal
1263	128	Paint (flammable)	1294	130	Toluene
1263	128	Paint related material (flammable)	1295	139	Trichlorosilane
1264	129	Paraldehyde	1296	132	Triethylamine
1265	128	Isopentane	1297	132	Trimethylamine, aqueous solution
1265	128	Pentanes	1298	155	Trimethylchlorosilane
1266	127	Perfumery products, with flammable solvents	1299	128	Turpentine
1267	128	Petroleum crude oil	1300	128	Turpentine substitute
1268	128	Petroleum distillates, n.o.s.	1301	129P	Vinyl acetate, stabilised
1268	128	Petroleum products, n.o.s.	1302	127P	Vinyl ethyl ether, stabilised
1270	128	Oil, petroleum	1303	130P	Vinylidene chloride, stabilised
1270	128	Petroleum oil	1304	127P	Vinyl isobutyl ether, stabilised
1272	129	Pine oil	1305	155P	Vinyltrichlorosilane
1274	129	n-Propanol	1305	155P	Vinyltrichlorosilane, stabilised
1274	129	Propyl alcohol, normal	1306	129	Wood preservatives, liquid
1275	129P	Propionaldehyde	1307	130	Xylenes
1276	129	n-Propyl acetate	1308	170	Zirconium suspended in a flammable liquid
1277	132	Propylamine	1308	170	Zirconium suspended in a liquid (flammable)
1278	129	1-Chloropropane	1309	170	Aluminum powder, coated
1278	129	Propyl chloride	1310	113	Ammonium picrate, wetted with not less than 10% water
1279	130	1,2-Dichloropropane			

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
1312	133	Borneol	1338	133	Red phosphorus
1313	133	Calcium resinate	1339	139	Phosphorus heptasulfide, free from yellow and white Phosphorus
1314	133	Calcium resinate, fused	1339	139	Phosphorus heptasulphide, free from yellow and white Phosphorus
1318	133	Cobalt resinate, precipitated	1340	139	Phosphorus pentasulfide, free from yellow and white Phosphorus
1320	113	Dinitrophenol, wetted with not less than 15% water	1340	139	Phosphorus pentasulphide, free from yellow and white Phosphorus
1321	113	Dinitrophenolates, wetted with not less than 15% water	1341	139	Phosphorus sesquisulfide, free from yellow and white Phosphorus
1322	113	Dinitroresorcinol, wetted with not less than 15% water	1341	139	Phosphorus sesquisulphide, free from yellow and white Phosphorus
1323	170	Ferrocium	1343	139	Phosphorus trisulfide, free from yellow and white Phosphorus
1324	133	Films, nitrocellulose base	1343	139	Phosphorus trisulphide, free from yellow and white Phosphorus
1325	133	Flammable solid, organic, n.o.s.	1344	113	Picric acid, wetted with not less than 30% water
1325	133	Fusee (rail or highway)	1344	113	Trinitrophenol, wetted with not less than 30% water
1326	170	Hafnium powder, wetted with not less than 25% water	1345	133	Rubber scrap, powdered or granulated
1327	133	Bhusa, wet, damp or contaminated with oil	1345	133	Rubber shoddy, powdered or granulated
1327	133	Hay, wet, damp or contaminated with oil	1346	170	Silicon powder, amorphous
1327	133	Straw, wet, damp or contaminated with oil	1347	113	Silver picrate, wetted with not less than 30% water
1328	133	Hexamethylenetetramine	1348	113	Sodium dinitro-o-cresolate, wetted with not less than 15% water
1330	133	Manganese resinate	1349	113	Sodium picramate, wetted with not less than 20% water
1331	133	Matches, "strike anywhere"	1350	133	Sulfur
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			

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
1350	133	Sulphur	1373	133	Fabrics, animal or vegetable or synthetic, n.o.s. with oil
1352	170	Titanium powder, wetted with not less than 25% water	1373	133	Fibres, animal or vegetable or synthetic, n.o.s. with oil
1353	133	Fabrics impregnated with weakly nitrated Nitrocellulose, n.o.s.	1373	133	Fibres, animal or vegetable or synthetic, n.o.s. with oil
1353	133	Fibres impregnated with weakly nitrated Nitrocellulose, n.o.s.	1374	133	Fish meal, unstabilised
1353	133	Fibres impregnated with weakly nitrated Nitrocellulose, n.o.s.	1374	133	Fish scrap, unstabilised
1354	113	Trinitrobenzene, wetted with not less than 30% water	1376	135	Iron oxide, spent
1355	113	Trinitrobenzoic acid, wetted with not less than 30% water	1376	135	Iron sponge, spent
1356	113	TNT, wetted with not less than 30% water	1378	170	Metal catalyst, wetted
1356	113	Trinitrotoluene, wetted with not less than 30% water	1379	133	Paper, unsaturated oil treated
1357	113	Urea nitrate, wetted with not less than 20% water	1380	135	Pentaborane
1358	170	Zirconium powder, wetted with not less than 25% water	1381	136	Phosphorus, white, dry or under water or in solution
1360	139	Calcium phosphide	1381	136	Phosphorus, yellow, dry or under water or in solution
1361	133	Carbon, animal or vegetable origin	1381	136	White phosphorus, dry
1361	133	Charcoal	1381	136	White phosphorus, in solution
1362	133	Carbon, activated	1381	136	White phosphorus, under water
1363	135	Copra	1381	136	Yellow phosphorus, dry
1364	133	Cotton waste, oily	1381	136	Yellow phosphorus, in solution
1365	133	Cotton	1381	136	Yellow phosphorus, under water
1365	133	Cotton, wet	1382	135	Potassium sulfide, anhydrous
1366	135	Diethylzinc	1382	135	Potassium sulfide, with less than 30% water of crystallization
1369	135	p-Nitrosodimethylaniline	1382	135	Potassium sulphide, anhydrous
1370	135	Dimethylzinc	1382	135	Potassium sulphide, with less than 30% water of crystallization
1372	133	Fibres, animal or vegetable, burnt, wet or damp	1383	135	Aluminum powder, pyrophoric
1372	133	Fibres, animal or vegetable, burnt, wet or damp	1383	135	Pyrophoric alloy, n.o.s.
			1383	135	Pyrophoric metal, n.o.s.
			1384	135	Sodium dithionite
			1384	135	Sodium hydrosulfite

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
1384	135	Sodium hydrosulphite	1408	139	Ferrosilicon
1385	135	Sodium sulfide, anhydrous	1409	138	Metal hydrides, water-reactive, n.o.s.
1385	135	Sodium sulfide, with less than 30% water of crystallization	1410	138	Lithium aluminum hydride
1385	135	Sodium sulphide, anhydrous	1411	138	Lithium aluminum hydride, ethereal
1385	135	Sodium sulphide, with less than 30% water of crystallization	1413	138	Lithium borohydride
1386	135	Seed cake, with more than 1.5% oil and not more than 11% moisture	1414	138	Lithium hydride
1387	133	Wool waste, wet	1415	138	Lithium
1389	138	Alkali metal amalgam	1417	138	Lithium silicon
1389	138	Alkali metal amalgam, liquid	1418	138	Magnesium alloys powder
1390	139	Alkali metal amides	1418	138	Magnesium powder
1391	138	Alkali metal dispersion	1419	139	Magnesium aluminum phosphide
1391	138	Alkaline earth metal dispersion	1420	138	Potassium, metal alloys
1392	138	Alkaline earth metal amalgam	1420	138	Potassium, metal alloys, liquid
1392	138	Alkaline earth metal amalgam, liquid	1421	138	Alkali metal alloy, liquid, n.o.s.
1393	138	Alkaline earth metal alloy, n.o.s.	1422	138	Potassium sodium alloys
1394	138	Aluminum carbide	1422	138	Potassium sodium alloys, liquid
1395	139	Aluminum ferrosilicon powder	1422	138	Sodium potassium alloys
1396	138	Aluminum powder, uncoated	1422	138	Sodium potassium alloys, liquid
1397	139	Aluminum phosphide	1423	138	Rubidium
1398	138	Aluminum silicon powder, uncoated	1423	138	Rubidium metal
1400	138	Barium	1426	138	Sodium borohydride
1401	138	Calcium	1427	138	Sodium hydride
1402	138	Calcium carbide	1428	138	Sodium
1403	138	Calcium cyanamide, with more than 0.1% Calcium carbide	1431	138	Sodium methylate
1404	138	Calcium hydride	1431	138	Sodium methylate, dry
1405	138	Calcium silicide	1432	139	Sodium phosphide
1407	138	Caesium	1433	139	Stannic phosphides
1407	138	Cesium	1435	138	Zinc ashes
			1435	138	Zinc dross
			1435	138	Zinc residue

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
1435	138	Zinc skimmings	1459	140	Magnesium chloride and Chlorate mixture, solid
1436	138	Zinc dust	1461	140	Chlorates, inorganic, n.o.s.
1436	138	Zinc powder	1462	143	Chlorites, inorganic, n.o.s.
1437	138	Zirconium hydride	1463	141	Chromium trioxide, anhydrous
1438	140	Aluminum nitrate	1465	140	Didymium nitrate
1439	141	Ammonium dichromate	1466	140	Ferric nitrate
1442	143	Ammonium perchlorate	1467	143	Guanidine nitrate
1444	140	Ammonium persulfate	1469	141	Lead nitrate
1444	140	Ammonium persulphate	1470	141	Lead perchlorate
1445	141	Barium chlorate	1470	141	Lead perchlorate, solid
1445	141	Barium chlorate, solid	1471	140	Lithium hypochlorite, dry
1446	141	Barium nitrate	1471	140	Lithium hypochlorite mixture
1447	141	Barium perchlorate	1471	140	Lithium hypochlorite mixtures, dry
1447	141	Barium perchlorate, solid	1472	143	Lithium peroxide
1448	141	Barium permanganate	1473	140	Magnesium bromate
1449	141	Barium peroxide	1474	140	Magnesium nitrate
1450	140	Bromates, inorganic, n.o.s.	1475	140	Magnesium perchlorate
1451	140	Caesium nitrate	1476	140	Magnesium peroxide
1451	140	Cesium nitrate	1477	140	Nitrates, inorganic, n.o.s.
1452	140	Calcium chlorate	1479	140	Oxidising solid, n.o.s.
1453	140	Calcium chlorite	1481	140	Perchlorates, inorganic, n.o.s.
1454	140	Calcium nitrate	1482	140	Permanganates, inorganic, n.o.s.
1455	140	Calcium perchlorate	1483	140	Peroxides, inorganic, n.o.s.
1456	140	Calcium permanganate	1484	140	Potassium bromate
1457	140	Calcium peroxide	1485	140	Potassium chlorate
1458	140	Borate and Chlorate mixture	1486	140	Potassium nitrate
1458	140	Chlorate and Borate mixture	1487	140	Potassium nitrate and Sodium nitrite mixture
1459	140	Chlorate and Magnesium chloride mixture	1487	140	Sodium nitrite and Potassium nitrate mixture
1459	140	Chlorate and Magnesium chloride mixture, solid	1488	140	Potassium nitrite
1459	140	Magnesium chloride and Chlorate mixture			

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
1489	140	Potassium perchlorate	1541	155	Acetone cyanohydrin, stabilised
1490	140	Potassium permanganate	1544	151	Alkaloids, solid, n.o.s. (poisonous)
1491	144	Potassium peroxide	1544	151	Alkaloid salts, solid, n.o.s. (poisonous)
1492	140	Potassium persulfate	1545	155	Allyl isothiocyanate, stabilised
1492	140	Potassium persulphate	1546	151	Ammonium arsenate
1493	140	Silver nitrate	1547	153	Aniline
1494	140	Sodium bromate	1548	153	Aniline hydrochloride
1495	140	Sodium chlorate	1549	157	Antimony compound, inorganic, solid, n.o.s.
1496	143	Sodium chlorite	1550	151	Antimony lactate
1498	140	Sodium nitrate	1551	151	Antimony potassium tartrate
1499	140	Potassium nitrate and Sodium nitrate mixture	1553	154	Arsenic acid, liquid
1499	140	Sodium nitrate and Potassium nitrate mixture	1554	154	Arsenic acid, solid
1500	141	Sodium nitrite	1555	151	Arsenic bromide
1502	140	Sodium perchlorate	1556	152	Arsenic compound, liquid, n.o.s.
1503	140	Sodium permanganate	1556	152	Arsenic compound, liquid, n.o.s., inorganic
1504	144	Sodium peroxide	1556	152	MD
1505	140	Sodium persulfate	1556	152	Methyldichloroarsine
1505	140	Sodium persulphate	1556	152	PD
1506	143	Strontium chlorate	1557	152	Arsenic compound, solid, n.o.s.
1507	140	Strontium nitrate	1557	152	Arsenic compound, solid, n.o.s., inorganic
1508	140	Strontium perchlorate	1558	152	Arsenic
1509	143	Strontium peroxide	1559	151	Arsenic pentoxide
1510	143	Tetranitromethane	1560	157	Arsenic chloride
1511	140	Urea hydrogen peroxide	1560	157	Arsenic trichloride
1512	140	Zinc ammonium nitrite	1561	151	Arsenic trioxide
1513	140	Zinc chlorate	1562	152	Arsenical dust
1514	140	Zinc nitrate	1564	154	Barium compound, n.o.s.
1515	140	Zinc permanganate	1565	157	Barium cyanide
1516	143	Zinc peroxide			
1517	113	Zirconium picramate, wetted with not less than 20% water			

UN No.	Guide No.	Name of Material
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
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

UN No.	Guide No.	Name of Material
1588	157	Cyanides, inorganic, solid, n.o.s.
1589	125	CK
1589	125	Cyanogen chloride, stabilised
1590	153	Dichloroanilines, liquid
1590	153	Dichloroanilines, solid
1591	152	o-Dichlorobenzene
1593	160	Dichloromethane
1593	160	Methylene chloride
1594	152	Diethyl sulfate
1594	152	Diethyl sulphate
1595	156	Dimethyl sulfate
1595	156	Dimethyl sulphate
1596	153	Dinitroanilines
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

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
1611	151	Hexaethyl tetraphosphate	1638	151	Mercury iodide
1612	123	Compressed gas and hexaethyl tetraphosphate mixture	1639	151	Mercury nucleate
1612	123	Hexaethyl tetraphosphate and compressed gas mixture	1640	151	Mercury oleate
1613	154	Hydrocyanic acid, aqueous solution, with less than 5% Hydrogen cyanide	1641	151	Mercury oxide
1613	154	Hydrocyanic acid, aqueous solution, with not more than 20% Hydrogen cyanide	1642	151	Mercuric oxycyanide
1613	154	Hydrogen cyanide, aqueous solution, with not more than 20% Hydrogen cyanide	1642	151	Mercury oxycyanide, desensitised
1614	152	Hydrogen cyanide, stabilised (absorbed)	1643	151	Mercury potassium iodide
1616	151	Lead acetate	1644	151	Mercury salicylate
1617	151	Lead arsenates	1645	151	Mercuric sulfate
1618	151	Lead arsenites	1645	151	Mercuric sulphate
1620	151	Lead cyanide	1645	151	Mercury sulphate
1621	151	London purple	1645	151	Mercury sulfate
1622	151	Magnesium arsenate	1646	151	Mercury thiocyanate
1623	151	Mercuric arsenate	1647	151	Ethylene dibromide and Methyl bromide mixture, liquid
1624	154	Mercuric chloride	1647	151	Methyl bromide and Ethylene dibromide mixture, liquid
1625	141	Mercuric nitrate	1648	127	Acetonitrile
1626	157	Mercuric potassium cyanide	1649	152	Motor fuel anti-knock mixture
1627	141	Mercurous nitrate	1650	153	beta-Naphthylamine
1629	151	Mercury acetate	1650	153	beta-Naphthylamine, solid
1630	151	Mercury ammonium chloride	1650	153	Naphthylamine (beta)
1631	154	Mercury benzoate	1650	153	Naphthylamine (beta), solid
1634	154	Mercuric bromide	1651	153	Naphthylthiourea
1634	154	Mercurous bromide	1652	153	Naphthylurea
1634	154	Mercury bromides	1653	151	Nickel cyanide
1636	154	Mercuric cyanide	1654	151	Nicotine
1636	154	Mercury cyanide	1655	151	Nicotine compound, solid, n.o.s.
1637	151	Mercury gluconate	1655	151	Nicotine preparation, solid, n.o.s.
			1656	151	Nicotine hydrochloride
			1656	151	Nicotine hydrochloride, liquid

UN No.	Guide No.	Name of Material
1656	151	Nicotine hydrochloride, solution
1657	151	Nicotine salicylate
1658	151	Nicotine sulfate, solid
1658	151	Nicotine sulfate, solution
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	Nitroxylens, liquid
1665	152	Nitroxylens, 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

UN No.	Guide No.	Name of Material
1687	153	Sodium azide
1688	152	Sodium cacodylate
1689	157	Sodium cyanide
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, stabilised
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	Xylol bromide
1701	152	Xylol bromide, liquid
1702	151	1,1,2,2-Tetrachloroethane
1702	151	Tetrachloroethane

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
1704	153	Tetraethyl dithiopyrophosphate	1728	155	Amyltrichlorosilane
1707	151	Thallium compound, n.o.s.	1729	156	Anisoyl chloride
1708	153	Toluidines, liquid	1730	157	Antimony pentachloride, liquid
1708	153	Toluidines, solid	1731	157	Antimony pentachloride, solution
1709	151	2,4-Toluenediamine, solid	1732	157	Antimony pentafluoride
1709	151	2,4-Toluylenediamine	1733	157	Antimony trichloride
1709	151	2,4-Toluylenediamine, solid	1733	157	Antimony trichloride, liquid
1710	160	Trichloroethylene	1733	157	Antimony trichloride, solid
1711	153	Xylidines, liquid	1736	137	Benzoyl chloride
1711	153	Xylidines, solid	1737	156	Benzyl bromide
1712	151	Zinc arsenate	1738	156	Benzyl chloride
1712	151	Zinc arsenate and Zinc arsenite mixture	1739	137	Benzyl chloroformate
1712	151	Zinc arsenite	1740	154	Hydrogendifluorides, n.o.s.
1712	151	Zinc arsenite and Zinc arsenate mixture	1740	154	Hydrogendifluorides, solid, n.o.s.
1713	151	Zinc cyanide	1741	125	Boron trichloride
1714	139	Zinc phosphide	1742	157	Boron trifluoride acetic acid complex
1715	137	Acetic anhydride	1742	157	Boron trifluoride acetic acid complex, liquid
1716	156	Acetyl bromide	1743	157	Boron trifluoride propionic acid complex
1717	155	Acetyl chloride	1743	157	Boron trifluoride propionic acid complex, liquid
1718	153	Acid butyl phosphate	1744	154	Bromine
1718	153	Butyl acid phosphate	1744	154	Bromine, solution
1719	154	Caustic alkali liquid, n.o.s.	1744	154	Bromine, solution (Inhalation Hazard Zone A)
1722	155	Allyl chlorocarbonate	1744	154	Bromine, solution (Inhalation Hazard Zone B)
1722	155	Allyl chloroformate	1745	144	Bromine pentafluoride
1723	132	Allyl iodide	1746	144	Bromine trifluoride
1724	155	Allyltrimethylchlorosilane, stabilised	1747	155	Butyltrichlorosilane
1725	137	Aluminum bromide, anhydrous	1748	140	Calcium hypochlorite, dry
1726	137	Aluminum chloride, anhydrous			
1727	154	Ammonium bifluoride, solid			
1727	154	Ammonium hydrogendifluoride, solid			

UN No.	Guide No.	Name of Material
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 Sulphur 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

UN No.	Guide No.	Name of Material
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 Sulphuric acid mixture
1786	157	Hydrofluoric acid and Sulfuric acid mixture
1786	157	Sulphuric acid and Hydrofluoric acid mixture
1786	157	Sulfuric acid and Hydrofluoric acid mixture
1787	154	Hydriodic acid
1788	154	Hydrobromic acid
1789	157	Hydrochloric acid
1789	157	Muriatic acid

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
1790	157	Hydrofluoric acid	1812	154	Potassium fluoride
1791	154	Hypochlorite solution	1812	154	Potassium fluoride, solid
1791	154	Sodium hypochlorite	1813	154	Caustic potash, solid
1792	157	Iodine monochloride, solid	1813	154	Potassium hydroxide, solid
1793	153	Isopropyl acid phosphate	1814	154	Caustic potash, solution
1794	154	Lead sulfate, with more than 3% free acid	1814	154	Potassium hydroxide, solution
1794	154	Lead sulphate, with more than 3% free acid	1815	132	Propionyl chloride
1796	157	Nitrating acid mixture with more than 50% nitric acid	1816	155	Propyltrichlorosilane
1796	157	Nitrating acid mixture with not more than 50% nitric acid	1817	137	Pyrosulfuryl chloride
1798	157	Aqua regia	1817	137	Pyrosulphuryl chloride
1798	157	Nitrohydrochloric acid	1818	157	Silicon tetrachloride
1799	156	Nonyltrichlorosilane	1819	154	Sodium aluminate, solution
1800	156	Octadecyltrichlorosilane	1823	154	Caustic soda, solid
1801	156	Octyltrichlorosilane	1823	154	Sodium hydroxide, solid
1802	157	Perchloric acid, with not more than 50% acid	1824	154	Caustic soda, solution
1803	153	Phenolsulfonic acid, liquid	1824	154	Sodium hydroxide, solution
1803	153	Phenolsulphonic acid, liquid	1825	157	Sodium monoxide
1804	156	Phenyltrichlorosilane	1826	157	Nitrating acid mixture, spent, with more than 50% nitric acid
1805	154	Phosphoric acid, liquid	1826	157	Nitrating acid mixture, spent, with not more than 50% nitric acid
1805	154	Phosphoric acid, solid	1827	137	Stannic chloride, anhydrous
1805	154	Phosphoric acid, solution	1827	137	Tin tetrachloride
1806	137	Phosphorus pentachloride	1828	137	Sulfur chlorides
1807	137	Phosphorus pentoxide	1828	137	Sulphur chlorides
1808	137	Phosphorus tribromide	1829	137	Sulfur trioxide, stabilised
1809	137	Phosphorus trichloride	1829	137	Sulphur trioxide, stabilised
1810	137	Phosphorus oxychloride	1830	137	Sulfuric acid
1811	154	Potassium hydrogendifluoride	1830	137	Sulfuric acid, with more than 51% acid
1811	154	Potassium hydrogen difluoride, solid	1830	137	Sulphuric acid
			1830	137	Sulphuric acid, with more than 51% acid
			1831	137	Sulfuric acid, fuming

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
1831	137	Sulfuric acid, fuming, with less than 30% free Sulfur trioxide	1847	153	Potassium sulphide, hydrated, with not less than 30% water of crystallization
1831	137	Sulphuric acid, fuming, with not less than 30% free Sulphur trioxide	1848	153	Propionic acid
1831	137	Sulphuric acid, fuming	1848	153	Propionic acid, with not less than 10% and less than 90% acid
1831	137	Sulfuric acid, fuming, with less than 30% free Sulfur trioxide	1849	153	Sodium sulfide, hydrated, with not less than 30% water
1831	137	Sulfuric acid, fuming, with not less than 30% free Sulphur trioxide	1849	153	Sodium sulphide, hydrated, with not less than 30% water
1832	137	Sulfuric acid, spent	1851	151	Medicine, liquid, poisonous, n.o.s.
1832	137	Sulphuric acid, spent	1851	151	Medicine, liquid, toxic, n.o.s.
1833	154	Sulfurous acid	1854	135	Barium alloys, pyrophoric
1833	154	Sulphurous acid	1855	135	Calcium, pyrophoric
1834	137	Sulfuryl chloride	1855	135	Calcium alloys, pyrophoric
1834	137	Sulphuryl chloride	1856	133	Rags, oily
1835	153	Tetramethylammonium hydroxide	1857	133	Textile waste, wet
1835	153	Tetramethylammonium hydroxide, solution	1858	126	Hexafluoropropylene
1836	137	Thionyl chloride	1858	126	Hexafluoropropylene, compressed
1837	157	Thiophosphoryl chloride	1858	126	Refrigerant gas R-1216
1838	137	Titanium tetrachloride	1859	125	Silicon tetrafluoride
1839	153	Trichloroacetic acid	1859	125	Silicon tetrafluoride, compressed
1840	154	Zinc chloride, solution	1860	116P	Vinyl fluoride, stabilised
1841	171	Acetaldehyde ammonia	1862	130	Ethyl crotonate
1843	141	Ammonium dinitro-o-cresolate	1863	128	Fuel, aviation, turbine engine
1843	141	Ammonium dinitro-o-cresolate, solid	1865	128	n-Propyl nitrate
1845	120	Carbon dioxide, solid	1866	127	Resin solution
1845	120	Dry ice	1868	134	Decaborane
1846	151	Carbon tetrachloride	1869	138	Magnesium
1847	153	Potassium sulfide, hydrated, with not less than 30% water of crystallization	1869	138	Magnesium, in pellets, turnings or ribbons

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
1869	138	Magnesium alloys, with more than 50% Magnesium, in pellets, turnings or ribbons	1911	119	Diborane, compressed
1870	138	Potassium borohydride	1911	119	Diborane mixtures
1871	170	Titanium hydride	1912	115	Methyl chloride and Methylene chloride mixture
1872	140	Lead dioxide	1912	115	Methylene chloride and Methyl chloride mixture
1873	143	Perchloric acid, with more than 50% but not more than 72% acid	1913	120	Neon, refrigerated liquid (cryogenic liquid)
1884	157	Barium oxide	1914	130	Butyl propionates
1885	153	Benzidine	1915	127	Cyclohexanone
1886	156	Benzylidene chloride	1916	152	2,2'-Dichlorodiethyl ether
1887	160	Bromochloromethane	1916	152	Dichloroethyl ether
1888	151	Chloroform	1917	129P	Ethyl acrylate, stabilised
1889	157	Cyanogen bromide	1918	130	Cumene
1891	131	Ethyl bromide	1918	130	Isopropylbenzene
1892	151	ED	1919	129P	Methyl acrylate, stabilised
1892	151	Ethylchloroarsine	1920	128	Nonanes
1894	151	Phenylmercuric hydroxide	1921	131P	Propyleneimine, stabilised
1895	151	Phenylmercuric nitrate	1922	132	Pyrrolidine
1897	160	Perchloroethylene	1923	135	Calcium dithionite
1897	160	Tetrachloroethylene	1923	135	Calcium hydrosulfite
1898	156	Acetyl iodide	1923	135	Calcium hydrosulphite
1902	153	Diisooctyl acid phosphate	1928	138	Methyl magnesium bromide in Ethyl ether
1903	153	Disinfectant, liquid, corrosive, n.o.s.	1929	135	Potassium dithionite
1905	154	Selenic acid	1929	135	Potassium hydrosulfite
1906	153	Acid, sludge	1929	135	Potassium hydrosulphite
1906	153	Sludge acid	1931	171	Zinc dithionite
1907	154	Soda lime, with more than 4% Sodium hydroxide	1931	171	Zinc hydrosulfite
1908	154	Chlorite solution	1931	171	Zinc hydrosulphite
1910	157	Calcium oxide	1932	135	Zirconium scrap
1911	119	Diborane	1935	157	Cyanide solution, n.o.s.
			1938	156	Bromoacetic acid
			1938	156	Bromoacetic acid, solution

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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)
1953	119	Compressed gas, toxic, flammable, n.o.s.
1953	119	Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)

UN No.	Guide No.	Name of Material
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)
1955	123	Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone D)
1955	123	Organic phosphate compound mixed with compressed gas

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
1955	123	Organic phosphate mixed with compressed gas	1971	115	Methane, compressed
1955	123	Organic phosphorus compound mixed with compressed gas	1971	115	Natural gas, compressed
1956	126	Compressed gas, n.o.s.	1972	115	Liquefied natural gas (cryogenic liquid)
1957	115	Deuterium	1972	115	LNG (cryogenic liquid)
1957	115	Deuterium, compressed	1972	115	Methane, refrigerated liquid (cryogenic liquid)
1958	126	1,2-Dichloro-1,1,2,2-tetrafluoroethane	1972	115	Natural gas, refrigerated liquid (cryogenic liquid)
1958	126	Refrigerant gas R-114	1973	126	Chlorodifluoromethane and Chloropentafluoroethane mixture
1959	116P	1,1-Difluoroethylene	1973	126	Chloropentafluoroethane and Chlorodifluoromethane mixture
1959	116P	Refrigerant gas R-1132a	1973	126	Refrigerant gas R-502
1961	115	Ethane, refrigerated liquid	1974	126	Chlorodifluorobromomethane
1961	115	Ethane-Propane mixture, refrigerated liquid	1974	126	Refrigerant gas R-12B1
1961	115	Propane-Ethane mixture, refrigerated liquid	1975	124	Dinitrogen tetroxide and Nitric oxide mixture
1962	116P	Ethylene	1975	124	Nitric oxide and Dinitrogen tetroxide mixture
1962	116P	Ethylene, compressed	1975	124	Nitric oxide and Nitrogen dioxide mixture
1963	120	Helium, refrigerated liquid (cryogenic liquid)	1975	124	Nitric oxide and Nitrogen tetroxide mixture
1964	115	Hydrocarbon gas mixture, compressed, n.o.s.	1975	124	Nitrogen dioxide and Nitric oxide mixture
1965	115	Hydrocarbon gas mixture, liquefied, n.o.s.	1975	124	Nitrogen tetroxide and Nitric oxide mixture
1966	115	Hydrogen, refrigerated liquid (cryogenic liquid)	1975	124	Nitrogen tetroxide and Nitric oxide mixture
1967	123	Insecticide gas, poisonous, n.o.s.	1976	126	Octafluorocyclobutane
1967	123	Insecticide gas, toxic, n.o.s.	1976	126	Refrigerant gas RC-318
1967	123	Parathion and compressed gas mixture	1977	120	Nitrogen, refrigerated liquid (cryogenic liquid)
1968	126	Insecticide gas, n.o.s.	1978	115	Propane
1969	115	Isobutane	1979	120	Rare gases mixture, compressed
1970	120	Krypton, refrigerated liquid (cryogenic liquid)			
1971	115	Methane			

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1980	120	Oxygen and Rare gases mixture, compressed
1980	120	Rare gases and Oxygen mixture, compressed
1981	120	Nitrogen and Rare gases mixture, compressed
1981	120	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	131P	Aldehydes, flammable, poisonous, n.o.s.
1988	131P	Aldehydes, flammable, toxic, n.o.s.
1989	129P	Aldehydes, n.o.s.
1990	171	Benzaldehyde
1991	131P	Chloroprene, stabilised
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)

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1993	128	Compounds, tree or weed killing, liquid (flammable)
1993	128	Diesel fuel
1993	128	Flammable liquid, n.o.s.
1993	128	Fuel oil
1994	136	Iron pentacarbonyl
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
2014	140	Hydrogen peroxide, aqueous solution, with not less than 20% but not more than 60% Hydrogen peroxide (stabilised as necessary)
2015	143	Hydrogen peroxide, aqueous solution, stabilised, with more than 60% Hydrogen peroxide

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2015	143	Hydrogen peroxide, stabilised	2034	115	Hydrogen and Methane mixture, compressed
2016	151	Ammunition, poisonous, non-explosive	2034	115	Methane and Hydrogen mixture, compressed
2016	151	Ammunition, toxic, non-explosive	2035	115	Refrigerant gas R-143a
2017	159	Ammunition, tear-producing, non-explosive	2035	115	1,1,1-Trifluoroethane
2018	152	Chloroanilines, solid	2036	120	Xenon
2019	152	Chloroanilines, liquid	2036	120	Xenon, compressed
2020	153	Chlorophenols, solid	2037	115	Gas cartridges
2021	153	Chlorophenols, liquid	2037	115	Receptacles, small, containing gas
2022	153	Cresylic acid	2038	152	Dinitrotoluenes
2023	131P	1-Chloro-2,3-epoxypropane	2038	152	Dinitrotoluenes, liquid
2023	131P	Epichlorohydrin	2038	152	Dinitrotoluenes, solid
2024	151	Mercury compound, liquid, n.o.s.	2044	115	2,2-Dimethylpropane
2025	151	Mercury compound, solid, n.o.s.	2045	130	Isobutyl aldehyde
2026	151	Phenylmercuric compound, n.o.s.	2045	130	Isobutyraldehyde
2027	151	Sodium arsenite, solid	2046	130	Cymenes
2028	153	Bombs, smoke, non-explosive, with corrosive liquid, without initiating device	2047	129	Dichloropropenes
2029	132	Hydrazine, anhydrous	2048	130P	Dicyclopentadiene
2030	153	Hydrazine, aqueous solution, with more than 37% Hydrazine	2049	130	Diethylbenzene
2030	153	Hydrazine, aqueous solution, with not less than 37% but not more than 64% Hydrazine	2050	128	Diisobutylene, isomeric compounds
2030	153	Hydrazine hydrate	2051	132	2-Dimethylaminoethanol
2031	157	Nitric acid, other than red fuming, with more than 70% nitric acid	2052	128	Dipentene
2031	157	Nitric acid, other than red fuming, with not more than 70% nitric acid	2053	129	Methylamyl alcohol
2032	157	Nitric acid, red fuming	2053	129	Methyl isobutyl carbinol
2033	154	Potassium monoxide	2053	129	M.I.B.C.
			2054	132	Morpholine
			2055	128P	Styrene monomer, stabilised
			2056	127	Tetrahydrofuran
			2057	128	Tripropylene
			2058	129	Valeraldehyde

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2059	127	Nitrocellulose, solution, flammable
2067	140	Ammonium nitrate based fertilizer
2068	140	Ammonium nitrate fertilizers, with Calcium carbonate
2069	140	Ammonium nitrate fertilizers, with Ammonium sulphate
2069	140	Ammonium nitrate fertilizers, with Ammonium sulphate
2070	143	Ammonium nitrate fertilizers, with Phosphate or Potash
2071	140	Ammonium nitrate based fertilizer
2072	140	Ammonium nitrate fertilizer, n.o.s.
2073	125	Ammonia, solution, with more than 35% but not more than 50% Ammonia
2074	153P	Acrylamide
2074	153P	Acrylamide, solid
2075	153	Chloral, anhydrous, stabilised
2076	153	Cresols, liquid
2076	153	Cresols, solid
2077	153	alpha-Naphthylamine
2077	153	Naphthylamine (alpha)
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

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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, stabilised
2201	122	Nitrous oxide, refrigerated liquid
2202	117	Hydrogen selenide, anhydrous
2203	116	Silane
2203	116	Silane, compressed
2204	119	Carbonyl sulfide
2204	119	Carbonyl sulphide
2205	153	Adiponitrile
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

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2208	140	Calcium hypochlorite mixture, dry, with more than 10% but not more than 39% available Chlorine	2232	153	Chloroacetaldehyde
2209	153	Formaldehyde, solution (corrosive)	2232	153	2-Chloroethanal
2209	153	Formalin (corrosive)	2233	152	Chloroanisidines
2210	135	Maneb	2234	130	Chlorobenzotrifluorides
2210	135	Maneb preparation, with not less than 60% Maneb	2235	153	Chlorobenzyl chlorides
2211	171	Polymeric beads, expandable	2235	153	Chlorobenzyl chlorides, liquid
2211	171	Polystyrene beads, expandable	2236	156	3-Chloro-4-methylphenyl isocyanate
2212	171	Asbestos	2236	156	3-Chloro-4-methylphenyl isocyanate, liquid
2212	171	Asbestos, amphibole	2237	153	Chloronitroanilines
2212	171	Asbestos, blue	2238	129	Chlorotoluenes
2212	171	Asbestos, brown	2239	153	Chlorotoluidines
2212	171	Blue asbestos	2239	153	Chlorotoluidines, solid
2212	171	Brown asbestos	2240	154	Chromosulfuric acid
2213	133	Paraformaldehyde	2240	154	Chromosulphuric acid
2214	156	Phthalic anhydride	2241	128	Cycloheptane
2215	156	Maleic anhydride	2242	128	Cycloheptene
2215	156	Maleic anhydride, molten	2243	130	Cyclohexyl acetate
2216	171	Fish meal, stabilised	2244	129	Cyclopentanol
2216	171	Fish scrap, stabilised	2245	128	Cyclopentanone
2217	135	Seed cake, with not more than 1.5% oil and not more than 11% moisture	2246	128	Cyclopentene
2218	132P	Acrylic acid, stabilised	2247	128	n-Decane
2219	129	Allyl glycidyl ether	2248	132	Di-n-butylamine
2222	128	Anisole	2249	131	Dichlorodimethyl ether, symmetrical
2224	152	Benzonitrile	2250	156	Dichlorophenyl isocyanates
2225	156	Benzenesulfonyl chloride	2251	128P	Bicyclo[2.2.1]hepta-2,5-diene, stabilised
2225	156	Benzenesulphonyl chloride	2251	128P	2,5-Norbornadiene, stabilised
2226	156	Benzotrichloride	2252	127	1,2-Dimethoxyethane
2227	130P	n-Butyl methacrylate, stabilised	2253	153	N,N-Dimethylaniline
			2254	133	Matches, fusee
			2256	130	Cyclohexene

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2257	138	Potassium
2257	138	Potassium, metal
2258	132	1,2-Propylenediamine
2259	153	Triethylenetetramine
2260	132	Tripropylamine
2261	153	Xylenols
2261	153	Xylenols, solid
2262	156	Dimethylcarbamoyl chloride
2263	128	Dimethylcyclohexanes
2264	132	N,N-Dimethylcyclohexylamine
2264	132	Dimethylcyclohexylamine
2265	129	N,N-Dimethylformamide
2266	132	Dimethyl-N-propylamine
2267	156	Dimethyl thiophosphoryl chloride
2269	153	3,3'-Iminodipropylamine
2270	132	Ethylamine, aqueous solution, with not less than 50% but not more than 70% Ethylamine
2271	128	Ethyl amyl ketone
2272	153	N-Ethylaniline
2273	153	2-Ethylaniline
2274	153	N-Ethyl-N-benzylaniline
2275	129	2-Ethylbutanol
2276	132	2-Ethylhexylamine
2277	130P	Ethyl methacrylate
2277	130P	Ethyl methacrylate, stabilised
2278	128	n-Heptene
2279	151	Hexachlorobutadiene
2280	153	Hexamethylenediamine, solid
2281	156	Hexamethylene diisocyanate
2282	129	Hexanols
2283	130P	Isobutyl methacrylate, stabilised

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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
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

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2310	131	Pentane-2,4-dione	2334	131	Allylamine
2311	153	Phenetidines	2335	131	Allyl ethyl ether
2312	153	Phenol, molten	2336	131	Allyl formate
2313	129	Picolines	2337	131	Phenyl mercaptan
2315	171	Articles containing Polychlorinated biphenyls (PCB)	2338	127	Benzotrifluoride
2315	171	PCB	2339	130	2-Bromobutane
2315	171	Polychlorinated biphenyls	2340	130	2-Bromoethyl ethyl ether
2315	171	Polychlorinated biphenyls, liquid	2341	130	1-Bromo-3-methylbutane
2316	157	Sodium cuprocyanide, solid	2342	130	Bromomethylpropanes
2317	157	Sodium cuprocyanide, solution	2343	130	2-Bromopentane
2318	135	Sodium hydrosulfide, with less than 25% water of crystallization	2344	129	Bromopropanes
2318	135	Sodium hydrosulphide, with less than 25% water of crystallization	2345	130	3-Bromopropyne
2319	128	Terpene hydrocarbons, n.o.s.	2346	127	Butanedione
2320	153	Tetraethylenepentamine	2346	127	Diacetyl
2321	153	Trichlorobenzenes, liquid	2347	130	Butyl mercaptan
2322	152	Trichlorobutene	2348	129P	Butyl acrylates, stabilised
2323	130	Triethyl phosphite	2350	127	Butyl methyl ether
2324	128	Triisobutylene	2351	129	Butyl nitrites
2325	129	1,3,5-Trimethylbenzene	2352	127P	Butyl vinyl ether, stabilised
2326	153	Trimethylcyclohexylamine	2353	132	Butyryl chloride
2327	153	Trimethylhexamethylenediamines	2354	131	Chloromethyl ethyl ether
2328	156	Trimethylhexamethylene diisocyanate	2356	129	2-Chloropropane
2329	130	Trimethyl phosphite	2357	132	Cyclohexylamine
2330	128	Undecane	2358	128P	Cyclooctatetraene
2331	154	Zinc chloride, anhydrous	2359	132	Diallylamine
2332	129	Acetaldehyde oxime	2360	131P	Diallyl ether
2333	131	Allyl acetate	2361	132	Diisobutylamine
			2362	130	1,1-Dichloroethane
			2363	129	Ethyl mercaptan
			2364	128	n-Propyl benzene
			2366	128	Diethyl carbonate
			2367	130	alpha-Methylvaleraldehyde

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2367 **130** Methyl valeraldehyde (alpha)
 2368 **128** alpha-Pinene
 2368 **128** Pinene (alpha)
 2370 **128** 1-Hexene
 2371 **128** Isopentenes
 2372 **129** 1,2-Di-(dimethylamino)ethane
 2373 **127** Diethoxymethane
 2374 **127** 3,3-Diethoxypropene
 2375 **129** Diethyl sulfide
 2375 **129** Diethyl sulphide
 2376 **127** 2,3-Dihydropyran
 2377 **127** 1,1-Dimethoxyethane
 2378 **131** 2-Dimethylaminoacetonitrile
 2379 **132** 1,3-Dimethylbutylamine
 2380 **127** Dimethyldiethoxysilane
 2381 **131** Dimethyl disulfide
 2381 **131** Dimethyl disulphide
 2382 **131** Dimethylhydrazine, symmetrical
 2383 **132** Dipropylamine
 2384 **127** Di-n-propyl ether
 2385 **129** Ethyl isobutyrate
 2386 **132** 1-Ethylpiperidine
 2387 **130** Fluorobenzene
 2388 **130** Fluorotoluenes
 2389 **128** Furan
 2390 **129** 2-Iodobutane
 2391 **129** Iodomethylpropanes
 2392 **129** Iodopropanes
 2393 **129** Isobutyl formate
 2394 **129** Isobutyl propionate
 2395 **132** Isobutyryl chloride
 2396 **131P** Methacrylaldehyde, stabilised

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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
 2413 **128** Tetrapropyl orthotitanate
 2414 **130** Thiophene
 2416 **129** Trimethyl borate
 2417 **125** Carbonyl fluoride
 2417 **125** Carbonyl fluoride, compressed
 2418 **125** Sulfur tetrafluoride
 2418 **125** Sulphur tetrafluoride
 2419 **116** Bromotrifluoroethylene
 2420 **125** Hexafluoroacetone
 2421 **124** Nitrogen trioxide
 2422 **126** Octafluorobut-2-ene
 2422 **126** Refrigerant gas R-1318
 2424 **126** Octafluoropropane
 2424 **126** Refrigerant gas R-218
 2426 **140** Ammonium nitrate, liquid (hot concentrated solution)
 2427 **140** Potassium chlorate, aqueous solution

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2428	140	Sodium chlorate, aqueous solution	2448	133	Sulfur, molten
2429	140	Calcium chlorate, aqueous solution	2448	133	Sulphur, molten
2430	153	Alkylphenols, solid, n.o.s. (including C2-C12 homologues)	2451	122	Nitrogen trifluoride
2431	153	Anisidines	2451	122	Nitrogen trifluoride, compressed
2431	153	Anisidines, liquid	2452	116P	Ethylacetylene, stabilised
2431	153	Anisidines, solid	2453	115	Ethyl fluoride
2432	153	N,N-Diethylaniline	2453	115	Refrigerant gas R-161
2433	152	Chloronitrotoluenes, liquid	2454	115	Methyl fluoride
2433	152	Chloronitrotoluenes, solid	2454	115	Refrigerant gas R-41
2434	156	Dibenzylidichlorosilane	2455	116	Methyl nitrite
2435	156	Ethylphenyldichlorosilane	2456	130P	2-Chloropropene
2436	129	Thioacetic acid	2457	128	2,3-Dimethylbutane
2437	156	Methylphenyldichlorosilane	2458	130	Hexadiene
2438	131	Trimethylacetyl chloride	2459	128	2-Methyl-1-butene
2439	154	Sodium hydrogendifluoride	2460	128	2-Methyl-2-butene
2440	154	Stannic chloride, pentahydrate	2461	128	Methylpentadiene
2441	135	Titanium trichloride, pyrophoric	2463	138	Aluminum hydride
2441	135	Titanium trichloride mixture, pyrophoric	2464	141	Beryllium nitrate
2442	156	Trichloroacetyl chloride	2465	140	Dichloroisocyanuric acid, dry
2443	137	Vanadium oxytrichloride	2465	140	Dichloroisocyanuric acid salts
2444	137	Vanadium tetrachloride	2465	140	Sodium dichloroisocyanurate
2445	135	Lithium alkyls	2465	140	Sodium dichloro-s-triazinetriene
2445	135	Lithium alkyls, liquid	2466	143	Potassium superoxide
2446	153	Nitrocresols	2468	140	Trichloroisocyanuric acid, dry
2446	153	Nitrocresols, solid	2469	140	Zinc bromate
2447	136	Phosphorus, white, molten	2470	152	Phenylacetoneitrile, liquid
2447	136	White phosphorus, molten	2471	154	Osmium tetroxide
2448	133	Molten Sulfur	2473	154	Sodium arsanilate
2448	133	Molten sulphur	2474	157	Thiophosgene
			2475	157	Vanadium trichloride
			2477	131	Methyl isothiocyanate

UN No.	Guide No.	Name of Material
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	155P	Methyl isocyanate
2481	155	Ethyl isocyanate
2482	155P	n-Propyl isocyanate
2483	155P	Isopropyl isocyanate
2484	155	tert-Butyl isocyanate
2485	155P	n-Butyl isocyanate
2486	155P	Isobutyl isocyanate
2487	155	Phenyl isocyanate
2488	155	Cyclohexyl isocyanate
2490	153	Dichloroisopropyl ether
2491	153	Ethanolamine
2491	153	Ethanolamine, solution
2491	153	Monoethanolamine
2493	132	Hexamethyleneimine
2495	144	Iodine pentafluoride
2496	156	Propionic anhydride
2498	129	1,2,3,6-Tetrahydrobenzaldehyde
2501	152	Tris-(1-aziridinyl)phosphine oxide, solution
2502	132	Valeryl chloride
2503	137	Zirconium tetrachloride
2504	159	Acetylene tetrabromide
2504	159	Tetrabromoethane
2505	154	Ammonium fluoride
2506	154	Ammonium hydrogen sulfate
2506	154	Ammonium hydrogen sulphate

UN No.	Guide No.	Name of Material
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
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, stabilised
2522	153P	2-Dimethylaminoethyl methacrylate
2524	129	Ethyl orthoformate
2525	156	Ethyl oxalate
2526	132	Furfurylamine
2527	129P	Isobutyl acrylate, stabilised
2528	130	Isobutyl isobutyrate
2529	132	Isobutyric acid
2531	153P	Methacrylic acid, stabilised
2533	156	Methyl trichloroacetate
2534	119	Methylchlorosilane
2535	132	4-Methylmorpholine
2535	132	N-Methylmorpholine
2536	127	Methyltetrahydrofuran
2538	133	Nitronaphthalene

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
2541	128	Terpinolene	2576	137	Phosphorus oxybromide, molten
2542	153	Tributylamine	2577	156	Phenylacetyl chloride
2545	135	Hafnium powder, dry	2578	157	Phosphorus trioxide
2546	135	Titanium powder, dry	2579	153	Piperazine
2547	143	Sodium superoxide	2580	154	Aluminum bromide, solution
2548	124	Chlorine pentafluoride	2581	154	Aluminum chloride, solution
2552	151	Hexafluoroacetone hydrate	2582	154	Ferric chloride, solution
2552	151	Hexafluoroacetone hydrate, liquid	2583	153	Alkyl sulfonic acids, solid, with more than 5% free Sulfuric acid
2554	130P	Methylallyl chloride	2583	153	Alkyl sulphonic acids, solid, with more than 5% free Sulphuric acid
2555	113	Nitrocellulose with water, not less than 25% water	2583	153	Aryl sulfonic acids, solid, with more than 5% free Sulfuric acid
2556	113	Nitrocellulose with alcohol	2583	153	Aryl sulphonic acids, solid, with more than 5% free Sulphuric acid
2556	113	Nitrocellulose with not less than 25% alcohol	2584	153	Alkyl sulfonic acids, liquid, with more than 5% free Sulfuric acid
2557	133	Nitrocellulose mixture, without pigment	2584	153	Alkyl sulphonic acids, liquid, with more than 5% free Sulphuric acid
2557	133	Nitrocellulose mixture, without plasticizer	2584	153	Aryl sulfonic acids, liquid, with more than 5% free Sulfuric acid
2557	133	Nitrocellulose mixture, with pigment	2584	153	Aryl sulphonic acids, liquid, with more than 5% free Sulphuric acid
2557	133	Nitrocellulose mixture, with plasticizer	2585	153	Alkyl sulfonic acids, solid, with not more than 5% free Sulfuric acid
2558	131	Epibromohydrin	2585	153	Alkyl sulphonic acids, solid, with not more than 5% free Sulphuric acid
2560	129	2-Methylpentan-2-ol	2585	153	Aryl sulfonic acids, solid, with not more than 5% free Sulfuric acid
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			

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
2585	153	Aryl sulphonic acids, solid, with not more than 5% free Sulphuric acid	2602	126	Dichlorodifluoromethane and Difluoroethane azeotropic mixture with approximately 74% Dichlorodifluoromethane
2586	153	Alkyl sulfonic acids, liquid, with not more than 5% free Sulfuric acid	2602	126	Difluoroethane and Dichlorodifluoromethane azeotropic mixture with approximately 74% Dichlorodifluoromethane
2586	153	Alkyl sulphonic acids, liquid, with not more than 5% free Sulphuric acid	2602	126	Refrigerant gas R-500
2586	153	Aryl sulfonic acids, liquid, with not more than 5% free Sulfuric acid	2603	131	Cycloheptatriene
2586	153	Aryl sulphonic acids, liquid, with not more than 5% free Sulphuric acid	2604	132	Boron trifluoride diethyl etherate
2587	153	Benzoquinone	2605	155	Methoxymethyl isocyanate
2588	151	Pesticide, solid, poisonous, n.o.s.	2606	155	Methyl orthosilicate
2588	151	Pesticide, solid, toxic, n.o.s.	2607	129P	Acrolein dimer, stabilised
2589	155	Vinyl chloroacetate	2608	129	Nitropropanes
2590	171	Asbestos, chrysolite	2609	156	Triallyl borate
2590	171	Asbestos, white	2610	132	Triallylamine
2590	171	White asbestos	2611	131	Propylene chlorohydrin
2591	120	Xenon, refrigerated liquid (cryogenic liquid)	2612	127	Methyl propyl ether
2599	126	Chlorotrifluoromethane and Trifluoromethane azeotropic mixture with approximately 60% Chlorotrifluoromethane	2614	129	Methallyl alcohol
2599	126	Refrigerant gas R-503	2615	127	Ethyl propyl ether
2599	126	Trifluoromethane and Chlorotrifluoromethane azeotropic mixture with approximately 60% Chlorotrifluoromethane	2616	129	Triisopropyl borate
2600	119	Carbon monoxide and Hydrogen mixture, compressed	2617	129	Methylcyclohexanols
2600	119	Hydrogen and Carbon monoxide mixture, compressed	2618	130P	Vinyltoluenes, stabilised
2601	115	Cyclobutane	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

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
2627	140	Nitrites, inorganic, n.o.s.	2671	153	Aminopyridines
2628	151	Potassium fluoroacetate	2672	154	Ammonia, solution, with more than 10% but not more than 35% Ammonia
2629	151	Sodium fluoroacetate	2672	154	Ammonium hydroxide
2630	151	Selenates	2672	154	Ammonium hydroxide, with more than 10% but not more than 35% Ammonia
2630	151	Selenites	2673	151	2-Amino-4-chlorophenol
2642	154	Fluoroacetic acid	2674	154	Sodium fluorosilicate
2643	155	Methyl bromoacetate	2674	154	Sodium silicofluoride
2644	151	Methyl iodide	2676	119	Stibine
2645	153	Phenacyl bromide	2677	154	Rubidium hydroxide, solution
2646	151	Hexachlorocyclopentadiene	2678	154	Rubidium hydroxide
2647	153	Malononitrile	2678	154	Rubidium hydroxide, solid
2648	154	1,2-Dibromobutan-3-one	2679	154	Lithium hydroxide, solution
2649	153	1,3-Dichloroacetone	2680	154	Lithium hydroxide
2650	153	1,1-Dichloro-1-nitroethane	2680	154	Lithium hydroxide, monohydrate
2651	153	4,4'-Diaminodiphenylmethane	2681	154	Caesium hydroxide, solution
2653	156	Benzyl iodide	2681	154	Cesium hydroxide, solution
2655	151	Potassium fluorosilicate	2682	157	Caesium hydroxide
2655	151	Potassium silicofluoride	2682	157	Cesium hydroxide
2656	154	Quinoline	2683	132	Ammonium sulfide, solution
2657	153	Selenium disulfide	2683	132	Ammonium sulphide, solution
2657	153	Selenium disulphide	2684	132	3-Diethylaminopropylamine
2659	151	Sodium chloroacetate	2684	132	Diethylaminopropylamine
2660	153	Mononitrotoluidines	2685	132	N,N-Diethylethylenediamine
2660	153	Nitrotoluidines (mono)	2686	132	2-Diethylaminoethanol
2661	153	Hexachloroacetone	2687	133	Dicyclohexylammonium nitrite
2662	153	Hydroquinone	2688	159	1-Bromo-3-chloropropane
2664	160	Dibromomethane	2689	153	Glycerol alpha-monochlorohydrin
2667	152	Butyltoluenes	2690	152	N,n-Butylimidazole
2668	131	Chloroacetonitrile	2691	137	Phosphorus pentabromide
2669	152	Chlorocresols			
2669	152	Chlorocresols, solution			
2670	157	Cyanuric chloride			

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2692	157	Boron tribromide
2693	154	Bisulfites, aqueous solution, n.o.s.
2693	154	Bisulphites, aqueous solution, n.o.s.
2698	156	Tetrahydrophthalic anhydrides
2699	154	Trifluoroacetic acid
2705	153P	1-Pentol
2707	127	Dimethyldioxanes
2709	128	Butylbenzenes
2710	128	Dipropyl ketone
2713	153	Acridine
2714	133	Zinc resinate
2715	133	Aluminum resinate
2716	153	1,4-Butynediol
2717	133	Camphor
2717	133	Camphor, synthetic
2719	141	Barium bromate
2720	141	Chromium nitrate
2721	140	Copper chlorate
2722	140	Lithium nitrate
2723	140	Magnesium chlorate
2724	140	Manganese nitrate
2725	140	Nickel nitrate
2726	140	Nickel nitrite
2727	141	Thallium nitrate
2728	140	Zirconium nitrate
2729	152	Hexachlorobenzene
2730	152	Nitroanisoles, liquid
2730	152	Nitroanisoles, solid
2732	152	Nitrobromobenzenes, liquid
2732	152	Nitrobromobenzenes, solid

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2733	132	Amines, flammable, corrosive, n.o.s.
2733	132	Polyalkylamines, n.o.s.
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

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
2753	153	N-Ethylbenzyltoluidines, liquid	2772	131	Thiocarbamate pesticide, liquid, flammable, toxic
2753	153	N-Ethylbenzyltoluidines, solid	2775	151	Copper based pesticide, solid, poisonous
2754	153	N-Ethyltoluidines	2775	151	Copper based pesticide, solid, toxic
2757	151	Carbamate pesticide, solid, poisonous	2776	131	Copper based pesticide, liquid, flammable, poisonous
2757	151	Carbamate pesticide, solid, toxic	2776	131	Copper based pesticide, liquid, flammable, toxic
2758	131	Carbamate pesticide, liquid, flammable, poisonous	2777	151	Mercury based pesticide, solid, poisonous
2758	131	Carbamate pesticide, liquid, flammable, toxic	2777	151	Mercury based pesticide, solid, toxic
2759	151	Arsenical pesticide, solid, poisonous	2778	131	Mercury based pesticide, liquid, flammable, poisonous
2759	151	Arsenical pesticide, solid, toxic	2778	131	Mercury based pesticide, liquid, flammable, toxic
2760	131	Arsenical pesticide, liquid, flammable, poisonous	2779	153	Substituted nitrophenol pesticide, solid, poisonous
2760	131	Arsenical pesticide, liquid, flammable, toxic	2779	153	Substituted nitrophenol pesticide, solid, toxic
2761	151	Organochlorine pesticide, solid, poisonous	2780	131	Substituted nitrophenol pesticide, liquid, flammable, poisonous
2761	151	Organochlorine pesticide, solid, toxic	2780	131	Substituted nitrophenol pesticide, liquid, flammable, toxic
2762	131	Organochlorine pesticide, liquid, flammable, poisonous	2781	151	Bipyridilium pesticide, solid, poisonous
2762	131	Organochlorine pesticide, liquid, flammable, toxic	2781	151	Bipyridilium pesticide, solid, toxic
2763	151	Triazine pesticide, solid, poisonous	2782	131	Bipyridilium pesticide, liquid, flammable, poisonous
2763	151	Triazine pesticide, solid, toxic	2782	131	Bipyridilium pesticide, liquid, flammable, toxic
2764	131	Triazine pesticide, liquid, flammable, poisonous	2783	152	Organophosphorus pesticide, solid, poisonous
2764	131	Triazine pesticide, liquid, flammable, toxic	2783	152	Organophosphorus pesticide, solid, toxic
2771	151	Thiocarbamate pesticide, solid, poisonous			
2771	151	Thiocarbamate pesticide, solid, toxic			
2772	131	Thiocarbamate pesticide, liquid, flammable, poisonous			

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
2784	131	Organophosphorus pesticide, liquid, flammable, poisonous	2801	154	Dye intermediate, liquid, corrosive, n.o.s.
2784	131	Organophosphorus pesticide, liquid, flammable, toxic	2802	154	Copper chloride
2785	152	4-Thiapentanal	2803	172	Gallium
2786	153	Organotin pesticide, solid, poisonous	2805	138	Lithium hydride, fused solid
2786	153	Organotin pesticide, solid, toxic	2806	139	Lithium nitride
2787	131	Organotin pesticide, liquid, flammable, poisonous	2807	171	Magnetized material
2787	131	Organotin pesticide, liquid, flammable, toxic	2809	172	Mercury
2788	153	Organotin compound, liquid, n.o.s.	2809	172	Mercury metal
2789	132	Acetic acid, glacial	2810	153	Buzz
2789	132	Acetic acid, solution, more than 80% acid	2810	153	BZ
2790	153	Acetic acid, solution, more than 10% but not more than 80% acid	2810	153	Compounds, tree or weed killing, liquid (toxic)
2793	170	Ferrous metal borings, shavings, turnings or cuttings	2810	153	CS
2794	154	Batteries, wet, filled with acid	2810	153	DC
2795	154	Batteries, wet, filled with alkali	2810	153	GA
2796	157	Battery fluid, acid	2810	153	GB
2796	157	Sulfuric acid, with not more than 51% acid	2810	153	GD
2796	157	Sulphuric acid, with not more than 51% acid	2810	153	GF
2797	154	Battery fluid, alkali	2810	153	H
2798	137	Benzene phosphorus dichloride	2810	153	HD
2798	137	Phenylphosphorus dichloride	2810	153	HL
2799	137	Benzene phosphorus thiodichloride	2810	153	HN-1
2799	137	Phenylphosphorus thiodichloride	2810	153	HN-2
2800	154	Batteries, wet, non-spillable	2810	153	HN-3
2801	154	Dye, liquid, corrosive, n.o.s.	2810	153	L (Lewisite)
			2810	153	Lewisite
			2810	153	Mustard
			2810	153	Mustard Lewisite
			2810	153	Poisonous liquid, organic, n.o.s.
			2810	153	Sarin
			2810	153	Soman

UN No.	Guide No.	Name of Material
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
2834	154	Phosphorous acid
2835	138	Sodium aluminum hydride
2837	154	Bisulfates, aqueous solution

UN No.	Guide No.	Name of Material
2837	154	Bisulphates, aqueous solution
2837	154	Sodium bisulfate, solution
2837	154	Sodium bisulphate, solution
2838	129P	Vinyl butyrate, stabilised
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.
2857	126	Refrigerating machines, containing Ammonia solutions (UN2672)

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
2857	126	Refrigerating machines, containing non-flammable, non-poisonous gases	2881	135	Nickel catalyst, dry
2857	126	Refrigerating machines, containing non-flammable, non-toxic gases	2900	158	Infectious substance, affecting animals only
2858	170	Zirconium, dry, coiled wire, finished metal sheets or strip	2901	124	Bromine chloride
2859	154	Ammonium metavanadate	2902	151	Pesticide, liquid, poisonous, n.o.s.
2861	151	Ammonium polyvanadate	2902	151	Pesticide, liquid, toxic, n.o.s.
2862	151	Vanadium pentoxide	2903	131	Pesticide, liquid, poisonous, flammable, n.o.s.
2863	154	Sodium ammonium vanadate	2903	131	Pesticide, liquid, toxic, flammable, n.o.s.
2864	151	Potassium metavanadate	2904	154	Chlorophenolates, liquid
2865	154	Hydroxylamine sulphate	2904	154	Phenolates, liquid
2865	154	Hydroxylamine sulphate	2905	154	Chlorophenolates, solid
2869	157	Titanium trichloride mixture	2905	154	Phenolates, solid
2870	135	Aluminum borohydride	2907	133	Isosorbide dinitrate mixture
2870	135	Aluminum borohydride in devices	2908	161	Radioactive material, excepted package, empty packaging
2871	170	Antimony powder	2909	161	Radioactive material, excepted package, articles manufactured from depleted Uranium
2872	159	Dibromochloropropanes	2909	161	Radioactive material, excepted package, articles manufactured from natural Thorium
2873	153	Dibutylaminoethanol	2909	161	Radioactive material, excepted package, articles manufactured from natural Uranium
2874	153	Furfuryl alcohol	2910	161	Radioactive material, excepted package, limited quantity of material
2875	151	Hexachlorophene	2911	161	Radioactive material, excepted package, instruments or articles
2876	153	Resorcinol	2912	162	Radioactive material, low specific activity (LSA-I), non fissile or fissile-excepted
2878	170	Titanium sponge granules			
2878	170	Titanium sponge powders			
2879	157	Selenium oxychloride			
2880	140	Calcium hypochlorite, hydrated, with not less than 5.5% but not more than 16% water			
2880	140	Calcium hypochlorite, hydrated mixture, with not less than 5.5% but not more than 16% water			
2881	135	Metal catalyst, dry			

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
2913	162	Radioactive material, surface contaminated objects (SCO-I), non fissile or fissile-excepted	2927	154	Ethyl phosphorodichloridate
2913	162	Radioactive material, surface contaminated objects (SCO-II), non fissile or fissile-excepted	2927	154	Poisonous liquid, corrosive, organic, n.o.s.
2915	163	Radioactive material, Type A package, non-special form, non fissile or fissile-excepted	2927	154	Toxic liquid, corrosive, organic, n.o.s.
2916	163	Radioactive material, Type B(U) package, non fissile or fissile-excepted	2928	154	Poisonous solid, corrosive, organic, n.o.s.
2917	163	Radioactive material, Type B(M) package, non fissile or fissile-excepted	2928	154	Toxic solid, corrosive, organic, n.o.s.
2919	163	Radioactive material, transported under special arrangement, non fissile or fissile-excepted	2929	131	Poisonous liquid, flammable, organic, n.o.s.
2920	132	Corrosive liquid, flammable, n.o.s.	2929	131	Toxic liquid, flammable, organic, n.o.s.
2921	134	Corrosive solid, flammable, n.o.s.	2930	134	Poisonous solid, flammable, organic, n.o.s.
2922	154	Corrosive liquid, poisonous, n.o.s.	2930	134	Toxic solid, flammable, organic, n.o.s.
2922	154	Corrosive liquid, toxic, n.o.s.	2931	151	Vanadyl sulfate
2923	154	Corrosive solid, poisonous, n.o.s.	2931	151	Vanadyl sulphate
2923	154	Corrosive solid, toxic, n.o.s.	2933	129	Methyl 2-chloropropionate
2924	132	Flammable liquid, corrosive, n.o.s.	2934	129	Isopropyl 2-chloropropionate
2925	134	Flammable solid, corrosive, organic, n.o.s.	2935	129	Ethyl 2-chloropropionate
2926	134	Flammable solid, poisonous, organic, n.o.s.	2936	153	Thiolactic acid
2926	134	Flammable solid, toxic, organic, n.o.s.	2937	153	alpha-Methylbenzyl alcohol
2927	154	Ethyl phosphonothioic dichloride, anhydrous	2937	153	alpha-Methylbenzyl alcohol, liquid
			2937	153	Methylbenzyl alcohol (alpha)
			2940	135	Cyclooctadiene phosphines
			2940	135	9-Phosphabicyclononanes
			2941	153	Fluoroanilines
			2942	153	2-Trifluoromethylaniline
			2943	129	Tetrahydrofurfurylamine
			2945	132	N-Methylbutylamine
			2946	153	2-Amino-5-diethylaminopentane
			2947	155	Isopropyl chloroacetate

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
2948	153	3-Trifluoromethylaniline	2983	131P	Propylene oxide and Ethylene oxide mixture, with not more than 30% Ethylene oxide
2949	154	Sodium hydrosulfide, hydrated, with not less than 25% water of crystallization	2984	140	Hydrogen peroxide, aqueous solution, with not less than 8% but less than 20% Hydrogen peroxide
2949	154	Sodium hydrosulfide, with not less than 25% water of crystallization	2985	155	Chlorosilanes, flammable, corrosive, n.o.s.
2949	154	Sodium hydrosulphide, hydrated, with not less than 25% water of crystallization	2986	155	Chlorosilanes, corrosive, flammable, n.o.s.
2949	154	Sodium hydrosulphide, with not less than 25% water of crystallization	2987	156	Chlorosilanes, corrosive, n.o.s.
2950	138	Magnesium granules, coated	2988	139	Chlorosilanes, water-reactive, flammable, corrosive, n.o.s.
2956	149	5-tert-Butyl-2,4,6-trinitro-m-xylene	2989	133	Lead phosphite, dibasic
2956	149	Musk xylene	2990	171	Life-saving appliances, self-inflating
2965	139	Boron trifluoride dimethyl etherate	2991	131	Carbamate pesticide, liquid, poisonous, flammable
2966	153	Thioglycol	2991	131	Carbamate pesticide, liquid, toxic, flammable
2967	154	Sulfamic acid	2992	151	Carbamate pesticide, liquid, poisonous
2967	154	Sulphamic acid	2992	151	Carbamate pesticide, liquid, toxic
2968	135	Maneb, stabilised	2993	131	Arsenical pesticide, liquid, poisonous, flammable
2968	135	Maneb preparation, stabilised	2993	131	Arsenical pesticide, liquid, toxic, flammable
2969	171	Castor beans, meal, pomace or flake	2994	151	Arsenical pesticide, liquid, poisonous
2977	166	Radioactive material, Uranium hexafluoride, fissile	2994	151	Arsenical pesticide, liquid, toxic
2977	166	Uranium hexafluoride, radioactive material, fissile	2995	131	Organochlorine pesticide, liquid, poisonous, flammable
2978	166	Radioactive material, Uranium hexafluoride, non fissile or fissile-excepted	2995	131	Organochlorine pesticide, liquid, toxic, flammable
2978	166	Uranium hexafluoride, radioactive material, non fissile or fissile-excepted	2996	151	Organochlorine pesticide, liquid, poisonous
2983	131P	Ethylene oxide and Propylene oxide mixture, with not more than 30% Ethylene oxide	2996	151	Organochlorine pesticide, liquid, toxic

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
2997	131	Triazine pesticide, liquid, poisonous, flammable	3013	131	Substituted nitrophenol pesticide, liquid, toxic, flammable
2997	131	Triazine pesticide, liquid, toxic, flammable	3014	153	Substituted nitrophenol pesticide, liquid, poisonous
2998	151	Triazine pesticide, liquid, poisonous	3014	153	Substituted nitrophenol pesticide, liquid, toxic
2998	151	Triazine pesticide, liquid, toxic	3015	131	Bipyridilium pesticide, liquid, poisonous, flammable
3002	151	Phenyl urea pesticide, liquid, poisonous	3015	131	Bipyridilium pesticide, liquid, toxic, flammable
3002	151	Phenyl urea pesticide, liquid, toxic	3016	151	Bipyridilium pesticide, liquid, poisonous
3005	131	Thiocarbamate pesticide, liquid, poisonous, flammable	3016	151	Bipyridilium pesticide, liquid, toxic
3005	131	Thiocarbamate pesticide, liquid, toxic, flammable	3017	131	Organophosphorus pesticide, liquid, poisonous, flammable
3006	151	Thiocarbamate pesticide, liquid, poisonous	3017	131	Organophosphorus pesticide, liquid, toxic, flammable
3006	151	Thiocarbamate pesticide, liquid, toxic	3018	152	Organophosphorus pesticide, liquid, poisonous
3009	131	Copper based pesticide, liquid, poisonous, flammable	3018	152	Organophosphorus pesticide, liquid, toxic
3009	131	Copper based pesticide, liquid, toxic, flammable	3019	131	Organotin pesticide, liquid, poisonous, flammable
3010	151	Copper based pesticide, liquid, poisonous	3019	131	Organotin pesticide, liquid, toxic, flammable
3010	151	Copper based pesticide, liquid, toxic	3020	153	Organotin pesticide, liquid, poisonous
3011	131	Mercury based pesticide, liquid, poisonous, flammable	3020	153	Organotin pesticide, liquid, toxic
3011	131	Mercury based pesticide, liquid, toxic, flammable	3021	131	Pesticide, liquid, flammable, poisonous, n.o.s.
3012	151	Mercury based pesticide, liquid, poisonous	3021	131	Pesticide, liquid, flammable, toxic, n.o.s.
3012	151	Mercury based pesticide, liquid, toxic	3022	127P	1,2-Butylene oxide, stabilised
3013	131	Substituted nitrophenol pesticide, liquid, poisonous, flammable	3023	131	2-Methyl-2-heptanethiol
			3024	131	Coumarin derivative pesticide, liquid, flammable, poisonous

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3024	131	Coumarin derivative pesticide, liquid, flammable, toxic	3065	127	Alcoholic beverages
3025	131	Coumarin derivative pesticide, liquid, poisonous, flammable	3066	153	Paint (corrosive)
3025	131	Coumarin derivative pesticide, liquid, toxic, flammable	3066	153	Paint related material (corrosive)
3026	151	Coumarin derivative pesticide, liquid, poisonous	3070	126	Dichlorodifluoromethane and Ethylene oxide mixture, with not more than 12.5% Ethylene oxide
3026	151	Coumarin derivative pesticide, liquid, toxic	3070	126	Ethylene oxide and Dichlorodifluoromethane mixture, with not more than 12.5% Ethylene oxide
3027	151	Coumarin derivative pesticide, solid, poisonous	3071	131	Mercaptan mixture, liquid, poisonous, flammable, n.o.s.
3027	151	Coumarin derivative pesticide, solid, toxic	3071	131	Mercaptan mixture, liquid, toxic, flammable, n.o.s.
3028	154	Batteries, dry, containing Potassium hydroxide solid	3071	131	Mercaptans, liquid, poisonous, flammable, n.o.s.
3048	157	Aluminum phosphide pesticide	3071	131	Mercaptans, liquid, toxic, flammable, n.o.s.
3049	138	Metal alkyl halides, water-reactive, n.o.s.	3072	171	Life-saving appliances, not self-inflating
3049	138	Metal aryl halides, water-reactive, n.o.s.	3073	131P	Vinylpyridines, stabilised
3050	138	Metal alkyl hydrides, water-reactive, n.o.s.	3076	138	Aluminum alkyl hydrides
3050	138	Metal aryl hydrides, water-reactive, n.o.s.	3077	171	Environmentally hazardous substance, solid, n.o.s.
3051	135	Aluminum alkyls	3077	171	Hazardous waste, solid, n.o.s.
3052	135	Aluminum alkyl halides, liquid	3077	171	Other regulated substances, solid, n.o.s.
3052	135	Aluminum alkyl halides, solid	3078	138	Cerium, turnings or gritty powder
3053	135	Magnesium alkyls	3079	131P	Methacrylonitrile, stabilised
3054	129	Cyclohexanethiol	3080	155	Isocyanate solution, poisonous, flammable, n.o.s.
3054	129	Cyclohexyl mercaptan	3080	155	Isocyanate solution, toxic, flammable, n.o.s.
3055	154	2-(2-Aminoethoxy)ethanol	3080	155	Isocyanates, poisonous, flammable, n.o.s.
3056	129	n-Heptaldehyde			
3057	125	Trifluoroacetyl chloride			
3064	127	Nitroglycerin, solution in alcohol, with more than 1% but not more than 5% Nitroglycerin			

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3080	155	Isocyanates, toxic, flammable, n.o.s.
3082	171	Environmentally hazardous substance, liquid, n.o.s.
3082	171	Hazardous waste, liquid, n.o.s.
3082	171	Other regulated substances, liquid, n.o.s.
3083	124	Perchloryl fluoride
3084	157	Corrosive solid, oxidising, n.o.s.
3085	140	Oxidising solid, corrosive, n.o.s.
3086	141	Poisonous solid, oxidising, n.o.s.
3086	141	Toxic solid, oxidising, n.o.s.
3087	141	Oxidising solid, poisonous, n.o.s.
3087	141	Oxidising solid, toxic, n.o.s.
3088	135	Self-heating solid, organic, n.o.s.
3089	170	Metal powder, flammable, n.o.s.
3090	138	Lithium batteries
3090	138	Lithium metal batteries (including lithium alloy batteries)
3091	138	Lithium batteries contained in equipment
3091	138	Lithium batteries packed with equipment
3091	138	Lithium metal batteries contained in equipment (including lithium alloy batteries)
3091	138	Lithium metal batteries packed with equipment (including lithium alloy batteries)
3092	129	1-Methoxy-2-propanol
3093	157	Corrosive liquid, oxidising, n.o.s.

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3094	138	Corrosive liquid, water-reactive, n.o.s.
3095	136	Corrosive solid, self-heating, n.o.s.
3096	138	Corrosive solid, water-reactive, n.o.s.
3097	140	Flammable solid, oxidising, n.o.s.
3098	140	Oxidising liquid, corrosive, n.o.s.
3099	142	Oxidising liquid, poisonous, n.o.s.
3099	142	Oxidising liquid, toxic, n.o.s.
3100	135	Oxidising solid, self-heating, n.o.s.
3101	146	Organic peroxide type B, liquid
3102	146	Organic peroxide type B, solid
3103	146	Organic peroxide type C, liquid
3104	146	Organic peroxide type C, solid
3105	145	Organic peroxide type D, liquid
3106	145	Organic peroxide type D, solid
3107	145	Organic peroxide type E, liquid
3108	145	Organic peroxide type E, solid
3109	145	Organic peroxide type F, liquid
3110	145	Organic peroxide type F, solid
3111	148	Organic peroxide type B, liquid, temperature controlled
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

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3117	148	Organic peroxide type E, liquid, temperature controlled	3131	138	Water-reactive solid, corrosive, n.o.s.
3118	148	Organic peroxide type E, solid, temperature controlled	3132	138	Water-reactive solid, flammable, n.o.s.
3119	148	Organic peroxide type F, liquid, temperature controlled	3133	138	Water-reactive solid, oxidising, n.o.s.
3120	148	Organic peroxide type F, solid, temperature controlled	3134	139	Water-reactive solid, poisonous, n.o.s.
3121	144	Oxidising solid, water-reactive, n.o.s.	3134	139	Water-reactive solid, toxic, n.o.s.
3122	142	Poisonous liquid, oxidising, n.o.s.	3135	138	Water-reactive solid, self-heating, n.o.s.
3122	142	Toxic liquid, oxidising, n.o.s.	3136	120	Trifluoromethane, refrigerated liquid
3123	139	Poisonous liquid, water-reactive, n.o.s.	3137	140	Oxidising solid, flammable, n.o.s.
3123	139	Toxic liquid, water-reactive, 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
3124	136	Poisonous solid, self-heating, n.o.s.	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
3124	136	Toxic solid, self-heating, n.o.s.	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
3125	139	Poisonous solid, water-reactive, n.o.s.	3139	140	Oxidising liquid, n.o.s.
3125	139	Toxic solid, water-reactive, n.o.s.	3140	151	Alkaloids, liquid, n.o.s. (poisonous)
3126	136	Self-heating solid, corrosive, organic, n.o.s.	3140	151	Alkaloid salts, liquid, n.o.s. (poisonous)
3127	135	Self-heating solid, oxidising, n.o.s.			
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.			

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3141	157	Antimony compound, inorganic, liquid, n.o.s.	3151	171	Halogenated monomethyldiphenylmethanes, liquid
3142	151	Disinfectant, liquid, poisonous, n.o.s.	3151	171	Polyhalogenated biphenyls, liquid
3142	151	Disinfectant, liquid, toxic, n.o.s.	3151	171	Polyhalogenated terphenyls, liquid
3143	151	Dye, solid, poisonous, n.o.s.	3152	171	Halogenated monomethyldiphenylmethanes, solid
3143	151	Dye, solid, toxic, n.o.s.	3152	171	Polyhalogenated biphenyls, solid
3143	151	Dye intermediate, solid, poisonous, n.o.s.	3152	171	Polyhalogenated terphenyls, solid
3143	151	Dye intermediate, solid, toxic, n.o.s.	3153	115	Perfluoro(methyl vinyl ether)
3144	151	Nicotine compound, liquid, n.o.s.	3154	115	Perfluoro(ethyl vinyl ether)
3144	151	Nicotine preparation, liquid, n.o.s.	3155	154	Pentachlorophenol
3145	153	Alkylphenols, liquid, n.o.s. (including C2-C12 homologues)	3156	122	Compressed gas, oxidising, n.o.s.
3146	153	Organotin compound, solid, n.o.s.	3157	122	Liquefied gas, oxidising, n.o.s.
3147	154	Dye, solid, corrosive, n.o.s.	3158	120	Gas, refrigerated liquid, n.o.s.
3147	154	Dye intermediate, solid, corrosive, n.o.s.	3159	126	Refrigerant gas R-134a
3148	138	Water-reactive liquid, n.o.s.	3159	126	1,1,1,2-Tetrafluoroethane
3149	140	Hydrogen peroxide and Peroxyacetic acid mixture, with acid(s), water and not more than 5% Peroxyacetic acid, stabilised	3160	119	Liquefied gas, poisonous, flammable, n.o.s.
3149	140	Peroxyacetic acid and hydrogen peroxide mixture, with acid(s), water and not more than 5% Peroxyacetic acid, stabilised	3160	119	Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)
3150	115	Devices, small, hydrocarbon gas powered, with release device	3160	119	Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)
3150	115	Hydrocarbon gas refills for small devices, with release device	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.

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3160	119	Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)
3160	119	Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)
3160	119	Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)
3160	119	Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)
3161	115	Liquefied gas, flammable, n.o.s.
3162	123	Liquefied gas, poisonous, n.o.s.
3162	123	Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone A)
3162	123	Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone B)
3162	123	Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone C)
3162	123	Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone D)
3162	123	Liquefied gas, toxic, n.o.s.
3162	123	Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone A)
3162	123	Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone B)
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, pressurised, hydraulic (containing non-flammable gas)
3164	126	Articles, pressurised, pneumatic (containing non-flammable gas)
3165	131	Aircraft hydraulic power unit fuel tank

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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-pressurised, flammable, n.o.s., not refrigerated liquid
3168	119	Gas sample, non-pressurised, poisonous, flammable, n.o.s., not refrigerated liquid
3168	119	Gas sample, non-pressurised, toxic, flammable, n.o.s., not refrigerated liquid
3169	123	Gas sample, non-pressurised, poisonous, n.o.s., not refrigerated liquid
3169	123	Gas sample, non-pressurised, toxic, n.o.s., not refrigerated liquid
3170	138	Aluminum dross
3170	138	Aluminum remelting by-products
3170	138	Aluminum smelting by-products
3171	154	Battery-powered equipment (wet battery)
3171	147	Battery-powered equipment (with lithium ion batteries)

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3171	138	Battery-powered equipment (with lithium metal batteries)	3184	136	Self-heating liquid, poisonous, organic, n.o.s.
3171	138	Battery-powered equipment (with sodium batteries)	3184	136	Self-heating liquid, toxic, organic, n.o.s.
3171	154	Battery-powered vehicle (wet battery)	3185	136	Self-heating liquid, corrosive, organic, n.o.s.
3171	147	Battery-powered vehicle (with lithium ion batteries)	3186	135	Self-heating liquid, inorganic, n.o.s.
3171	138	Battery-powered vehicle (with sodium batteries)	3187	136	Self-heating liquid, poisonous, inorganic, n.o.s.
3171	154	Wheelchair, electric, with batteries	3187	136	Self-heating liquid, toxic, inorganic, n.o.s.
3172	153	Toxins, extracted from living sources, liquid, n.o.s.	3188	136	Self-heating liquid, corrosive, inorganic, n.o.s.
3172	153	Toxins, extracted from living sources, solid, n.o.s.	3189	135	Metal powder, self-heating, n.o.s.
3174	135	Titanium disulfide	3190	135	Self-heating solid, inorganic, n.o.s.
3174	135	Titanium disulphide	3191	136	Self-heating solid, poisonous, inorganic, n.o.s.
3175	133	Solids containing flammable liquid, n.o.s.	3191	136	Self-heating solid, toxic, inorganic, n.o.s.
3176	133	Flammable solid, organic, molten, n.o.s.	3192	136	Self-heating solid, corrosive, inorganic, n.o.s.
3178	133	Flammable solid, inorganic, n.o.s.	3194	135	Pyrophoric liquid, inorganic, n.o.s.
3178	133	Smokeless powder for small arms	3200	135	Pyrophoric solid, inorganic, n.o.s.
3179	134	Flammable solid, poisonous, inorganic, n.o.s.	3203	135	Pyrophoric organometallic compound, water-reactive, n.o.s.
3179	134	Flammable solid, toxic, inorganic, n.o.s.	3205	135	Alkaline earth metal alcoholates, n.o.s.
3180	134	Flammable solid, corrosive, inorganic, n.o.s.	3206	136	Alkali metal alcoholates, self-heating, corrosive, n.o.s.
3181	133	Metal salts of organic compounds, flammable, n.o.s.	3207	138	Organometallic compound, water-reactive, flammable, n.o.s.
3182	170	Metal hydrides, flammable, n.o.s.	3207	138	Organometallic compound dispersion, water-reactive, flammable, n.o.s.
3183	135	Self-heating liquid, organic, n.o.s.			

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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.
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

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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
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.

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
3248	131	Medicine, liquid, flammable, toxic, n.o.s.	3264	154	Corrosive liquid, acidic, inorganic, n.o.s.
3249	151	Medicine, solid, poisonous, n.o.s.	3265	153	Corrosive liquid, acidic, organic, n.o.s.
3249	151	Medicine, solid, toxic, n.o.s.	3266	154	Corrosive liquid, basic, inorganic, n.o.s.
3250	153	Chloroacetic acid, molten	3267	153	Corrosive liquid, basic, organic, n.o.s.
3251	133	Isosorbide-5-mononitrate	3268	171	Air bag inflators
3252	115	Difluoromethane	3268	171	Air bag modules
3252	115	Refrigerant gas R-32	3268	171	Safety devices
3253	154	Disodium trioxosilicate	3268	171	Seat-belt pre-tensioners
3254	135	Tributylphosphane	3269	128	Polyester resin kit
3255	135	tert-Butyl hypochlorite	3269	128	Polyester resin kit, liquid base material
3256	128	Elevated temperature liquid, flammable, n.o.s., with flash point above 37.8°C (100°F), at or above its flash point	3270	133	Nitrocellulose membrane filters
3256	128	Elevated temperature liquid, flammable, n.o.s., with flash point above 60°C (140°F), at or above its flash point	3271	127	Ethers, n.o.s.
3257	171	Elevated temperature liquid, n.o.s., at or above 100°C (212°F), and below its flash point	3272	127	Esters, n.o.s.
3258	171	Elevated temperature solid, n.o.s., at or above 240°C (464°F)	3273	131	Nitriles, flammable, poisonous, n.o.s.
3259	154	Amines, solid, corrosive, n.o.s.	3273	131	Nitriles, flammable, toxic, n.o.s.
3259	154	Polyamines, solid, corrosive, n.o.s.	3274	132	Alcoholates solution, n.o.s., in alcohol
3260	154	Corrosive solid, acidic, inorganic, n.o.s.	3275	131	Nitriles, poisonous, flammable, n.o.s.
3261	154	Corrosive solid, acidic, organic, n.o.s.	3275	131	Nitriles, toxic, flammable, n.o.s.
3262	154	Corrosive solid, basic, inorganic, n.o.s.	3276	151	Nitriles, liquid, poisonous, n.o.s.
3263	154	Corrosive solid, basic, organic, 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.

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
3277	154	Chloroformates, toxic, corrosive, n.o.s.	3284	151	Tellurium compound, n.o.s.
3278	151	Organophosphorus compound, liquid, poisonous, n.o.s.	3285	151	Vanadium compound, n.o.s.
3278	151	Organophosphorus compound, liquid, toxic, n.o.s.	3286	131	Flammable liquid, poisonous, corrosive, n.o.s.
3278	151	Organophosphorus compound, poisonous, liquid, n.o.s.	3286	131	Flammable liquid, toxic, corrosive, n.o.s.
3278	151	Organophosphorus compound, poisonous, n.o.s.	3287	151	Poisonous liquid, inorganic, n.o.s.
3278	151	Organophosphorus compound, toxic, liquid, n.o.s.	3287	151	Toxic liquid, inorganic, n.o.s.
3278	151	Organophosphorus compound, toxic, n.o.s.	3288	151	Poisonous solid, inorganic, n.o.s.
3279	131	Organophosphorus compound, poisonous, flammable, n.o.s.	3288	151	Toxic solid, inorganic, n.o.s.
3279	131	Organophosphorus compound, toxic, flammable, n.o.s.	3289	154	Poisonous liquid, corrosive, inorganic, n.o.s.
3280	151	Organoarsenic compound, liquid, n.o.s.	3289	154	Toxic liquid, corrosive, inorganic, n.o.s.
3280	151	Organoarsenic compound, n.o.s.	3290	154	Poisonous solid, corrosive, inorganic, n.o.s.
3281	151	Metal carbonyls, liquid, n.o.s.	3290	154	Toxic solid, corrosive, inorganic, n.o.s.
3281	151	Metal carbonyls, n.o.s.	3291	158	(Bio)Medical waste, n.o.s.
3282	151	Organometallic compound, liquid, poisonous, n.o.s.	3291	158	Clinical waste, unspecified, n.o.s.
3282	151	Organometallic compound, liquid, toxic, n.o.s.	3291	158	Medical waste, n.o.s.
3282	151	Organometallic compound, poisonous, liquid, n.o.s.	3291	158	Regulated medical waste, n.o.s.
3282	151	Organometallic compound, poisonous, n.o.s.	3292	138	Batteries, containing Sodium
3282	151	Organometallic compound, toxic, liquid, n.o.s.	3292	138	Cells, containing Sodium
3282	151	Organometallic compound, toxic, n.o.s.	3292	138	Sodium, batteries containing
3283	151	Selenium compound, n.o.s.	3293	152	Hydrazine, aqueous solution, with not more than 37% Hydrazine
3283	151	Selenium compound, solid, n.o.s.	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

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
3297	126	Chlorotetrafluoroethane and Ethylene oxide mixture, with not more than 8.8% Ethylene oxide	3303	124	Compressed gas, poisonous, oxidising, n.o.s. (Inhalation Hazard Zone D)
3297	126	Ethylene oxide and Chlorotetrafluoroethane mixture, with not more than 8.8% Ethylene oxide	3303	124	Compressed gas, toxic, oxidising, n.o.s.
3298	126	Ethylene oxide and Pentafluoroethane mixture, with not more than 7.9% Ethylene oxide	3303	124	Compressed gas, toxic, oxidising, n.o.s. (Inhalation Hazard Zone A)
3298	126	Pentafluoroethane and Ethylene oxide mixture, with not more than 7.9% Ethylene oxide	3303	124	Compressed gas, toxic, oxidising, n.o.s. (Inhalation Hazard Zone B)
3299	126	Ethylene oxide and Tetrafluoroethane mixture, with not more than 5.6% Ethylene oxide	3303	124	Compressed gas, toxic, oxidising, n.o.s. (Inhalation Hazard Zone C)
3299	126	Tetrafluoroethane and Ethylene oxide mixture, with not more than 5.6% Ethylene oxide	3303	124	Compressed gas, toxic, oxidising, n.o.s. (Inhalation Hazard Zone D)
3300	119P	Carbon dioxide and Ethylene oxide mixture, with more than 87% Ethylene oxide	3304	125	Compressed gas, poisonous, corrosive, n.o.s.
3300	119P	Ethylene oxide and Carbon dioxide mixture, with more than 87% Ethylene oxide	3304	125	Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone A)
3301	136	Corrosive liquid, self-heating, n.o.s.	3304	125	Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone B)
3302	152	2-Dimethylaminoethyl acrylate	3304	125	Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone C)
3303	124	Compressed gas, poisonous, oxidising, n.o.s.	3304	125	Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone D)
3303	124	Compressed gas, poisonous, oxidising, n.o.s. (Inhalation Hazard Zone A)	3304	125	Compressed gas, toxic, corrosive, n.o.s.
3303	124	Compressed gas, poisonous, oxidising, n.o.s. (Inhalation Hazard Zone B)	3304	125	Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone A)
3303	124	Compressed gas, poisonous, oxidising, n.o.s. (Inhalation Hazard Zone C)	3304	125	Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone B)
3303	124	Compressed gas, poisonous, oxidising, n.o.s. (Inhalation Hazard Zone D)	3304	125	Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone C)

UN No.	Guide No.	Name of Material
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3304	125	Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone D)
3305	119	Compressed gas, poisonous, flammable, corrosive, n.o.s.
3305	119	Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)
3305	119	Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)
3305	119	Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)
3305	119	Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)
3305	119	Compressed gas, toxic, flammable, corrosive, n.o.s. (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, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone A)
3306	124	Compressed gas, poisonous, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone B)
3306	124	Compressed gas, poisonous, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone C)

UN No.	Guide No.	Name of Material
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3306	124	Compressed gas, poisonous, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone D)
3306	124	Compressed gas, toxic, oxidising, corrosive, n.o.s.
3306	124	Compressed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone A)
3306	124	Compressed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone B)
3306	124	Compressed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone C)
3306	124	Compressed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone D)
3307	124	Liquefied gas, poisonous, oxidising, n.o.s.
3307	124	Liquefied gas, poisonous, oxidising, n.o.s. (Inhalation Hazard Zone A)
3307	124	Liquefied gas, poisonous, oxidising, n.o.s. (Inhalation Hazard Zone B)
3307	124	Liquefied gas, poisonous, oxidising, n.o.s. (Inhalation Hazard Zone C)
3307	124	Liquefied gas, poisonous, oxidising, n.o.s. (Inhalation Hazard Zone D)
3307	124	Liquefied gas, toxic, oxidising, n.o.s.
3307	124	Liquefied gas, toxic, oxidising, n.o.s. (Inhalation Hazard Zone A)
3307	124	Liquefied gas, toxic, oxidising, n.o.s. (Inhalation Hazard Zone B)
3307	124	Liquefied gas, toxic, oxidising, n.o.s. (Inhalation Hazard Zone C)

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
3307	124	Liquefied gas, toxic, oxidising, n.o.s. (Inhalation Hazard Zone D)	3309	119	Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)
3308	125	Liquefied gas, poisonous, corrosive, n.o.s.	3309	119	Liquefied gas, toxic, flammable, corrosive, n.o.s.
3308	125	Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone A)	3309	119	Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)
3308	125	Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone B)	3309	119	Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)
3308	125	Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone C)	3309	119	Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)
3308	125	Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone D)	3309	119	Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)
3308	125	Liquefied gas, toxic, corrosive, n.o.s.	3310	124	Liquefied gas, poisonous, oxidising, corrosive, n.o.s.
3308	125	Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone A)	3310	124	Liquefied gas, poisonous, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone A)
3308	125	Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone B)	3310	124	Liquefied gas, poisonous, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone B)
3308	125	Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone C)	3310	124	Liquefied gas, poisonous, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone C)
3308	125	Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone D)	3310	124	Liquefied gas, poisonous, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone D)
3309	119	Liquefied gas, poisonous, flammable, corrosive, n.o.s.	3310	124	Liquefied gas, toxic, oxidising, corrosive, n.o.s.
3309	119	Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	3310	124	Liquefied gas, toxic, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone A)
3309	119	Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	3310	124	Liquefied gas, toxic, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone B)
3309	119	Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)	3310	124	Liquefied gas, toxic, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone C)

UN No.	Guide No.	Name of Material
3310	124	Liquefied gas, toxic, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone D)
3311	122	Gas, refrigerated liquid, oxidising, 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
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, desensitised, 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

UN No.	Guide No.	Name of Material
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
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-pressurised
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

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
3342	135	Xanthates	3350	131	Pyrethroid pesticide, liquid, flammable, toxic
3343	113	Nitroglycerin mixture, desensitised, liquid, flammable, n.o.s., with not more than 30% Nitroglycerin	3351	131	Pyrethroid pesticide, liquid, poisonous, flammable
3344	113	Pentaerythrite tetranitrate mixture, desensitised, solid, n.o.s., with more than 10% but not more than 20% PETN	3351	131	Pyrethroid pesticide, liquid, toxic, flammable
3344	113	Pentaerythritol tetranitrate mixture, desensitised, solid, n.o.s., with more than 10% but not more than 20% PETN	3352	151	Pyrethroid pesticide, liquid, poisonous
3344	113	PETN mixture, desensitised, solid, n.o.s., with more than 10% but not more than 20% PETN	3352	151	Pyrethroid pesticide, liquid, toxic
3345	153	Phenoxyacetic acid derivative pesticide, solid, poisonous	3354	115	Insecticide gas, flammable, n.o.s.
3345	153	Phenoxyacetic acid derivative pesticide, solid, toxic	3355	119	Insecticide gas, poisonous, flammable, n.o.s.
3346	131	Phenoxyacetic acid derivative pesticide, liquid, flammable, poisonous	3355	119	Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)
3346	131	Phenoxyacetic acid derivative pesticide, liquid, flammable, toxic	3355	119	Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)
3347	131	Phenoxyacetic acid derivative pesticide, liquid, poisonous, flammable	3355	119	Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)
3347	131	Phenoxyacetic acid derivative pesticide, liquid, toxic, flammable	3355	119	Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D)
3348	153	Phenoxyacetic acid derivative pesticide, liquid, poisonous	3355	119	Insecticide gas, toxic, flammable, n.o.s.
3348	153	Phenoxyacetic acid derivative pesticide, liquid, toxic	3355	119	Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)
3349	151	Pyrethroid pesticide, solid, poisonous	3355	119	Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)
3349	151	Pyrethroid pesticide, solid, toxic	3355	119	Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)
3350	131	Pyrethroid pesticide, liquid, flammable, poisonous	3355	119	Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)
			3356	140	Oxygen generator, chemical

UN No.	Guide No.	Name of Material
3356	140	Oxygen generator, chemical, spent
3357	113	Nitroglycerin mixture, desensitised, liquid, n.o.s., with not more than 30% Nitroglycerin
3358	115	Refrigerating machines, containing flammable, non-poisonous, liquefied gas
3358	115	Refrigerating machines, containing flammable, non-toxic, liquefied gas
3359	171	Fumigated cargo transport unit
3359	171	Fumigated unit
3360	133	Fibres, 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

UN No.	Guide No.	Name of Material
3367	113	Trinitrobenzene, wetted with not less than 10% water
3368	113	Trinitrobenzoic acid, wetted with not less than 10% water
3369	113	Sodium dinitro-o-cresolate, wetted with not less than 10% water
3370	113	Urea nitrate, wetted with not less than 10% water
3371	129	2-Methylbutanal
3373	158	Biological substance, category B
3374	116	Acetylene, solvent free
3375	140	Ammonium nitrate emulsion
3375	140	Ammonium nitrate gel
3375	140	Ammonium nitrate suspension
3376	113	4-Nitrophenylhydrazine, with not less than 30% water
3377	140	Sodium perborate monohydrate
3378	140	Sodium carbonate peroxyhydrate
3379	113	Desensitised explosive, liquid, n.o.s.
3380	113	Desensitised 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)

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
3383	131	Toxic by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone A)	3390	154	Toxic by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone B)
3384	131	Poisonous by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone B)	3391	135	Organometallic substance, solid, pyrophoric
3384	131	Toxic by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone B)	3392	135	Organometallic substance, liquid, pyrophoric
3385	139	Poisonous by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone A)	3393	135	Organometallic substance, solid, pyrophoric, water-reactive
3385	139	Toxic by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone A)	3394	135	Organometallic substance, liquid, pyrophoric, water-reactive
3386	139	Poisonous by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone B)	3395	135	Organometallic substance, solid, water-reactive
3386	139	Toxic by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone B)	3396	138	Organometallic substance, solid, water-reactive, flammable
3387	142	Poisonous by inhalation liquid, oxidising, n.o.s. (Inhalation Hazard Zone A)	3397	138	Organometallic substance, solid, water-reactive, self-heating
3387	142	Toxic by inhalation liquid, oxidising, n.o.s. (Inhalation Hazard Zone A)	3398	135	Organometallic substance, liquid, water-reactive
3388	142	Poisonous by inhalation liquid, oxidising, n.o.s. (Inhalation Hazard Zone B)	3399	138	Organometallic substance, liquid, water-reactive, flammable
3388	142	Toxic by inhalation liquid, oxidising, n.o.s. (Inhalation Hazard Zone B)	3400	138	Organometallic substance, solid, self-heating
3389	154	Poisonous by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone A)	3401	138	Alkali metal amalgam, solid
3389	154	Toxic by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone A)	3402	138	Alkaline earth metal amalgam, solid
3390	154	Poisonous by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone B)	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

UN No.	Guide No.	Name of Material
3408	141	Lead perchlorate, solution
3409	152	Chloronitrobenzenes, liquid
3410	153	4-Chloro-o-toluidine hydrochloride, solution
3411	153	beta-Naphthylamine, solution
3411	153	Naphthylamine (beta), solution
3412	153	Formic acid, with not less than 5% but less than 10% acid
3412	153	Formic acid, with not less than 10% but not more than 85% acid
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

UN No.	Guide No.	Name of Material
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
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 sulphate, solid
3445	151	Nicotine sulphate, solid
3446	152	Nitrotoluenes, solid
3447	152	Nitroxyls, 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

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
3456	157	Nitrosylsulfuric acid, solid	3469	132	Paint, flammable, corrosive
3456	157	Nitrosylsulphuric acid, solid	3469	132	Paint related material, flammable, corrosive
3457	152	Chloronitrotoluenes, solid	3470	132	Paint, corrosive, flammable
3458	152	Nitroanisoles, solid	3470	132	Paint related material, corrosive, flammable
3459	152	Nitrobromobenzenes, solid	3471	154	Hydrogendifluorides, solution, n.o.s.
3460	153	N-Ethylbenzyltoluidines, solid	3472	153	Crotonic acid, liquid
3461	135	Aluminum alkyl halides, solid	3473	128	Fuel cell cartridges, contained in equipment, containing flammable liquids
3462	153	Toxins, extracted from living sources, solid, n.o.s.	3473	128	Fuel cell cartridges containing flammable liquids
3463	153	Propionic acid, with not less than 90% acid	3473	128	Fuel cell cartridges packed with equipment, containing flammable liquids
3464	151	Organophosphorus compound, poisonous, solid, n.o.s.	3474	113	1-Hydroxybenzotriazole, anhydrous, wetted with not less than 20% water
3464	151	Organophosphorus compound, solid, poisonous, n.o.s.	3474	113	1-Hydroxybenzotriazole, monohydrate
3464	151	Organophosphorus compound, solid, toxic, n.o.s.	3475	127	Ethanol and gasoline mixture, with more than 10% ethanol
3464	151	Organophosphorus compound, toxic, solid, n.o.s.	3475	127	Ethanol and motor spirit mixture, with more than 10% ethanol
3465	151	Organoarsenic compound, solid, n.o.s.	3475	127	Ethanol and petrol mixture, with more than 10% ethanol
3466	151	Metal carbonyls, solid, n.o.s.	3475	127	Gasoline and ethanol mixture, with more than 10% ethanol
3467	151	Organometallic compound, poisonous, solid, n.o.s.	3475	127	Motor spirit and ethanol mixture, with more than 10% ethanol
3467	151	Organometallic compound, solid, poisonous, n.o.s.	3475	127	Petrol and ethanol mixture, with more than 10% ethanol
3467	151	Organometallic compound, solid, toxic, n.o.s.	3476	138	Fuel cell cartridges contained in equipment, containing water-reactive substances
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			

UN Guide			UN Guide		
No. No.		Name of Material	No. No.		Name of Material
3476	138	Fuel cell cartridges, containing water-reactive substances	3484	132	Hydrazine aqueous solution, flammable, with more than 37% hydrazine, by mass
3476	138	Fuel cell cartridges packed with equipment, containing water-reactive substances	3485	140	Calcium hypochlorite, dry, corrosive, with more than 39% available chlorine (8.8% available oxygen)
3477	153	Fuel cell cartridges contained in equipment, containing corrosive substances	3485	140	Calcium hypochlorite mixture, dry, corrosive, with more than 39% available chlorine (8.8% available oxygen)
3477	153	Fuel cell cartridges, containing corrosive substances	3486	140	Calcium hypochlorite mixture, dry, corrosive, with more than 10% but not more than 39% available chlorine
3477	153	Fuel cell cartridges packed with equipment, containing corrosive substances	3487	140	Calcium hypochlorite, hydrated, corrosive, with not less than 5.5% but not more than 16% water
3478	115	Fuel cell cartridges contained in equipment, containing liquefied flammable gas	3487	140	Calcium hypochlorite, hydrated mixture, corrosive, with not less than 5.5% but not more than 16% water
3478	115	Fuel cell cartridges, containing liquefied flammable gas	3488	131	Poisonous by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)
3478	115	Fuel cell cartridges packed with equipment, containing liquefied flammable gas	3488	131	Toxic by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)
3479	115	Fuel cell cartridges contained in equipment, containing hydrogen in metal hydride	3489	131	Poisonous by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)
3479	115	Fuel cell cartridges, containing hydrogen in metal hydride	3489	131	Toxic by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)
3479	115	Fuel cell cartridges packed with equipment, containing hydrogen in metal hydride	3490	155	Poisonous by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone A)
3480	147	Lithium ion batteries (including lithium ion polymer batteries)	3490	155	Toxic by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone A)
3481	147	Lithium ion batteries contained in equipment (including lithium ion polymer batteries)	3491	155	Poisonous by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone B)
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			

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
3491	155	Toxic by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone B)	3506	172	Mercury contained in manufactured articles
3492	131	Poisonous by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone A)	3507	166	Uranium hexafluoride, radioactive material, excepted package, less than 0.1 kg per package, non-fissile or fissile-excepted
3492	131	Toxic by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone A)	3508	171	Capacitor, asymmetric
3493	131	Poisonous by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone B)	3509	171	Packaging discarded, empty, uncleaned
3493	131	Toxic by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone B)	3510	174	Adsorbed gas, flammable, n.o.s.
3494	131	Petroleum sour crude oil, flammable, poisonous	3511	174	Adsorbed gas, n.o.s.
3494	131	Petroleum sour crude oil, flammable, toxic	3512	173	Adsorbed gas, poisonous, n.o.s.
3495	154	Iodine	3512	173	Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone A)
3496	171	Batteries, nickel-metal hydride	3512	173	Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone B)
3497	133	Krill meal	3512	173	Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone C)
3498	157	Iodine monochloride, liquid	3512	173	Adsorbed gas, poisonous, n.o.s. (Inhalation hazard zone D)
3499	171	Capacitor, electric double layer	3512	173	Adsorbed gas, toxic, n.o.s.
3500	126	Chemical under pressure, n.o.s.	3512	173	Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone A)
3501	115	Chemical under pressure, flammable, n.o.s.	3512	173	Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone B)
3502	123	Chemical under pressure, poisonous, n.o.s.	3512	173	Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone C)
3502	123	Chemical under pressure, toxic, n.o.s.	3512	173	Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone D)
3503	125	Chemical under pressure, corrosive, n.o.s.	3513	174	Adsorbed gas, oxidising, n.o.s.
3504	119	Chemical under pressure, flammable, poisonous, n.o.s.	3514	173	Adsorbed gas, poisonous, flammable, n.o.s.
3504	119	Chemical under pressure, flammable, toxic, n.o.s.			
3505	118	Chemical under pressure, flammable, corrosive, n.o.s.			

UN No.	Guide No.	Name of Material
3514	173	Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone A)
3514	173	Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone B)
3514	173	Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone C)
3514	173	Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone D)
3514	173	Adsorbed gas, toxic, flammable, n.o.s.
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, oxidising, n.o.s.
3515	173	Adsorbed gas, poisonous, oxidising, n.o.s. (Inhalation hazard zone A)
3515	173	Adsorbed gas, poisonous, oxidising, n.o.s. (Inhalation hazard zone B)
3515	173	Adsorbed gas, poisonous, oxidising, n.o.s. (Inhalation hazard zone C)
3515	173	Adsorbed gas, poisonous, oxidising, n.o.s. (Inhalation hazard zone D)
3515	173	Adsorbed gas, toxic, oxidising, n.o.s.

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

UN No.	Guide No.	Name of Material	UN No.	Guide No.	Name of Material
3517	173	Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone A)	3518	173	Adsorbed gas, toxic, oxidising, 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, oxidising, corrosive, n.o.s. (Inhalation hazard zone B)
3517	173	Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone C)	3518	173	Adsorbed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation hazard zone C)
3517	173	Adsorbed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation hazard zone D)	3518	173	Adsorbed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation hazard zone D)
3517	173	Adsorbed gas, toxic, flammable, corrosive, n.o.s.	3519	173	Boron trifluoride, adsorbed
3517	173	Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone A)	3520	173	Chlorine, adsorbed
3517	173	Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone B)	3521	173	Silicon tetrafluoride, adsorbed
3517	173	Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone C)	3522	173	Arsine, adsorbed
3517	173	Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone D)	3523	173	Germane, adsorbed
3518	173	Adsorbed gas, poisonous, oxidising, corrosive, n.o.s.	3524	173	Phosphorus pentafluoride, adsorbed
3518	173	Adsorbed gas, poisonous, oxidising, corrosive, n.o.s. (Inhalation hazard zone A)	3525	173	Phosphine, adsorbed
3518	173	Adsorbed gas, poisonous, oxidising, corrosive, n.o.s. (Inhalation hazard zone B)	3526	173	Hydrogen selenide, adsorbed
3518	173	Adsorbed gas, poisonous, oxidising, corrosive, n.o.s. (Inhalation hazard zone C)	3527	128P	Polyester resin kit, solid base material
3518	173	Adsorbed gas, poisonous, oxidising, corrosive, n.o.s. (Inhalation hazard zone D)	3528	128	Engine, fuel cell, flammable liquid powered
3518	173	Adsorbed gas, toxic, oxidising, corrosive, n.o.s.	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

UN No.	Guide No.	Name of Material
3530	171	Engine, internal combustion
3530	171	Machinery, internal combustion
3531	149P	Polymerizing substance, solid, stabilised, n.o.s.
3532	149P	Polymerizing substance, liquid, stabilised, n.o.s.
3533	150P	Polymerizing substance, solid, temperature controlled, n.o.s.
3534	150P	Polymerizing substance, liquid, temperature controlled, n.o.s.
3535	134	Toxic solid, flammable, inorganic, n.o.s.
3536	147	Lithium batteries installed in cargo transport unit (lithium metal batteries)
3536	138	Lithium batteries installed in cargo transport unit (lithium ion batteries)
3537	115	Articles containing flammable gas, n.o.s.
3538	120	Articles containing non-flammable, non-toxic gas, n.o.s.
3539	123	Articles containing toxic gas, n.o.s.
3540	127	Articles containing flammable liquid, n.o.s.
3541	133	Articles containing flammable solid, n.o.s.
3542	135	Articles containing a substance liable to spontaneous combustion, n.o.s.
3543	138	Articles containing a substance which emits flammable gas in contact with water, n.o.s.
3544	140	Articles containing oxidizing substance, n.o.s.
3545	145	Articles containing organic peroxide, n.o.s.

UN No.	Guide No.	Name of Material
3546	151	Articles containing toxic substance, n.o.s.
3547	154	Articles containing corrosive substance, n.o.s.
3548	171	Articles containing miscellaneous dangerous goods, n.o.s.
3549	158	Medical waste, category A, affecting humans, solid
3549	158	Medical waste, category A, affecting animals only, solid
8000	171	Consumer commodity
9035	123	Gas identification set

NOTES

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 UN number and name of material
- Identify initial isolation and protective action distances

- **IF A FIRE IS INVOLVED:**

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

Note 1: If the name in **Table 1** is shown with “(when spilled in water)”, these materials produce large amounts of Toxic Inhalation Hazard (TIH) 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.

Note 3: Chemical warfare agents do not have an assigned UN number because they are not commercially transported. In an emergency situation, the assigned orange guide will provide guidance for the initial response.

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN 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, stabilised	132P	2218
Acetaldehyde oxime	129	2332	Acrylonitrile, stabilised	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, stabilised	155	1541	Adsorbed gas, oxidising, 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 D)	173	3517
Acid, sludge	153	1906			
Acid butyl phosphate	153	1718			
Acridine	153	2713			
Acrolein, stabilised	131P	1092			
Acrolein dimer, stabilised	129P	2607			

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

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Adsorbed gas, toxic, flammable, n.o.s.	173	3514	Adsorbed gas, toxic, oxidising, 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, oxidising, 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, oxidising, 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.	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-pressurised	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 D)	173	3512	Aircraft hydraulic power unit fuel tank	131	3165
Adsorbed gas, toxic, oxidising, corrosive, n.o.s.	173	3518	Alcoholates solution, n.o.s., in alcohol	132	3274
Adsorbed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation hazard zone A)	173	3518	Alcoholic beverages	127	3065
Adsorbed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation hazard zone B)	173	3518	Alcohols, flammable, poisonous, n.o.s.	131	1986
Adsorbed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation hazard zone C)	173	3518	Alcohols, flammable, toxic, n.o.s.	131	1986
Adsorbed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation hazard zone D)	173	3518	Alcohols, n.o.s.	127	1987
Adsorbed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation hazard zone A)	173	3515	Aldehydes, flammable, poisonous, n.o.s.	131P	1988
Adsorbed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation hazard zone B)	173	3515	Aldehydes, flammable, toxic, n.o.s.	131P	1988
Adsorbed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation hazard zone C)	173	3515	Aldehydes, n.o.s.	129P	1989
Adsorbed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation hazard zone D)	173	3515	Aldol	153	2839
Adsorbed gas, toxic, oxidising, n.o.s.	173	3515	Alkali metal alcoholates, self-heating, corrosive, n.o.s.	136	3206
Adsorbed gas, toxic, oxidising, n.o.s. (Inhalation hazard zone A)	173	3515	Alkali metal alloy, liquid, n.o.s.	138	1421
			Alkali metal amalgam	138	1389
			Alkali metal amalgam, liquid	138	1389

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Alkali metal amalgam, solid	138	3401	Alkyl sulfonic acids, solid, with not more than 5% free Sulfuric acid	153	2585
Alkali metal amides	139	1390	Alkyl sulfuric acids	156	2571
Alkali metal dispersion	138	1391	Alkyl sulphonic acids, liquid, with more than 5% free Sulphuric acid	153	2584
Alkali metal dispersion, flammable	138	3482	Alkyl sulphonic acids, liquid, with not more than 5% free Sulphuric acid	153	2586
Alkaline earth metal alcoholates, n.o.s.	135	3205	Alkyl sulphonic acids, solid, with more than 5% free Sulphuric acid	153	2583
Alkaline earth metal alloy, n.o.s.	138	1393	Alkyl sulphonic acids, solid, with not more than 5% free Sulphuric acid	153	2585
Alkaline earth metal amalgam	138	1392	Alkyl sulphuric acids	156	2571
Alkaline earth metal amalgam, liquid	138	1392	Allyl acetate	131	2333
Alkaline earth metal amalgam, solid	138	3402	Allyl alcohol	131	1098
Alkaline earth metal dispersion	138	1391	Allylamine	131	2334
Alkaline earth metal dispersion, flammable	138	3482	Allyl bromide	131P	1099
Alkaloids, liquid, n.o.s. (poisonous)	151	3140	Allyl chloride	131P	1100
Alkaloids, solid, n.o.s. (poisonous)	151	1544	Allyl chlorocarbonate	155	1722
Alkaloid salts, liquid, n.o.s. (poisonous)	151	3140	Allyl chloroformate	155	1722
Alkaloid salts, solid, n.o.s. (poisonous)	151	1544	Allyl ethyl ether	131	2335
Alkylphenols, liquid, n.o.s. (including C2-C12 homologues)	153	3145	Allyl formate	131	2336
Alkylphenols, solid, n.o.s. (including C2-C12 homologues)	153	2430	Allyl glycidyl ether	129	2219
Alkyl sulfonic acids, liquid, with more than 5% free Sulfuric acid	153	2584	Allyl iodide	132	1723
Alkyl sulfonic acids, liquid, with not more than 5% free Sulfuric acid	153	2586	Allyl isothiocyanate, stabilised	155	1545
Alkyl sulfonic acids, solid, with more than 5% free Sulfuric acid	153	2583	Allyltrichlorosilane, stabilised	155	1724
			Aluminum, molten	169	9260
			Aluminum alkyl halides, liquid	135	3052
			Aluminum alkyl halides, solid	135	3052
			Aluminum alkyl halides, solid	135	3461
			Aluminum alkyl hydrides	138	3076
			Aluminum alkyls	135	3051

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
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	Ammonium hydroxide, with more than 10% but not more than 35% Ammonia	154	2672
Amines, liquid, corrosive, n.o.s.	153	2735	Ammonium metavanadate	154	2859
Amines, solid, corrosive, n.o.s.	154	3259	Ammonium nitrate, liquid (hot concentrated solution)	140	2426
2-Amino-4-chlorophenol	151	2673			
2-Amino-5-diethylaminopentane	153	2946			
2-Amino-4,6-dinitrophenol, wetted with not less than 20% water	113	3317			
2-(2-Aminoethoxy)ethanol	154	3055			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Ammonium nitrate, with not more than 0.2% combustible substances	140	1942	Ammunition, toxic, non-explosive	151	2016
Ammonium nitrate based fertilizer	140	2067	Amyl acetates	129	1104
Ammonium nitrate based fertilizer	140	2071	Amyl acid phosphate	153	2819
Ammonium nitrate emulsion	140	3375	Amylamine	132	1106
Ammonium nitrate fertilizer, n.o.s.	140	2072	Amyl butyrates	130	2620
Ammonium nitrate fertilizers, with Ammonium sulphate	140	2069	Amyl chloride	129	1107
Ammonium nitrate fertilizers, with Ammonium sulphate	140	2069	n-Amylene	128	1108
Ammonium nitrate fertilizers, with Calcium carbonate	140	2068	Amyl formates	129	1109
Ammonium nitrate fertilizers, with Phosphate or Potash	143	2070	Amyl mercaptan	130	1111
Ammonium nitrate-fuel oil mixtures	112	—	n-Amyl methyl ketone	127	1110
Ammonium nitrate gel	140	3375	Amyl nitrate	128	1112
Ammonium nitrate suspension	140	3375	Amyl nitrite	129	1113
Ammonium perchlorate	143	1442	Amyltrimethylsilane	155	1728
Ammonium persulfate	140	1444	Anhydrous ammonia	125	1005
Ammonium persulphate	140	1444	Aniline	153	1547
Ammonium picrate, wetted with not less than 10% water	113	1310	Aniline hydrochloride	153	1548
Ammonium polysulfide, solution	154	2818	Anisidines	153	2431
Ammonium polysulphide, solution	154	2818	Anisidines, liquid	153	2431
Ammonium polyvanadate	151	2861	Anisidines, solid	153	2431
Ammonium silicofluoride	151	2854	Anisole	128	2222
Ammonium sulfide, solution	132	2683	Anisoyl chloride	156	1729
Ammonium sulphide, solution	132	2683	Antimony compound, inorganic, liquid, n.o.s.	157	3141
Ammunition, poisonous, non-explosive	151	2016	Antimony compound, inorganic, solid, n.o.s.	157	1549
Ammunition, tear-producing, non-explosive	159	2017	Antimony lactate	151	1550
			Antimony pentachloride, liquid	157	1730
			Antimony pentachloride, solution	157	1731
			Antimony pentafluoride	157	1732
			Antimony potassium tartrate	151	1551
			Antimony powder	170	2871
			Antimony trichloride	157	1733

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Antimony trichloride, liquid	157	1733	Articles containing flammable liquid, n.o.s.	127	3540
Antimony trichloride, solid	157	1733	Articles containing flammable solid, n.o.s.	133	3541
Aqua regia	157	1798	Articles containing miscellaneous dangerous goods, n.o.s.	171	3548
Argon	120	1006	Articles containing non-flammable, non-toxic gas, n.o.s.	120	3538
Argon, compressed	120	1006	Articles containing oxidizing substance, n.o.s.	140	3544
Argon, refrigerated liquid (cryogenic liquid)	120	1951	Articles containing organic peroxide, n.o.s.	145	3545
Arsenic	152	1558	Articles containing Polychlorinated biphenyls (PCB)	171	2315
Arsenic acid, liquid	154	1553	Articles containing toxic gas, n.o.s.	123	3539
Arsenic acid, solid	154	1554	Articles containing toxic substance, n.o.s.	151	3546
Arsenical dust	152	1562	Articles, pressurised, hydraulic (containing non-flammable gas)	126	3164
Arsenical pesticide, liquid, flammable, poisonous	131	2760	Articles, pressurised, pneumatic (containing non-flammable gas)	126	3164
Arsenical pesticide, liquid, flammable, toxic	131	2760	Aryl sulfonic acids, liquid, with more than 5% free Sulfuric acid	153	2584
Arsenical pesticide, liquid, poisonous	151	2994	Aryl sulfonic acids, liquid, with not more than 5% free Sulfuric acid	153	2586
Arsenical pesticide, liquid, poisonous, flammable	131	2993	Aryl sulphonic acids, solid, with more than 5% free Sulphuric acid	153	2583
Arsenical pesticide, liquid, toxic	151	2994	Aryl sulfonic acids, solid, with not more than 5% free Sulfuric acid	153	2585
Arsenical pesticide, liquid, toxic, flammable	131	2993	Aryl sulfonic acids, liquid, with more than 5% free Sulfuric acid	153	2584
Arsenical pesticide, solid, poisonous	151	2759	Aryl sulphonic acids, liquid, with not more than 5% free Sulphuric acid	153	2586
Arsenical pesticide, solid, toxic	151	2759	Aryl sulphonic acids, solid, with more than 5% free Sulphuric acid	153	2583
Arsenic bromide	151	1555			
Arsenic chloride	157	1560			
Arsenic compound, liquid, n.o.s.	152	1556			
Arsenic compound, solid, n.o.s.	152	1557			
Arsenic pentoxide	151	1559			
Arsenic trichloride	157	1560			
Arsenic trioxide	151	1561			
Arsine	119	2188			
Arsine, adsorbed	173	3522			
Articles containing a substance liable to spontaneous combustion, n.o.s.	135	3542			
Articles containing a substance which emits flammable gas in contact with water, n.o.s.	138	3543			
Articles containing corrosive substance, n.o.s.	154	3547			
Articles containing flammable gas, n.o.s.	115	3537			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Aryl sulphonic acids, solid, with not more than 5% free Sulphuric acid	153	2585	Battery fluid, alkali	154	2797
Asbestos	171	2212	Battery-powered equipment (wet battery)	154	3171
Asbestos, amphibole	171	2212	Battery-powered equipment (with lithium ion batteries)	147	3171
Asbestos, blue	171	2212	Battery-powered equipment (with lithium metal batteries)	138	3171
Asbestos, brown	171	2212	Battery-powered equipment (with sodium batteries)	138	3171
Asbestos, chrysotile	171	2590	Battery-powered vehicle (wet battery)	154	3171
Asbestos, white	171	2590	Battery-powered vehicle (with lithium ion batteries)	147	3171
Asphalt	130	1999	Battery-powered vehicle (with sodium batteries)	138	3171
Asphalt, cut back	130	1999	Benzaldehyde	171	1990
Aviation regulated liquid, n.o.s.	171	3334	Benzene	130	1114
Aviation regulated solid, n.o.s.	171	3335	Benzene phosphorus dichloride	137	2798
Azodicarbonamide	149	3242	Benzene phosphorus thiodichloride	137	2799
Barium	138	1400	Benzenesulfonyl chloride	156	2225
Barium alloys, pyrophoric	135	1854	Benzenesulphonyl chloride	156	2225
Barium azide, wetted with not less than 50% water	113	1571	Benzidine	153	1885
Barium bromate	141	2719	Benzonitrile	152	2224
Barium chlorate	141	1445	Benzoquinone	153	2587
Barium chlorate, solid	141	1445	Benzotrichloride	156	2226
Barium chlorate, solution	141	3405	Benzotrifluoride	127	2338
Barium compound, n.o.s.	154	1564	Benzoyl chloride	137	1736
Barium cyanide	157	1565	Benzyl bromide	156	1737
Barium hypochlorite, with more than 22% available Chlorine	141	2741	Benzyl chloride	156	1738
Barium nitrate	141	1446	Benzyl chloroformate	137	1739
Barium oxide	157	1884	Benzylidimethylamine	132	2619
Barium perchlorate	141	1447	Benzylidene chloride	156	1886
Barium perchlorate, solid	141	1447	Benzyl iodide	156	2653
Barium perchlorate, solution	141	3406	Beryllium compound, n.o.s.	154	1566
Barium permanganate	141	1448	Beryllium nitrate	141	2464
Barium peroxide	141	1449			
Batteries, containing Sodium	138	3292			
Batteries, dry, containing Potassium hydroxide solid	154	3028			
Batteries, nickel-metal hydride	171	3496			
Batteries, wet, filled with acid	154	2794			
Batteries, wet, filled with alkali	154	2795			
Batteries, wet, non-spillable	154	2800			
Battery fluid, acid	157	2796			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Beryllium powder	134	1567	Borneol	133	1312
Bhusa, wet, damp or contaminated with oil	133	1327	Boron tribromide	157	2692
Bicyclo[2.2.1]hepta-2,5-diene, stabilised	128P	2251	Boron trichloride	125	1741
Biological agents	158	—	Boron trifluoride	125	1008
Biological substance, category B	158	3373	Boron trifluoride, adsorbed	173	3519
(Bio)Medical waste, n.o.s.	158	3291	Boron trifluoride, compressed	125	1008
Bipyridilium pesticide, liquid, flammable, poisonous	131	2782	Boron trifluoride, dihydrate	157	2851
Bipyridilium pesticide, liquid, flammable, toxic	131	2782	Boron trifluoride acetic acid complex	157	1742
Bipyridilium pesticide, liquid, poisonous	151	3016	Boron trifluoride acetic acid complex, liquid	157	1742
Bipyridilium pesticide, liquid, poisonous, flammable	131	3015	Boron trifluoride acetic acid complex, solid	157	3419
Bipyridilium pesticide, liquid, toxic	151	3016	Boron trifluoride diethyl etherate	132	2604
Bipyridilium pesticide, liquid, toxic, flammable	131	3015	Boron trifluoride dimethyl etherate	139	2965
Bipyridilium pesticide, solid, poisonous	151	2781	Boron trifluoride propionic acid complex	157	1743
Bipyridilium pesticide, solid, toxic	151	2781	Boron trifluoride propionic acid complex, liquid	157	1743
Bisulfates, aqueous solution	154	2837	Boron trifluoride propionic acid complex, solid	157	3420
Bisulfites, aqueous solution, n.o.s.	154	2693	Bromates, inorganic, aqueous solution, n.o.s.	140	3213
Bisulphates, aqueous solution	154	2837	Bromates, inorganic, n.o.s.	140	1450
Bisulphites, aqueous solution, n.o.s.	154	2693	Bromine	154	1744
Blasting agent, n.o.s.	112	—	Bromine, solution	154	1744
Bleaching powder	140	2208	Bromine, solution (Inhalation Hazard Zone A)	154	1744
Blue asbestos	171	2212	Bromine, solution (Inhalation Hazard Zone B)	154	1744
Bombs, smoke, non-explosive, with corrosive liquid, without initiating device	153	2028	Bromine chloride	124	2901
Borate and Chlorate mixture	140	1458	Bromine pentafluoride	144	1745
			Bromine trifluoride	144	1746
			Bromoacetic acid	156	1938
			Bromoacetic acid, solid	156	3425

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Bromoacetic acid, solution	156	1938	n-Butylamine	132	1125
Bromoacetone	131	1569	N-Butylaniline	153	2738
Bromoacetyl bromide	156	2513	Butylbenzenes	128	2709
Bromobenzene	130	2514	n-Butyl bromide	130	1126
Bromobenzyl cyanides, liquid	159	1694	n-Butyl chloride	130	1127
Bromobenzyl cyanides, solid	159	1694	n-Butyl chloroformate	155	2743
Bromobenzyl cyanides, solid	159	3449	sec-Butyl chloroformate	155	2742
1-Bromobutane	130	1126	tert-Butylcyclohexyl chloroformate	156	2747
2-Bromobutane	130	2339	Butylene	115	1012
Bromochloromethane	160	1887	Butylene	115	1075
1-Bromo-3-chloropropane	159	2688	1,2-Butylene oxide, stabilised	127P	3022
2-Bromoethyl ethyl ether	130	2340	Butyl ethers	128	1149
Bromoform	159	2515	n-Butyl formate	129	1128
1-Bromo-3-methylbutane	130	2341	tert-Butyl hypochlorite	135	3255
Bromomethylpropanes	130	2342	N,n-Butylimidazole	152	2690
2-Bromo-2-nitropropane-1,3-diol	133	3241	n-Butyl isocyanate	155P	2485
2-Bromopentane	130	2343	tert-Butyl isocyanate	155	2484
Bromopropanes	129	2344	Butyl mercaptan	130	2347
3-Bromopropyne	130	2345	n-Butyl methacrylate, stabilised	130P	2227
Bromotrifluoroethylene	116	2419	Butyl methyl ether	127	2350
Bromotrifluoromethane	126	1009	Butyl nitrites	129	2351
Brown asbestos	171	2212	Butyl propionates	130	1914
Brucine	152	1570	Butyltoluenes	152	2667
Butadienes, stabilised	116P	1010	Butyltrichlorosilane	155	1747
Butadienes and hydrocarbon mixture, stabilised	116P	1010	5-tert-Butyl-2,4,6-trinitro-m-xylene	149	2956
Butane	115	1011	Butyl vinyl ether, stabilised	127P	2352
Butane	115	1075			
Butanedione	127	2346	1,4-Butynediol	153	2716
Butanols	129	1120	Butyraldehyde	129P	1129
Butyl acetates	129	1123	Butyraldoxime	129	2840
Butyl acid phosphate	153	1718	Butyric acid	153	2820
Butyl acrylates, stabilised	129P	2348			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Butyric anhydride	156	2739	Calcium hypochlorite, dry, corrosive, with more than 39% available chlorine (8.8% available oxygen)	153 129 129	3485
Butyronitrile	131	2411	Calcium hypochlorite, hydrated, corrosive, with not less than 5.5% but not more than 16% water	153 156 131	3487
Butyryl chloride	132	2353	Calcium hypochlorite, hydrated, with not less than 5.5% but not more than 16% water	131	2880
Buzz	153	2810	Calcium hypochlorite, hydrated mixture, corrosive, with not less than 5.5% but not more than 16% water	140	3487
BZ	153	2810	Calcium hypochlorite, hydrated mixture, with not less than 5.5% but not more than 16% water	140	2880
CA	159	1694	Calcium hypochlorite mixture, dry, corrosive, with more than 10% but not more than 39% available chlorine	140	3486
Cacodylic acid	151	1572	Calcium hypochlorite mixture, dry, corrosive, with more than 39% available chlorine (8.8% available oxygen)	140	3485
Cadmium compound	154	2570	Calcium hypochlorite mixture, dry, with more than 10% but not more than 39% available Chlorine	140	2208
Caesium	138	1407	Calcium hypochlorite mixture, dry, with more than 39% available Chlorine (8.8% available Oxygen)	140	1748
Caesium hydroxide	157	2682	Calcium manganese silicon	138	2844
Caesium hydroxide, solution	154	2681	Calcium nitrate	140	1454
Caesium nitrate	140	1451	Calcium oxide	157	1910
Calcium	138	1401	Calcium perchlorate	140	1455
Calcium, pyrophoric	135	1855	Calcium permanganate	140	1456
Calcium alloys, pyrophoric	135	1855	Calcium peroxide	140	1457
Calcium arsenate	151	1573	Calcium phosphide	139	1360
Calcium arsenate and Calcium arsenite mixture, solid	151	1574	Calcium resinate	133	1313
Calcium arsenite and Calcium arsenate mixture, solid	151	1574			
Calcium carbide	138	1402			
Calcium chlorate	140	1452			
Calcium chlorate, aqueous solution	140	2429			
Calcium chlorite	140	1453			
Calcium cyanamide, with more than 0.1% Calcium carbide	138	1403			
Calcium cyanide	157	1575			
Calcium dithionite	135	1923			
Calcium hydride	138	1404			
Calcium hydrosulfite	135	1923			
Calcium hydrosulphite	135	1923			
Calcium hypochlorite, dry	140	1748			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Calcium resinate, fused	133	1314	Carbon dioxide and Ethylene oxide mixture, with more than 87% Ethylene oxide	119P	3300
Calcium silicide	138	1405	Carbon dioxide and Ethylene oxide mixtures, with not more than 9% Ethylene oxide	126	1952
Camphor	133	2717	Carbon dioxide and Nitrous oxide mixture	126	1015
Camphor, synthetic	133	2717	Carbon dioxide and Oxygen mixture, compressed	122	1014
Camphor oil	128	1130	Carbon disulfide	131	1131
Capacitor, asymmetric	171	3508	Carbon disulphide	131	1131
Capacitor, electric double layer	171	3499	Carbon monoxide	119	1016
Caproic acid	153	2829	Carbon monoxide, compressed	119	1016
Carbamate pesticide, liquid, flammable, poisonous	131	2758	Carbon monoxide, refrigerated liquid (cryogenic liquid)	168	9202
Carbamate pesticide, liquid, flammable, toxic	131	2758	Carbon monoxide and Hydrogen mixture, compressed	119	2600
Carbamate pesticide, liquid, poisonous	151	2992	Carbon tetrabromide	151	2516
Carbamate pesticide, liquid, poisonous, flammable	131	2991	Carbon tetrachloride	151	1846
Carbamate pesticide, liquid, toxic, flammable	131	2991	Carbonyl fluoride	125	2417
Carbamate pesticide, solid, poisonous	151	2757	Carbonyl fluoride, compressed	125	2417
Carbamate pesticide, solid, toxic	151	2757	Carbonyl sulfide	119	2204
Carbon, activated	133	1362	Carbonyl sulphide	119	2204
Carbon, animal or vegetable origin	133	1361	Castor beans, meal, pomace or flake	171	2969
Carbon bisulfide	131	1131	Caustic alkali liquid, n.o.s.	154	1719
Carbon bisulphide	131	1131	Caustic potash, solid	154	1813
Carbon dioxide	120	1013	Caustic potash, solution	154	1814
Carbon dioxide, compressed	120	1013	Caustic soda, solid	154	1823
Carbon dioxide, refrigerated liquid	120	2187	Caustic soda, solution	154	1824
Carbon dioxide, solid	120	1845	Cells, containing Sodium	138	3292
Carbon dioxide and Ethylene oxide mixture, with more than 9% but not more than 87% Ethylene oxide	115	1041	Celluloid, in blocks, rods, rolls, sheets, tubes, etc., except scrap	133	2000
			Celluloid, scrap	135	2002

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Cerium, slabs, ingots or rods	170	1333	Chlorates, inorganic, aqueous solution, n.o.s.	140	3210
Cerium, turnings or gritty powder	138	3078	Chlorates, inorganic, n.o.s.	140	1461
Cesium	138	1407	Chloric acid, aqueous solution, with not more than 10% Chloric acid	140	2626
Cesium hydroxide	157	2682	Chlorine	124	1017
Cesium hydroxide, solution	154	2681	Chlorine, adsorbed	173	3520
Cesium nitrate	140	1451	Chlorine dioxide, hydrate, frozen	143	9191
CG	125	1076	Chlorine pentafluoride	124	2548
Charcoal	133	1361	Chlorine trifluoride	124	1749
Chemical kit	154	1760	Chlorite solution	154	1908
Chemical kit	171	3316	Chlorites, inorganic, n.o.s.	143	1462
Chemical sample, poisonous	151	3315	Chloroacetaldehyde	153	2232
Chemical sample, toxic	151	3315	Chloroacetic acid, molten	153	3250
Chemical under pressure, corrosive, n.o.s.	125	3503	Chloroacetic acid, solid	153	1751
Chemical under pressure, flammable, corrosive, n.o.s.	118	3505	Chloroacetic acid, solution	153	1750
Chemical under pressure, flammable, n.o.s.	115	3501	Chloroacetone, stabilised	131	1695
Chemical under pressure, flammable, poisonous, n.o.s.	119	3504	Chloroacetonitrile	131	2668
Chemical under pressure, flammable, toxic, n.o.s.	119	3504	Chloroacetophenone	153	1697
Chemical under pressure, n.o.s.	126	3500	Chloroacetophenone, liquid	153	3416
Chemical under pressure, poisonous, n.o.s.	123	3502	Chloroacetophenone, solid	153	1697
Chemical under pressure, toxic, n.o.s.	123	3502	Chloroacetyl chloride	156	1752
Chloral, anhydrous, stabilised	153	2075	Chloroanilines, liquid	152	2019
Chlorate and Borate mixture	140	1458	Chloroanilines, solid	152	2018
Chlorate and Magnesium chloride mixture	140	1459	Chloroanisidines	152	2233
Chlorate and Magnesium chloride mixture, solid	140	1459	Chlorobenzene	130	1134
Chlorate and Magnesium chloride mixture, solution	140	3407	Chlorobenzotrifluorides	130	2234
			Chlorobenzyl chlorides	153	2235
			Chlorobenzyl chlorides, liquid	153	2235
			Chlorobenzyl chlorides, solid	153	3427
			Chlorobutanes	130	1127
			Chlorocresols	152	2669

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Chlorocresols, solid	152	3437	Chloronitrotoluenes, solid	152	3457
Chlorocresols, solution	152	2669	Chloropentafluoroethane	126	1020
Chlorodifluorobromomethane	126	1974	Chloropentafluoroethane and Chlorodifluoromethane mixture	126	1973
1-Chloro-1,1-difluoroethane	115	2517	Chlorophenolates, liquid	154	2904
Chlorodifluoromethane	126	1018	Chlorophenolates, solid	154	2905
Chlorodifluoromethane and Chloropentafluoroethane mixture	126	1973	Chlorophenols, liquid	153	2021
Chlorodinitrobenzenes, liquid	153	1577	Chlorophenols, solid	153	2020
Chlorodinitrobenzenes, solid	153	1577	Chlorophenyltrichlorosilane	156	1753
Chlorodinitrobenzenes, solid	153	3441	Chloropicrin	154	1580
1-Chloro-2,3-epoxypropane	131P	2023	Chloropicrin and Methyl bromide mixture	123	1581
2-Chloroethanal	153	2232	Chloropicrin and Methyl chloride mixture	119	1582
Chloroform	151	1888	Chloropicrin mixture, n.o.s.	154	1583
Chloroformates, poisonous, corrosive, flammable, n.o.s.	155	2742	Chloropivaloyl chloride	156	9263
Chloroformates, poisonous, corrosive, n.o.s.	154	3277	Chloroplatinic acid, solid	154	2507
Chloroformates, toxic, corrosive, flammable, n.o.s.	155	2742	Chloroprene, stabilised	131P	1991
Chloroformates, toxic, corrosive, n.o.s.	154	3277	1-Chloropropane	129	1278
Chloromethyl chloroformate	157	2745	2-Chloropropane	129	2356
Chloromethyl ethyl ether	131	2354	3-Chloropropanol-1	153	2849
3-Chloro-4-methylphenyl isocyanate	156	2236	2-Chloropropene	130P	2456
3-Chloro-4-methylphenyl isocyanate, liquid	156	2236	2-Chloropropionic acid	153	2511
3-Chloro-4-methylphenyl isocyanate, solid	156	3428	2-Chloropropionic acid, solid	153	2511
Chloronitroanilines	153	2237	2-Chloropropionic acid, solution	153	2511
Chloronitrobenzenes	152	1578	2-Chloropyridine	153	2822
Chloronitrobenzenes, liquid	152	3409	Chlorosilanes, corrosive, flammable, n.o.s.	155	2986
Chloronitrobenzenes, solid	152	1578	Chlorosilanes, corrosive, n.o.s.	156	2987
Chloronitrotoluenes, liquid	152	2433	Chlorosilanes, flammable, corrosive, n.o.s.	155	2985
Chloronitrotoluenes, solid	152	2433	Chlorosilanes, poisonous, corrosive, flammable, n.o.s.	155	3362

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Chlorosilanes, poisonous, corrosive, n.o.s.	156	3361	Chromium oxychloride	137	1758
Chlorosilanes, toxic, corrosive, flammable, n.o.s.	155	3362	Chromium trioxide, anhydrous	141	1463
Chlorosilanes, toxic, corrosive, n.o.s.	156	3361	Chromosulfuric acid	154	2240
Chlorosilanes, water-reactive, flammable, corrosive, n.o.s.	139	2988	Chromosulphuric acid	154	2240
Chlorosulfonic acid (with or without sulfur trioxide mixture)	137	1754	CK	125	1589
Chlorosulphonic acid (with or without sulphur trioxide mixture)	137	1754	Clinical waste, unspecified, n.o.s.	158	3291
1-Chloro-1,2,2,2-tetrafluoroethane	126	1021	CN	153	1697
Chlorotetrafluoroethane and Ethylene oxide mixture, with not more than 8.8% Ethylene oxide	126	3297	CN	153	3416
Chlorotoluenes	129	2238	Coal gas	119	1023
4-Chloro-o-toluidine hydrochloride	153	1579	Coal gas, compressed	119	1023
4-Chloro-o-toluidine hydrochloride, solid	153	1579	Coal tar distillates, flammable	128	1136
4-Chloro-o-toluidine hydrochloride, solution	153	3410	Coating solution	127	1139
Chlorotoluidines	153	2239	Cobalt naphthenates, powder	133	2001
Chlorotoluidines, liquid	153	3429	Cobalt resinate, precipitated	133	1318
Chlorotoluidines, solid	153	2239	Combustible liquid, n.o.s.	128	1993
1-Chloro-2,2,2-trifluoroethane	126	1983	Compounds, cleaning liquid (corrosive)	154	1760
Chlorotrifluoromethane	126	1022	Compounds, cleaning liquid (flammable)	128	1993
Chlorotrifluoromethane and Trifluoromethane azeotropic mixture with approximately 60% Chlorotrifluoromethane	126	2599	Compounds, tree or weed killing, liquid (corrosive)	154	1760
Chromic acid, solution	154	1755	Compounds, tree or weed killing, liquid (flammable)	128	1993
Chromic fluoride, solid	154	1756	Compounds, tree or weed killing, liquid (toxic)	153	2810
Chromic fluoride, solution	154	1757	Compressed gas, flammable, n.o.s.	115	1954
Chromium nitrate	141	2720	Compressed gas, n.o.s.	126	1956
			Compressed gas, oxidising, n.o.s.	122	3156
			Compressed gas, poisonous, corrosive, n.o.s.	125	3304
			Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone A)	125	3304

Name of Material	Guide No.	UN No.
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Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone B)	125	3304
Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone C)	125	3304
Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone D)	125	3304
Compressed gas, poisonous, flammable, corrosive, n.o.s.	119	3305
Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	119	3305
Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	119	3305
Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)	119	3305
Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)	119	3305
Compressed gas, poisonous, flammable, n.o.s.	119	1953
Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)	119	1953
Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)	119	1953
Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)	119	1953
Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D)	119	1953
Compressed gas, poisonous, n.o.s.	123	1955
Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone A)	123	1955

Name of Material	Guide No.	UN No.
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Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone B)	123	1955
Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone C)	123	1955
Compressed gas, poisonous, n.o.s. (Inhalation Hazard Zone D)	123	1955
Compressed gas, poisonous, oxidising, corrosive, n.o.s.	124	3306
Compressed gas, poisonous, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone A)	124	3306
Compressed gas, poisonous, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone B)	124	3306
Compressed gas, poisonous, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone C)	124	3306
Compressed gas, poisonous, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone D)	124	3306
Compressed gas, poisonous, oxidising, n.o.s.	124	3303
Compressed gas, poisonous, oxidising, n.o.s. (Inhalation Hazard Zone A)	124	3303
Compressed gas, poisonous, oxidising, n.o.s. (Inhalation Hazard Zone B)	124	3303
Compressed gas, poisonous, oxidising, n.o.s. (Inhalation Hazard Zone C)	124	3303
Compressed gas, poisonous, oxidising, n.o.s. (Inhalation Hazard Zone D)	124	3303
Compressed gas, toxic, corrosive, n.o.s.	125	3304
Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone A)	125	3304

Name of Material	Guide No.	UN No.
Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone B)	125	3304
Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone C)	125	3304
Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone D)	125	3304
Compressed gas, toxic, flammable, corrosive, n.o.s.	119	3305
Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	119	3305
Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	119	3305
Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)	119	3305
Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)	119	3305
Compressed gas, toxic, flammable, n.o.s.	119	1953
Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)	119	1953
Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)	119	1953
Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)	119	1953
Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)	119	1953
Compressed gas, toxic, n.o.s.	123	1955
Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone A)	123	1955
Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone B)	123	1955

Name of Material	Guide No.	UN No.
Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone C)	123	1955
Compressed gas, toxic, n.o.s. (Inhalation Hazard Zone D)	123	1955
Compressed gas, toxic, oxidising, corrosive, n.o.s.	124	3306
Compressed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone A)	124	3306
Compressed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone B)	124	3306
Compressed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone C)	124	3306
Compressed gas, toxic, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone D)	124	3306
Compressed gas, toxic, oxidising, n.o.s.	124	3303
Compressed gas, toxic, oxidising, n.o.s. (Inhalation Hazard Zone A)	124	3303
Compressed gas, toxic, oxidising, n.o.s. (Inhalation Hazard Zone B)	124	3303
Compressed gas, toxic, oxidising, n.o.s. (Inhalation Hazard Zone C)	124	3303
Compressed gas, toxic, oxidising, n.o.s. (Inhalation Hazard Zone D)	124	3303
Compressed gas and hexaethyl tetraphosphate mixture	123	1612
Consumer commodity	171	8000
Copper acetoarsenite	151	1585
Copper arsenite	151	1586
Copper based pesticide, liquid, flammable, poisonous	131	2776
Copper based pesticide, liquid, flammable, toxic	131	2776

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Copper based pesticide, liquid, poisonous	151	3010	Corrosive solid, acidic, organic, n.o.s.	154	3261
Copper based pesticide, liquid, poisonous, flammable	131	3009	Corrosive solid, basic, inorganic, n.o.s.	154	3262
Copper based pesticide, liquid, toxic	151	3010	Corrosive solid, basic, organic, n.o.s.	154	3263
Copper based pesticide, liquid, toxic, flammable	131	3009	Corrosive solid, flammable, n.o.s.	134	2921
Copper based pesticide, solid, poisonous	151	2775	Corrosive solid, n.o.s.	154	1759
Copper based pesticide, solid, toxic	151	2775	Corrosive solid, oxidising, n.o.s.	157	3084
Copper chlorate	140	2721	Corrosive solid, poisonous, n.o.s.	154	2923
Copper chloride	154	2802	Corrosive solid, self-heating, n.o.s.	136	3095
Copper cyanide	151	1587	Corrosive solid, toxic, n.o.s.	154	2923
Copra	135	1363	Corrosive solid, water-reactive, n.o.s.	138	3096
Corrosive liquid, acidic, inorganic, n.o.s.	154	3264	Cotton	133	1365
Corrosive liquid, acidic, organic, n.o.s.	153	3265	Cotton, wet	133	1365
Corrosive liquid, basic, inorganic, n.o.s.	154	3266	Cotton waste, oily	133	1364
Corrosive liquid, basic, organic, n.o.s.	153	3267	Coumarin derivative pesticide, liquid, flammable, poisonous	131	3024
Corrosive liquid, flammable, n.o.s.	132	2920	Coumarin derivative pesticide, liquid, flammable, toxic	131	3024
Corrosive liquid, n.o.s.	154	1760	Coumarin derivative pesticide, liquid, poisonous	151	3026
Corrosive liquid, oxidising, n.o.s.	157	3093	Coumarin derivative pesticide, liquid, poisonous, flammable	131	3025
Corrosive liquid, poisonous, n.o.s.	154	2922	Coumarin derivative pesticide, liquid, toxic	151	3026
Corrosive liquid, self-heating, n.o.s.	136	3301	Coumarin derivative pesticide, liquid, toxic, flammable	131	3025
Corrosive liquid, toxic, n.o.s.	154	2922	Coumarin derivative pesticide, solid, poisonous	151	3027
Corrosive liquid, water-reactive, n.o.s.	138	3094	Coumarin derivative pesticide, solid, toxic	151	3027
Corrosive solid, acidic, inorganic, n.o.s.	154	3260	Cresols, liquid	153	2076
			Cresols, solid	153	2076

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Cresols, solid	153	3455	Cyclohexyl isocyanate	155	2488
Cresylic acid	153	2022	Cyclohexyl mercaptan	129	3054
Crotonaldehyde	131P	1143	Cyclohexyltrichlorosilane	156	1763
Crotonaldehyde, stabilised	131P	1143	Cyclooctadiene phosphines	135	2940
Crotonic acid	153	2823	Cyclooctadienes	130P	2520
Crotonic acid, liquid	153	2823	Cyclooctatetraene	128P	2358
Crotonic acid, liquid	153	3472	Cyclopentane	128	1146
Crotonic acid, solid	153	2823	Cyclopentanol	129	2244
Crotonylene	128	1144	Cyclopentanone	128	2245
CS	153	2810	Cyclopentene	128	2246
Cumene	130	1918	Cyclopropane	115	1027
Cupriethylenediamine, solution	154	1761	Cymenes	130	2046
CX	154	2811	DA	151	1699
Cyanide solution, n.o.s.	157	1935	Dangerous goods in apparatus	171	3363
Cyanides, inorganic, solid, n.o.s.	157	1588	Dangerous goods in machinery	171	3363
Cyanogen	119	1026	DC	153	2810
Cyanogen bromide	157	1889	Decaborane	134	1868
Cyanogen chloride, stabilised	125	1589	Decahydronaphthalene	130	1147
Cyanuric chloride	157	2670	n-Decane	128	2247
Cyclobutane	115	2601	Denatured alcohol	127	1987
Cyclobutyl chloroformate	155	2744	Desensitised explosive, liquid, n.o.s.	113	3379
1,5,9-Cyclododecatriene	153	2518	Desensitised explosive, solid, n.o.s.	113	3380
Cycloheptane	128	2241	Deuterium	115	1957
Cycloheptatriene	131	2603	Deuterium, compressed	115	1957
Cycloheptene	128	2242	Devices, small, hydrocarbon gas powered, with release device	115	3150
Cyclohexane	128	1145	Diacetone alcohol	129	1148
Cyclohexanethiol	129	3054	Diacetyl	127	2346
Cyclohexanone	127	1915	Diallylamine	132	2359
Cyclohexene	130	2256	Diallyl ether	131P	2360
Cyclohexenyltrichlorosilane	156	1762	4,4'-Diaminodiphenylmethane	153	2651
Cyclohexyl acetate	130	2243			
Cyclohexylamine	132	2357			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Di-n-amylamine	131	2841	Dichloroisocyanuric acid, dry	140	2465
Dibenzylchlorosilane	156	2434	Dichloroisocyanuric acid salts	140	2465
Diborane	119	1911	Dichloroisopropyl ether	153	2490
Diborane, compressed	119	1911	Dichloromethane	160	1593
Diborane mixtures	119	1911	1,1-Dichloro-1-nitroethane	153	2650
1,2-Dibromobutan-3-one	154	2648	Dichloropentanes	130	1152
Dibromochloropropanes	159	2872	Dichlorophenyl isocyanates	156	2250
Dibromodifluoromethane	171	1941	Dichlorophenyltrichlorosilane	156	1766
Dibromomethane	160	2664	1,2-Dichloropropane	130	1279
Di-n-butylamine	132	2248	1,3-Dichloropropanol-2	153	2750
Dibutylaminoethanol	153	2873	Dichloropropenes	129	2047
Dibutyl ethers	128	1149	Dichlorosilane	119	2189
Dichloroacetic acid	153	1764	1,2-Dichloro-1,1,2,2-tetrafluoroethane	126	1958
1,3-Dichloroacetone	153	2649	3,5-Dichloro-2,4,6-trifluoropyridine	151	9264
Dichloroacetyl chloride	156	1765	Dicyclohexylamine	153	2565
Dichloroanilines, liquid	153	1590	Dicyclohexylammonium nitrite	133	2687
Dichloroanilines, solid	153	1590	Dicyclopentadiene	130P	2048
Dichloroanilines, solid	153	3442	1,2-Di-(dimethylamino)ethane	129	2372
o-Dichlorobenzene	152	1591	Didymium nitrate	140	1465
2,2'-Dichlorodiethyl ether	152	1916	Diesel fuel	128	1202
Dichlorodifluoromethane	126	1028	Diesel fuel	128	1993
Dichlorodifluoromethane and Difluoroethane azeotropic mixture with approximately 74% Dichlorodifluoromethane	126	2602	Diethoxymethane	127	2373
Dichlorodifluoromethane and Ethylene oxide mixture, with not more than 12.5% Ethylene oxide	126	3070	3,3-Diethoxypropene	127	2374
Dichlorodimethyl ether, symmetrical	131	2249	Diethylamine	132	1154
1,1-Dichloroethane	130	2362	2-Diethylaminoethanol	132	2686
1,2-Dichloroethylene	130P	1150	3-Diethylaminopropylamine	132	2684
Dichloroethyl ether	152	1916	Diethylaminopropylamine	132	2684
Dichlorofluoromethane	126	1029	N,N-Diethylaniline	153	2432
			Diethylbenzene	130	2049
			Diethyl carbonate	128	2366
			Diethyldichlorosilane	155	1767

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Diethylenetriamine	154	2079	Dimethylamine, solution	132	1160
Diethyl ether	127	1155	2-Dimethylaminoacetonitrile	131	2378
N,N-Diethylethylenediamine	132	2685	2-Dimethylaminoethanol	132	2051
Diethyl ketone	127	1156	2-Dimethylaminoethyl acrylate	152	3302
Diethyl sulfate	152	1594	2-Dimethylaminoethyl methacrylate	153P	2522
Diethyl sulfide	129	2375	N,N-Dimethylaniline	153	2253
Diethyl sulphate	152	1594	2,3-Dimethylbutane	128	2457
Diethyl sulphide	129	2375	1,3-Dimethylbutylamine	132	2379
Diethylthiophosphoryl chloride	155	2751	Dimethylcarbamoyl chloride	156	2262
Diethylzinc	135	1366	Dimethyl carbonate	129	1161
Difluorochloroethanes	115	2517	Dimethylcyclohexanes	128	2263
1,1-Difluoroethane	115	1030	N,N-Dimethylcyclohexylamine	132	2264
Difluoroethane and Dichlorodifluoromethane azeotropic mixture with approximately 74% Dichlorodifluoromethane	126	2602	Dimethylcyclohexylamine	132	2264
1,1-Difluoroethylene	116P	1959	Dimethyldichlorosilane	155	1162
Difluoromethane	115	3252	Dimethyldiethoxysilane	127	2380
Difluorophosphoric acid, anhydrous	154	1768	Dimethyldioxanes	127	2707
2,3-Dihydropyran	127	2376	Dimethyl disulfide	131	2381
Diisobutylamine	132	2361	Dimethyl disulphide	131	2381
Diisobutylene, isomeric compounds	128	2050	Dimethyl ether	115	1033
Diisobutyl ketone	128	1157	N,N-Dimethylformamide	129	2265
Diisooctyl acid phosphate	153	1902	1,1-Dimethylhydrazine	131	1163
Diisopropylamine	132	1158	Dimethylhydrazine, symmetrical	131	2382
Diisopropyl ether	127	1159	Dimethylhydrazine, unsymmetrical	131	1163
Diketene, stabilised	131P	2521	2,2-Dimethylpropane	115	2044
1,1-Dimethoxyethane	127	2377	Dimethyl-N-propylamine	132	2266
1,2-Dimethoxyethane	127	2252	Dimethyl sulfate	156	1595
Dimethylamine, anhydrous	118	1032	Dimethyl sulfide	130	1164
Dimethylamine, aqueous solution	132	1160	Dimethyl sulphate	156	1595
			Dimethyl sulphide	130	1164
			Dimethyl thiophosphoryl chloride	156	2267

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Dimethylzinc	135	1370	Dipropylamine	132	2383
Dinitroanilines	153	1596	Di-n-propyl ether	127	2384
Dinitrobenzenes, liquid	152	1597	Dipropyl ketone	128	2710
Dinitrobenzenes, solid	152	1597	Disinfectant, liquid, corrosive, n.o.s.	153	1903
Dinitrobenzenes, solid	152	3443	Disinfectant, liquid, poisonous, n.o.s.	151	3142
Dinitrochlorobenzenes	153	1577	Disinfectant, liquid, toxic, n.o.s.	151	3142
Dinitro-o-cresol	153	1598	Disinfectant, solid, poisonous, n.o.s.	151	1601
Dinitrogen tetroxide	124	1067	Disinfectant, solid, toxic, n.o.s.	151	1601
Dinitrogen tetroxide and Nitric oxide mixture	124	1975	Disodium trioxosilicate	154	3253
Dinitrophenol, solution	153	1599	Dispersant gas, n.o.s.	126	1078
Dinitrophenol, wetted with not less than 15% water	113	1320	Dispersant gases, n.o.s. (flammable)	115	1954
Dinitrophenolates, wetted with not less than 15% water	113	1321	Divinyl ether, stabilised	128P	1167
Dinitroresorcinol, wetted with not less than 15% water	113	1322	DM	154	1698
Dinitrotoluenes	152	2038	Dodecyltrichlorosilane	156	1771
Dinitrotoluenes, liquid	152	2038	DP	125	1076
Dinitrotoluenes, molten	152	1600	Dry ice	120	1845
Dinitrotoluenes, solid	152	2038	Dye, liquid, corrosive, n.o.s.	154	2801
Dinitrotoluenes, solid	152	3454	Dye, liquid, poisonous, n.o.s.	151	1602
Dioxane	127	1165	Dye, liquid, toxic, n.o.s.	151	1602
Dioxolane	127	1166	Dye, solid, corrosive, n.o.s.	154	3147
Dipentene	128	2052	Dye, solid, poisonous, n.o.s.	151	3143
Diphenylamine chloroarsine	154	1698	Dye, solid, toxic, n.o.s.	151	3143
Diphenylchloroarsine, liquid	151	1699	Dye intermediate, liquid, corrosive, n.o.s.	154	2801
Diphenylchloroarsine, solid	151	1699	Dye intermediate, liquid, poisonous, n.o.s.	151	1602
Diphenylchloroarsine, solid	151	3450	Dye intermediate, liquid, toxic, n.o.s.	151	1602
Diphenyldichlorosilane	156	1769	Dye intermediate, solid, corrosive, n.o.s.	154	3147
Diphenylmethyl bromide	153	1770			
Dipicryl sulfide, wetted with not less than 10% water	113	2852			
Dipicryl sulphide, wetted with not less than 10% water	113	2852			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Dye intermediate, solid, poisonous, n.o.s.	151	3143	Environmentally hazardous substance, solid, n.o.s.	171	3077
Dye intermediate, solid, toxic, n.o.s.	151	3143	Epibromohydrin	131	2558
ED	151	1892	Epichlorohydrin	131P	2023
Elevated temperature liquid, flammable, n.o.s., with flash point above 37.8°C (100°F), at or above its flash point	128	3256	1,2-Epoxy-3-ethoxypropane	127	2752
Elevated temperature liquid, flammable, n.o.s., with flash point above 60°C (140°F), at or above its flash point	128	3256	Esters, n.o.s.	127	3272
Elevated temperature liquid, n.o.s., at or above 100°C (212°F), and below its flash point	171	3257	Ethane	115	1035
Elevated temperature solid, n.o.s., at or above 240°C (464°F)	171	3258	Ethane, compressed	115	1035
Engine, fuel cell, flammable gas powered	115	3166	Ethane, refrigerated liquid	115	1961
Engine, fuel cell, flammable gas powered	115	3529	Ethane-Propane mixture, refrigerated liquid	115	1961
Engine, fuel cell, flammable liquid powered	128	3166	Ethanol	127	1170
Engine, fuel cell, flammable liquid powered	128	3528	Ethanol and gasoline mixture, with more than 10% ethanol	127	3475
Engine, internal combustion	128	3166	Ethanol and motor spirit mixture, with more than 10% ethanol	127	3475
Engine, internal combustion	171	3530	Ethanol and petrol mixture, with more than 10% ethanol	127	3475
Engine, internal combustion flammable gas powered	115	3529	Ethanol, solution	127	1170
Engine, internal combustion flammable liquid powered	128	3528	Ethanolamine	153	2491
Engines, internal combustion, flammable gas powered	115	3166	Ethanolamine, solution	153	2491
Engines, internal combustion, flammable liquid powered	128	3166	Ethers, n.o.s.	127	3271
Environmentally hazardous substance, liquid, n.o.s.	171	3082	Ethyl acetate	129	1173
			Ethylacetylene, stabilised	116P	2452
			Ethyl acrylate, stabilised	129P	1917
			Ethyl alcohol	127	1170
			Ethyl alcohol, solution	127	1170
			Ethylamine	118	1036
			Ethylamine, aqueous solution, with not less than 50% but not more than 70% Ethylamine	132	2270
			Ethyl amyl ketone	128	2271
			2-Ethylaniline	153	2273
			N-Ethylaniline	153	2272

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Ethylbenzene	130	1175	Ethylene dibromide	154	1605
N-Ethyl-N-benzylaniline	153	2274	Ethylene dibromide and Methyl bromide mixture, liquid	151	1647
N-Ethylbenzyltoluidines, liquid	153	2753	Ethylene dichloride	131	1184
N-Ethylbenzyltoluidines, solid	153	2753	Ethylene glycol diethyl ether	127	1153
N-Ethylbenzyltoluidines, solid	153	3460	Ethylene glycol monoethyl ether	127	1171
Ethyl borate	129	1176	Ethylene glycol monoethyl ether acetate	129	1172
Ethyl bromide	131	1891	Ethylene glycol monomethyl ether	127	1188
Ethyl bromoacetate	155	1603	Ethylene glycol monomethyl ether acetate	129	1189
2-Ethylbutanol	129	2275	Ethyleneimine, stabilised	131P	1185
2-Ethylbutyl acetate	130	1177	Ethylene oxide	119P	1040
Ethylbutyl acetate	130	1177	Ethylene oxide and Carbon dioxide mixture, with more than 9% but not more than 87% Ethylene oxide	115	1041
Ethyl butyl ether	127	1179	Ethylene oxide and Carbon dioxide mixture, with more than 87% Ethylene oxide	119P	3300
2-Ethylbutyraldehyde	130	1178	Ethylene oxide and Carbon dioxide mixtures, with not more than 9% Ethylene oxide	126	1952
Ethyl butyrate	130	1180	Ethylene oxide and Chlorotetrafluoroethane mixture, with not more than 8.8% Ethylene oxide	126	3297
Ethyl chloride	115	1037	Ethylene oxide and Dichlorodifluoromethane mixture, with not more than 12.5% Ethylene oxide	126	3070
Ethyl chloroacetate	155	1181	Ethylene oxide and Pentafluoroethane mixture, with not more than 7.9% Ethylene oxide	126	3298
Ethyl chloroformate	155	1182	Ethylene oxide and Propylene oxide mixture, with not more than 30% Ethylene oxide	131P	2983
Ethyl 2-chloropropionate	129	2935			
Ethyl chlorothioformate	155	2826			
Ethyl crotonate	130	1862			
Ethyldichloroarsine	151	1892			
Ethyldichlorosilane	139	1183			
Ethylene	116P	1962			
Ethylene, Acetylene and Propylene in mixture, refrigerated liquid containing at least 71.5% Ethylene with not more than 22.5% Acetylene and not more than 6% Propylene	115	3138			
Ethylene, compressed	116P	1962			
Ethylene, refrigerated liquid (cryogenic liquid)	115	1038			
Ethylene chlorohydrin	131	1135			
Ethylenediamine	132	1604			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Ethylene oxide and Tetrafluoroethane mixture, with not more than 5.6% Ethylene oxide	126	3299	Explosives, division 1.1, 1.2, 1.3 or 1.5	112	—
Ethylene oxide with Nitrogen	119P	1040	Explosives, division 1.4 or 1.6	114	—
Ethyl ether	127	1155	Extracts, aromatic, liquid	127	1169
Ethyl fluoride	115	2453	Extracts, flavoring, liquid	127	1197
Ethyl formate	129	1190	Extracts, flavouring, liquid	127	1197
Ethylhexaldehydes	129	1191	Fabrics, animal or vegetable or synthetic, n.o.s. with oil	133	1373
2-Ethylhexylamine	132	2276	Fabrics impregnated with weakly nitrated Nitrocellulose, n.o.s.	133	1353
2-Ethylhexyl chloroformate	156	2748	Ferric arsenate	151	1606
Ethyl isobutyrate	129	2385	Ferric arsenite	151	1607
Ethyl isocyanate	155	2481	Ferric chloride, anhydrous	157	1773
Ethyl lactate	129	1192	Ferric chloride, solution	154	2582
Ethyl mercaptan	129	2363	Ferric nitrate	140	1466
Ethyl methacrylate	130P	2277	Ferrocium	170	1323
Ethyl methacrylate, stabilised	130P	2277	Ferrosilicon	139	1408
Ethyl methyl ether	115	1039	Ferrous arsenate	151	1608
Ethyl methyl ketone	127	1193	Ferrous chloride, solid	154	1759
Ethyl nitrite, solution	131	1194	Ferrous chloride, solution	154	1760
Ethyl orthoformate	129	2524	Ferrous metal borings, shavings, turnings or cuttings	170	2793
Ethyl oxalate	156	2525	Fertilizer, ammoniating solution, with free Ammonia	125	1043
Ethylphenyldichlorosilane	156	2435	Fibres, animal or vegetable, burnt, wet or damp	133	1372
Ethyl phosphonothioic dichloride, anhydrous	154	2927	Fibres, animal or vegetable or synthetic, n.o.s. with oil	133	1373
Ethyl phosphonous dichloride, anhydrous	135	2845	Fibres, vegetable, dry	133	3360
Ethyl phosphorodichloridate	154	2927	Fibres impregnated with weakly nitrated Nitrocellulose, n.o.s.	133	1353
1-Ethylpiperidine	132	2386	Fibres, animal or vegetable, burnt, wet or damp	133	1372
Ethyl propionate	129	1195	Fibres, animal or vegetable or synthetic, n.o.s. with oil	133	1373
Ethyl propyl ether	127	2615			
Ethyl silicate	129	1292			
N-Ethyltoluidines	153	2754			
Ethyltrichlorosilane	155	1196			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Fibres, vegetable, dry	133	3360	Flammable solid, oxidising, n.o.s.	140	3097
Fibres impregnated with weakly nitrated Nitrocellulose, n.o.s.	133	1353	Flammable solid, poisonous, inorganic, n.o.s.	134	3179
Films, nitrocellulose base	133	1324	Flammable solid, poisonous, organic, n.o.s.	134	2926
Fire extinguisher charges, corrosive liquid	154	1774	Flammable solid, toxic, inorganic, n.o.s.	134	3179
Fire extinguishers with compressed gas	126	1044	Flammable solid, toxic, organic, n.o.s.	134	2926
Fire extinguishers with liquefied gas	126	1044	Fluorine	124	1045
Firelighters, solid, with flammable liquid	133	2623	Fluorine, compressed	124	1045
First aid kit	171	3316	Fluoroacetic acid	154	2642
Fish meal, stabilised	171	2216	Fluoroanilines	153	2941
Fish meal, unstabilised	133	1374	Fluorobenzene	130	2387
Fish scrap, stabilised	171	2216	Fluoroboric acid	154	1775
Fish scrap, unstabilised	133	1374	Fluorophosphoric acid, anhydrous	154	1776
Flammable liquid, corrosive, n.o.s	132	2924	Fluorosilicates, n.o.s.	151	2856
Flammable liquid, n.o.s.	128	1993	Fluorosilicic acid	154	1778
Flammable liquid, poisonous, corrosive, n.o.s.	131	3286	Fluorosulfonic acid	137	1777
Flammable liquid, poisonous, n.o.s.	131	1992	Fluorosulphonic acid	137	1777
Flammable liquid, toxic, corrosive, n.o.s.	131	3286	Fluorotoluenes	130	2388
Flammable liquid, toxic, n.o.s.	131	1992	Formaldehyde, solution (corrosive)	153	2209
Flammable solid, corrosive, inorganic, n.o.s.	134	3180	Formaldehyde, solution, flammable	132	1198
Flammable solid, corrosive, organic, n.o.s.	134	2925	Formalin (corrosive)	153	2209
Flammable solid, inorganic, n.o.s.	133	3178	Formalin (flammable)	132	1198
Flammable solid, organic, molten, n.o.s.	133	3176	Formic acid	153	1779
Flammable solid, organic, n.o.s.	133	1325	Formic acid, with more than 85% acid	153	1779
			Formic acid, with not less than 5% but less than 10% acid	153	3412
			Formic acid, with not less than 10% but not more than 85% acid	153	3412

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Fuel, aviation, turbine engine	128	1863	Fuel oil	128	1993
Fuel cell cartridges contained in equipment, containing corrosive substances	153	3477	Fumaryl chloride	156	1780
Fuel cell cartridges contained in equipment, containing flammable liquids	128	3473	Fumigated cargo transport unit	171	3359
Fuel cell cartridges contained in equipment, containing hydrogen in metal hydride	115	3479	Fumigated unit	171	3359
Fuel cell cartridges contained in equipment, containing liquefied flammable gas	115	3478	Furaldehydes	153P	1199
Fuel cell cartridges contained in equipment, containing water-reactive substances	138	3476	Furan	128	2389
Fuel cell cartridges, containing corrosive substances	153	3477	Furfural	153P	1199
Fuel cell cartridges, containing flammable liquids	128	3473	Furfuraldehydes	153P	1199
Fuel cell cartridges, containing hydrogen in metal hydride	115	3479	Furfuryl alcohol	153	2874
Fuel cell cartridges, containing liquefied flammable gas	115	3478	Furfurylamine	132	2526
Fuel cell cartridges, containing water-reactive substances	138	3476	Fusee (rail or highway)	133	1325
Fuel cell cartridges packed with equipment, containing corrosive substances	153	3477	Fusel oil	127	1201
Fuel cell cartridges packed with equipment, containing flammable liquids	128	3473	GA	153	2810
Fuel cell cartridges packed with equipment, containing hydrogen in metal hydride	115	3479	Gallium	172	2803
Fuel cell cartridges packed with equipment, containing liquefied flammable gas	115	3478	Gas, refrigerated liquid, flammable, n.o.s.	115	3312
Fuel cell cartridges packed with equipment, containing water-reactive substances	138	3476	Gas, refrigerated liquid, n.o.s.	120	3158
Fuel oil	128	1202	Gas, refrigerated liquid, oxidising, n.o.s.	122	3311
			Gas cartridges	115	2037
			Gas identification set	123	9035
			Gasohol	128	1203
			Gas oil	128	1202
			Gasoline	128	1203
			Gasoline and ethanol mixture, with more than 10% ethanol	127	3475
			Gas sample, non-pressurised, flammable, n.o.s., not refrigerated liquid	115	3167
			Gas sample, non-pressurised, poisonous, flammable, n.o.s., not refrigerated liquid	119	3168
			Gas sample, non-pressurised, poisonous, n.o.s., not refrigerated liquid	123	3169

Name of Material	Guide No.	UN No.
Gas sample, non-pressurised, toxic, flammable, n.o.s., not refrigerated liquid	119	3168
Gas sample, non-pressurised, toxic, n.o.s., not refrigerated liquid	123	3169
GB	153	2810
GD	153	2810
Genetically modified micro-organisms	171	3245
Genetically modified organisms	171	3245
Germane	119	2192
Germane, adsorbed	173	3523
GF	153	2810
Glycerol alpha-monochlorohydrin	153	2689
Glycidaldehyde	131P	2622
Guanidine nitrate	143	1467
H	153	2810
Hafnium powder, dry	135	2545
Hafnium powder, wetted with not less than 25% water	170	1326
Halogenated monomethyldiphenylmethanes, liquid	171	3151
Halogenated monomethyldiphenylmethanes, solid	171	3152
Hay, wet, damp or contaminated with oil	133	1327
Hazardous waste, liquid, n.o.s.	171	3082
Hazardous waste, solid, n.o.s.	171	3077
HD	153	2810
Heating oil, light	128	1202
Helium	120	1046
Helium, compressed	120	1046
Helium, refrigerated liquid (cryogenic liquid)	120	1963

Name of Material	Guide No.	UN No.
Heptafluoropropane	126	3296
n-Heptaldehyde	129	3056
Heptanes	128	1206
n-Heptene	128	2278
Hexachloroacetone	153	2661
Hexachlorobenzene	152	2729
Hexachlorobutadiene	151	2279
Hexachlorocyclopentadiene	151	2646
Hexachlorophene	151	2875
Hexadecyltrichlorosilane	156	1781
Hexadiene	130	2458
Hexaethyl tetraphosphate	151	1611
Hexaethyl tetraphosphate and compressed gas mixture	123	1612
Hexafluoroacetone	125	2420
Hexafluoroacetone hydrate	151	2552
Hexafluoroacetone hydrate, liquid	151	2552
Hexafluoroacetone hydrate, solid	151	3436
Hexafluoroethane	126	2193
Hexafluoroethane, compressed	126	2193
Hexafluorophosphoric acid	154	1782
Hexafluoropropylene	126	1858
Hexafluoropropylene, compressed	126	1858
Hexaldehyde	130	1207
Hexamethylenediamine, solid	153	2280
Hexamethylenediamine, solution	153	1783
Hexamethylene diisocyanate	156	2281
Hexamethyleneimine	132	2493
Hexamethylenetetramine	133	1328
Hexanes	128	1208
Hexanoic acid	153	2829

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Hexanols	129	2282	Hydrocyanic acid, aqueous solution, with not more than 20% Hydrogen cyanide	154	1613
1-Hexene	128	2370	Hydrocyanic acid, aqueous solutions, with more than 20% Hydrogen cyanide	117P	1051
Hexyltrichlorosilane	156	1784	Hydrofluoric acid	157	1790
HL	153	2810	Hydrofluoric acid and Sulfuric acid mixture	157	1786
HN-1	153	2810	Hydrofluoric acid and Sulphuric acid mixture	157	1786
HN-2	153	2810	Hydrofluorosilicic acid	154	1778
HN-3	153	2810	Hydrogen	115	1049
Hydrazine, anhydrous	132	2029	Hydrogen absorbed in metal hydride	115	9279
Hydrazine aqueous solution, flammable, with more than 37% hydrazine, by mass	132	3484	Hydrogen, compressed	115	1049
Hydrazine, aqueous solution, with more than 37% Hydrazine	153	2030	Hydrogen in a metal hydride storage system	115	3468
Hydrazine, aqueous solution, with not less than 37% but not more than 64% Hydrazine	153	2030	Hydrogen in a metal hydride storage system contained in equipment	115	3468
Hydrazine, aqueous solution, with not more than 37% Hydrazine	152	3293	Hydrogen in a metal hydride storage system packed with equipment	115	3468
Hydrazine hydrate	153	2030	Hydrogen, refrigerated liquid (cryogenic liquid)	115	1966
Hydriodic acid	154	1787	Hydrogen and Carbon monoxide mixture, compressed	119	2600
Hydrobromic acid	154	1788	Hydrogen and Methane mixture, compressed	115	2034
Hydrocarbon and butadienes mixture, stabilised	116P	1010	Hydrogen bromide, anhydrous	125	1048
Hydrocarbon gas mixture, compressed, n.o.s.	115	1964	Hydrogen chloride, anhydrous	125	1050
Hydrocarbon gas mixture, liquefied, n.o.s.	115	1965	Hydrogen chloride, refrigerated liquid	125	2186
Hydrocarbon gas refills for small devices, with release device	115	3150	Hydrogen cyanide, anhydrous, stabilised	117	1051
Hydrocarbons, liquid, n.o.s.	128	3295	Hydrogen cyanide, aqueous solution, with not more than 20% Hydrogen cyanide	154	1613
Hydrochloric acid	157	1789			
Hydrocyanic acid, aqueous solution, with less than 5% Hydrogen cyanide	154	1613			

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Hydrogen cyanide, solution in alcohol, with not more than 45% Hydrogen cyanide	131	3294
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Hydrogen cyanide, stabilised	117P	1051
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Hydrogen cyanide, stabilised (absorbed)	152	1614
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Hydrogendifluorides, n.o.s.	154	1740
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Hydrogendifluorides, solid, n.o.s.	154	1740
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Hydrogendifluorides, solution, n.o.s.	154	3471
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Hydrogen fluoride, anhydrous	125	1052
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Hydrogen iodide, anhydrous	125	2197
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Hydrogen peroxide, aqueous solution, stabilised, with more than 60% Hydrogen peroxide	143	2015
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Hydrogen peroxide, aqueous solution, with not less than 8% but less than 20% Hydrogen peroxide	140	2984
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Hydrogen peroxide, aqueous solution, with not less than 20% but not more than 60% Hydrogen peroxide (stabilised as necessary)	140	2014
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Hydrogen peroxide, stabilised	143	2015
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Hydrogen peroxide and Peroxyacetic acid mixture, with acid(s), water and not more than 5% Peroxyacetic acid, stabilised	140	3149
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Hydrogen selenide, adsorbed	173	3526
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Hydrogen selenide, anhydrous	117	2202
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Hydrogen sulfide	117	1053
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Hydrogen sulphide	117	1053
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Hydroquinone	153	2662
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Hydroquinone, solution	153	3435
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1-Hydroxybenzotriazole, anhydrous, wetted with not less than 20% water	113	3474
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1-Hydroxybenzotriazole, monohydrate	113	3474
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Hydroxylamine sulphate	154	2865
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Hydroxylamine sulphate	154	2865
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Hypochlorite solution	154	1791
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Hypochlorites, inorganic, n.o.s.	140	3212
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3,3'-Iminodipropylamine	153	2269
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Infectious substance, affecting animals only	158	2900
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Infectious substance, affecting humans	158	2814
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Ink, printer's, flammable	129	1210
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Insecticide gas, flammable, n.o.s.	115	3354
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Insecticide gas, n.o.s.	126	1968
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Insecticide gas, poisonous, flammable, n.o.s.	119	3355
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Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)	119	3355
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Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)	119	3355
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Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)	119	3355
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Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D)	119	3355
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Insecticide gas, poisonous, n.o.s.	123	1967
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Insecticide gas, toxic, flammable, n.o.s.	119	3355
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Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)	119	3355
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Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)	119	3355
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Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)	119	3355	Isobutyraldehyde	130	2045
Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)	119	3355	Isobutyric acid	132	2529
Insecticide gas, toxic, n.o.s.	123	1967	Isobutyronitrile	131	2284
Iodine	154	3495	Isobutryl chloride	132	2395
Iodine monochloride, liquid	157	3498	Isocyanate solution, flammable, poisonous, n.o.s.	155	2478
Iodine monochloride, solid	157	1792	Isocyanate solution, flammable, toxic, n.o.s.	155	2478
Iodine pentafluoride	144	2495	Isocyanate solution, poisonous, flammable, n.o.s.	155	3080
2-Iodobutane	129	2390	Isocyanate solution, poisonous, n.o.s.	155	2206
Iodomethylpropanes	129	2391	Isocyanate solution, toxic, flammable, n.o.s.	155	3080
Iodopropanes	129	2392	Isocyanate solution, toxic, n.o.s.	155	2206
IPDI	156	2290	Isocyanates, flammable, poisonous, n.o.s.	155	2478
Iron oxide, spent	135	1376	Isocyanates, flammable, toxic, n.o.s.	155	2478
Iron pentacarbonyl	136	1994	Isocyanates, poisonous, flammable, n.o.s.	155	3080
Iron sponge, spent	135	1376	Isocyanates, poisonous, n.o.s.	155	2206
Isobutane	115	1075	Isocyanates, toxic, flammable, n.o.s.	155	3080
Isobutane	115	1969	Isocyanates, toxic, n.o.s.	155	2206
Isobutanol	129	1212	Isocyanatobenzotrifluorides	156	2285
Isobutyl acetate	129	1213	Isoheptenes	128	2287
Isobutyl acrylate, stabilised	129P	2527	Isohexenes	128	2288
Isobutyl alcohol	129	1212	Isooctane	128	1262
Isobutyl aldehyde	130	2045	Isooctenes	128	1216
Isobutylamine	132	1214	Isopentane	128	1265
Isobutyl chloroformate	155	2742	Isopentenes	128	2371
Isobutylene	115	1055	Isophoronediamine	153	2289
Isobutylene	115	1075	Isophorone diisocyanate	156	2290
Isobutyl formate	129	2393	Isoprene, stabilised	130P	1218
Isobutyl isobutyrate	130	2528			
Isobutyl isocyanate	155P	2486			
Isobutyl methacrylate, stabilised	130P	2283			
Isobutyl propionate	129	2394			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Isopropanol	129	1219	Lead perchlorate	141	1470
Isopropenyl acetate	129P	2403	Lead perchlorate, solid	141	1470
Isopropenylbenzene	128	2303	Lead perchlorate, solution	141	3408
Isopropyl acetate	129	1220	Lead phosphite, dibasic	133	2989
Isopropyl acid phosphate	153	1793	Lead sulfate, with more than 3% free acid	154	1794
Isopropyl alcohol	129	1219	Lead sulphate, with more than 3% free acid	154	1794
Isopropylamine	132	1221	Lewisite	153	2810
Isopropylbenzene	130	1918	Life-saving appliances, not self-inflating	171	3072
Isopropyl butyrate	129	2405	Life-saving appliances, self-inflating	171	2990
Isopropyl chloroacetate	155	2947	Lighter refills (cigarettes) (flammable gas)	115	1057
Isopropyl chloroformate	155	2407	Lighters (cigarettes) (flammable gas)	115	1057
Isopropyl 2-chloropropionate	129	2934	Lighters, non-pressurised, containing flammable liquid	128	1057
Isopropyl isobutyrate	127	2406	Liquefied gas, flammable, n.o.s.	115	3161
Isopropyl isocyanate	155P	2483	Liquefied gas, n.o.s.	126	3163
Isopropyl nitrate	130	1222	Liquefied gas, oxidising, n.o.s.	122	3157
Isopropyl propionate	129	2409	Liquefied gas, poisonous, corrosive, n.o.s.	125	3308
Isosorbide dinitrate mixture	133	2907	Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone A)	125	3308
Isosorbide-5-mononitrate	133	3251	Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone B)	125	3308
Kerosene	128	1223	Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone C)	125	3308
Ketones, liquid, n.o.s.	127	1224	Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone D)	125	3308
Krill meal	133	3497	Liquefied gas, poisonous, flammable, corrosive, n.o.s.	119	3309
Krypton	120	1056			
Krypton, compressed	120	1056			
Krypton, refrigerated liquid (cryogenic liquid)	120	1970			
L (Lewisite)	153	2810			
Lead acetate	151	1616			
Lead arsenates	151	1617			
Lead arsenites	151	1618			
Lead compound, soluble, n.o.s.	151	2291			
Lead cyanide	151	1620			
Lead dioxide	140	1872			
Lead nitrate	141	1469			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	119	3309	Liquefied gas, poisonous, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone A)	124	3310
Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	119	3309	Liquefied gas, poisonous, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone B)	124	3310
Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)	119	3309	Liquefied gas, poisonous, oxidising, 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, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone D)	124	3310
Liquefied gas, poisonous, flammable, n.o.s.	119	3160	Liquefied gas, poisonous, oxidising, n.o.s.	124	3307
Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)	119	3160	Liquefied gas, poisonous, oxidising, 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, oxidising, 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, oxidising, 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, oxidising, n.o.s. (Inhalation Hazard Zone D)	124	3307
Liquefied gas, poisonous, n.o.s.	123	3162	Liquefied gas, toxic, corrosive, n.o.s.	125	3308
Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone A)	123	3162	Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone A)	125	3308
Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone B)	123	3162	Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone B)	125	3308
Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone C)	123	3162	Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone C)	125	3308
Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone D)	123	3162	Liquefied gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone D)	125	3308
Liquefied gas, poisonous, oxidising, corrosive, n.o.s.	124	3310	Liquefied gas, toxic, flammable, corrosive, n.o.s.	119	3309

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	119	3309	Liquefied gas, toxic, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone C)	124	3310
Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	119	3309	Liquefied gas, toxic, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone D)	124	3310
Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)	119	3309	Liquefied gas, toxic, oxidising, n.o.s.	124	3307
Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)	119	3309	Liquefied gas, toxic, oxidising, n.o.s. (Inhalation Hazard Zone A)	124	3307
Liquefied gas, toxic, flammable, n.o.s.	119	3160	Liquefied gas, toxic, oxidising, n.o.s. (Inhalation Hazard Zone B)	124	3307
Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)	119	3160	Liquefied gas, toxic, oxidising, n.o.s. (Inhalation Hazard Zone C)	124	3307
Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)	119	3160	Liquefied gas, toxic, oxidising, n.o.s. (Inhalation Hazard Zone D)	124	3307
Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)	119	3160	Liquefied gases, non-flammable, charged with Nitrogen, Carbon dioxide or Air	120	1058
Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)	119	3160	Liquefied natural gas (cryogenic liquid)	115	1972
Liquefied gas, toxic, n.o.s.	123	3162	Liquefied petroleum gas	115	1075
Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone A)	123	3162	Lithium	138	1415
Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone B)	123	3162	Lithium alkyls	135	2445
Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone C)	123	3162	Lithium alkyls, liquid	135	2445
Liquefied gas, toxic, n.o.s. (Inhalation Hazard Zone D)	123	3162	Lithium alkyls, solid	135	3433
Liquefied gas, toxic, oxidising, corrosive, n.o.s.	124	3310	Lithium aluminum hydride	138	1410
Liquefied gas, toxic, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone A)	124	3310	Lithium aluminum hydride, ethereal	138	1411
Liquefied gas, toxic, oxidising, corrosive, n.o.s. (Inhalation Hazard Zone B)	124	3310	Lithium batteries	138	3090
			Lithium batteries contained in equipment	138	3091
			Lithium batteries packed with equipment	138	3091
			Lithium batteries installed in cargo transport unit (lithium ion batteries)	147	3536
			Lithium batteries installed in cargo transport unit (lithium metal batteries)	138	3536
			Lithium borohydride	138	1413

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Lithium ferrosilicon	139	2830	Machinery, fuel cell, flammable liquid powered	128	3528
Lithium hydride	138	1414	Machinery, internal combustion	171	3530
Lithium hydride, fused solid	138	2805	Machinery, internal combustion, flammable gas powered	115	3529
Lithium hydroxide	154	2680	Machinery, internal combustion, flammable liquid powered	128	3528
Lithium hydroxide, monohydrate	154	2680	Magnesium	138	1869
Lithium hydroxide, solution	154	2679	Magnesium, in pellets, turnings or ribbons	138	1869
Lithium hypochlorite, dry	140	1471	Magnesium alkyls	135	3053
Lithium hypochlorite mixture	140	1471	Magnesium alloys, with more than 50% Magnesium, in pellets, turnings or ribbons	138	1869
Lithium hypochlorite mixtures, dry	140	1471	Magnesium alloys powder	138	1418
Lithium ion batteries (including lithium ion polymer batteries)	147	3480	Magnesium aluminum phosphide	139	1419
Lithium ion batteries contained in equipment (including lithium ion polymer batteries)	147	3481	Magnesium arsenate	151	1622
Lithium ion batteries packed with equipment (including lithium ion polymer batteries)	147	3481	Magnesium bromate	140	1473
Lithium metal batteries (including lithium alloy batteries)	138	3090	Magnesium chlorate	140	2723
Lithium metal batteries contained in equipment (including lithium alloy batteries)	138	3091	Magnesium chloride and Chlorate mixture	140	1459
Lithium metal batteries packed with equipment (including lithium alloy batteries)	138	3091	Magnesium chloride and Chlorate mixture, solid	140	1459
Lithium nitrate	140	2722	Magnesium chloride and Chlorate mixture, solution	140	3407
Lithium nitride	139	2806	Magnesium diamide	135	2004
Lithium peroxide	143	1472	Magnesium diphenyl	135	2005
Lithium silicon	138	1417	Magnesium fluorosilicate	151	2853
LNG (cryogenic liquid)	115	1972	Magnesium granules, coated	138	2950
London purple	151	1621	Magnesium hydride	138	2010
LPG	115	1075	Magnesium nitrate	140	1474
Machinery, fuel cell, flammable gas powered	115	3529	Magnesium perchlorate	140	1475
			Magnesium peroxide	140	1476
			Magnesium phosphide	139	2011

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
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, toxic, flammable, n.o.s.	131	3071
Maneb, stabilised	135	2968	Mercuric arsenate	151	1623
Maneb preparation, stabilised	135	2968	Mercuric bromide	154	1634
Maneb preparation, with not less than 60% Maneb	135	2210	Mercuric chloride	154	1624
Manganese nitrate	140	2724	Mercuric cyanide	154	1636
Manganese resinate	133	1330	Mercuric nitrate	141	1625
Matches, fusee	133	2254	Mercuric oxycyanide	151	1642
Matches, safety	133	1944	Mercuric potassium cyanide	157	1626
Matches, "strike anywhere"	133	1331	Mercuric sulfate	151	1645
Matches, wax "vesta"	133	1945	Mercuric sulphate	151	1645
MD	152	1556	Mercurous bromide	154	1634
Medical waste, category A, affecting animals only, solid	158	3549	Mercurous nitrate	141	1627
Medical waste, category A, affecting humans, solid	158	3549	Mercury	172	2809
Medical waste, n.o.s.	158	3291	Mercury acetate	151	1629
Medicine, liquid, flammable, poisonous, n.o.s.	131	3248	Mercury ammonium chloride	151	1630
Medicine, liquid, flammable, toxic, n.o.s.	131	3248	Mercury based pesticide, liquid, flammable, poisonous	131	2778
Medicine, liquid, poisonous, n.o.s.	151	1851	Mercury based pesticide, liquid, flammable, toxic	131	2778
Medicine, liquid, toxic, n.o.s.	151	1851	Mercury based pesticide, liquid, poisonous	151	3012
Medicine, solid, poisonous, n.o.s.	151	3249			
Medicine, solid, toxic, n.o.s.	151	3249			
Mercaptan mixture, liquid, flammable, n.o.s.	130	3336			
Mercaptan mixture, liquid, flammable, poisonous, n.o.s.	131	1228			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Mercury based pesticide, liquid, poisonous, flammable	131	3011	Metal alkyls, water-reactive, n.o.s.	135	2003
Mercury based pesticide, liquid, toxic	151	3012	Metal aryl halides, water-reactive, n.o.s.	138	3049
Mercury based pesticide, liquid, toxic, flammable	131	3011	Metal aryl hydrides, water-reactive, n.o.s.	138	3050
Mercury based pesticide, solid, poisonous	151	2777	Metal aryls, water-reactive, n.o.s.	135	2003
Mercury based pesticide, solid, toxic	151	2777	Metal carbonyls, liquid, n.o.s.	151	3281
Mercury benzoate	154	1631	Metal carbonyls, n.o.s.	151	3281
Mercury bromides	154	1634	Metal carbonyls, solid, n.o.s.	151	3466
Mercury compound, liquid, n.o.s.	151	2024	Metal catalyst, dry	135	2881
Mercury compound, solid, n.o.s.	151	2025	Metal catalyst, wetted	170	1378
Mercury contained in manufactured articles	172	3506	Metaldehyde	133	1332
Mercury cyanide	154	1636	Metal hydrides, flammable, n.o.s.	170	3182
Mercury gluconate	151	1637	Metal hydrides, water-reactive, n.o.s.	138	1409
Mercury iodide	151	1638	Metallic substance, water-reactive, n.o.s.	138	3208
Mercury metal	172	2809	Metallic substance, water-reactive, self-heating, n.o.s.	138	3209
Mercury nucleate	151	1639	Metal powder, flammable, n.o.s.	170	3089
Mercury oleate	151	1640	Metal powder, self-heating, n.o.s.	135	3189
Mercury oxide	151	1641	Metal salts of organic compounds, flammable, n.o.s.	133	3181
Mercury oxycyanide, desensitised	151	1642	Methacrylaldehyde, stabilised	131P	2396
Mercury potassium iodide	151	1643	Methacrylic acid, stabilised	153P	2531
Mercury salicylate	151	1644	Methacrylonitrile, stabilised	131P	3079
Mercury sulfate	151	1645	Methallyl alcohol	129	2614
Mercury sulphate	151	1645	Methane	115	1971
Mercury thiocyanate	151	1646	Methane, compressed	115	1971
Mesityl oxide	129	1229	Methane, refrigerated liquid (cryogenic liquid)	115	1972
Metal alkyl halides, water-reactive, n.o.s.	138	3049			
Metal alkyl hydrides, water-reactive, n.o.s.	138	3050			

Name of Material	Guide No.	UN No.
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Methane and Hydrogen mixture, compressed	115	2034
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Methanesulfonyl chloride	156	3246
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Methanesulphonyl chloride	156	3246
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Methanol	131	1230
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Methoxymethyl isocyanate	155	2605
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4-Methoxy-4-methylpentan-2-one	128	2293
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1-Methoxy-2-propanol	129	3092
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Methyl acetate	129	1231
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Methylacetylene and Propadiene mixture, stabilised	116P	1060
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Methyl acrylate, stabilised	129P	1919
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Methylal	127	1234
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Methyl alcohol	131	1230
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Methylallyl chloride	130P	2554
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Methylamine, anhydrous	118	1061
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Methylamine, aqueous solution	132	1235
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Methylamyl acetate	130	1233
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Methylamyl alcohol	129	2053
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Methyl amyl ketone	127	1110
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N-Methylaniline	153	2294
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alpha-Methylbenzyl alcohol	153	2937
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alpha-Methylbenzyl alcohol, liquid	153	2937
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alpha-Methylbenzyl alcohol, solid	153	3438
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Methylbenzyl alcohol (alpha)	153	2937
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Methyl bromide	123	1062
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Methyl bromide and Chloropicrin mixture	123	1581
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Methyl bromide and Ethylene dibromide mixture, liquid	151	1647
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Methyl bromoacetate	155	2643
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2-Methylbutanal	129	3371
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Name of Material	Guide No.	UN No.
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3-Methylbutan-2-one	127	2397
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2-Methyl-1-butene	128	2459
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2-Methyl-2-butene	128	2460
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3-Methyl-1-butene	128	2561
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N-Methylbutylamine	132	2945
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Methyl tert-butyl ether	127	2398
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Methyl butyrate	129	1237
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Methyl chloride	115	1063
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Methyl chloride and Chloropicrin mixture	119	1582
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Methyl chloride and Methylene chloride mixture	115	1912
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Methyl chloroacetate	155	2295
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Methyl chloroformate	155	1238
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Methyl chloromethyl ether	131	1239
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Methyl 2-chloropropionate	129	2933
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Methylchlorosilane	119	2534
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Methylcyclohexane	128	2296
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Methylcyclohexanols	129	2617
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Methylcyclohexanone	128	2297
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Methylcyclopentane	128	2298
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Methyl dichloroacetate	155	2299
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Methyldichloroarsine	152	1556
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Methyldichlorosilane	139	1242
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Methylene chloride	160	1593
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Methylene chloride and Methyl chloride mixture	115	1912
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Methyl ethyl ether	115	1039
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Methyl ethyl ketone	127	1193
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2-Methyl-5-ethylpyridine	153	2300
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Methyl fluoride	115	2454
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Methyl formate	129	1243
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2-Methylfuran	128	2301
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2-Methyl-2-heptanethiol	131	3023
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Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
5-Methylhexan-2-one	127	2302	M.I.B.C.	129	2053
Methylhydrazine	131	1244	Molten sulfur	133	2448
Methyl iodide	151	2644	Molten sulphur	133	2448
Methyl isobutyl carbinol	129	2053	Molybdenum pentachloride	156	2508
Methyl isobutyl ketone	127	1245	Monoethanolamine	153	2491
Methyl isocyanate	155P	2480	Mononitrotoluidines	153	2660
Methyl isopropenyl ketone, stabilised	127P	1246	Morpholine	132	2054
Methyl isothiocyanate	131	2477	Motor fuel anti-knock mixture	152	1649
Methyl isovalerate	130	2400	Motor fuel anti-knock mixture, flammable	131	3483
Methyl magnesium bromide in Ethyl ether	138	1928	Motor spirit	128	1203
Methyl mercaptan	117	1064	Motor spirit and ethanol mixture, with more than 10% ethanol	127	3475
Methyl methacrylate monomer, stabilised	129P	1247	Muriatic acid	157	1789
4-Methylmorpholine	132	2535	Musk xylene	149	2956
N-Methylmorpholine	132	2535	Mustard	153	2810
Methyl nitrite	116	2455	Mustard Lewisite	153	2810
Methyl orthosilicate	155	2606	Naphthalene, crude	133	1334
Methylpentadiene	128	2461	Naphthalene, molten	133	2304
2-Methylpentan-2-ol	129	2560	Naphthalene, refined	133	1334
Methylphenyldichlorosilane	156	2437	alpha-Naphthylamine	153	2077
Methyl phosphonic dichloride	137	9206	beta-Naphthylamine	153	1650
Methyl phosphonous dichloride	135	2845	beta-Naphthylamine, solid	153	1650
1-Methylpiperidine	132	2399	beta-Naphthylamine, solution	153	3411
Methyl propionate	129	1248	Naphthylamine (alpha)	153	2077
Methyl propyl ether	127	2612	Naphthylamine (beta)	153	1650
Methyl propyl ketone	127	1249	Naphthylamine (beta), solid	153	1650
Methyltetrahydrofuran	127	2536	Naphthylamine (beta), solution	153	3411
Methyl trichloroacetate	156	2533	Naphthylthiourea	153	1651
Methyltrichlorosilane	155	1250	Naphthylurea	153	1652
alpha-Methylvaleraldehyde	130	2367	Natural gas, compressed	115	1971
Methyl valeraldehyde (alpha)	130	2367	Natural gas, refrigerated liquid (cryogenic liquid)	115	1972
Methyl vinyl ketone, stabilised	131P	1251			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Neohexane	128	1208	Nitrating acid mixture with more than 50% nitric acid	157	1796
Neon	120	1065	Nitrating acid mixture with not more than 50% nitric acid	157	1796
Neon, compressed	120	1065	Nitrating acid mixture, spent, with more than 50% nitric acid	157	1826
Neon, refrigerated liquid (cryogenic liquid)	120	1913	Nitrating acid mixture, spent, with not more than 50% nitric acid	157	1826
Nickel carbonyl	131	1259	Nitric acid, other than red fuming, with more than 70% nitric acid	157	2031
Nickel catalyst, dry	135	2881	Nitric acid, other than red fuming, with not more than 70% nitric acid	157	2031
Nickel cyanide	151	1653	Nitric acid, red fuming	157	2032
Nickel nitrate	140	2725	Nitric oxide	124	1660
Nickel nitrite	140	2726	Nitric oxide, compressed	124	1660
Nicotine	151	1654	Nitric oxide and Dinitrogen tetroxide mixture	124	1975
Nicotine compound, liquid, n.o.s.	151	3144	Nitric oxide and Nitrogen dioxide mixture	124	1975
Nicotine compound, solid, n.o.s.	151	1655	Nitric oxide and Nitrogen tetroxide mixture	124	1975
Nicotine hydrochloride	151	1656	Nitriles, flammable, poisonous, n.o.s.	131	3273
Nicotine hydrochloride, liquid	151	1656	Nitriles, flammable, toxic, n.o.s.	131	3273
Nicotine hydrochloride, solid	151	3444	Nitriles, liquid, poisonous, n.o.s.	151	3276
Nicotine hydrochloride, solution	151	1656	Nitriles, liquid, toxic, n.o.s.	151	3276
Nicotine preparation, liquid, n.o.s.	151	3144	Nitriles, poisonous, flammable, n.o.s.	131	3275
Nicotine preparation, solid, n.o.s.	151	1655	Nitriles, poisonous, liquid, n.o.s.	151	3276
Nicotine salicylate	151	1657	Nitriles, poisonous, n.o.s.	151	3276
Nicotine sulfate, solid	151	1658	Nitriles, poisonous, solid, n.o.s.	151	3439
Nicotine sulfate, solid	151	3445	Nitriles, solid, poisonous, n.o.s.	151	3439
Nicotine sulfate, solution	151	1658	Nitriles, solid, toxic, n.o.s.	151	3439
Nicotine sulphate, solid	151	1658			
Nicotine sulphate, solid	151	3445			
Nicotine sulphate, solution	151	1658			
Nicotine tartrate	151	1659			
Nitrates, inorganic, aqueous solution, n.o.s.	140	3218			
Nitrates, inorganic, n.o.s.	140	1477			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Nitriles, toxic, flammable, n.o.s.	131	3275	Nitrocellulose with water, not less than 25% water	113	2555
Nitriles, toxic, liquid, n.o.s.	151	3276	3-Nitro-4-chlorobenzotrifluoride	152	2307
Nitriles, toxic, n.o.s.	151	3276	Nitrocresols	153	2446
Nitriles, toxic, solid, n.o.s.	151	3439	Nitrocresols, liquid	153	3434
Nitrites, inorganic, aqueous solution, n.o.s.	140	3219	Nitrocresols, solid	153	2446
Nitrites, inorganic, n.o.s.	140	2627	Nitroethane	129	2842
Nitroanilines	153	1661	Nitrogen	120	1066
Nitroanisoles, liquid	152	2730	Nitrogen, compressed	120	1066
Nitroanisoles, solid	152	2730	Nitrogen, refrigerated liquid (cryogenic liquid)	120	1977
Nitroanisoles, solid	152	3458	Nitrogen and Rare gases mixture, compressed	120	1981
Nitrobenzene	152	1662	Nitrogen dioxide	124	1067
Nitrobenzenesulfonic acid	153	2305	Nitrogen dioxide and Nitric oxide mixture	124	1975
Nitrobenzenesulphonic acid	153	2305	Nitrogen tetroxide and Nitric oxide mixture	124	1975
Nitrobenzotrifluorides	152	2306	Nitrogen trifluoride	122	2451
Nitrobenzotrifluorides, liquid	152	2306	Nitrogen trifluoride, compressed	122	2451
Nitrobenzotrifluorides, solid	152	3431	Nitrogen trioxide	124	2421
Nitrobromobenzenes, liquid	152	2732	Nitroglycerin, solution in alcohol, with more than 1% but not more than 5% Nitroglycerin	127	3064
Nitrobromobenzenes, solid	152	2732	Nitroglycerin, solution in alcohol, with not more than 1% Nitroglycerin	127	1204
Nitrobromobenzenes, solid	152	3459	Nitroglycerin mixture, desensitised, liquid, flammable, n.o.s., with not more than 30% Nitroglycerin	113	3343
Nitrocellulose membrane filters	133	3270	Nitroglycerin mixture, desensitised, liquid, n.o.s., with not more than 30% Nitroglycerin	113	3357
Nitrocellulose mixture, without pigment	133	2557			
Nitrocellulose mixture, without plasticizer	133	2557			
Nitrocellulose mixture, with pigment	133	2557			
Nitrocellulose mixture, with plasticizer	133	2557			
Nitrocellulose, solution, flammable	127	2059			
Nitrocellulose with alcohol	113	2556			
Nitrocellulose with not less than 25% alcohol	113	2556			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Nitroglycerin mixture, desensitised, solid, n.o.s., with more than 2% but not more than 10% Nitroglycerin	113	3319	Nonanes	128	1920
Nitroguanidine, wetted with not less than 20% water	113	1336	Nonyltrichlorosilane	156	1799
Nitrohydrochloric acid	157	1798	2,5-Norbornadiene, stabilised	128P	2251
Nitromethane	129	1261	Octadecyltrichlorosilane	156	1800
Nitronaphthalene	133	2538	Octadiene	128P	2309
Nitrophenols	153	1663	Octafluorobut-2-ene	126	2422
4-Nitrophenylhydrazine, with not less than 30% water	113	3376	Octafluorocyclobutane	126	1976
Nitropropanes	129	2608	Octafluoropropane	126	2424
p-Nitrosodimethylaniline	135	1369	Octanes	128	1262
Nitrostarch, wetted with not less than 20% water	113	1337	Octyl aldehydes	129	1191
Nitrosyl chloride	125	1069	Octyltrichlorosilane	156	1801
Nitrosylsulfuric acid, liquid	157	2308	Oil, petroleum	128	1270
Nitrosylsulfuric acid, solid	157	2308	Oil gas	119	1071
Nitrosylsulphuric acid, solid	157	3456	Oil gas, compressed	119	1071
Nitrosylsulphuric acid, liquid	157	2308	Organic peroxide type B, liquid	146	3101
Nitrosylsulfuric acid, solid	157	2308	Organic peroxide type B, liquid, temperature controlled	148	3111
Nitrosylsulphuric acid, solid	157	3456	Organic peroxide type B, solid	146	3102
Nitrotoluenes, liquid	152	1664	Organic peroxide type B, solid, temperature controlled	148	3112
Nitrotoluenes, solid	152	1664	Organic peroxide type C, liquid	146	3103
Nitrotoluenes, solid	152	3446	Organic peroxide type C, liquid, temperature controlled	148	3113
Nitrotoluidines (mono)	153	2660	Organic peroxide type C, solid	146	3104
Nitrous oxide	122	1070	Organic peroxide type C, solid, temperature controlled	148	3114
Nitrous oxide, compressed	122	1070	Organic peroxide type D, liquid	145	3105
Nitrous oxide, refrigerated liquid	122	2201	Organic peroxide type D, liquid, temperature controlled	148	3115
Nitrous oxide and Carbon dioxide mixture	126	1015	Organic peroxide type D, solid	145	3106
Nitroxylenes, liquid	152	1665	Organic peroxide type D, solid, temperature controlled	148	3116
Nitroxylenes, solid	152	1665	Organic peroxide type E, liquid	145	3107
Nitroxylenes, solid	152	3447			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Organic peroxide type E, liquid, temperature controlled	148	3117	Organochlorine pesticide, solid, toxic	151	2761
Organic peroxide type E, solid	145	3108	Organometallic compound, liquid, poisonous, n.o.s.	151	3282
Organic peroxide type E, solid, temperature controlled	148	3118	Organometallic compound, liquid, toxic, n.o.s.	151	3282
Organic peroxide type F, liquid	145	3109	Organometallic compound, poisonous, liquid, n.o.s.	151	3282
Organic peroxide type F, liquid, temperature controlled	148	3119	Organometallic compound, poisonous, n.o.s.	151	3282
Organic peroxide type F, solid	145	3110	Organometallic compound, poisonous, solid, n.o.s.	151	3467
Organic peroxide type F, solid, temperature controlled	148	3120	Organometallic compound, solid, poisonous, n.o.s.	151	3467
Organic phosphate compound mixed with compressed gas	123	1955	Organometallic compound, solid, toxic, n.o.s.	151	3467
Organic phosphate mixed with compressed gas	123	1955	Organometallic compound, toxic, liquid, n.o.s.	151	3282
Organic phosphorus compound mixed with compressed gas	123	1955	Organometallic compound, toxic, n.o.s.	151	3282
Organic pigments, self-heating	135	3313	Organometallic compound, toxic, solid, n.o.s.	151	3467
Organoarsenic compound, liquid, n.o.s.	151	3280	Organometallic compound, water-reactive, flammable, n.o.s.	138	3207
Organoarsenic compound, n.o.s.	151	3280	Organometallic compound dispersion, water-reactive, flammable, n.o.s.	138	3207
Organoarsenic compound, solid, n.o.s.	151	3465	Organometallic compound solution, water-reactive, flammable, n.o.s.	138	3207
Organochlorine pesticide, liquid, flammable, poisonous	131	2762	Organometallic substance, liquid, pyrophoric	135	3392
Organochlorine pesticide, liquid, flammable, toxic	131	2762	Organometallic substance, liquid, pyrophoric, water-reactive	135	3394
Organochlorine pesticide, liquid, poisonous	151	2996	Organometallic substance, liquid, water-reactive	135	3398
Organochlorine pesticide, liquid, poisonous, flammable	131	2995	Organometallic substance, liquid, water-reactive, flammable	138	3399
Organochlorine pesticide, liquid, toxic	151	2996			
Organochlorine pesticide, liquid, toxic, flammable	131	2995			
Organochlorine pesticide, solid, poisonous	151	2761			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Organometallic substance, solid, pyrophoric	135	3391	Organophosphorus pesticide, liquid, flammable, toxic	131	2784
Organometallic substance, solid, pyrophoric, water-reactive	135	3393	Organophosphorus pesticide, liquid, poisonous	152	3018
Organometallic substance, solid, self-heating	138	3400	Organophosphorus pesticide, liquid, poisonous, flammable	131	3017
Organometallic substance, solid, water-reactive	135	3395	Organophosphorus pesticide, liquid, toxic	152	3018
Organometallic substance, solid, water-reactive, flammable	138	3396	Organophosphorus pesticide, liquid, toxic, flammable	131	3017
Organometallic substance, solid, water-reactive, self-heating	138	3397	Organophosphorus pesticide, solid, poisonous	152	2783
Organophosphorus compound, liquid, poisonous, n.o.s.	151	3278	Organophosphorus pesticide, solid, toxic	152	2783
Organophosphorus compound, liquid, toxic, n.o.s.	151	3278	Organotin compound, liquid, n.o.s.	153	2788
Organophosphorus compound, poisonous, flammable, n.o.s.	131	3279	Organotin compound, solid, n.o.s.	153	3146
Organophosphorus compound, poisonous, liquid, n.o.s.	151	3278	Organotin pesticide, liquid, flammable, poisonous	131	2787
Organophosphorus compound, poisonous, n.o.s.	151	3278	Organotin pesticide, liquid, flammable, toxic	131	2787
Organophosphorus compound, poisonous, solid, n.o.s.	151	3464	Organotin pesticide, liquid, poisonous	153	3020
Organophosphorus compound, solid, poisonous, n.o.s.	151	3464	Organotin pesticide, liquid, poisonous, flammable	131	3019
Organophosphorus compound, solid, toxic, n.o.s.	151	3464	Organotin pesticide, liquid, toxic	153	3020
Organophosphorus compound, toxic, flammable, n.o.s.	131	3279	Organotin pesticide, liquid, toxic, flammable	131	3019
Organophosphorus compound, toxic, liquid, n.o.s.	151	3278	Organotin pesticide, solid, poisonous	153	2786
Organophosphorus compound, toxic, n.o.s.	151	3278	Organotin pesticide, solid, toxic	153	2786
Organophosphorus compound, toxic, solid, n.o.s.	151	3464	Osmium tetroxide	154	2471
Organophosphorus pesticide, liquid, flammable, poisonous	131	2784	Other regulated substances, liquid, n.o.s.	171	3082
			Other regulated substances, solid, n.o.s.	171	3077
			Oxidising liquid, corrosive, n.o.s.	140	3098

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Oxidising liquid, n.o.s.	140	3139	Paint related material, corrosive, flammable	132	3470
Oxidising liquid, poisonous, n.o.s.	142	3099	Paint related material (flammable)	128	1263
Oxidising liquid, toxic, n.o.s.	142	3099	Paint related material, flammable, corrosive	132	3469
Oxidising solid, corrosive, n.o.s.	140	3085	Paper, unsaturated oil treated	133	1379
Oxidising solid, flammable, n.o.s.	140	3137	Paraformaldehyde	133	2213
Oxidising solid, n.o.s.	140	1479	Paraldehyde	129	1264
Oxidising solid, poisonous, n.o.s.	141	3087	Parathion and compressed gas mixture	123	1967
Oxidising solid, self-heating, n.o.s.	135	3100	PCB	171	2315
Oxidising solid, toxic, n.o.s.	141	3087	PD	152	1556
Oxidising solid, water-reactive, n.o.s.	144	3121	Pentaborane	135	1380
Oxygen	122	1072	Pentachloroethane	151	1669
Oxygen, compressed	122	1072	Pentachlorophenol	154	3155
Oxygen, refrigerated liquid (cryogenic liquid)	122	1073	Pentaerythrite tetranitrate mixture, desensitised, solid, n.o.s., with more than 10% but not more than 20% PETN	113	3344
Oxygen and Carbon dioxide mixture, compressed	122	1014	Pentaerythritol tetranitrate mixture, desensitised, solid, n.o.s., with more than 10% but not more than 20% PETN	113	3344
Oxygen and Rare gases mixture, compressed	120	1980	Pentafluoroethane	126	3220
Oxygen difluoride	124	2190	Pentafluoroethane and Ethylene oxide mixture, with not more than 7.9% Ethylene oxide	126	3298
Oxygen difluoride, compressed	124	2190	Pentamethylheptane	128	2286
Oxygen generator, chemical	140	3356	Pentane-2,4-dione	131	2310
Oxygen generator, chemical, spent	140	3356	Pentanes	128	1265
Packaging discarded, empty, uncleaned	171	3509	Pentanol	129	1105
Paint (corrosive)	153	3066	1-Pentene	128	1108
Paint, corrosive, flammable	132	3470	1-Pentol	153P	2705
Paint (flammable)	128	1263	Perchlorates, inorganic, aqueous solution, n.o.s.	140	3211
Paint, flammable, corrosive	132	3469	Perchlorates, inorganic, n.o.s.	140	1481
Paint related material (corrosive)	153	3066			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
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	157	1802	Pesticide, solid, toxic, n.o.s.	151	2588
Perchloroethylene	160	1897	PETN mixture, desensitised, solid, n.o.s., with more than 10% but not more than 20% PETN	113	3344
Perchloromethyl mercaptan	157	1670	Petrol	128	1203
Perchloryl fluoride	124	3083	Petrol and ethanol mixture, with more than 10% ethanol	127	3475
Perfluoro(ethyl vinyl ether)	115	3154	Petroleum crude oil	128	1267
Perfluoro(methyl vinyl ether)	115	3153	Petroleum distillates, n.o.s.	128	1268
Perfumery products, with flammable solvents	127	1266	Petroleum gases, liquefied	115	1075
Permanganates, inorganic, aqueous solution, n.o.s.	140	3214	Petroleum oil	128	1270
Permanganates, inorganic, n.o.s.	140	1482	Petroleum products, n.o.s.	128	1268
Peroxides, inorganic, n.o.s.	140	1483	Petroleum sour crude oil, flammable, poisonous	131	3494
Peroxyacetic acid and hydrogen peroxide mixture, with acid(s), water and not more than 5% Peroxyacetic acid, stabilised	140	3149	Petroleum sour crude oil, flammable, toxic	131	3494
Persulfates, inorganic, aqueous solution, n.o.s.	140	3216	Phenacyl bromide	153	2645
Persulfates, inorganic, n.o.s.	140	3215	Phenetidines	153	2311
Persulphates, inorganic, aqueous solution, n.o.s.	140	3216	Phenol, molten	153	2312
Persulphates, inorganic, n.o.s.	140	3215	Phenol, solid	153	1671
Pesticide, liquid, flammable, poisonous, n.o.s.	131	3021	Phenol solution	153	2821
Pesticide, liquid, flammable, toxic, n.o.s.	131	3021	Phenolates, liquid	154	2904
Pesticide, liquid, poisonous, flammable, n.o.s.	131	2903	Phenolates, solid	154	2905
Pesticide, liquid, poisonous, n.o.s.	151	2902	Phenolsulfonic acid, liquid	153	1803
Pesticide, liquid, toxic, flammable, n.o.s.	131	2903	Phenolsulphonic acid, liquid	153	1803
Pesticide, liquid, toxic, n.o.s.	151	2902	Phenoxyacetic acid derivative pesticide, liquid, flammable, poisonous	131	3346
			Phenoxyacetic acid derivative pesticide, liquid, flammable, toxic	131	3346
			Phenoxyacetic acid derivative pesticide, liquid, poisonous	153	3348

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Phenoxyacetic acid derivative pesticide, liquid, poisonous, flammable	131	3347	Phosphoric acid, liquid	154	1805
Phenoxyacetic acid derivative pesticide, liquid, toxic	153	3348	Phosphoric acid, solid	154	1805
Phenoxyacetic acid derivative pesticide, liquid, toxic, flammable	131	3347	Phosphoric acid, solid	154	3453
Phenoxyacetic acid derivative pesticide, solid, poisonous	153	3345	Phosphoric acid, solution	154	1805
Phenoxyacetic acid derivative pesticide, solid, toxic	153	3345	Phosphorous acid	154	2834
Phenylacetoneitrile, liquid	152	2470	Phosphorus, amorphous	133	1338
Phenylacetyl chloride	156	2577	Phosphorus, white, dry or under water or in solution	136	1381
Phenylcarbylamine chloride	151	1672	Phosphorus, white, molten	136	2447
Phenyl chloroformate	156	2746	Phosphorus, yellow, dry or under water or in solution	136	1381
Phenylenediamines	153	1673	Phosphorus heptasulfide, free from yellow and white Phosphorus	139	1339
Phenylhydrazine	153	2572	Phosphorus heptasulphide, free from yellow and white Phosphorus	139	1339
Phenyl isocyanate	155	2487	Phosphorus oxybromide	137	1939
Phenyl mercaptan	131	2337	Phosphorus oxybromide, molten	137	2576
Phenylmercuric acetate	151	1674	Phosphorus oxybromide, solid	137	1939
Phenylmercuric compound, n.o.s.	151	2026	Phosphorus oxychloride	137	1810
Phenylmercuric hydroxide	151	1894	Phosphorus pentabromide	137	2691
Phenylmercuric nitrate	151	1895	Phosphorus pentachloride	137	1806
Phenylphosphorus dichloride	137	2798	Phosphorus pentafluoride	125	2198
Phenylphosphorus thiodichloride	137	2799	Phosphorus pentafluoride, adsorbed	173	3524
Phenyltrichlorosilane	156	1804	Phosphorus pentafluoride, compressed	125	2198
Phenyl urea pesticide, liquid, poisonous	151	3002	Phosphorus pentasulfide, free from yellow and white Phosphorus	139	1340
Phenyl urea pesticide, liquid, toxic	151	3002	Phosphorus pentasulphide, free from yellow and white Phosphorus	139	1340
Phosgene	125	1076	Phosphorus pentoxide	137	1807
9-Phosphabicyclononanes	135	2940			
Phosphine	119	2199			
Phosphine, adsorbed	173	3525			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Phosphorus sesquisulfide, free from yellow and white Phosphorus	139	1341	Poisonous by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone A)	154	3389
Phosphorus sesquisulphide, free from yellow and white Phosphorus	139	1341	Poisonous by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone B)	154	3390
Phosphorus tribromide	137	1808	Poisonous by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	131	3488
Phosphorus trichloride	137	1809	Poisonous by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	131	3489
Phosphorus trioxide	157	2578	Poisonous by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone A)	131	3383
Phosphorus trisulfide, free from yellow and white Phosphorus	139	1343	Poisonous by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone B)	131	3384
Phosphorus trisulphide, free from yellow and white Phosphorus	139	1343	Poisonous by inhalation liquid, n.o.s. (Inhalation Hazard Zone A)	151	3381
Phthalic anhydride	156	2214	Poisonous by inhalation liquid, n.o.s. (Inhalation Hazard Zone B)	151	3382
Picolines	129	2313	Poisonous by inhalation liquid, oxidising, n.o.s. (Inhalation Hazard Zone A)	142	3387
Picric acid, wetted with not less than 10% water	113	3364	Poisonous by inhalation liquid, oxidising, n.o.s. (Inhalation Hazard Zone B)	142	3388
Picric acid, wetted with not less than 30% water	113	1344	Poisonous by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone A)	155	3490
Picrite, wetted with not less than 20% water	113	1336	Poisonous by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone B)	155	3491
Picryl chloride, wetted with not less than 10% water	113	3365	Poisonous by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone A)	139	3385
alpha-Pinene	128	2368	Poisonous by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone B)	139	3386
Pinene (alpha)	128	2368			
Pine oil	129	1272			
Piperazine	153	2579			
Piperidine	132	2401			
Plastic molding compound	171	3314			
Plastics moulding compound	171	3314			
Plastics, nitrocellulose-based, self-heating, n.o.s.	135	2006			
Poisonous by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone A)	131	3492			
Poisonous by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone B)	131	3493			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Poisonous liquid, corrosive, inorganic, n.o.s.	154	3289	Polychlorinated biphenyls	171	2315
Poisonous liquid, corrosive, organic, n.o.s.	154	2927	Polychlorinated biphenyls, liquid	171	2315
Poisonous liquid, flammable, organic, n.o.s.	131	2929	Polychlorinated biphenyls, solid	171	3432
Poisonous liquid, inorganic, n.o.s.	151	3287	Polyester resin kit	128	3269
Poisonous liquid, organic, n.o.s.	153	2810	Polyester resin kit, liquid base material	128	3269
Poisonous liquid, oxidising, n.o.s.	142	3122	Polyester resin kit, solid base material	128P	3527
Poisonous liquid, water-reactive, n.o.s.	139	3123	Polyhalogenated biphenyls, liquid	171	3151
Poisonous solid, corrosive, inorganic, n.o.s.	154	3290	Polyhalogenated biphenyls, solid	171	3152
Poisonous solid, corrosive, organic, n.o.s.	154	2928	Polyhalogenated terphenyls, liquid	171	3151
Poisonous solid, flammable, organic, n.o.s.	134	2930	Polyhalogenated terphenyls, solid	171	3152
Poisonous solid, inorganic, n.o.s.	151	3288	Polymeric beads, expandable	171	2211
Poisonous solid, organic, n.o.s.	154	2811	Polymerizing substance, liquid, stabilised, n.o.s.	149P	3532
Poisonous solid, oxidising, n.o.s.	141	3086	Polymerizing substance, liquid, temperature controlled, n.o.s.	150P	3534
Poisonous solid, self-heating, n.o.s.	136	3124	Polymerizing substance, solid, stabilised, n.o.s.	149P	3531
Poisonous solid, water-reactive, n.o.s.	139	3125	Polymerizing substance, solid, temperature controlled, n.o.s.	150P	3533
Polyalkylamines, n.o.s.	132	2733	Polystyrene beads, expandable	171	2211
Polyalkylamines, n.o.s.	132	2734	Potassium	138	2257
Polyalkylamines, n.o.s.	153	2735	Potassium, metal	138	2257
Polyamines, flammable, corrosive, n.o.s.	132	2733	Potassium, metal alloys	138	1420
Polyamines, liquid, corrosive, flammable, n.o.s.	132	2734	Potassium, metal alloys, liquid	138	1420
Polyamines, liquid, corrosive, n.o.s.	153	2735	Potassium, metal alloys, solid	138	3403
Polyamines, solid, corrosive, n.o.s.	154	3259	Potassium arsenate	151	1677
			Potassium arsenite	154	1678
			Potassium borohydride	138	1870

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Potassium bromate	140	1484	Potassium peroxide	144	1491
Potassium chlorate	140	1485	Potassium persulphate	140	1492
Potassium chlorate, aqueous solution	140	2427	Potassium persulphate	140	1492
Potassium cuprocyanide	157	1679	Potassium phosphide	139	2012
Potassium cyanide	157	1680	Potassium silicofluoride	151	2655
Potassium cyanide, solid	157	1680	Potassium sodium alloys	138	1422
Potassium cyanide, solution	157	3413	Potassium sodium alloys, liquid	138	1422
Potassium dithionite	135	1929	Potassium sodium alloys, solid	138	3404
Potassium fluoride	154	1812	Potassium sulfide, anhydrous	135	1382
Potassium fluoride, solid	154	1812	Potassium sulfide, hydrated, with not less than 30% water of crystallization	153	1847
Potassium fluoride, solution	154	3422	Potassium sulfide, with less than 30% water of crystallization	135	1382
Potassium fluoroacetate	151	2628	Potassium sulphide, anhydrous	135	1382
Potassium fluorosilicate	151	2655	Potassium sulphide, hydrated, with not less than 30% water of crystallization	153	1847
Potassium hydrogendifluoride	154	1811	Potassium sulphide, with less than 30% water of crystallization	135	1382
Potassium hydrogen difluoride, solid	154	1811	Potassium superoxide	143	2466
Potassium hydrogen difluoride, solution	154	3421	Printing ink, flammable	129	1210
Potassium hydrogen sulfate	154	2509	Printing ink related material	129	1210
Potassium hydrogen sulphate	154	2509	Propadiene, stabilised	116P	2200
Potassium hydrosulfite	135	1929	Propadiene and Methylacetylene mixture, stabilised	116P	1060
Potassium hydrosulphite	135	1929	Propane	115	1075
Potassium hydroxide, solid	154	1813	Propane	115	1978
Potassium hydroxide, solution	154	1814	Propane-Ethane mixture, refrigerated liquid	115	1961
Potassium metavanadate	151	2864	Propanethiols	130	2402
Potassium monoxide	154	2033	n-Propanol	129	1274
Potassium nitrate	140	1486	Propionaldehyde	129P	1275
Potassium nitrate and Sodium nitrate mixture	140	1499	Propionic acid	153	1848
Potassium nitrate and Sodium nitrite mixture	140	1487			
Potassium nitrite	140	1488			
Potassium perchlorate	140	1489			
Potassium permanganate	140	1490			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Propionic acid, with not less than 10% and less than 90% acid	153	1848	Pyrethroid pesticide, liquid, flammable, toxic	131	3350
Propionic acid, with not less than 90% acid	153	3463	Pyrethroid pesticide, liquid, poisonous	151	3352
Propionic anhydride	156	2496	Pyrethroid pesticide, liquid, poisonous, flammable	131	3351
Propionitrile	131	2404	Pyrethroid pesticide, liquid, toxic	151	3352
Propionyl chloride	132	1815	Pyrethroid pesticide, liquid, toxic, flammable	131	3351
n-Propyl acetate	129	1276	Pyrethroid pesticide, solid, poisonous	151	3349
Propyl alcohol, normal	129	1274	Pyrethroid pesticide, solid, toxic	151	3349
Propylamine	132	1277	Pyridine	129	1282
n-Propyl benzene	128	2364	Pyrophoric alloy, n.o.s.	135	1383
Propyl chloride	129	1278	Pyrophoric liquid, inorganic, n.o.s.	135	3194
n-Propyl chloroformate	155	2740	Pyrophoric liquid, organic, n.o.s.	135	2845
Propylene	115	1075	Pyrophoric metal, n.o.s.	135	1383
Propylene	115	1077	Pyrophoric organometallic compound, water-reactive, n.o.s.	135	3203
Propylene, Ethylene and Acetylene in mixture, refrigerated liquid containing at least 71.5% Ethylene with not more than 22.5% Acetylene and not more than 6% Propylene	115	3138	Pyrophoric solid, inorganic, n.o.s.	135	3200
Propylene chlorohydrin	131	2611	Pyrophoric solid, organic, n.o.s.	135	2846
1,2-Propylenediamine	132	2258	Pyrosulfuryl chloride	137	1817
Propyleneimine, stabilised	131P	1921	Pyrosulphuryl chloride	137	1817
Propylene oxide	127P	1280	Pyrrolidine	132	1922
Propylene oxide and Ethylene oxide mixture, with not more than 30% Ethylene oxide	131P	2983	Quinoline	154	2656
Propylene tetramer	128	2850	Radioactive material, excepted package, articles manufactured from depleted Uranium	161	2909
Propyl formates	129	1281	Radioactive material, excepted package, articles manufactured from natural Thorium	161	2909
n-Propyl isocyanate	155P	2482			
n-Propyl nitrate	128	1865			
Propyltrichlorosilane	155	1816			
Pyrethroid pesticide, liquid, flammable, poisonous	131	3350			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Radioactive material, excepted package, articles manufactured from natural Uranium	161	2909	Radioactive material, transported under special arrangement, non fissile or fissile-excepted	163	2919
Radioactive material, excepted package, empty packaging	161	2908	Radioactive material, Type A package, fissile, non-special form	165	3327
Radioactive material, excepted package, instruments or articles	161	2911	Radioactive material, Type A package, non-special form, non fissile or fissile-excepted	163	2915
Radioactive material, excepted package, limited quantity of material	161	2910	Radioactive material, Type A package, special form, fissile	165	3333
Radioactive material, low specific activity (LSA-I), non fissile or fissile-excepted	162	2912	Radioactive material, Type A package, special form, non fissile or fissile-excepted	164	3332
Radioactive material, low specific activity (LSA-II), fissile	165	3324	Radioactive material, Type B(M) package, fissile	165	3329
Radioactive material, low specific activity (LSA-II), non fissile or fissile-excepted	162	3321	Radioactive material, Type B(M) package, non fissile or fissile-excepted	163	2917
Radioactive material, low specific activity (LSA-III), fissile	165	3325	Radioactive material, Type B(U) package, fissile	165	3328
Radioactive material, low specific activity (LSA-III), non fissile or fissile-excepted	162	3322	Radioactive material, Type B(U) package, non fissile or fissile-excepted	163	2916
Radioactive material, surface contaminated objects (SCO-I), fissile	165	3326	Radioactive material, Type C package, fissile	165	3330
Radioactive material, surface contaminated objects (SCO-I), non fissile or fissile-excepted	162	2913	Radioactive material, Type C package, non fissile or fissile-excepted	163	3323
Radioactive material, surface contaminated objects (SCO-II), fissile	165	3326	Radioactive material, Uranium hexafluoride, fissile	166	2977
Radioactive material, surface contaminated objects (SCO-II), non fissile or fissile-excepted	162	2913	Radioactive material, Uranium hexafluoride, non fissile or fissile-excepted	166	2978
Radioactive material, transported under special arrangement, fissile	165	3331	Rags, oily	133	1856
			Rare gases and Nitrogen mixture, compressed	120	1981
			Rare gases and Oxygen mixture, compressed	120	1980
			Rare gases mixture, compressed	120	1979

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Receptacles, small, containing gas	115	2037	Refrigerant gas R-227	126	3296
Red phosphorus	133	1338	Refrigerant gas R-404A	126	3337
Refrigerant gas, n.o.s.	126	1078	Refrigerant gas R-407A	126	3338
Refrigerant gases, n.o.s. (flammable)	115	1954	Refrigerant gas R-407B	126	3339
Refrigerant gas R-12	126	1028	Refrigerant gas R-407C	126	3340
Refrigerant gas R-12B1	126	1974	Refrigerant gas R-500	126	2602
Refrigerant gas R-12B2	171	1941	Refrigerant gas R-502	126	1973
Refrigerant gas R-13	126	1022	Refrigerant gas R-503	126	2599
Refrigerant gas R-13B1	126	1009	Refrigerant gas R-1113	119P	1082
Refrigerant gas R-14	126	1982	Refrigerant gas R-1132a	116P	1959
Refrigerant gas R-14, compressed	126	1982	Refrigerant gas R-1216	126	1858
Refrigerant gas R-21	126	1029	Refrigerant gas R-1318	126	2422
Refrigerant gas R-22	126	1018	Refrigerant gas RC-318	126	1976
Refrigerant gas R-23	126	1984	Refrigerating machines, containing Ammonia solutions (UN2672)	126	2857
Refrigerant gas R-32	115	3252	Refrigerating machines, containing flammable, non-poisonous, liquefied gas	115	3358
Refrigerant gas R-40	115	1063	Refrigerating machines, containing flammable, non-toxic, liquefied gas	115	3358
Refrigerant gas R-41	115	2454	Refrigerating machines, containing non-flammable, non-poisonous gases	126	2857
Refrigerant gas R-114	126	1958	Refrigerating machines, containing non-flammable, non-toxic gases	126	2857
Refrigerant gas R-115	126	1020	Regulated medical waste, n.o.s.	158	3291
Refrigerant gas R-116	126	2193	Resin solution	127	1866
Refrigerant gas R-116, compressed	126	2193	Resorcinol	153	2876
Refrigerant gas R-124	126	1021	Rosin oil	127	1286
Refrigerant gas R-125	126	3220	Rubber scrap, powdered or granulated	133	1345
Refrigerant gas R-133a	126	1983	Rubber shoddy, powdered or granulated	133	1345
Refrigerant gas R-134a	126	3159	Rubber solution	127	1287
Refrigerant gas R-142b	115	2517			
Refrigerant gas R-143a	115	2035			
Refrigerant gas R-152a	115	1030			
Refrigerant gas R-161	115	2453			
Refrigerant gas R-218	126	2424			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Rubidium	138	1423	Self-heating liquid, poisonous, inorganic, n.o.s.	136	3187
Rubidium hydroxide	154	2678	Self-heating liquid, poisonous, organic, n.o.s.	136	3184
Rubidium hydroxide, solid	154	2678	Self-heating liquid, toxic, inorganic, n.o.s.	136	3187
Rubidium hydroxide, solution	154	2677	Self-heating liquid, toxic, organic, n.o.s.	136	3184
Rubidium metal	138	1423	Self-heating solid, corrosive, inorganic, n.o.s.	136	3192
SA	119	2188	Self-heating solid, corrosive, organic, n.o.s.	136	3126
Safety devices	171	3268	Self-heating solid, inorganic, n.o.s.	135	3190
Sarin	153	2810	Self-heating solid, organic, n.o.s.	135	3088
Seat-belt pre-tensioners	171	3268	Self-heating solid, oxidising, n.o.s.	135	3127
Seed cake, with more than 1.5% oil and not more than 11% moisture	135	1386	Self-heating solid, poisonous, inorganic, n.o.s.	136	3191
Seed cake, with not more than 1.5% oil and not more than 11% moisture	135	2217	Self-heating solid, poisonous, organic, n.o.s.	136	3128
Selenates	151	2630	Self-heating solid, toxic, inorganic, n.o.s.	136	3191
Selenic acid	154	1905	Self-heating solid, toxic, organic, n.o.s.	136	3128
Selenites	151	2630	Self-reactive liquid type B	149	3221
Selenium compound, liquid, n.o.s.	151	3440	Self-reactive liquid type B, temperature controlled	150	3231
Selenium compound, n.o.s.	151	3283	Self-reactive liquid type C	149	3223
Selenium compound, solid, n.o.s.	151	3283	Self-reactive liquid type C, temperature controlled	150	3233
Selenium disulfide	153	2657	Self-reactive liquid type D	149	3225
Selenium disulphide	153	2657	Self-reactive liquid type D, temperature controlled	150	3235
Selenium hexafluoride	125	2194	Self-reactive liquid type E	149	3227
Selenium oxychloride	157	2879	Self-reactive liquid type E, temperature controlled	150	3237
Self-defense spray, non-pressurised	171	3334	Self-reactive liquid type F	149	3229
Self-heating liquid, corrosive, inorganic, n.o.s.	136	3188			
Self-heating liquid, corrosive, organic, n.o.s.	136	3185			
Self-heating liquid, inorganic, n.o.s.	135	3186			
Self-heating liquid, organic, n.o.s.	135	3183			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Self-reactive liquid type F, temperature controlled	150	3239	Soda lime, with more than 4% Sodium hydroxide	154	1907
Self-reactive solid type B	149	3222	Sodium	138	1428
Self-reactive solid type B, temperature controlled	150	3232	Sodium aluminate, solid	154	2812
Self-reactive solid type C	149	3224	Sodium aluminate, solution	154	1819
Self-reactive solid type C, temperature controlled	150	3234	Sodium aluminum hydride	138	2835
Self-reactive solid type D	149	3226	Sodium ammonium vanadate	154	2863
Self-reactive solid type D, temperature controlled	150	3236	Sodium arsanilate	154	2473
Self-reactive solid type E	149	3228	Sodium arsenate	151	1685
Self-reactive solid type E, temperature controlled	150	3238	Sodium arsenite, aqueous solution	154	1686
Self-reactive solid type F	149	3230	Sodium arsenite, solid	151	2027
Self-reactive solid type F, temperature controlled	150	3240	Sodium azide	153	1687
Shale oil	128	1288	Sodium, batteries containing	138	3292
Silane	116	2203	Sodium bisulfate, solution	154	2837
Silane, compressed	116	2203	Sodium bisulphate, solution	154	2837
Silicofluorides, n.o.s.	151	2856	Sodium borohydride	138	1426
Silicon powder, amorphous	170	1346	Sodium borohydride and Sodium hydroxide solution, with not more than 12% Sodium borohydride and not more than 40% Sodium hydroxide	157	3320
Silicon tetrachloride	157	1818	Sodium bromate	140	1494
Silicon tetrafluoride	125	1859	Sodium cacodylate	152	1688
Silicon tetrafluoride, adsorbed	173	3521	Sodium carbonate peroxyhydrate	140	3378
Silicon tetrafluoride, compressed	125	1859	Sodium chlorate	140	1495
Silver arsenite	151	1683	Sodium chlorate, aqueous solution	140	2428
Silver cyanide	151	1684	Sodium chlorite	143	1496
Silver nitrate	140	1493	Sodium chloroacetate	151	2659
Silver picrate, wetted with not less than 30% water	113	1347	Sodium cuprocyanide, solid	157	2316
Sludge acid	153	1906	Sodium cuprocyanide, solution	157	2317
Smokeless powder for small arms	133	3178	Sodium cyanide	157	1689
			Sodium cyanide, solid	157	1689

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Sodium cyanide, solution	157	3414	Sodium hydroxide, solution	154	1824
Sodium dichloroisocyanurate	140	2465	Sodium hypochlorite	154	1791
Sodium dichloro-s-triazinetriene	140	2465	Sodium methylate	138	1431
Sodium dinitro-o-cresolate, wetted with not less than 10% water	113	3369	Sodium methylate, dry	138	1431
Sodium dinitro-o-cresolate, wetted with not less than 15% water	113	1348	Sodium methylate, solution in alcohol	132	1289
Sodium dithionite	135	1384	Sodium monoxide	157	1825
Sodium fluoride	154	1690	Sodium nitrate	140	1498
Sodium fluoride, solid	154	1690	Sodium nitrate and Potassium nitrate mixture	140	1499
Sodium fluoride, solution	154	3415	Sodium nitrite	141	1500
Sodium fluoroacetate	151	2629	Sodium nitrite and Potassium nitrate mixture	140	1487
Sodium fluorosilicate	154	2674	Sodium pentachlorophenate	154	2567
Sodium hydride	138	1427	Sodium perborate monohydrate	140	3377
Sodium hydrogendifluoride	154	2439	Sodium perchlorate	140	1502
Sodium hydrosulfide, hydrated, with not less than 25% water of crystallization	154	2949	Sodium permanganate	140	1503
Sodium hydrosulfide, with less than 25% water of crystallization	135	2318	Sodium peroxide	144	1504
Sodium hydrosulfide, with not less than 25% water of crystallization	154	2949	Sodium peroxoborate, anhydrous	140	3247
Sodium hydrosulfite	135	1384	Sodium persulfate	140	1505
Sodium hydrosulphide, hydrated, with not less than 25% water of crystallization	154	2949	Sodium persulphate	140	1505
Sodium hydrosulphide, with less than 25% water of crystallization	135	2318	Sodium phosphide	139	1432
Sodium hydrosulphide, with not less than 25% water of crystallization	154	2949	Sodium picramate, wetted with not less than 20% water	113	1349
Sodium hydrosulphite	135	1384	Sodium potassium alloys	138	1422
Sodium hydroxide, solid	154	1823	Sodium potassium alloys, liquid	138	1422
			Sodium potassium alloys, solid	138	3404
			Sodium silicofluoride	154	2674
			Sodium sulfide, anhydrous	135	1385
			Sodium sulfide, hydrated, with not less than 30% water	153	1849
			Sodium sulfide, with less than 30% water of crystallization	135	1385
			Sodium sulphide, anhydrous	135	1385

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Sodium sulphide, hydrated, with not less than 30% water	153	1849	Substituted nitrophenol pesticide, liquid, poisonous, flammable	131	3013
Sodium sulphide, with less than 30% water of crystallization	135	1385	Substituted nitrophenol pesticide, liquid, toxic	153	3014
Sodium superoxide	143	2547	Substituted nitrophenol pesticide, liquid, toxic, flammable	131	3013
Solids containing corrosive liquid, n.o.s.	154	3244	Substituted nitrophenol pesticide, solid, poisonous	153	2779
Solids containing flammable liquid, n.o.s.	133	3175	Substituted nitrophenol pesticide, solid, toxic	153	2779
Solids containing poisonous liquid, n.o.s.	151	3243	Sulfamic acid	154	2967
Solids containing toxic liquid, n.o.s.	151	3243	Sulfur	133	1350
Soman	153	2810	Sulfur, molten	133	2448
Stannic chloride, anhydrous	137	1827	Sulfur chlorides	137	1828
Stannic chloride, pentahydrate	154	2440	Sulfur dioxide	125	1079
Stannic phosphides	139	1433	Sulfur hexafluoride	126	1080
Stibine	119	2676	Sulfuric acid	137	1830
Straw, wet, damp or contaminated with oil	133	1327	Sulfuric acid, fuming	137	1831
Strontium arsenite	151	1691	Sulfuric acid, fuming, with less than 30% free Sulfur trioxide	137	1831
Strontium chlorate	143	1506	Sulfuric acid, fuming, with not less than 30% free Sulfur trioxide	137	1831
Strontium nitrate	140	1507	Sulfuric acid, spent	137	1832
Strontium perchlorate	140	1508	Sulfuric acid, with more than 51% acid	137	1830
Strontium peroxide	143	1509	Sulfuric acid, with not more than 51% acid	157	2796
Strontium phosphide	139	2013	Sulfuric acid and Hydrofluoric acid mixture	157	1786
Strychnine	151	1692	Sulfurous acid	154	1833
Strychnine salts	151	1692	Sulfur tetrafluoride	125	2418
Styrene monomer, stabilised	128P	2055	Sulfur trioxide, stabilised	137	1829
Substituted nitrophenol pesticide, liquid, flammable, poisonous	131	2780	Sulfuryl chloride	137	1834
Substituted nitrophenol pesticide, liquid, flammable, toxic	131	2780	Sulfuryl fluoride	123	2191
Substituted nitrophenol pesticide, liquid, poisonous	153	3014	Sulphamic acid	154	2967

Name of Material	Guide No.	UN No.
Sulphur	133	1350
Sulphur, molten	133	2448
Sulphur chlorides	137	1828
Sulphur dioxide	125	1079
Sulphur hexafluoride	126	1080
Sulphuric acid	137	1830
Sulphuric acid, fuming	137	1831
Sulphuric acid, fuming, with less than 30% free Sulphur trioxide	137	1831
Sulphuric acid, fuming, with not less than 30% free Sulphur trioxide	137	1831
Sulphuric acid, spent	137	1832
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
Sulphur tetrafluoride	125	2418
Sulphur trioxide, stabilised	137	1829
Sulphuryl chloride	137	1834
Sulphuryl fluoride	123	2191
Tabun	153	2810
Tars, liquid	130	1999
Tear gas candles	159	1700
Tear gas devices	159	1693
Tear gas grenades	159	1700
Tear gas substance, liquid, n.o.s.	159	1693
Tear gas substance, solid, n.o.s.	159	1693
Tear gas substance, solid, n.o.s.	159	3448

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Tellurium compound, n.o.s.	151	3284
Tellurium hexafluoride	125	2195
Terpene hydrocarbons, n.o.s.	128	2319
Terpinolene	128	2541
Tetrabromoethane	159	2504
1,1,2,2-Tetrachloroethane	151	1702
Tetrachloroethane	151	1702
Tetrachloroethylene	160	1897
Tetraethyl dithiopyrophosphate	153	1704
Tetraethylenepentamine	153	2320
Tetraethyl silicate	129	1292
1,1,1,2-Tetrafluoroethane	126	3159
Tetrafluoroethane and Ethylene oxide mixture, with not more than 5.6% Ethylene oxide	126	3299
Tetrafluoroethylene, stabilised	116P	1081
Tetrafluoromethane	126	1982
Tetrafluoromethane, compressed	126	1982
1,2,3,6-Tetrahydrobenzaldehyde	129	2498
Tetrahydrofuran	127	2056
Tetrahydrofurfurylamine	129	2943
Tetrahydrophthalic anhydrides	156	2698
1,2,3,6-Tetrahydropyridine	129	2410
Tetrahydrothiophene	130	2412
Tetramethylammonium hydroxide	153	1835
Tetramethylammonium hydroxide, solid	153	3423
Tetramethylammonium hydroxide, solution	153	1835
Tetramethylsilane	130	2749
Tetranitromethane	143	1510
Tetrapropyl orthotitanate	128	2413
Textile waste, wet	133	1857

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Thallium chlorate	141	2573	Titanium powder, wetted with not less than 25% water	170	1352
Thallium compound, n.o.s.	151	1707	Titanium sponge granules	170	2878
Thallium nitrate	141	2727	Titanium sponge powders	170	2878
4-Thiapentanal	152	2785	Titanium tetrachloride	137	1838
Thickened GD	153	2810	Titanium trichloride, pyrophoric	135	2441
Thioacetic acid	129	2436	Titanium trichloride mixture	157	2869
Thiocarbamate pesticide, liquid, flammable, poisonous	131	2772	Titanium trichloride mixture, pyrophoric	135	2441
Thiocarbamate pesticide, liquid, flammable, toxic	131	2772	TNT, wetted with not less than 10% water	113	3366
Thiocarbamate pesticide, liquid, poisonous	151	3006	TNT, wetted with not less than 30% water	113	1356
Thiocarbamate pesticide, liquid, poisonous, flammable	131	3005	Toluene	130	1294
Thiocarbamate pesticide, liquid, toxic	151	3006	2,4-Toluenediamine, solid	151	1709
Thiocarbamate pesticide, liquid, toxic, flammable	131	3005	2,4-Toluenediamine, solution	151	3418
Thiocarbamate pesticide, solid, poisonous	151	2771	Toluene diisocyanate	156	2078
Thiocarbamate pesticide, solid, toxic	151	2771	Toluidines, liquid	153	1708
Thioglycol	153	2966	Toluidines, solid	153	1708
Thioglycolic acid	153	1940	Toluidines, solid	153	3451
Thiolactic acid	153	2936	2,4-Toluylenediamine	151	1709
Thionyl chloride	137	1836	2,4-Toluylenediamine, solid	151	1709
Thiophene	130	2414	2,4-Toluylenediamine, solution	151	3418
Thiophosgene	157	2474	Toxic by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone A)	131	3492
Thiophosphoryl chloride	157	1837	Toxic by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone B)	131	3493
Thiourea dioxide	135	3341	Toxic by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone A)	154	3389
Tinctures, medicinal	127	1293	Toxic by inhalation liquid, corrosive, n.o.s. (Inhalation Hazard Zone B)	154	3390
Tin tetrachloride	137	1827	Toxic by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	131	3488
Titanium disulfide	135	3174			
Titanium disulphide	135	3174			
Titanium hydride	170	1871			
Titanium powder, dry	135	2546			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Toxic by inhalation liquid, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	131	3489	Toxic liquid, water-reactive, n.o.s.	139	3123
Toxic by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone A)	131	3383	Toxic solid, corrosive, inorganic, n.o.s.	154	3290
Toxic by inhalation liquid, flammable, n.o.s. (Inhalation Hazard Zone B)	131	3384	Toxic solid, corrosive, organic, n.o.s.	154	2928
Toxic by inhalation liquid, n.o.s. (Inhalation Hazard Zone A)	151	3381	Toxic solid, flammable, organic, n.o.s.	134	2930
Toxic by inhalation liquid, n.o.s. (Inhalation Hazard Zone B)	151	3382	Toxic solid, inorganic, n.o.s.	151	3288
Toxic by inhalation liquid, oxidising, n.o.s. (Inhalation Hazard Zone A)	142	3387	Toxic solid, organic, n.o.s.	154	2811
Toxic by inhalation liquid, oxidising, n.o.s. (Inhalation Hazard Zone B)	142	3388	Toxic solid, oxidising, n.o.s.	141	3086
Toxic by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone A)	155	3490	Toxic solid, self-heating, n.o.s.	136	3124
Toxic by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone B)	155	3491	Toxic solid, water-reactive, n.o.s.	139	3125
Toxic by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone A)	139	3385	Toxins	153	—
Toxic by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone B)	139	3386	Toxins, extracted from living sources, liquid, n.o.s.	153	3172
Toxic liquid, corrosive, inorganic, n.o.s.	154	3289	Toxins, extracted from living sources, solid, n.o.s.	153	3172
Toxic liquid, corrosive, organic, n.o.s.	154	2927	Toxins, extracted from living sources, solid, n.o.s.	153	3462
Toxic liquid, flammable, organic, n.o.s.	131	2929	Triallylamine	132	2610
Toxic liquid, inorganic, n.o.s.	151	3287	Triallyl borate	156	2609
Toxic liquid, organic, n.o.s.	153	2810	Triazine pesticide, liquid, flammable, poisonous	131	2764
Toxic liquid, oxidising, n.o.s.	142	3122	Triazine pesticide, liquid, flammable, toxic	131	2764
			Triazine pesticide, liquid, poisonous	151	2998
			Triazine pesticide, liquid, poisonous, flammable	131	2997
			Triazine pesticide, liquid, toxic	151	2998
			Triazine pesticide, liquid, toxic, flammable	131	2997
			Triazine pesticide, solid, poisonous	151	2763
			Triazine pesticide, solid, toxic	151	2763
			Tributylamine	153	2542

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Tributylphosphane	135	3254	Trimethylamine, aqueous solution	132	1297
Trichloroacetic acid	153	1839	1,3,5-Trimethylbenzene	129	2325
Trichloroacetic acid, solution	153	2564	Trimethyl borate	129	2416
Trichloroacetyl chloride	156	2442	Trimethylchlorosilane	155	1298
Trichlorobenzenes, liquid	153	2321	Trimethylcyclohexylamine	153	2326
Trichlorobutene	152	2322	Trimethylhexamethylenediamines	153	2327
1,1,1-Trichloroethane	160	2831	Trimethylhexamethylene diisocyanate	156	2328
Trichloroethylene	160	1710	Trimethyl phosphite	130	2329
Trichloroisocyanuric acid, dry	140	2468	Trinitrobenzene, wetted with not less than 10% water	113	3367
Trichlorosilane	139	1295	Trinitrobenzene, wetted with not less than 30% water	113	1354
Tricresyl phosphate	151	2574	Trinitrobenzoic acid, wetted with not less than 10% water	113	3368
Triethylamine	132	1296	Trinitrobenzoic acid, wetted with not less than 30% water	113	1355
Triethylenetetramine	153	2259	Trinitrochlorobenzene, wetted with not less than 10% water	113	3365
Triethyl phosphite	130	2323	Trinitrophenol, wetted with not less than 10% water	113	3364
Trifluoroacetic acid	154	2699	Trinitrophenol, wetted with not less than 30% water	113	1344
Trifluoroacetyl chloride	125	3057	Trinitrotoluene, wetted with not less than 10% water	113	3366
Trifluorochloroethylene, stabilised	119P	1082	Trinitrotoluene, wetted with not less than 30% water	113	1356
1,1,1-Trifluoroethane	115	2035	Tripopylamine	132	2260
Trifluoromethane	126	1984	Tripopylene	128	2057
Trifluoromethane, refrigerated liquid	120	3136	Tris-(1-aziridinyl)phosphine oxide, solution	152	2501
Trifluoromethane and Chlorotrifluoromethane azeotropic mixture with approximately 60% Chlorotrifluoromethane	126	2599	Tungsten hexafluoride	125	2196
2-Trifluoromethylaniline	153	2942	Turpentine	128	1299
3-Trifluoromethylaniline	153	2948	Turpentine substitute	128	1300
Triisobutylene	128	2324	Undecane	128	2330
Triisopropyl borate	129	2616			
Trimethoxysilane	132	9269			
Trimethylacetyl chloride	131	2438			
Trimethylamine, anhydrous	118	1083			

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Uranium hexafluoride, radioactive material, excepted package, less than 0.1 kg per package, non-fissile or fissile-excepted	166	3507	Vinyl fluoride, stabilised	116P	1860
Uranium hexafluoride, radioactive material, fissile	166	2977	Vinylidene chloride, stabilised	130P	1303
Uranium hexafluoride, radioactive material, non fissile or fissile-excepted	166	2978	Vinyl isobutyl ether, stabilised	127P	1304
Urea hydrogen peroxide	140	1511	Vinyl methyl ether, stabilised	116P	1087
Urea nitrate, wetted with not less than 10% water	113	3370	Vinylpyridines, stabilised	131P	3073
Urea nitrate, wetted with not less than 20% water	113	1357	Vinyltoluenes, stabilised	130P	2618
Valeraldehyde	129	2058	Vinyltrichlorosilane	155P	1305
Valeryl chloride	132	2502	Vinyltrichlorosilane, stabilised	155P	1305
Vanadium compound, n.o.s.	151	3285	VX	153	2810
Vanadium oxytrichloride	137	2443	Water-reactive liquid, corrosive, n.o.s.	138	3129
Vanadium pentoxide	151	2862	Water-reactive liquid, n.o.s.	138	3148
Vanadium tetrachloride	137	2444	Water-reactive liquid, poisonous, n.o.s.	139	3130
Vanadium trichloride	157	2475	Water-reactive liquid, toxic, n.o.s.	139	3130
Vanadyl sulphate	151	2931	Water-reactive solid, corrosive, n.o.s.	138	3131
Vanadyl sulphate	151	2931	Water-reactive solid, flammable, n.o.s.	138	3132
Vehicle, flammable gas powered	115	3166	Water-reactive solid, n.o.s.	138	2813
Vehicle, flammable liquid powered	128	3166	Water-reactive solid, oxidising, n.o.s.	138	3133
Vehicle, fuel cell, flammable gas powered	115	3166	Water-reactive solid, poisonous, n.o.s.	139	3134
Vehicle, fuel cell, flammable liquid powered	128	3166	Water-reactive solid, self-heating, n.o.s.	138	3135
Vinyl acetate, stabilised	129P	1301	Water-reactive solid, toxic, n.o.s.	139	3134
Vinyl bromide, stabilised	116P	1085	Wheelchair, electric, with batteries	154	3171
Vinyl butyrate, stabilised	129P	2838	White asbestos	171	2590
Vinyl chloride, stabilised	116P	1086	White phosphorus, dry	136	1381
Vinyl chloroacetate	155	2589	White phosphorus, in solution	136	1381
Vinyl ethyl ether, stabilised	127P	1302	White phosphorus, molten	136	2447
			White phosphorus, under water	136	1381

Name of Material	Guide No.	UN No.	Name of Material	Guide No.	UN No.
Wood preservatives, liquid	129	1306	Zinc dross	138	1435
Wool waste, wet	133	1387	Zinc dust	138	1436
Xanthates	135	3342	Zinc fluorosilicate	151	2855
Xenon	120	2036	Zinc hydrosulfite	171	1931
Xenon, compressed	120	2036	Zinc hydrosulphite	171	1931
Xenon, refrigerated liquid (cryogenic liquid)	120	2591	Zinc nitrate	140	1514
Xylenes	130	1307	Zinc permanganate	140	1515
Xylenols	153	2261	Zinc peroxide	143	1516
Xylenols, liquid	153	3430	Zinc phosphide	139	1714
Xylenols, solid	153	2261	Zinc powder	138	1436
Xylidines, liquid	153	1711	Zinc residue	138	1435
Xylidines, solid	153	1711	Zinc resinate	133	2714
Xylidines, solid	153	3452	Zinc silicofluoride	151	2855
Xylyl bromide	152	1701	Zinc skimmings	138	1435
Xylyl bromide, liquid	152	1701	Zirconium, dry, coiled wire, finished metal sheets or strip	170	2858
Xylyl bromide, solid	152	3417	Zirconium, dry, finished sheets, strips or coiled wire	135	2009
Yellow phosphorus, dry	136	1381	Zirconium hydride	138	1437
Yellow phosphorus, in solution	136	1381	Zirconium nitrate	140	2728
Yellow phosphorus, under water	136	1381	Zirconium picramate, wetted with not less than 20% water	113	1517
Zinc ammonium nitrite	140	1512	Zirconium powder, dry	135	2008
Zinc arsenate	151	1712	Zirconium powder, wetted with not less than 25% water	170	1358
Zinc arsenate and Zinc arsenite mixture	151	1712	Zirconium scrap	135	1932
Zinc arsenite	151	1712	Zirconium suspended in a flammable liquid	170	1308
Zinc arsenite and Zinc arsenate mixture	151	1712	Zirconium suspended in a liquid (flammable)	170	1308
Zinc ashes	138	1435	Zirconium tetrachloride	137	2503
Zinc bromate	140	2469			
Zinc chlorate	140	1513			
Zinc chloride, anhydrous	154	2331			
Zinc chloride, solution	154	1840			
Zinc cyanide	151	1713			
Zinc dithionite	171	1931			

NOTES

NOTES

GUIDES

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

HOW TO USE THE ORANGE GUIDES

1	GUIDE 117 GASES - TOXIC - FLAMMABLE (EXTREME HAZARD)	GASES - TOXIC - FLAMMABLE (EXTREME HAZARD) GUIDE 117	4
2	POTENTIAL HAZARDS HEALTH <ul style="list-style-type: none">• TOXIC: Extremely Hazardous.<ul style="list-style-type: none">• May be fatal if inhaled or absorbed through skin.• Initial odor may be irritating or foul and may deaden your sense of smell.• Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.• Fire will produce irritating, corrosive and/or toxic gases.• Runoff from fire control or dilution water may cause environmental contamination. FIRE OR EXPLOSION <ul style="list-style-type: none">• These materials are extremely flammable.• May form explosive mixtures with air.• May be ignited by heat, sparks or flames.• Vapors from liquefied gas are initially heavier than air and spread along ground.• Vapors may travel to source of ignition and flash back.• Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.• Runoff may create fire or explosion hazard.• Cylinders exposed to fire may vent and release toxic and flammable gas through pressure relief devices.• Containers may explode when heated.• Ruptured cylinders may rocket. PUBLIC SAFETY <ul style="list-style-type: none">• CALL 911. Then call emergency response telephone number on shipping paper. If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.• Keep unauthorized personnel away.• Stay upwind, uphill and/or upstream.• Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).• Ventilate closed spaces before entering, but only if properly trained and equipped. PROTECTIVE CLOTHING <ul style="list-style-type: none">• Wear positive pressure self-contained breathing apparatus (SCBA).• Wear chemical protective clothing that is specifically recommended by the manufacturer when there is NO RISK OF FIRE.• Structural firefighters' protective clothing provides thermal protection but only limited chemical protection. EVACUATION Immediate precautionary measure <ul style="list-style-type: none">• Isolate spill or leak area for at least 100 metres (330 feet) in all directions. Spill <ul style="list-style-type: none">• See Table 1 - Initial Isolation and Protective Action Distances. Fire <ul style="list-style-type: none">• If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 metres (1 mile) in all directions; also, consider initial evacuation for 1600 metres (1 mile) in all directions.	EMERGENCY RESPONSE FIRE: DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED. Small Fire <ul style="list-style-type: none">• Dry chemical, CO₂, water spray or regular foam. Large Fire <ul style="list-style-type: none">• Water spray, fog or regular foam.• If it can be done safely, move undamaged containers away from the area around the fire.• Damaged cylinders should be handled only by specialists. Fire Involving Tanks <ul style="list-style-type: none">• Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.• Cool containers with flooding quantities of water until well after fire is out.• Do not direct water at source of leak or safety devices; icing may occur.• Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.• ALWAYS stay away from tanks engulfed in fire. SPILL OR LEAK <ul style="list-style-type: none">• ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.• All equipment used when handling the product must be grounded.• Do not touch or walk through spilled material.• Stop leak if you can do it without risk.• Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.• Do not direct water at spill or source of leak.• If possible, turn leaking containers so that gas escapes rather than liquid.• Prevent entry into waterways, sewers, basements or confined areas.• Isolate area until gas has dispersed.• Consider igniting spill or leak to eliminate toxic gas concerns. FIRST AID <ul style="list-style-type: none">• Call 911 or emergency medical service.• Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.• Move victim to fresh air if it can be done safely.• Give artificial respiration if victim is not breathing.• Do not perform mouth-to-mouth resuscitation if victim ingested or inhaled the substance; wash face and mouth before giving artificial respiration. Use a pocket mask equipped with a one-way valve or other proper respiratory medical device.• Administer oxygen if breathing is difficult.• Remove and isolate contaminated clothing and shoes.• In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.• In case of contact with liquefied gas, thaw frostbitten parts with lukewarm water.• In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.• Keep victim calm and warm.• Keep victim under observation.• Effects of contact or inhalation may be delayed.	

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1

GUIDE NUMBER AND TITLE

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

2

POTENTIAL HAZARDS

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

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

3

PUBLIC SAFETY

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

4

EMERGENCY RESPONSE

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

GUIDE 00

Vehicle Fire

INHALED

- If overcome by smoke or fumes, remove victim to fresh air #.
- Apply resuscitation if victim is not breathing. Administer oxygen if breathing is difficult.
- Keep victim warm and quiet.
- Obtain immediate medical care

EYES

- Hold eyelids open and flush with clean, running water (if available) for at least 15 minutes.
- Remove any contact lenses.
- Obtain immediate medical care.

FIRE BURNS

- Immerse or flood affected area with cold water for at least 15 minutes.
- Bandage lightly with sterile dressing.
- Treat for shock if necessary.
- Do not forcibly separate skin from any adhering material.
- Obtain immediate medical care.

EMERGENCY RESPONSE

ENGINE FIRE

- Shut off engine and any electrical equipment and leave 'off'.
- Use fire extinguisher provided in the vehicle.
- Inject the contents through any available opening, without raising the bonnet if possible.
- If necessary, extinguish blaze with sand, earth, or large amounts of water.
- If unable to control fire, evacuate the immediate area and keep upwind.
- Contact police and local fire brigade. Tell them location and condition of vehicle and any damage observed. Advise of dangerous goods in load.
- Warn other traffic.

CABIN FIRE

- Shut off engine and any electrical equipment and leave 'off'.
- If safe to do so, remove burning materials.
- Beware of toxic fumes from burning upholstery.
- Use fire extinguisher provided in the vehicle.
- If necessary, extinguish blaze with sand, earth or large amounts of water.
- If unable to control fire, evacuate the immediate area and keep upwind.
- Contact police and local fire brigade. Tell them location and condition of vehicle and any damage observed. Advise of dangerous goods in load.
- Warn other traffic.

EMERGENCY RESPONSE

CARGO FIRE

- Shut off engine and any electrical equipment and leave 'off.
- Where the cargo requires special procedures, refer to the HAZCHEM code on the EIP or SDS for the substances involved
- Use personal protective equipment (PPE) on vehicle.
- Use fire extinguisher provided with the vehicle.
- If necessary, extinguish blaze with sand, earth or (if HAZCHEM code permits) large amounts of water.
- If safe to do so, remove burning materials from cargo or remove other materials from area of fire. If no, keep good cool by spraying with water.
- If unable to control fire, evacuate the immediate area and keep upwind.
- Contact police and local fire brigade. Tell them location material, quantity, UN Number and emergency contact, as well as condition of vehicle and any damage observed.
- Warn other traffic.

TYRE FIRE

- Stop vehicle. Assess fire and its extent in relations to load and hazards.
- Use fire extinguisher provided in the vehicle. consider flooding the tyre with water if available.
- If possible change tyre and place it at least 15 metres from the vehicle, in an area free from combustible material; the tyre could re-ignite
- **If fire cannot be put out or tyre cannot be removed:**
- If tyre is on prime mover, and if safe to do so, consider dropping the trailer and carefully driving the prime mover to a nearby safe location.
- Consider driving again, carefully, until burning rubber is thrown off.
- If fire persists after the above measures have been taken:
- If unable to control fire, evacuate the immediate area and keep upwind.
- Contact police and local fire brigade. Tell them location and condition of vehicle and any damage observed. Advise of dangerous goods in load.
- Warn other traffic.

BRAKE OVERHEATING

- Stop vehicle. Assess fire and its extent in relations to load and hazards. Allow brake to cool.
Only use extinguisher or water if there is a fire or immediate danger of fire
Do not drive the vehicle until the braking system has been inspected by a competent person and, if necessary, repaired.
- **If an uncontrolled fire develops:**
- Evacuate the immediate area and keep upwind.
- Contact police and local fire brigade. Tell them location and condition of vehicle and any damage observed. Advise of dangerous goods in load.
- Warn other traffic.

GUIDE Mixed Load/Unidentified Cargo

111

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.
- Vapours 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 Transport Document first. If Transport Document 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 metres (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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

CAUTION: Material may react with extinguishing agent.

Small Fire

- Dry chemical, CO₂, 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 discolouration 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 vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Explosives* - Division 1.1, 1.2, 1.3 or 1.5

112

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- MAY EXPLODE AND THROW FRAGMENTS 1600 METRES (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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- Isolate spill or leak area immediately for at least 500 metres (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 provide thermal protection, but provides on limited chemical protection

EVACUATION

Immediate Precautionary measure

Large Spill

- Consider initial EVACUATION for 800 metres (1/2 mile) in all directions.

Fire

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

* 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 metres (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 CO₂, 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 METRES (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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 113

Flammable Solids - Toxic (Wet/Desensitised Explosive)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

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

HEALTH

- Some are toxic and may be fatal if inhaled, swallowed or absorbed through skin. Specifically, Dinitrophenol wetted (UN1320) sodium dinitro-o-cresolate, wetted (UN1348) and Barium Azide, wetted (UN1571) are known to be toxic.
- Contact may cause burns to skin and eyes.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- CALL EMERGENCY RESPONSE Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- Isolate spill or leak area immediately for at least 100 metres (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 provide thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

Large Spill

- Consider initial EVACUATION for 500 metres (1/3 mile) in all directions.

Fire

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

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 metres (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 CO₂, 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Explosives* - Division 1.4 or 1.6

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POTENTIAL HAZARDS

FIRE OR EXPLOSION

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

HEALTH

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

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE** Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- Move people out of line of sight of the scene and away from windows.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

PROTECTIVE CLOTHING

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

EVACUATION

Immediate precautionary measure

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

Large Spill

- **Consider initial EVACUATION for 250 metres (800 feet) in all directions.**

Fire

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

* For information on "Compatibility Group" Letters, refer to the **Glossary** section.

EMERGENCY RESPONSE

FIRE

CARGO Fire

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

TYRE or VEHICLE Fire

- Use plenty of water - FLOOD it! If water is not available, use CO₂, 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.
- If fire cannot be prevented from involving cargo, treat cargo fire and evacuate in all directions for at least 800 metres (1/2 mile) in all directions and let burn.
- Pay special attention to tyre fires as re-ignition may occur. Stand by, at a safe distance, with extinguisher ready for possible re-ignition.

CLASS 1.4S Fire

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

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames 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 METRES (330 FEET) OF ELECTRIC DETONATORS.
- **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

FIRST AID

- Call 000 (Australia) or 111 (New Zealand) or emergency medical service.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air if it can be done safely.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.

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 metres (50 feet) in all directions. Fight fire with normal precautions from a reasonable distance.

GUIDE 115

Gases - Flammable (Including Refrigerated Liquids)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- **EXTREMELY FLAMMABLE**

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

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

- Vapours 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

- Vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 100 metres (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 provides thermal protection but provides only limited chemical protection.
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

EVACUATION

Immediate precautionary measure

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

Large Spill

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

Fire

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

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. Use an alternate method of detection (thermal camera, broom handle, etc.)

Small Fire

- Dry chemical or CO₂.

Large Fire

- Water spray or fog.
- Move containers from fire area if you can do it without risk.
- CAUTION: For LNG - Liquefied natural gas (UN1972) pool fires, DO NOT USE water. Use dry chemical or high-expansion foam.

Fire involving Tanks

- Fight fire from maximum distance or use unmanned 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 discolouration 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 vapours or divert vapour cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- CAUTION: For LNG - Liquefied natural gas (UN1972), DO NOT apply water, regular or alcohol-resistant foam directly on spill. Use high-expansion foam if available to reduce vapors.
- Prevent spreading of vapours 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Gases - Flammable (Unstable)

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POTENTIAL HAZARDS

FIRE OR EXPLOSION

- EXTREMELY FLAMMABLE.
- Will be easily ignited by heat, sparks or flames.
- Will form explosive mixtures with air. Acetylene (UN1001, UN3374) may react explosively even in the absence of air.
- Silane (UN2203) will ignite spontaneously in air.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Vapours from liquefied gas are initially heavier than air and spread along ground.
- Vapours 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

- Vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 100 metres (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 provide thermal protection, but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

Large Spill

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

Fire

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

EMERGENCY RESPONSE

FIRE

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

Small Fire

- Dry chemical or CO₂.

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 discolouration 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 vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 117

Gases - Toxic - Flammable (Extreme Hazard)

POTENTIAL HAZARDS

HEALTH

- TOXIC; Extremely Hazardous.
- May be fatal if inhaled or absorbed through skin.
- Initial odour 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.
- Vapours from liquefied gas are initially heavier than air and spread along ground.
- Vapours may travel to source of ignition and flash back.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Runoff may create fire or explosion hazard.
- Cylinders exposed to fire may vent and release toxic and flammable gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

PUBLIC SAFETY

- CALL EMERGENCY RESPONSE Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 100 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres (1 mile) in all directions; also, consider initial evacuation for 1600 metres (1 mile) in all directions.

EMERGENCY RESPONSE

FIRE

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

Small Fire

- Dry chemical, CO₂, 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 discolouration 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, vapour-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 vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Gases - Flammable - Corrosive

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POTENTIAL HAZARDS

FIRE OR EXPLOSION

- EXTREMELY FLAMMABLE.
- May be ignited by heat, sparks or flames.
- May form explosive mixtures with air.
- Vapours from liquefied gas are initially heavier than air and spread along ground.
- Vapours 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.
- Vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 100 metres (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 where there is no risk of fire. 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

Immediate precautionary measure

Large Spill

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

Fire

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

EMERGENCY RESPONSE

FIRE

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

Small Fire

- Dry chemical or CO₂.

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 discolouration 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, vapour-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 vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Gases - Toxic - Flammable

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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. Ethylene oxide (UN 1040) may react explosively even in the absence of air.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Vapours from liquefied gas are initially heavier than air and spread along ground.
- Vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 100 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

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

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 metres (1 mile) in all directions; also, consider initial evacuation for 1600 metres (1 mile) in all directions.

EMERGENCY RESPONSE

FIRE

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

Small Fire

- Dry chemical, CO₂, 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 discolouration 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, vapour-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 vapours or divert vapour cloud drift. Avoid allowing water runoff to contact spilled material.
- FOR CHLOROSILANES, use AFFF alcohol-resistant medium-expansion foam to reduce vapours.
- 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 120

Gases - Inert (Including Refrigerated Liquids)

POTENTIAL HAZARDS

HEALTH

- Vapours may cause dizziness or asphyxiation without warning.
- Vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 100 metres (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 provide thermal protection but provides only limited chemical protection.
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids or solids.

EVACUATION

Immediate precautionary measure

Large Spill

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

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (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 discolouration 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 vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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.

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There are no materials that refer to this guide.

GUIDE 122

Gases - Oxidising (Including Refrigerated Liquids)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Substance does not burn but will support combustion.
- Some may react explosively with fuels.
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- Vapours 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

- Vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 100 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

Large Spill

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

Fire

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

EMERGENCY RESPONSE

FIRE

- Use extinguishing agent suitable for type of surrounding fire.

Small Fire

- Dry chemical or CO₂.

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 discolouration 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 vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Gases - Toxic and/or Corrosive

123

POTENTIAL HAZARDS

HEALTH

- TOXIC; may be fatal if inhaled or absorbed through skin.
- Vapours 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.
- Vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 100 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical or CO₂.

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 discolouration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- Fully encapsulating, vapour-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 vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Gases - Toxic and/or Corrosive - Oxidising

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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.
- Vapours from liquefied gas are initially heavier than air and spread along ground.
- These are strong oxidisers 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service. As an immediate precautionary measure, isolate spill or leak area for at least 100 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

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, CO₂ 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 discolouration 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, vapour-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 vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Gases - Corrosive

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POTENTIAL HAZARDS

HEALTH

- TOXIC; may be fatal if inhaled, ingested or absorbed through skin.
- Vapours 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.
- Vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 100 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres (1 mile) in all directions; also, consider initial evacuation for 1600 metres (1 mile) in all directions.

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical or CO₂.

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 discolouration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- Fully encapsulating, vapour-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 vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 126

Gases - Compressed or Liquefied (Including Refrigerant Gases)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Some may burn but none ignite readily.
- Containers may explode when heated.
- Ruptured cylinders may rocket.
- Caution: aerosols (UN1950) may contain a flammable propellant.

HEALTH

- Vapours may cause dizziness or asphyxiation without warning.
- Vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 100 metres (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 when there is no risk of fire. It may provide little or no thermal protection.
- Structural firefighters' protective clothing will provide thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

Large Spill

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

Fire

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

EMERGENCY RESPONSE

FIRE

- Use extinguishing agent suitable for type of surrounding fire.

Small Fire

- Dry chemical or CO₂.

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 discolouration 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 vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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.
- Vapours may form explosive mixtures with air.
- Vapours may travel to source of ignition and flash back.
- Most vapours are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapour 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.
- Vapours may cause dizziness or suffocation.
- Runoff from fire control may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE** Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 50 metres (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 thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

Large Spill

- Consider initial downwind evacuation for at least 300 metres (1000 feet).

Fire

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

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.

CAUTION: Ethanol (UN1170) can burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)

Small Fire

- Dry chemical, CO₂, 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 discolouration 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 vapour-suppressing foam may be used to reduce vapours.
- 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 vapour, 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 128

Flammable Liquids (Water-Immiscible)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE:** Will be easily ignited by heat, sparks or flames.
- Vapours may form explosive mixtures with air.
- Vapours may travel to source of ignition and flash back.
- Most vapours are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapour 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

- **CAUTION:** Petroleum crude oil (UN1267) may contain TOXIC hydrogen sulphide gas.
- Inhalation or contact with material may irritate or burn skin and eyes.
- Fire may produce irritating, corrosive and/or toxic gases.
- Vapours may cause dizziness or suffocation.
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE** Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 50 metres (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 provide thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

Large Spill

- Consider initial downwind evacuation for at least 300 metres (1000 feet).

Fire

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

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, CO₂, 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 discolouration 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 vapour-suppressing foam may be used to reduce vapours.
- 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 vapour, 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 129

Flammable Liquids (Water-Miscible/Noxious)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE:** Will be easily ignited by heat, sparks or flames.
- Vapours may form explosive mixtures with air.
- Vapours may travel to source of ignition and flash back.
- Most vapours are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapour 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.
- Vapours may cause dizziness or suffocation.
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE** Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 50 metres (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 provide thermal protection but provides only limited chemical protection.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 300 metres (1000 feet).

Fire

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

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, CO₂, 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 discolouration 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 vapour-suppressing foam may be used to reduce vapours.
- 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 vapour, 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 130

Flammable Liquids (Water-Immiscible/Noxious)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE:** Will be easily ignited by heat, sparks or flames.
- Vapours may form explosive mixtures with air.
- Vapours may travel to source of ignition and flash back.
- Most vapours are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapour 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.
- Vapours may cause dizziness or suffocation.
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- **CALL EMERGENCY RESPONSE** Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service. As an immediate precautionary measure, isolate spill or leak area for at least 50 metres (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 provide thermal protection but provides only limited chemical protection.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 300 metres (1000 feet).

Fire

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

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, CO₂, 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 discolouration 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 vapour-suppressing foam may be used to reduce vapours.
- 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 vapour, 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Flammable Liquids - Toxic

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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.
- Vapours 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.
- Vapours may form explosive mixtures with air.
- Vapours may travel to source of ignition and flash back.
- Most vapours are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapour 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 50 metres (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

Immediate precautionary measure

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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

CAUTION: All these products have a very low flash point. Use of water spray when fighting fire may be inefficient. CAUTION: Methanol (UN1230) will burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)

Small Fire

- Dry chemical, CO₂, 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 discolouration 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, vapour-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 vapour-suppressing foam may be used to reduce vapours.

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 vapour, 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Flammable Liquids - Corrosive

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POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Flammable/combustible material.
- May be ignited by heat, sparks or flames.
- Vapours may form explosive mixtures with air.
- Vapours may travel to source of ignition and flash back.
- Most vapours are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapour 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.
- Vapours may cause dizziness or suffocation.
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- CALL EMERGENCY RESPONSE Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 50 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

- Some of these materials may react violently with water.

Small Fire

- Dry chemical, CO₂, 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 discolouration 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, vapour-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 vapour-suppressing foam may be used to reduce vapours.
- 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 vapour, 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Flammable Solids

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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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 25 metres (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 provide thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

Large Spill

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

Fire

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

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂, 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 discolouration 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Flammable Solids - Toxic and/or Corrosive

134

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Flammable/combustible material.
- May be ignited by heat, sparks or flames.
- When heated, vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 25 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

Large Spill

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

Fire

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

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂, 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 discolouration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- Fully encapsulating, vapour-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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Substances - Spontaneously Combustible

135

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Flammable/combustible material.
- May ignite on contact with moist air or moisture.
- May burn rapidly with flare-burning effect.
- Some react vigorously or explosively on contact with water.
- Some may decompose explosively when heated or involved in a fire.
- May re-ignite after fire is extinguished.
- Runoff may create fire or explosion hazard.
- Containers may explode when heated.

HEALTH

- Fire will produce irritating, corrosive and/or toxic gases.
- Inhalation of decomposition products may cause severe injury or death.
- Contact with substance may cause severe burns to skin and eyes.
- Runoff from fire control may cause pollution.
- **CAUTION: Pentaborane (UN1380) is highly toxic and may be fatal if inhaled, ingested or absorbed through skin.**

PUBLIC SAFETY

- CALL EMERGENCY RESPONSE Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 provide thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

- DO NOT USE WATER, CO₂ OR FOAM ON MATERIAL ITSELF.
- Some of these materials may react violently with water.

CAUTION: For Xanthates, UN3342 and for Dithionite (Hydrosulfite/Hydrosulphite) UN1384, UN1923 and UN1929, USE FLOODING AMOUNTS OF WATER for SMALL AND LARGE fires to stop the reaction. Smothering will not work for these materials, they do not need air to burn.

Small Fire

- Dry chemical, soda ash, lime or DRY sand, EXCEPT for UN1384, UN1923, UN1929 and UN3342.

Large Fire

- DRY sand, dry chemical, soda ash or lime EXCEPT for UN1384, UN1923, UN1929 and UN3342, or withdraw from area and let fire burn.
- CAUTION: UN3342 when flooded with water will continue to evolve flammable Carbon disulfide/Carbon disulphide vapours.
- 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 discolouration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- Fully encapsulating, vapour-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

CAUTION: For spills of Xanthates, UN3342 and for Dithionite (Hydrosulfite/Hydrosulphite), UN1384, UN1923 and UN1929, dissolve in 5 parts water and collect for proper disposal.

- CAUTION: UN3342 when flooded with water will continue to evolve flammable Carbon disulfide/Carbon disulphide vapours.
- 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 136 Substances - Spontaneously Combustible - Toxic and/or Corrosive (Air-Reactive)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Extremely flammable; will ignite itself if exposed to air.
- Burns rapidly, releasing dense, white, irritating fumes.
- Substance may be transported in a molten form.
- May re-ignite after fire is extinguished.
- Corrosive substances in contact with metals may produce flammable hydrogen gas.
- Containers may explode when heated.

HEALTH

- Fire will produce irritating, corrosive and/or toxic gases.
- TOXIC; ingestion of substance or inhalation of decomposition products will cause severe injury or death.
- Contact with substance may cause severe burns to skin and eyes.
- Some effects may be experienced due to skin absorption.
- Runoff from fire control may be corrosive and/or toxic and cause pollution.

PUBLIC SAFETY

- CALL EMERGENCY RESPONSE Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

Spill

- Consider initial downwind evacuation for at least 300 metres (1000 feet).

Fire

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

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 discolouration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- Fully encapsulating, vapour-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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Substances - Water-Reactive - Corrosive

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POTENTIAL HAZARDS

HEALTH

- CORROSIVE and/or TOXIC; inhalation, ingestion or contact (skin, eyes) with vapours, 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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

Immediate precautionary measure

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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

- When material is not involved in fire, do not use water on material itself.

Small Fire

- Dry chemical or CO₂.
- 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 vapours with water fog. If insufficient water supply: knock down vapours 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 discolouration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- Fully encapsulating, vapour-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 vapours; 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 138 Substances - Water-Reactive (Emitting Flammable Gases)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Produce flammable gases on contact with water.
- May ignite on contact with water or moist air.
- Some react vigorously or explosively on contact with water.
- May be ignited by heat, sparks or flames.
- May re-ignite after fire is extinguished.
- Some are transported in highly flammable liquids.
- Runoff may create fire or explosion hazard.

HEALTH

- Inhalation or contact with vapours, 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

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 discolouration 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 vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 139

Substances - Water-Reactive (Emitting Flammable And Toxic Gases)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Produce flammable and toxic gases on contact with water.
- May ignite on contact with water or moist air.
- Some react vigorously or explosively on contact with water.
- May be ignited by heat, sparks or flames.
- May re-ignite after fire is extinguished.
- Some are transported in highly flammable liquids.
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

HEALTH

- Highly toxic: contact with water produces toxic gas, may be fatal if inhaled.
- Inhalation or contact with vapours, 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

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 discolouration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- Fully encapsulating, vapour-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 vapours or divert vapour cloud drift. Avoid allowing water runoff to contact spilled material.
- FOR CHLOROSILANES, use AFFF alcohol-resistant medium-expansion foam to reduce vapours.

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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Oxidisers

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POTENTIAL HAZARDS

FIRE OR EXPLOSION

CAUTION: Ammonium Nitrate may explode if involved in fire or contaminated with hydrocarbons (fuels), organic matter, other contaminants or when hot molten and contained; Treat as an explosive (GUIDE 112).

- 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 vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. It may provide little or no thermal protection.
- Structural firefighters protective clothing will provide thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

Large Spill

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

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.
- **If ammonium nitrate** is in a tank, rail car or tank truck and involved in a fire, ISOLATE for 1600 metres (1 mile) in all directions also, initiate evacuation including emergency responders for 1600 metres (1 mile) in all directions.

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

- Consider initial evacuation in all directions for at least 500 metres (1/3 mile).
- Use water. Do not use carbon dioxide, dry chemicals or foam.
- If not sure about size of fire, treat as large fire.
- If safe to do so from a protected position or use unmanned monitors apply FLOODING quantities of water.
- Allow fire to burn out and containers to cool.

Large Fire or Fire involving transport containers

- Do not fight cargo fire involving Ammonium Nitrate - Withdraw, evacuate and isolate area for at least 1600 metres (1 mile). Treat as an explosive (GUIDE 112)
- If unable to control truck fire, or fire cannot be prevented from involving Ammonium Nitrate, treat as cargo fire involving Ammonium Nitrate.
- Do not enter area for 24 hours or until expert advice has been provided.
- Do not move cargo or vehicle if cargo has been exposed to heat.

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 000 (Australia) or 111 (New Zealand) 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. It may provide little or no thermal protection.
- Structural firefighters protective clothing will provide thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

Large Spill

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

Fire

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

EMERGENCY RESPONSE

FIRE

Small Fire

- Use water. Do not use dry chemicals or foams. CO₂ 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 000 (Australia) or 111 (New Zealand) 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 Oxidisers - Toxic (Liquid)

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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 vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 50 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

Small Fire

- Use water. Do not use dry chemicals or foams. CO₂ 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, vapour-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 vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Oxidisers (Unstable)

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POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Caution oxidisers (such as chlorites, chlorates and perchlorates) may explode if involved in fire or contaminated with hydrocarbons, (fuels), organic matter, other contaminants or when hot, molten and contained. Treat as an explosive (Guide 112).
- 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.).
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

HEALTH

- TOXIC; inhalation, ingestion or contact (skin, eyes) with vapours, 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. 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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

Small Fire

- Consider initial evacuation in all directions for at least 500 metres (1/3 mile).
- Use water. Do not use carbon dioxide, dry chemicals or foam.
- If not sure about size of fire, treat as large fire.
- If safe to do so from a protected position or use unmanned monitors apply FLOODING quantities of water.
- Allow fire to burn out and containers to cool.

Large Fire

- Do not fight cargo fire involving the product - Withdraw, evacuate and isolate area for at least 1600 metres (1 mile). Treat as an explosive (GUIDE 112).
- If unable to control truck fire, or fire cannot be prevented from involving the product, treat as cargo fire involving the product.
- Do not enter area for 24 hours or until expert advice has been provided.
- Do not get water inside containers: a violent reaction may occur.

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 vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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 Oxidisers (Water-Reactive)

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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 vapour, 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

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 discolouration 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 vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 145

Organic Peroxides (Heat and Contamination Sensitive)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- May explode from heat or contamination.
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- May be ignited by heat, sparks or flames.
- May burn rapidly with flare-burning effect.
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

HEALTH

- Fire may produce irritating, corrosive and/or toxic gases.
- Ingestion or contact (skin, eyes) with substance may cause severe injury or burns.
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- CALL EMERGENCY RESPONSE Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. It may provide little or no thermal protection.
- Structural firefighters protective clothing will provide thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

Large Spill

- Consider initial evacuation for at least 250 metres (800 feet) in all directions.

Fire

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

EMERGENCY RESPONSE

FIRE

Small Fire

- Water spray or fog is preferred; if water not available use dry chemical, CO₂ 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 146

Organic Peroxides (Heat, Contamination and Friction Sensitive)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- May explode from heat, shock, friction or contamination.
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- May be ignited by heat, sparks or flames.
- May burn rapidly with flare-burning effect.
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

HEALTH

- Fire may produce irritating, corrosive and/or toxic gases.
- Ingestion or contact (skin, eyes) with substance may cause severe injury or burns.
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- CALL EMERGENCY RESPONSE Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. It may provide little or no thermal protection.
- Structural firefighters protective clothing will provide thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

Large Spill

- Consider initial evacuation for at least 250 metres (800 feet) in all directions.

Fire

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

EMERGENCY RESPONSE

FIRE

Small Fire

- Water spray or fog is preferred; if water not available use dry chemical, CO₂ 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Lithium Ion Batteries

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POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Lithium ion batteries contain flammable liquid electrolyte that may vent, ignite and produce sparks when subjected to high temperatures ($> 150^{\circ}\text{C}$ (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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 25 metres (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 provide thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

Large Spill

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

Fire

- If rail car or trailer is involved in a fire, ISOLATE for 500 metres (1/3 mile) in all directions; also initiate evacuation including emergency responders for 500 metres (1/3 mile) in all directions.

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂, 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 000 (Australia) or 111 (New Zealand) 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. It may provide little or no thermal protection.
- Structural firefighters protective clothing will provide thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

Large Spill

- Consider initial evacuation for at least 250 metres (800 feet) in all directions.

Fire

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

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, CO₂ 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Substances (Self-Reactive)

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POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Self-decomposition, self-polymerisation, 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 polymerisation may be self-accelerating and produce large amounts of gases.
- Vapours or dust may form explosive mixtures with air.

HEALTH

- Inhalation or contact with vapours, 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. It may provide little or no thermal protection.
- Structural firefighters protective clothing will provide thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

Large Spill

- Consider initial evacuation for at least 250 metres (800 feet) in all directions.

Fire

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

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂, 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 discolouration 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 000 (Australia) or 111 (New Zealand) 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-polymerisation, 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 polymerisation may be self-accelerating and produce large amounts of gases.
- Vapours or dust may form explosive mixtures with air.

HEALTH

- Inhalation or contact with vapours, 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. It may provide little or no thermal protection.
- Structural firefighters protective clothing will provide thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

Large Spill

- Consider initial evacuation for at least 250 metres (800 feet) in all directions.

Fire

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

EMERGENCY RESPONSE

FIRE

- The temperature of the substance must be maintained at or below the "Control Temperature" at all times.

Small Fire

- Dry chemical, CO₂, 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 discolouration 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Substances - Toxic (Non-Combustible)

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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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂ 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 discolouration 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Substances - Toxic (Combustible)

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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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. 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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂ 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 discolouration 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 153 Substances - Toxic and/or Corrosive (Combustible)

POTENTIAL HAZARDS

HEALTH

- TOXIC; inhalation, ingestion or skin contact with material may cause severe injury or death.
- Contact with molten substance may cause severe burns to skin and eyes.
- Avoid any skin contact.
- Effects of contact or inhalation may be delayed.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution.

FIRE OR EXPLOSION

- Combustible material: may burn but does not ignite readily.
- When heated, vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂ or water spray.

Large Fire

- Dry chemical, CO₂, 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 discolouration 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 154 Substances - Toxic and/or Corrosive (Non-Combustible)

POTENTIAL HAZARDS

HEALTH

- TOXIC; inhalation, ingestion or skin contact with material may cause severe injury or death.
- Contact with molten substance may cause severe burns to skin and eyes.
- Avoid any skin contact.
- Effects of contact or inhalation may be delayed.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause 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 oxidisers 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂ or water spray.

Large Fire

- Dry chemical, CO₂, 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 discolouration 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 155

Substances - Toxic and/or Corrosive (Flammable/Water-Sensitive)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE:** Will be easily ignited by heat, sparks or flames.
- Vapours form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.
- Most vapours are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapours 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 vapours, 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

- Note: Most foams will react with the material and release corrosive/toxic gases.

CAUTION: For Acetyl chloride (UN1717), use CO₂ or dry chemical only.

Small Fire

- CO₂, 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 discolouration 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 vapour-suppressing foam may be used to reduce vapours.
- FOR CHLOROSILANES, use AFFF alcohol-resistant medium-expansion foam to reduce vapours.
- DO NOT GET WATER on spilled substance or inside containers.
- Use water spray to reduce vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 156 Substances - Toxic and/or Corrosive (Combustible/Water-Sensitive)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Combustible material: may burn but does not ignite readily.
- Substance will react with water (some violently) releasing flammable, toxic or corrosive gases and runoff.
- When heated, vapours may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.
- Most vapours are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapours 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 vapours, 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

- Note: Most foams will react with the material and release corrosive/toxic gases.

Small Fire

- CO₂, 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 discolouration 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 vapour-suppressing foam may be used to reduce vapours.
- FOR CHLOROSILANES, use AFFF alcohol-resistant medium-expansion foam to reduce vapours.
- DO NOT GET WATER on spilled substance or inside containers.
- Use water spray to reduce vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 157 Substances - Toxic and/or Corrosive (Non-Combustible/Water-Sensitive)

POTENTIAL HAZARDS

HEALTH

- TOXIC; inhalation, ingestion or contact (skin, eyes) with vapours, 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, UN1802, UN1826, UN2032, UN3084, UN3085 at high concentrations above 65 , UN2031 may act as oxidisers, also consult GUIDE 140.
- Vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

- Note: Some foams will react with the material and release corrosive/toxic gases.

Small Fire

- CO₂ (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 discolouration 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 vapour-suppressing foam may be used to reduce vapours.
- DO NOT GET WATER INSIDE CONTAINERS.
- Use water spray to reduce vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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, UN2900 or UN3549) are more hazardous, or are in a more hazardous form, than infectious substances shipped as Category B Biological Substances (UN3373) or clinical waste / medical waste (UN3291).
- Runoff from fire control may cause environmental contamination.
- Note: Damaged packages containing solid CO₂ 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 CO₂ 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 25 metres (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 provide thermal protection but provides only limited chemical protection.

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 000 (Australia) or 111 (New Zealand) 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 Centre.

GUIDE Substances (Irritating)

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POTENTIAL HAZARDS

HEALTH

- Inhalation of vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres (150 feet) for liquids and at least 25 metres (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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂, 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 discolouration 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, vapour-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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Halogenated Solvents

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POTENTIAL HAZARDS

HEALTH

- Toxic by ingestion.
- Vapours 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 vapours are heavier than air.
- Air/vapour mixtures may explode when ignited.
- Container may explode in heat of fire.

PUBLIC SAFETY

- CALL EMERGENCY RESPONSE Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 50 metres (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 when there is no risk of fire.
- Structural firefighters protective clothing will provide thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

Large Spill

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

Fire

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

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂ or water spray.

Large Fire

- Dry chemical, CO₂, 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 discolouration 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 000 (Australia) or 111 (New Zealand) 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- 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 metres (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

Immediate precautionary measure

Large Spill

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

Fire

- When a large quantity of this material is involved in a major fire, consider an initial evacuation distance of 300 metres (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, CO₂, 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 162 Radioactive Materials (Low to Moderate Level Radiation)

POTENTIAL HAZARDS

HEALTH

- Radiation presents minimal risk to transport workers, emergency response personnel and the public during transportation accidents. Packaging durability increases as potential hazard of radioactive content increases.
- Undamaged packages are safe. Contents of damaged packages may cause higher external radiation exposure, or both external and internal radiation exposure if contents are released.
- Low radiation hazard when material is inside container. If material is released from package or bulk container, hazard will vary from low to moderate. Level of hazard will depend on the type and amount of radioactivity, the kind of material it is in, and/or the surfaces it is on.
- Some material may be released from packages during accidents of moderate severity but risks to people are not great.
- Released radioactive materials or contaminated objects usually will be visible if packaging fails.
- Some exclusive use shipments of bulk and packaged materials will not have "RADIOACTIVE" labels. Placards, markings and Transport Documents 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.
- Some radio active materials may be transported unpackaged. E.g. UN 2912 (LSA-I) and UN 2913 (SCO-I)
- 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 oxidisers and may ignite other combustibles (see GUIDE 141).

PUBLIC SAFETY

- CALL EMERGENCY RESPONSE Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- 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 metres (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

Immediate precautionary measure

Large Spill

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

Fire

- When a large quantity of this material is involved in a major fire, consider an initial evacuation distance of 300 metres (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, CO₂, 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 163

Radioactive Materials (Low to High Level Radiation)

POTENTIAL HAZARDS

HEALTH

- Radiation presents minimal risk to transport workers, emergency response personnel and the public during transportation accidents. Packaging durability increases as potential hazard of radioactive content increases.
- Undamaged packages are safe. Contents of damaged packages may cause higher external radiation exposure, or both external and internal radiation exposure if contents are released.
- Type A packages (cartons, boxes, drums, articles, etc.) identified as "Type A" by marking on packages or by Transport Documents 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 Transport Documents. 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 Transport Documents.
- 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 metre 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- 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 metres 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 metres.

Fire

- When a large quantity of this material is involved in a major fire, consider an initial evacuation distance of 300 metres 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, CO₂, 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 164

Radioactive Materials (Special Form/ Low to High Level External Radiation)

POTENTIAL HAZARDS

HEALTH

- Radiation presents minimal risk to transport workers, emergency response personnel and the public during transportation accidents. Packaging durability increases as potential hazard of radioactive content increases.
- Undamaged packages are safe; contents of damaged packages may cause external radiation exposure, and much higher external exposure if contents (source capsules) are released.
- Contamination and internal radiation hazards are not expected, but not impossible.
- Type A packages (cartons, boxes, drums, articles, etc.) identified as "Type A" by marking on packages or by Transport Documents 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 Transport Documents. 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 metre 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- 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 metres 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

Immediate precautionary measure

Large Spill

- Consider initial downwind evacuation for at least 100 metres.

Fire

- When a large quantity of this material is involved in a major fire, consider an initial evacuation distance of 300 metres 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, CO₂, 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 165

Radioactive Materials (Fissile/Low to High Level Radiation)

POTENTIAL HAZARDS

HEALTH

- Radiation presents minimal risk to transport workers, emergency response personnel and the public during transportation accidents. Packaging durability increases as potential radiation and criticality hazards of the content increase.
- Undamaged packages are safe. Contents of damaged packages may cause higher external radiation exposure, or both external and internal radiation exposure if contents are released.
- Type AF or IF packages, identified by package markings, do not contain life-threatening amounts of material. External radiation levels are low and packages are designed, evaluated and tested to control releases and to prevent a fission chain reaction under severe transport conditions.
- Type B(U)F, B(M)F and CF packages (identified by markings on packages or Transport Documents) 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 Transport Documents.
- The transport index (TI) shown on labels or a Transport Document might not indicate the radiation level at one metre 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 Transport Document.
- Some radioactive materials cannot be detected by commonly available instruments.
- Water from cargo fire control is not expected to cause pollution.

FIRE OR EXPLOSION

- These materials are seldom flammable. Packages are designed to withstand fires without damage to contents.
- Radioactivity does not change flammability or other properties of materials.
- Type AF, IF, B(U)F, B(M)F and CF packages are designed and evaluated to withstand total engulfment in flames at temperatures of 800°C (1475°F) for a period of 30 minutes.

PUBLIC SAFETY

- CALL EMERGENCY RESPONSE Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- 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 metres 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

Immediate precautionary measure

Large Spill

- Consider initial downwind evacuation for at least 100 metres.

Fire

- When a large quantity of this material is involved in a major fire, consider an initial evacuation distance of 300 metres 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, CO₂, 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 166

Radioactive Materials - Corrosive (Uranium Hexafluoride/Water-Sensitive)

POTENTIAL HAZARDS

HEALTH

- Radiation presents minimal risk to transport workers, emergency response personnel and the public during transportation accidents. Packaging durability increases as potential radiation and criticality hazards of the content increase.
- Chemical hazard greatly exceeds radiation hazard.
- Substance reacts with water and water vapour in air to form toxic and corrosive hydrogen fluoride gas and an extremely irritating and corrosive, white-coloured, 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 Transport Documents 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- 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 metres 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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres in all directions.

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 CO₂.

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 vapours and residue forming at the point of release.
- Use fine water spray to reduce vapours; 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 167

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GUIDE Carbon Monoxide (Refrigerated Liquid)

168

POTENTIAL HAZARDS

HEALTH

- TOXIC; Extremely Hazardous.
- Inhalation extremely dangerous; may be fatal.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- odourless, 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.
- Vapour explosion and poison hazard indoors, outdoors or in sewers.
- Vapours from liquefied gas are initially heavier than air and spread along ground.
- Vapours may travel to source of ignition and flash back.
- Runoff may create fire or explosion hazard.

PUBLIC SAFETY

- CALL EMERGENCY RESPONSE Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 100 metres 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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres in all directions; also, consider initial evacuation for 800 metres in all directions.

EMERGENCY RESPONSE

FIRE

- CAUTION: Flame can be invisible. Use an alternate method of detection (thermal camera, broom handle, etc.)
- DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.

Small Fire

- Dry chemical, CO₂ 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 discolouration 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, vapour-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 vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Aluminum (Molten)

169

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Substance is transported in molten form at a temperature above 705°C (1300°F).
- Violent reaction with water; contact may cause an explosion or may produce a flammable gas.
- Will ignite combustible materials (wood, paper, oil, debris, etc.).
- Contact with nitrates or other oxidisers 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 50 metres 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE 170 Metals (Powders, Dusts, Shavings, Borings, Turnings, or Cuttings, etc.)

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- May react violently or explosively on contact with water.
- Some are transported in flammable liquids.
- May be ignited by friction, heat, sparks or flames.
- Some of these materials will burn with intense heat.
- Dusts or fumes may form explosive mixtures in air.
- Containers may explode when heated.
- May re-ignite after fire is extinguished.

HEALTH

- Oxides from metallic fires are a severe health hazard.
- Inhalation or contact with substance or decomposition products may cause severe injury or death.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

- CALL EMERGENCY RESPONSE Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres for liquids and at least 25 metres 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 provide thermal protection but provides only limited chemical protection.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 50 metres.

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 metres in all directions; also, consider initial evacuation for 800 metres in all directions.

EMERGENCY RESPONSE

FIRE

- DO NOT USE WATER, FOAM OR CO₂.
- 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Substances (Low to Moderate Hazard)

171

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Some may burn but none ignite readily.
- Containers may explode when heated.
- Some may be transported hot.
- For UN3508, be aware of possible short circuiting as this product is transported in a charged state.
- Polymeric beads, expandable (UN2211) may evolve flammable vapours.

HEALTH

- Inhalation of material may be harmful.
- Contact may cause burns to skin and eyes.
- Inhalation of Asbestos dust may have a damaging effect on the lungs.
- Fire may produce irritating, corrosive and/or toxic gases.
- Some liquids produce vapours that may cause dizziness or suffocation.
- Runoff from fire control may cause pollution.

PUBLIC SAFETY

- CALL EMERGENCY RESPONSE Telephone Number on Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 metres for liquids and at least 25 metres 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 provide thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

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 metres in all directions; also, consider initial evacuation for 800 metres in all directions.

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂, 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 discolouration 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Gallium and Mercury

172

POTENTIAL HAZARDS

HEALTH

- Inhalation of vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 50 metres 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 provide thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

Large Spill

- Consider initial downwind evacuation for at least 100 metres.

Fire

- When any large container is involved in a fire, consider initial evacuation for 500 metres 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Adsorbed Gases - Toxic*

173

POTENTIAL HAZARDS

HEALTH

- TOXIC; may be fatal if inhaled or absorbed through skin.
- Vapours 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.
- Oxidisers may ignite combustibles (wood, paper, oil, clothing, etc.) but NOT readily due to low transportation pressures.
- Vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 100 metres 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 when there is no risk of fire. 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

Immediate precautionary measure

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 metres in all directions; also, consider initial evacuation for 1600 metres in all directions.

*** SOME SUBSTANCES MAY ALSO BE FLAMMABLE, CORROSIVE AND/OR OXIDISING**

EMERGENCY RESPONSE

FIRE

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

Small Fire

- Dry chemical, CO₂, water spray or alcohol-resistant foam.
- For UN3515, UN3518, UN3520, use water only; no dry chemical, CO₂ 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 discolouration 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, vapour-protective clothing should be worn for spills and leaks with no fire.
- For oxidising 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 vapours or divert vapour 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 000 (Australia) or 111 (New Zealand) 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.

GUIDE Adsorbed Gases - Flammable or Oxidising

174

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.
- Vapours 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

- Vapours 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 Transport Documents first. If Transport Documents are not available or no answer, refer to appropriate emergency service.
- As an immediate precautionary measure, isolate spill or leak area for at least 100 metres 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 provide thermal protection but provides only limited chemical protection.

EVACUATION

Immediate precautionary measure

Large Spill

- Consider initial downwind evacuation for at least 800 metres.

Fire

- If several small packages (rail or trailer) are involved in a fire, ISOLATE for 1600 metres in all directions; also, consider initial evacuation for 1600 metres 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 CO₂.

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 discolouration 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 oxidising 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 vapours or divert vapour cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- Prevent spreading of vapours 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 000 (Australia) or 111 (New Zealand) 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.

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 vapours/gases resulting from spills involving:

- materials that are considered toxic by inhalation (TIH) (PIH in the US)
- materials that produce toxic gases upon contact with water
- chemical warfare agents

This table provides first responders with initial guidance until technically qualified emergency response personnel are available. For each material, first responders will find distances for the following zones:

- The **Initial Isolation Zone** defines an area surrounding the incident in which people may be exposed to dangerous (upwind) and life-threatening (downwind) concentrations of material.
- The **Protective Action Zone** defines an area downwind from the incident in which people may become incapacitated and unable to take protective action and/or incur serious or irreversible health effects. Table 1 provides specific guidance for small and large spills occurring day or night.

Adjusting distances for a specific incident involves many interdependent variables 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

Fire

In the **orange-bordered pages**, under **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 as an isolation distance and Table 1 should be used to protection downwind for residual material release.

Worst-case scenario: terrorism, sabotage or catastrophic accident

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.

When more than one large package is leaking

If more than one tank car containing TIH materials involved in the incident is leaking, LARGE SPILL distances may need to be increased.

Other factors that can increase the protective action distance:

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 vapour 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).

Water-reactive materials

Materials that react with water to produce large amounts of toxic gases are included in Table 1 - Initial Isolation and Protective Action Distances. Some of these materials have 2 entries in Table 1. They are identified by **(when spilled on land)** since they are TIH products and **(when spilled in water)** because they produce additional toxic gases when spilled in water. Choose the larger protective action distance if: it is not clear whether the spill is on land or in water, the spill occurs both on land and in water.

Table 2 Water-Reactive Materials Which Produce Toxic Gases

This table lists materials that produce large amounts of Toxic Inhalation Hazard gases (TIH) when spilled in water as well as the toxic gases that are produced when spilled in water.

NOTE: The produced TIH gases indicated in Table 2 are for information purposes only. In Table 1, the initial isolation and protective action distances have already taken into consideration the produced TIH gas. When a water-reactive TIH-producing material is spilled into a river or stream, the source of the toxic gas may flow downstream for a great distance.

Table 3 lists Initial Isolation and Protective Action Distances for Toxic Inhalation Hazard materials that may be more commonly encountered.

This table lists materials that may be more commonly encountered. These materials are:

- UN1005- Ammonia, anhydrous
- UN1017-Chlorine
- UN1040-Ethylene oxide and UN1040-Ethylene oxide with nitrogen
- UN1050-Hydrogen chloride, anhydrous (UN1050) and UN2186-Hydrogen chloride, refrigerated liquid
- UN1052-Hydrogen fluoride, anhydrous
- UN1079-Sulfur dioxide/Sulphur dioxide

This table provides Initial Isolation and Protective Action Distances for large spills (more than 208 litres 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 vapour 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 vapour 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. **It is vital for first responders to maintain communications with sheltered-in-place people** so that they are advised about changing conditions. Sheltering-in-place is used when either: evacuating the public would cause greater risk than staying where they are or 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. Stay far from windows to avoid shattered glass and projectile metal fragments in the event of a fire and/or explosion. Tune in to local radio or TV station and stay inside until told it is safe to leave by first responders.

Shelter in-place may not be the best option if (a) the vapours 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.

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 was conducted using: 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 90th 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.

DESCRIPTION OF THE ANALYSIS

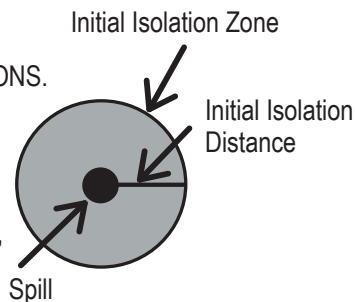
Release amounts and emission rates into the atmosphere were statistically modeled based on (1) data from the U.S. DOT HMIS database (2) container types and sizes authorized for transport as specified in 49 CFR 172.101 and Part 173 (3) physical properties of the individual materials, and (4) atmospheric data from a historical database. For liquified gases, which can flash to form both a vapour/aerosol mixture and an evaporating pool, the emission mode calculated one or both of: the release of vapour due to evaporation of pools on the ground, direct release of vapours from the container. The emission model also calculated the emission of toxic vapour by-products generated from spilling water-reactive materials in water. Small spills involve 208 litres for liquids (55 US gallons) and 300 kg for solids (660 lbs). Large spills involve greater quantities. The exceptions are the entries at the beginning of Table 1 marked **(when used as a weapon)**. The volumes used for these calculations varies, but in most cases: Small spills include releases up to 2 kg (4.4 lbs), and Large Spills include releases up to 25 kg (55 lbs). **Downwind dispersion** of the vapour was estimated for each case modeled. Using a database containing hourly meteorological data from 120 cities in the United States, Canada and Mexico the atmospheric parameters affecting the dispersion and the emission rate were selected. The dispersion calculation accounted for the time- dependent emission rate from the source and density of the vapour plume (i.e., heavy gas effects). Since atmospheric mixing is less effective at dispersing vapour plumes during nighttime, day and night were separated in the analysis. In the table 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 incur serious health effects after a single or rare, exposure. When available, toxicological exposure guidelines were chosen from AEGL-2 or ERPG-2 emergency response guidelines, with AEGL-2 values being the first choice. For materials without AEGL-2 or ERPG-2 values, emergency response guidelines were estimated from lethal concentration limits derived from animal studies. This approach was recommended by an independent panel of toxicological experts from industry and academia.

HOW TO USE TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

- (1) The responder should already have:
 - Identified the material by its UN Number and Name; (if a UN Number cannot be found, use the Name of Material index in the blue-bordered pages to locate that number.)
 - confirmed that the material is highlighted in green in the yellow or blue-bordered pages. If not, Table 1 doesn't apply
 - Found the three-digit guide for 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 UN Number and Name of the Material involved in the incident. Some UN 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 UN 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 litres. 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 litres (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.

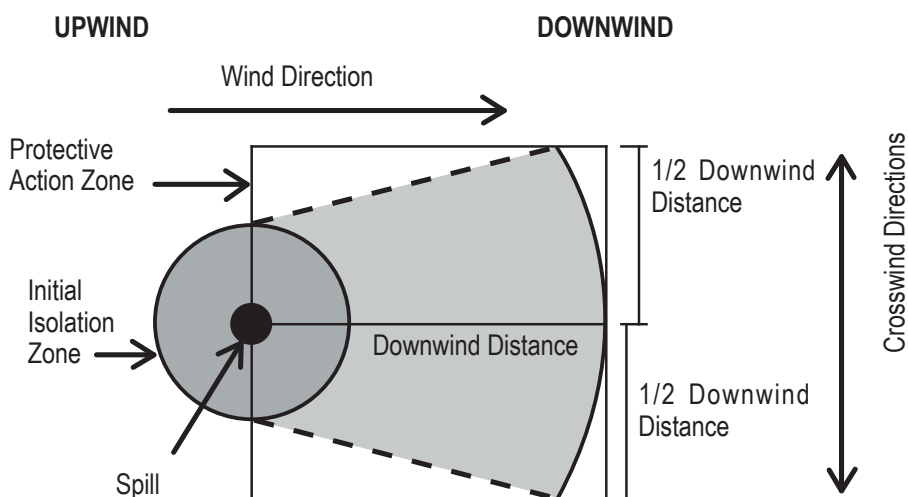


- (5) Look up the initial PROTECTIVE ACTION DISTANCE. For a given material, spill size, and whether day or night, Table 1 gives the downwind distance—in kilometres and miles—from the spill/leak source for which protective actions should be considered. For practical purposes, the Protective Action Zone (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. Consult pages 288-290.

(6) Initiate Protective Actions 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 large distance.

In the fire below, the spill is located at the centre of the small circle. The larger circle represents the INITIAL ISOLATION zone around the spill. The square (the protective action zone) is the area in which you should take protective actions.



NOTE 1: See “Introduction To Green Tables - Initial Isolation And Protective Action Distances” under “Factors That May Change the Protective Action Distances” (page 288)

NOTE 2: When a product in Table 1 has the mention “(when spilled in water)”, refer to Table 2 – Water-Reactive Materials for the list of gases produced when these materials are spilled in water. The TIH gases in Table 2 are for information purposes only.

Call the emergency response telephone number listed on the Transport Documents 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

		SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
UN No.	Guide	NAME OF MATERIAL	First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions	Then PROTECT persons Downwind during	
			Metres (Feet)		DAY Kilometres (Miles)	NIGHT Kilometres (Miles)		DAY Kilometres (Miles)	NIGHT Kilometres (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							
1008	125	Boron trifluoride	30 m (100 ft)		0.2 km (0.1 mi)	0.7 km (0.5 mi)	400 m (1250 ft)	2.3 km (1.4 mi)	5.1 km (3.2 mi)
1008	125	Boron trifluoride, compressed							
1016	119	Carbon monoxide	30 m (100 ft)		0.1 km (0.1 mi)	0.2 km (0.1 mi)	200 m (600 ft)	1.2 km (0.7 mi)	4.3 km (2.7 mi)
1016	119	Carbon monoxide, compressed							
1017	124	Chlorine	60 m (200 ft)		0.3 km (0.2 mi)	1.4 km (0.9 mi)	Refer to table 3		
1026	119	Cyanogen	30 m (100 ft)		0.1 km (0.1 mi)	0.4 km (0.3 mi)	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)
1040	119P	Ethylene oxide	30 m (100 ft)		0.1 km (0.1 mi)	0.2 km (0.2 mi)	Refer to table 3		
1040	119P	Ethylene oxide with Nitrogen							
1045	124	Fluorine	30 m (100 ft)		0.1 km (0.1 mi)	0.2 km (0.1 mi)	100 m (300 ft)	0.5 km (0.3 mi)	2.3 km (1.4 mi)
1045	124	Fluorine, compressed							
1048	125	Hydrogen bromide, anhydrous	30 m (100 ft)		0.1 km (0.1 mi)	0.2 km (0.2 mi)	150 m (500 ft)	1.0 km (0.6 mi)	3.4 km (2.1 mi)
1050	125	Hydrogen chloride, anhydrous	30 m (100 ft)		0.1 km (0.1 mi)	0.3 km (0.2 mi)	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)	1000 m	3.7 km (2.3 mi)	8.4 km (5.3 mi)

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

			SMALL SPILLS				LARGE SPILLS			
			(From a small package or small leak from a large package)				(From a large package or from many small packages)			
UN No.	Guide	NAME OF MATERIAL	First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions	Then PROTECT persons Downwind during		
			Metres (Feet)	Kilometres (Miles)	DAY Kilometres (Miles)	NIGHT Kilometres (Miles)		Metres (Feet)	DAY Kilometres (Miles)	NIGHT Kilometres (Miles)
1092	131P	Acrolein, stabilised	100 m (300 ft)	1.2 km (0.8 mi)	3.3 km (2.1 mi)		500 m (1500 ft)	6.1 km (3.8 mi)	10.8 km (6.7 mi)	
1093	131P	Acrylonitrile, stabilised	30 m (100 ft)	0.2 km (0.2 mi)	0.6 km (0.4 mi)		100 m (300 ft)	1.2 km (0.8 mi)	2.3 km (1.4 mi)	
1098	131	Allyl alcohol	30 m (100 ft)	0.2 km (0.1 mi)	0.3 km (0.2 mi)		60 m (200 ft)	0.7 km (0.5 mi)	1.2 km (0.8 mi)	
1135	131	Ethylene chlorohydrin	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)		30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	
1143	131P	Crotonaldehyde	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)		60 m (200 ft)	0.5 km (0.3 mi)	0.7 km (0.5 mi)	
1143	131P	Crotonaldehyde, stabilised								
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)	0.6 km (0.4 mi)	1.8 km (1.1 mi)	
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								
1182	155	Ethyl chloroformate	30 m (100 ft)	0.2 km (0.1 mi)	0.3 km (0.2 mi)		60 m (200 ft)	0.6 km (0.4 mi)	0.9 km (0.6 mi)	
1183	139	Ethyldichlorosilane (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)		60 m (200 ft)	0.6 km (0.4 mi)	2.0 km (1.3 mi)	
1185	131P	Ethyleneimine, stabilised	30 m (100 ft)	0.2 km (0.1 mi)	0.5 km (0.3 mi)		200 m (600 ft)	0.9 km (0.6 mi)	1.8 km (1.1 mi)	
1196	155	Ethyltrichlorosilane (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.5 km (0.3 mi)		200 m (600 ft)	2.1 km (1.3 mi)	5.8 km (3.6 mi)	
1238	155	Methyl chloroformate	30 m (100 ft)	0.2 km (0.2 mi)	0.5 km (0.4 mi)		150 m (500 ft)	1.1 km (0.7 mi)	2.1 km (1.3 mi)	
1239	131	Methyl chloromethyl ether	60 m (200 ft)	0.5 km (0.3 mi)	1.5 km (0.9 mi)		300 m (1000 ft)	3.1 km (2.0 mi)	5.8 km (3.6 mi)	

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

		SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
UN No.	Guide	NAME OF MATERIAL	First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		
				DAY Kilometres (Miles)	NIGHT Kilometres (Miles)		DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	
1380	135	Pentaborane	60 m (200 ft)	0.6 km (0.4 mi)	1.9 km (1.2 mi)	200 m (600 ft)	2.7 km (1.7 mi)	6.2 km (3.9 mi)	
1384	135	Sodium dithionite (when spilled in water)							
1384	135	Sodium hydrosulphite (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	60 m (200 ft)	0.6 km (0.4 mi)	2.5 km (1.6 mi)	
1384	135	Sodium hydrosulphite (when spilled in water)							
1390	139	Alkali metal amides (when spilled in water)	30 m (100 ft)	0.1 k (0.1 mi)	0.3 km (0.2 mi)	60 m (200 ft)	0.6 km (0.4 mi)	2.2 km (1.4 mi)	
1397	139	Aluminum phosphide (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.7 km (0.5 mi)	500 m (1500 ft)	2.0 km (1.2 mi)	6.5 km (4.0 mi)	
1419	139	Magnesium aluminum phosphide (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.6 km (0.4 mi)	500 m (1500 ft)	1.8 km (1.1 mi)	5.8 km (3.6 mi)	
1432	139	Sodium phosphide (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.2 mi)	300 m (1000 ft)	1.3 km (0.8 mi)	3.8 km (2.4 mi)	
1510	143	Tetranitromethane	30 m (100 ft)	0.2 km (0.1 mi)	0.3 km (0.2 mi)	30 m (100 ft)	0.4 km (0.3 mi)	0.7 km (0.4 mi)	
1541	155	Acetone cyanohydrin, stabilised (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	60 m (200 ft)	0.2 km (0.2 mi)	0.8 km (0.5 mi)	
1556	152	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	Methyldichloroarsine	100 m (300 ft)	1.4 km (0.9 mi)	2.1 km (1.3 mi)	300 m (1000 ft)	3.8 km (2.4 mi)	5.2 km (3.3 mi)	
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)	

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

		SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
UN No.	Guide	NAME OF MATERIAL	First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		
				DAY Kilometres (Miles)	NIGHT Kilometres (Miles)		DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	
1613	154	Hydrocyanic acid, aqueous solution, with not more than 20% Hydrogen cyanide	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	100 m (300 ft)	0.5 km (0.3 mi)	1.1 km (0.7 mi)	
1613	154	Hydrogen cyanide, aqueous solution, with not more than 20% Hydrogen cyanide							
1614	152	Hydrogen cyanide, stabilised (absorbed)	60 m (200 ft)	0.2 km (0.1 mi)	0.6 km (0.4 mi)	150 m (500 ft)	0.5 km (0.3 mi)	1.5 km (0.9 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)	0.8 km (0.5 mi)	
1660	124	Nitric oxide	30 m (100 ft)	0.1 km (0.1 mi)	0.6 km (0.4 mi)	100 m (300 ft)	0.6 km (0.4 mi)	2.2 km (1.4 mi)	
1660	124	Nitric oxide, compressed							
1670	157	Perchloromethyl mercaptan	30 m (100 ft)	0.2 km (0.2 mi)	0.4 km (0.2 mi)	100 m (300 ft)	0.8 km (0.5 mi)	1.2 km (0.8 mi)	
1672	151	Phenylcarbamine 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)	0.1 km (0.1 mi)	60 m (200 ft)	0.2 km (0.2 mi)	1.0 km (0.6 mi)	
1689	157	Sodium cyanide							
1689	157	(when spilled in water) Sodium cyanide, solid (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)	1.2 km (0.7 mi)	

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

		SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
UN No.	Guide	NAME OF MATERIAL	First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		
				DAY Kilometres (Miles)	NIGHT Kilometres (Miles)		DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	
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)	3.8 km (2.4 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 (0.2 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)	100 m (300 ft)	0.9 km (0.5 mi)	2.5 km (1.6 mi)	400 m (1250 ft)	5.4 km (3.3 mi)	10.7 km (6.6 mi)	
1745	144	Bromine pentafluoride (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	150 m (500 ft)	1.2 km (0.7 mi)	4.0 km (2.5 mi)	
1746	144	Bromine trifluoride (when spilled on land)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.3 km (0.2 mi)	0.4 km (0.3 mi)	
1746	144	Bromine trifluoride (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	100 m (300 ft)	1.0 km (0.7 mi)	3.7 km (2.3 mi)	
1747	155	Butyltrichlorosilane (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	60 m (200 ft)	0.5 km (0.3 mi)	1.6 km (1.0 mi)	
1749	124	Chlorine trifluoride	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)	200 m (600 ft)	1.4 km (0.9 mi)	3.6 km (2.3 mi)	
1752	156	Chloroacetyl chloride (when spilled on land)	30 m (100 ft)	0.3 km (0.2 mi)	0.6 km (0.4 mi)	100 m (300 ft)	1.1 km (0.7 mi)	1.9 km (1.2 mi)	
1752	156	Chloroacetyl chloride (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.2 km (0.1 mi)	0.6 km (0.4 mi)	

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

UN 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 Metres (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Metres (Feet)	First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		
				DAY Kilometres (Miles)	NIGHT Kilometres (Miles)			DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	
1769	156	Diphenylchlorosilane (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	30 m (100 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)	
1771	156	Dodecyltrichlorosilane (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (200 ft)	30 m (200 ft)	0.4 km (0.3 mi)	1.2 km (0.8 mi)	
1777	137	Fluorosulfonic acid (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)			0.2 km (0.1 mi)	0.5 km (0.3 mi)	
1777	137	Fluorosulphonic acid (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)			0.2 km (0.1 mi)	0.5 km (0.3 mi)	
1781	156	Hexadecyltrichlorosilane (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	
1784	156	Hexyltrichlorosilane (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	30 m (100 ft)	0.4 km (0.2 mi)	1.3 km (0.8 mi)	
1799	156	Nonyltrichlorosilane (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	30 m (100 ft)	0.4 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)	0.1 km (0.1 mi)	30 m (100 ft)	30 m (100 ft)	0.4 km (0.3 mi)	1.3 km (0.8 mi)	
1801	156	Octyltrichlorosilane (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	30 m (100 ft)	0.4 km (0.3 mi)	1.4 km (0.9 mi)	
1804	156	Phenyltrichlorosilane (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	30 m (100 ft)	0.4 km (0.2 mi)	1.3 km (0.8 mi)	
1806	137	Phosphorus pentachloride (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	30 m (100 ft)	0.3 km (0.2 mi)	1.3 km (0.8 mi)	

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

			SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
UN No.	Guide	NAME OF MATERIAL	First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Metres (Feet)	Kilometres (Miles)	DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	Metres (Feet)	Kilometres (Miles)	DAY Kilometres (Miles)	NIGHT Kilometres (Miles)
1831	137	Sulfuric acid, fuming	60 m (200 ft)	0.4 km (0.2 mi)	1.0 km (0.6 mi)	1.0 km (0.6 mi)	300 m (1000 ft)	2.9 km (1.8 mi)	6.3 km (4.0 mi)	
1831	137	Sulfuric acid, fuming, with not less than 30% free Sulfur trioxide								
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)	0.4 km (0.3 mi)	60 m (200 ft)	0.8 km (0.5 mi)	1.5 km (0.9 mi)	
1834	137	Sulfuryl chloride (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.4 km (0.3 mi)	1.6 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)	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)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.4 km (0.3 mi)	1.6 km (1.0 mi)	
1836	137	Thionyl chloride (when spilled on land)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	0.2 km (0.2 mi)	30 m (100 ft)	0.3 km (0.2 mi)	0.5 km (0.3 mi)	
1836	137	Thionyl chloride (when spilled in water)	100 m (300 ft)	0.9 km (0.6 mi)	2.9 km (1.8 mi)	2.9 km (1.8 mi)	800 m (2500 ft)	9.7 km (6.0 mi)	11.0+ km (7.0+ mi)	
1838	137	Titanium tetrachloride (when spilled on land)	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)	0.3 km (0.2 mi)	0.5 km (0.3 mi)	

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

UN 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 Metres (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during			
DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	DAY Kilometres (Miles)		NIGHT Kilometres (Miles)						
1953	119	Compressed gas, poisonous, flammable, n.o.s.	150 m (500 ft)	1.0 km (0.6 mi)	3.8 km (2.4 mi)	1000 m (3000 ft)	5.7 km (3.6 mi)	10.1 km (6.3 mi)		
1953	119	Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.2 mi)	300 m (1000 ft)	1.3 km (0.8 mi)	3.4 km (2.1 mi)		
1953	119	Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	150 m (500 ft)	1.0 km (0.6 mi)	2.9 km (1.8 mi)		
1953	119	Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	150 m (500 ft)	0.8 km (0.5 mi)	2.0 km (1.3 mi)		
1953	119	Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)	150 m (500 ft)	1.0 km (0.6 mi)	3.8 km (2.4 mi)	1000 m (3000 ft)	5.7 km (3.6 mi)	10.1 km (6.3 mi)		
1953	119	Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.2 mi)	300 m (1000 ft)	1.3 km (0.8 mi)	3.4 km (2.1 mi)		
1953	119	Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	150 m (500 ft)	1.0 km (0.6 mi)	2.9 km (1.8 mi)		

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

		SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)				
UN No.	Guide	NAME OF MATERIAL	First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions		Then PROTECT persons Downwind during	
			Metres (Feet)	Kilometres (Miles)	DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	Metres (Feet)	Kilometres (Miles)	DAY Kilometres (Miles)	NIGHT Kilometres (Miles)
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	30 m (100 ft)		0.1 km (0.1 mi)	0.6 km (0.4 mi)	100 m (300 ft)	0.6 km (0.4 mi)	2.2 km (1.4 mi)	
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								
1994	136	Iron pentacarbonyl	100 m (300 ft)	0.9 km (0.6 mi)	2.0 km (1.2 mi)		400 m (1250 ft)	4.8 km (3.0 mi)	7.5 km (4.7 mi)	

[illegible]

"+" means distance can be larger in certain atmospheric conditions

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

		SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
UN No.	Guide	NAME OF MATERIAL	First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions	Then PROTECT persons Downwind during	
			Metres (Feet)	Kilometres (Miles)	DAY	NIGHT		DAY	NIGHT
					Kilometres (Miles)	Kilometres (Miles)	Metres (Feet)	Kilometres (Miles)	Kilometres (Miles)
2199	119	Phosphine	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)	1.3 km (0.8 mi)	300 m (1000 ft)	1.3 km (0.8 mi)	3.7 km (2.3 mi)
2202	117	Hydrogen selenide, anhydrous	300 m (1000 ft)	1.7 km (1.1 mi)	6.0 km (3.7 mi)	10.7 km (6.7 mi)	1000 m (3000 ft)	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)	1.6 km (1.0 mi)	300 m (1000 ft)	3.8 km (2.4 mi)	
2204	119	Carbonyl sulphide	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	1.6 km (1.0 mi)	300 m (1000 ft)	3.8 km (2.4 mi)	
2232	153	Chloroacetaldehyde	30 m (100 ft)	0.2 km (0.1 mi)	0.3 km (0.2 mi)	0.6 km (0.4 mi)	60 m (200 ft)	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)	0.6 km (0.4 mi)	60 m (200 ft)	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)	0.4 km (0.3 mi)	30 m (100 ft)	0.6 km (0.4 mi)	
2308	157	Nitrosylsulfuric acid, liquid (when spilled in water)							
2308	157	Nitrosylsulfuric acid, solid (when spilled in water)							
2308	157	Nitrosylsulphuric acid, liquid (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	1.0 km (0.6 mi)	300 m (1000 ft)	2.9 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 (0.4 mi)	1.4 km (0.9 mi)	150 m (500 ft)	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)	0.3 km (0.2 mi)	30 m (100 ft)	0.4 km (0.2 mi)	
2353	132	Butynyl chloride (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	30 m (100 ft)	0.7 km (0.5 mi)	
2382	131	Dimethylhydrazine, symmetrical	30 m (100 ft)	0.2 km (0.1 mi)	0.3 km (0.2 mi)	0.7 km (0.5 mi)	60 m (200 ft)	1.3 km (0.8 mi)	

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TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

UN 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	
			Metres (Feet)		DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	Metres (Feet)		DAY Kilometres (Miles)	NIGHT Kilometres (Miles)
2478	155	Isocyanate solution, flammable, poisonous, n.o.s.								
2478	155	Isocyanate solution, flammable, toxic, n.o.s.	60 m (200 ft)		0.8 km (0.5 mi)	1.8 km (1.1 mi)	400 m (1250 ft)		4.4 km (2.7 mi)	7.0 km (4.3 mi)
2478	155	Isocyanates, flammable, poisonous, n.o.s.								
2478	155	Isocyanates, flammable, toxic, n.o.s.								
2480	155P	Methyl isocyanate	150 m (500 ft)		1.7 km (1.1 mi)	5.0 km (3.1 mi)	1000 m (3000 ft)		11.0+ km (7.0+ mi)	11.0+ km (7.0+ mi)
2481	155	Ethyl isocyanate	150 m (500 ft)		2.0 km (1.2 mi)	5.1 km (3.2 mi)	1000 m (3000 ft)		11.0+ km (7.0+ mi)	11.0+ km (7.0+ mi)
2482	155P	n-Propyl isocyanate	100 m (300 ft)		1.3 km (0.8 mi)	2.7 km (1.7 mi)	600 m (2000 ft)		7.4 km (4.6 mi)	10.8 km (6.7 mi)
2483	155P	Isopropyl isocyanate	150 m (500 ft)		1.5 km (0.9 mi)	3.2 km (2.0 mi)	1000 m (3000 ft)		11.0 km (6.9 mi)	11.0+ km (7.0+ mi)
2484	155	tert-Butyl isocyanate	60 m (200 ft)		0.8 km (0.5 mi)	1.8 km (1.1 mi)	400 m (1250 ft)		4.4 km (2.7 mi)	7.0 km (4.3 mi)
2485	155P	n-Butyl isocyanate	60 m (200 ft)		0.6 km (0.4 mi)	1.1 km (0.7 mi)	200 m (600 ft)		2.6 km (1.7 mi)	4.0 km (2.5 mi)
2486	155P	Isobutyl isocyanate	60 m (200 ft)		0.6 km (0.4 mi)	1.2 km (0.8 mi)	300 m (1000 ft)		3.1 km (1.9 mi)	4.7 km (3.0 mi)
2487	155	Phenyl isocyanate	100 m (300 ft)		0.9 km (0.6 mi)	1.4 km (0.9 mi)	300 m (1000 ft)		3.7 km (2.3 mi)	5.4 km (3.4 mi)
2488	155	Cyclohexyl isocyanate	30 m (100 ft)		0.3 km (0.2 mi)	0.4 km (0.3 mi)	100 m (300 ft)		1.0 km (0.6 mi)	1.4 km (0.9 mi)
2495	144	Iodine pentafluoride (when spilled in water)	30 m (100 ft)		0.1 km (0.1 mi)	0.3 km (0.2 mi)	100 m (300 ft)		1.1 km (0.7 mi)	4.1 km (2.6 mi)
2521	131P	Diketene, stabilized	30 m (100 ft)		0.2 km (0.1 mi)	0.3 km (0.2 mi)	60 m (200 ft)		0.6 km (0.4 mi)	1.0 km (0.6 mi)
2534	119	Methylchlorosilane	30 m (100 ft)		0.1 km (0.1 mi)	0.3 km (0.2 mi)	150 m (500 ft)		0.7 km (0.5 mi)	1.9 km (1.2 mi)

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TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

		SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
UN No.	Guide	NAME OF MATERIAL	First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions	Then PROTECT persons Downwind during	
			Metres (Feet)	Kilometres (Miles)	DAY	NIGHT		DAY	NIGHT
2806	139	Lithium nitride (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	60 m (200 ft)	0.5 km (0.3 mi)	1.9 km (1.2 mi)
2810	153	Buzz (when used as a weapon)	60 m (200 ft)	0.4 km (0.2 mi)	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	CS (when used as a weapon)	30 m (100 ft)	0.1 km (0.1 mi)	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	DC (when used as a weapon)	30 m (100 ft)	0.1 km (0.1 mi)	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	GA (when used as a weapon)	30 m (100 ft)	0.2 km (0.1 mi)	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	GB (when used as a weapon)	60 m (200 ft)	0.4 km (0.3 mi)	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	GD (when used as a weapon)	60 m (200 ft)	0.4 km (0.3 mi)	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	GF (when used as a weapon)	30 m (100 ft)	0.2 km (0.2 mi)	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	H (when used as a weapon)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	60 m (200 ft)	0.3 km (0.2 mi)	0.4 km (0.3 mi)
2810	153	HD (when used as a weapon)	30 m (100 ft)	0.1 km (0.1 mi)	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	HN-1 (when used as a weapon)	60 m (200 ft)	0.3 km (0.2 mi)	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	HN-2 (when used as a weapon)	60 m (200 ft)	0.3 km (0.2 mi)	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)	0.1 km (0.1 mi)	60 m (200 ft)	0.3 km (0.2 mi)	0.3 km (0.2 mi)

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 (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	Sarin (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	Soman (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	Tabun (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	Thickened GD (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 chloroethoformate	30 m (100 ft)	0.2 km (0.1 mi)	0.2 km (0.2 mi)	60 m (200 ft)	0.5 km (0.3 mi)	0.7 km (0.5 mi)
2845	135	Ethyl phosphonous dichloride, anhydrous	30 m (100 ft)	0.3 km (0.2 mi)	0.7 km (0.5 mi)	100 m (300 ft)	1.3 km (0.8 mi)	2.3 km (1.5 mi)
2845	135	Methyl phosphonous dichloride	30 m (100 ft)	0.4 km (0.3 mi)	1.1 km (0.7 mi)	200 m (600 ft)	2.4 km (1.5 mi)	4.1 km (2.6 mi)
2901	124	Bromine chloride	100 m (300 ft)	0.5 km (0.3 mi)	1.8 km (1.1 mi)	1000 m (3000 ft)	5.4 km (3.4 mi)	11.0 km (7.0 mi)
2927	154	Ethyl phosphonothioic dichloride, anhydrous	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.2 km (0.1 mi)	0.2 km (0.1 mi)
2927	154	Ethyl phosphorodichloridate	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.3 km (0.2 mi)	0.3 km (0.2 mi)
2965	139	Boron trifluoride dimethyl etherate (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	100 m (300 ft)	1.2 km (0.8 mi)	3.6 km (2.2 mi)

"+" means distance can be larger in certain atmospheric conditions

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

UN 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 Metres (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during	DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	
				DAY Kilometres (Miles)	NIGHT Kilometres (Miles)					
2977	166	Radioactive material, Uranium hexafluoride, fissile (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)	2.1 km (1.3 mi)		
2977	166	Uranium hexafluoride, radioactive material, fissile (when spilled in water)								
2978	166	Radioactive material, Uranium hexafluoride, non fissile or fissile-excepted (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)	2.1 km (1.3 mi)		
2978	166	Uranium hexafluoride, radioactive material, non fissile or fissile-excepted (when spilled in water)								
2985	155	Chlorosilanes, flammable, corrosive, n.o.s. (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	60 m (200 ft)	0.5 km (0.3 mi)	1.6 km (1.0 mi)		
2986	155	Chlorosilanes, corrosive, flammable, n.o.s. (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	60 m (200 ft)	0.5 km (0.3 mi)	1.6 km (1.0 mi)		
2987	156	Chlorosilanes, corrosive, n.o.s. (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	60 m (200 ft)	0.5 km (0.3 mi)	1.6 km (1.0 mi)		
2988	139	Chlorosilanes, water-reactive, flammable, corrosive, n.o.s. (when spilled in water)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	60 m (200 ft)	0.5 km (0.3 mi)	1.6 km (1.0 mi)		

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

UN 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 Metres (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Metres (Feet)	First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		
				DAY Kilometres (Miles)	NIGHT Kilometres (Miles)			DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	
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)	1000 m (3000 ft)	5.7 km (3.6 mi)	10.1 km (6.3 mi)	
3160	119	Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.2 mi)	300 m (1000 ft)	300 m (1000 ft)	1.3 km (0.8 mi)	3.4 km (2.1 mi)	
3160	119	Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	150 m (500 ft)	150 m (500 ft)	1.0 km (0.6 mi)	2.9 km (1.8 mi)	
3160	119	Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	150 m (500 ft)	150 m (500 ft)	0.8 km (0.5 mi)	2.0 km (1.3 mi)	
3162	123	Liquefied gas, poisonous, n.o.s.								
3162	123	Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone A)	100 m (300 ft)	0.5 km (0.3 mi)	2.5 km (1.6 mi)	1000 m (3000 ft)	1000 m (3000 ft)	5.7 km (3.6 mi)	10.1 km (6.3 mi)	
3162	123	Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.2 km (0.1 mi)	0.9 km (0.6 mi)	400 m (1250 ft)	400 m (1250 ft)	2.3 km (1.4 mi)	5.1 km (3.2 mi)	
3162	123	Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone C)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	150 m (500 ft)	150 m (500 ft)	1.0 km (0.6 mi)	2.9 km (1.8 mi)	
3162	123	Liquefied gas, poisonous, n.o.s. (Inhalation Hazard Zone D)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	150 m (500 ft)	150 m (500 ft)	0.8 km (0.5 mi)	2.0 km (1.3 mi)	

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

UN 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 Metres (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during	
				DAY Kilometres (Miles)	NIGHT Kilometres (Miles)		DAY Kilometres (Miles)	NIGHT Kilometres (Miles)
3278	151	Organophosphorus compound, liquid, poisonous, n.o.s.	30 m (100 ft)	0.4 km (0.3 mi)	1.1 km (0.7 mi)	200 m (600 ft)	2.4 km (1.5 mi)	4.1 km (2.6 mi)
3278	151	Organophosphorus compound, liquid, toxic, n.o.s.						
3278	151	Organophosphorus compound, 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 (0.3 mi)	1.1 km (0.7 mi)	200 m (600 ft)	2.4 km (1.5 mi)	4.1 km (2.6 mi)
3279	131	Organophosphorus compound, toxic, flammable, n.o.s.						
3280	151	Organoarsenic compound, liquid, n.o.s.	30 m (100 ft)	0.2 km (0.1 mi)	0.7 km (0.4 mi)	150 m (500 ft)	1.6 km (1.0 mi)	3.6 km (2.2 mi)
3280	151	Organoarsenic compound, n.o.s.						
3281	151	Metal carbonyls, liquid, n.o.s.	100 m (300 ft)	1.3 km (0.8 mi)	5.0 km (3.1 mi)	1000 m (3000 ft)	10.8 km (6.8 mi)	11.0+ km (7.0+ mi)
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)

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

		SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
UN No.	Guide	NAME OF MATERIAL	First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		
				DAY Kilometres (Miles)	NIGHT Kilometres (Miles)		DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	
3303	124	Compressed gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone D)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	150 m (500 ft)	0.8 km (0.5 mi)	2.0 km (1.3 mi)	
3304	125	Compressed gas, poisonous, corrosive, n.o.s.							
3304	125	Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone A)	100 m (300 ft)	0.5 km (0.3 mi)	2.5 km (1.6 mi)	500 m (1500 ft)	2.9 km (1.8 mi)	9.2 km (5.7 mi)	
3304	125	Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.2 km (0.2 mi)	1.0 km (0.7 mi)	400 m (1250 ft)	2.3 km (1.4 mi)	5.1 km (3.2 mi)	
3304	125	Compressed gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone C)	30 m (100 ft)	0.1 km (0.1 mi)	0.5 km (0.3 mi)	300 m (1000 ft)	1.6 km (1.0 mi)	3.2 km (2.0 mi)	
3304	125	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)	0.8 km (0.5 mi)	2.0 km (1.3 mi)	
3304	125	Compressed gas, toxic, corrosive, n.o.s.							
3304	125	Compressed gas, toxic, corrosive, n.o.s. (Inhalation Hazard Zone A)	100 m (300 ft)	0.5 km (0.3 mi)	2.5 km (1.6 mi)	500 m (1500 ft)	2.9 km (1.8 mi)	9.2 km (5.7 mi)	

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

		SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
UN No.	Guide	NAME OF MATERIAL	First ISOLATE in all Directions		Then PROTECT persons Downwind during		First ISOLATE in all Directions	Then PROTECT persons Downwind during	
			Metres (Feet)	Kilometres (Miles)	DAY Kilometres (Miles)	NIGHT Kilometres (Miles)		DAY Kilometres (Miles)	NIGHT Kilometres (Miles)
3305	119	Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.5 km (0.3 mi)	300 m (1000 ft)	1.6 km (1.0 mi)	3.2 km (2.0 mi)
3305	119	Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	150 m (500 ft)	0.8 km (0.5 mi)	2.0 km (1.3 mi)
3306	124	Compressed gas, poisonous, oxidizing, corrosive, n.o.s.							
3306	124	Compressed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A)	100 m (300 ft)	0.5 km (0.3 mi)	0.5 km (0.3 mi)	2.5 km (1.6 mi)	500 m (1500 ft)	2.9 km (1.8 mi)	9.2 km (5.7 mi)
3306	124	Compressed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.2 km (0.2 mi)	0.2 km (0.2 mi)	1.0 km (0.7 mi)	400 m (1250 ft)	2.3 km (1.4 mi)	5.1 km (3.2 mi)
3306	124	Compressed gas, 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)	0.5 km (0.3 mi)	300 m (1000 ft)	1.6 km (1.0 mi)	3.2 km (2.0 mi)
3306	124	Compressed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone D)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	150 m (500 ft)	0.8 km (0.5 mi)	2.0 km (1.3 mi)

[illegible]

"+" means distance can be larger in certain atmospheric conditions

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

		SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
UN No.	Guide	NAME OF MATERIAL	First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		
				DAY Kilometres (Miles)	NIGHT Kilometres (Miles)		DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	
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)	5.0 km (3.1 mi)	11.0+ km (7.0+ mi)	
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)	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)	400 m (1250 ft)	2.5 km (1.5 mi)	6.7 km (4.2 mi)	
3307	124	Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone C)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	150 m (500 ft)	1.0 km (0.6 mi)	2.9 km (1.8 mi)	
3307	124	Liquefied gas, toxic, oxidizing, n.o.s. (Inhalation Hazard Zone D)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	150 m (500 ft)	0.8 km (0.5 mi)	2.0 km (1.3 mi)	
3308	125	Liquefied gas, poisonous, corrosive, n.o.s.							
3308	125	Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone A)	100 m (300 ft)	0.5 km (0.3 mi)	2.5 km (1.6 mi)	500 m (1500 ft)	2.9 km (1.8 mi)	9.2 km (5.7 mi)	
3308	125	Liquefied gas, poisonous, corrosive, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.2 km (0.2 mi)	1.0 km (0.7 mi)	400 m (1250 ft)	2.3 km (1.4 mi)	5.1 km (3.2 mi)	

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

UN 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	
			Metres (Feet)	Kilometres (Miles)	DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	Metres (Feet)	Kilometres (Miles)	DAY Kilometres (Miles)	NIGHT Kilometres (Miles)
3309	119	Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	150 m (500 ft)	0.8 km (0.5 mi)	2.0 km (1.3 mi)	
3309	119	Liquefied gas, toxic, flammable, corrosive, n.o.s.								
3309	119	Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	100 m (300 ft)	0.5 km (0.3 mi)	0.5 km (0.3 mi)	2.5 km (1.6 mi)	500 m (1500 ft)	2.9 km (1.8 mi)	9.2 km (5.7 mi)	
3309	119	Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.2 km (0.2 mi)	0.2 km (0.2 mi)	1.0 km (0.7 mi)	400 m (1250 ft)	2.3 km (1.4 mi)	5.1 km (3.2 mi)	
3309	119	Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.5 km (0.3 mi)	300 m (1000 ft)	1.6 km (1.0 mi)	3.2 km (2.0 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)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	150 m (500 ft)	0.8 km (0.5 mi)	2.0 km (1.3 mi)	
3310	124	Liquefied gas, poisonous, oxidizing, corrosive, n.o.s.								
3310	124	Liquefied gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation Hazard Zone A)	100 m (300 ft)	0.5 km (0.3 mi)	0.5 km (0.3 mi)	2.5 km (1.6 mi)	500 m (1500 ft)	2.9 km (1.8 mi)	9.2 km (5.7 mi)	

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

UN 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 Metres (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Metres (Feet)	First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		Then PROTECT persons Downwind during
				DAY Kilometres (Miles)	NIGHT Kilometres (Miles)			DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	
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)	300 m	1000 ft	1.3 km (0.8 mi)	3.4 km (2.1 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)	1.0 km (0.6 mi)	2.9 km (1.8 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)	150 m	(500 ft)	0.8 km (0.5 mi)	2.0 km (1.3 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)	5.7 km (3.6 mi)	10.1 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)	300 m	(1000 ft)	1.3 km (0.8 mi)	3.4 km (2.1 mi)	
3355	119	Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)	30 m (100 ft)	0.1 km (0.1 mi)	0.3 km (0.2 mi)	150 m	(500 ft)	1.0 km (0.6 mi)	2.9 km (1.8 mi)	
3355	119	Insecticide gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	150 m	(500 ft)	0.8 km (0.5 mi)	2.0 km (1.3 mi)	

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

UN 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 Metres (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during	DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	
				DAY Kilometres (Miles)	NIGHT Kilometres (Miles)					
3385	139	Poisonous by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone A)	60 m (200 ft)	0.6 km (0.4 mi)	1.2 km (0.8 mi)	200 m (600 ft)	2.2 km (1.4 mi)	4.2 km (2.6 mi)		
3385	139	Toxic by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone A)								
3386	139	Poisonous by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone B)	30 m (100 ft)	0.2 km (0.1 mi)	0.2 km (0.2 mi)	60 m (200 ft)	0.5 km (0.3 mi)	0.7 km (0.5 mi)		
3386	139	Toxic by inhalation liquid, water-reactive, n.o.s. (Inhalation Hazard Zone B)								
3387	142	Poisonous by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone A)	60 m (200 ft)	0.6 km (0.4 mi)	1.2 km (0.8 mi)	200 m (600 ft)	2.2 km (1.4 mi)	4.2 km (2.6 mi)		
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)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.3 km (0.2 mi)	0.4 km (0.3 mi)		
3388	142	Toxic by inhalation liquid, oxidizing, n.o.s. (Inhalation Hazard Zone B)								

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

UN 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	
			Metres (Feet)	Kilometres (Miles)	DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	Metres (Feet)	Kilometres (Miles)	DAY Kilometres (Miles)	NIGHT Kilometres (Miles)
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)	0.3 km (0.2 mi)	60 m (200 ft)	0.6 km (0.4 mi)	1.0 km (0.6 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)	0.5 km (0.3 mi)	1.5 km (0.9 mi)	300 m (1000 ft)	3.1 km (2.0 mi)	5.8 km (3.6 mi)	
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)	0.3 km (0.2 mi)	60 m (200 ft)	0.6 km (0.4 mi)	1.0 km (0.6 mi)	
3491	155	Toxic by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone B)								
3492	131	Poisonous by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone A)	100 m (300 ft)	0.9 km (0.6 mi)	0.9 km (0.6 mi)	2.0 km (1.2 mi)	400 m (1250 ft)	4.8 km (3.0 mi)	7.5 km (4.7 mi)	
3492	131	Toxic by inhalation liquid, corrosive, flammable, n.o.s. (Inhalation Hazard Zone A)								

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

			SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
UN No.	Guide	NAME OF MATERIAL	First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during			
				DAY Kilometres (Miles)	NIGHT Kilometres (Miles)		DAY Kilometres (Miles)	NIGHT Kilometres (Miles)		
3512	173	Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone B)								
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)	0.1 km (0.1 mi)	
3512	173	Adsorbed gas, toxic, n.o.s. (Inhalation hazard zone D)								
3514	173	Adsorbed gas, poisonous, flammable, n.o.s.								
3514	173	Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone A)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)		
3514	173	Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone B)								
3514	173	Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone C)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	
3514	173	Adsorbed gas, poisonous, flammable, n.o.s. (Inhalation hazard zone D)								
3514	173	Adsorbed gas, toxic, flammable, n.o.s.								
3514	173	Adsorbed gas, toxic, flammable, n.o.s. (Inhalation hazard zone A)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)		

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

		SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
UN No.	Guide	NAME OF MATERIAL	First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		
				DAY Kilometres (Miles)	NIGHT Kilometres (Miles)		DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	
3515	173	Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone B)							
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)	
3515	173	Adsorbed gas, toxic, oxidizing, n.o.s. (Inhalation hazard zone D)							
3516	173	Adsorbed gas, poisonous, corrosive, n.o.s.							
3516	173	Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone A)	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	
3516	173	Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone B)							
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)	
3516	173	Adsorbed gas, poisonous, corrosive, n.o.s. (Inhalation hazard zone D)							

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

		SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
UN No.	Guide	NAME OF MATERIAL	First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		
				DAY Kilometres (Miles)	NIGHT Kilometres (Miles)		DAY Kilometres (Miles)	NIGHT Kilometres (Miles)	
3517	173	Adsorbed gas, toxic, flammable, corrosive, n.o.s	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	
3517	173	Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone A)							
3517	173	Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone B)							
3517	173	Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone C)	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)	
3517	173	Adsorbed gas, toxic, flammable, corrosive, n.o.s. (Inhalation hazard zone D)							
3518	173	Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.2 mi)	
3518	173	Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone A)							
3518	173	Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone B)	30 m (100 ft)			30 m (100 ft)			
3518	173	Adsorbed gas, poisonous, oxidizing, corrosive, n.o.s. (Inhalation hazard zone C)		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)							

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

UN 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 Metres (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during		First ISOLATE in all Directions Metres (Feet)	Then PROTECT persons Downwind during
				DAY Kilometres (Miles)	NIGHT Kilometres (Miles)		DAY Kilometres (Miles)	NIGHT Kilometres (Miles)		
9202	168	Carbon monoxide, refrigerated liquid (cryogenic liquid)	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	200 m (600 ft)	1.2 km (0.7 mi)	4.3 km (2.7 mi)		
9206	137	Methyl phosphonic dichloride	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	30 m (100 ft)	0.4 km (0.3 mi)	0.6 km (0.4 mi)		
9263	156	Chloropivaloyl chloride	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.2 km (0.2 mi)	0.3 km (0.2 mi)		
9264	151	3,5-Dichloro-2,4,6-trifluoropyridine	30 m (100 ft)	0.1 km (0.1 mi)	0.1 km (0.1 mi)	30 m (100 ft)	0.2 km (0.2 mi)	0.3 km (0.2 mi)		
9269	132	Trimethoxysilane	30 m (100 ft)	0.2 km (0.2 mi)	0.6 km (0.4 mi)	100 m (300 ft)	1.3 km (0.8 mi)	2.3 km (1.5 mi)		

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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) gases when spilled in water and identifies the TIH gases produced.

The materials are listed by UN 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: The TIH gases indicated in Table 2 are for information purposes only. In Table 1, the initial isolation and protective distances have already taken into consideration the TIH gases produced. For example: Table 2 indicates that UN1689 sodium cyanide, when spilled in water, will generate hydrogen cyanide gas (HCN). In Table 1, you must refer to the distances for sodium cyanide and not the distances for hydrogen cyanide gas.

Note 2: Some water reactive materials are also TIH materials themselves (e.g., Bromine trifluoride (UN1746), Thionyl chloride (UN1836)). In these instances, two entries are provided in Table 1 for land-based and water-based spills. If a Water Reactive material only has one entry in Table 1 for (when spilled in water), and the product is NOT spilled in water, Table 1 and Table 2 do NOT apply. Refer only to the appropriate orange guide.

Note 3: Materials classified as a Division 4.3 are substances that, on contact with water, are liable to become spontaneously FLAMMABLE or give off FLAMMABLE or sometimes TOXIC gases in dangerous quantities. For the purpose of this table, water reactive materials are materials that generate substantial quantities of TOXIC gases rapidly after a spill into water. Therefore, a material classified as a Division 4.3 will not always be included in Table 2.

TABLE2 - WATER-REACTIVE MATERIALS WHICH PRODUCE TOXIC GASES

**Materials Which Produce Large Amounts of Toxic-by-Inhalation (TIH)
Gas(es) When Spilled in Water**

UN No.	Guide No.	Name of Material	TIH Gas(es) Produced
1162	155	Dimethyldichlorosilane	HCl
1183	139	Ethyldichlorosilane	HCl
1196	155	Ethyltrichlorosilane	HCl
1242	139	Methyldichlorosilane	HCl
1250	155	Methyltrichlorosilane	HCl
1295	139	Trichlorosilane	HCl
1298	155	Trimethylchlorosilane	HCl
1305	155P	Vinyltrichlorosilane	HCl
1305	155P	Vinyltrichlorosilane, stabilized	HCl
1340	139	Phosphorus pentasulfide, free from yellow and white Phosphorus	H ₂ S
1340	139	Phosphorus pentasulphide, free from yellow and white Phosphorus	H ₂ S
1360	139	Calcium phosphide	PH ₃
1384	135	Sodium dithionite	H ₂ S SO ₂
1384	135	Sodium hydrosulfite	H ₂ S SO ₂
1384	135	Sodium hydrosulphite	H ₂ S SO ₂
1397	139	Aluminum phosphide	PH ₃
1419	139	Magnesium aluminum phosphide	PH ₃
1432	139	Sodium phosphide	PH ₃
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
1716	156	Acetyl bromide	HBr

Chemical Symbols for TIH Gases:

Br ₂	Bromine	HF	Hydrogen fluoride	NO ₂	Nitrogen dioxide
Cl ₂	Chlorine	HI	Hydrogen iodide	PH ₃	Phosphine
HBr	Hydrogen bromide	H ₂ S	Hydrogen sulfide	SO ₂	Sulfur dioxide
HCl	Hydrogen chloride	H ₂ S	Hydrogen sulphide	SO ₂	Sulphur dioxide
HCN	Hydrogen cyanide	NH ₃	Ammonia		

TABLE2 - WATER-REACTIVE MATERIALS WHICH PRODUCE TOXIC GASES

**Materials Which Produce Large Amounts of Toxic-by-Inhalation (TIH)
Gas(es) When Spilled in Water**

UN No.	Guide No.	Name of Material	TIH Gas(es) Produced
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 ₂
1746	144	Bromine trifluoride	HF Br ₂
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	Dipenyldichlorosilane	HCl
1771	156	Dodecyltrichlorosilane	HCl
1777	137	Fluorosulfonic acid	HF
1777	137	Fluorosulphonic acid	HF

Chemical Symbols for TIH Gases:

Br ₂	Bromine	HF	Hydrogen fluoride	NO ₂	Nitrogen dioxide
Cl ₂	Chlorine	HI	Hydrogen iodide	PH ₃	Phosphine
HBr	Hydrogen bromide	H ₂ S	Hydrogen sulfide	SO ₂	Sulfur dioxide
HCl	Hydrogen chloride	H ₂ S	Hydrogen sulphide	SO ₂	Sulphur dioxide
HCN	Hydrogen cyanide	NH ₃	Ammonia		

TABLE2 - WATER-REACTIVE MATERIALS WHICH PRODUCE TOXIC GASES

**Materials Which Produce Large Amounts of Toxic-by-Inhalation (TIH)
Gas(es) When Spilled in Water**

UN No.	Guide No.	Name of Material	TIH Gas(es) Produced
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 ₂ H ₂ S
1828	137	Sulphur chlorides	HCl SO ₂ H ₂ S
1834	137	Sulfuryl chloride	HCl
1834	137	Sulphuryl chloride	HCl
1836	137	Thionyl chloride	HCl SO ₂
1838	137	Titanium tetrachloride	HCl
1898	156	Acetyl iodide	HI
1923	135	Calcium dithionite	H ₂ S SO ₂
1923	135	Calcium hydrosulfite	H ₂ S SO ₂
1923	135	Calcium hydrosulphite	H ₂ S SO ₂
1929	135	Potassium dithionite	H ₂ S SO ₂

Chemical Symbols for TIH Gases:

Br ₂	Bromine	HF	Hydrogen fluoride	NO ₂	Nitrogen dioxide
Cl ₂	Chlorine	HI	Hydrogen iodide	PH ₃	Phosphine
HBr	Hydrogen bromide	H ₂ S	Hydrogen sulfide	SO ₂	Sulfur dioxide
HCl	Hydrogen chloride	H ₂ S	Hydrogen sulphide	SO ₂	Sulphur dioxide
HCN	Hydrogen cyanide	NH ₃	Ammonia		

TABLE2 - WATER-REACTIVE MATERIALS WHICH PRODUCE TOXIC GASES

**Materials Which Produce Large Amounts of Toxic-by-Inhalation (TIH)
Gas(es) When Spilled in Water**

UN No.	Guide No.	Name of Material	TIH Gas(es) Produced
1929	135	Potassium hydrosulfite	H ₂ S SO ₂
1929	135	Potassium hydrosulphite	H ₂ S SO ₂
1931	171	Zinc dithionite	H ₂ S SO ₂
1931	171	Zinc hydrosulfite	H ₂ S SO ₂
1931	171	Zinc hydrosulphite	H ₂ S SO ₂
2004	135	Magnesium diamide	NH ₃
2011	139	Magnesium phosphide	PH ₃
2012	139	Potassium phosphide	PH ₃
2013	139	Strontium phosphide	PH ₃
2308	157	Nitrosylsulfuric acid, liquid	NO ₂
2308	157	Nitrosylsulfuric acid, solid	NO ₂
2308	157	Nitrosylsulphuric acid, liquid	NO ₂
2308	157	Nitrosylsulphuric acid, solid	NO ₂
2353	132	Butyryl chloride	HCl
2395	132	Isobutyryl chloride	HCl
2434	156	Dibenzylchlorosilane	HCl
2435	156	Ethylphenylchlorosilane	HCl
2437	156	Methylphenylchlorosilane	HCl
2495	144	Iodine pentafluoride	HF
2691	137	Phosphorus pentabromide	HBr
2692	157	Boron tribromide	HBr
2806	138	Lithium nitride	NH ₃
2977	166	Radioactive material, Uranium hexafluoride, fissile	HF
2977	166	Uranium hexafluoride, radioactive material, fissile	HF

Chemical Symbols for TIH Gases:

Br ₂	Bromine	HF	Hydrogen fluoride	NO ₂	Nitrogen dioxide
Cl ₂	Chlorine	HI	Hydrogen iodide	PH ₃	Phosphine
HBr	Hydrogen bromide	H ₂ S	Hydrogen sulfide	SO ₂	Sulfur dioxide
HCl	Hydrogen chloride	H ₂ S	Hydrogen sulphide	SO ₂	Sulphur dioxide
HCN	Hydrogen cyanide	NH ₃	Ammonia		

TABLE2 - WATER-REACTIVE MATERIALS WHICH PRODUCE TOXIC GASES

**Materials Which Produce Large Amounts of Toxic-by-Inhalation (TIH)
Gas(es) When Spilled in Water**

UN No.	Guide No.	Name of Material	TIH Gas(es) Produced
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 ₃
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 ₂
3456	157	Nitrosylsulphuric acid, solid	NO ₂
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 ₂

Chemical Symbols for TIH Gases:

Br ₂	Bromine	HF	Hydrogen fluoride	NO ₂	Nitrogen dioxide
Cl ₂	Chlorine	HI	Hydrogen iodide	PH ₃	Phosphine
HBr	Hydrogen bromide	H ₂ S	Hydrogen sulfide	SO ₂	Sulfur dioxide
HCl	Hydrogen chloride	H ₂ S	Hydrogen sulphide	SO ₂	Sulphur dioxide
HCN	Hydrogen cyanide	NH ₃	Ammonia		

HOW TO USE TABLE 3 – INITIAL ISOLATION AND PROTECTIVE ACTION
DISTANCES FOR LARGE SPILLS FOR DIFFERENT QUANTITIES OF
SIX COMMON TIH GASES

Table 3 lists Toxic Inhalation Hazard materials that may be more commonly encountered.

The selected materials are:

- UN1005 - Ammonia, anhydrous
- UN1017 - Chlorine)
- UN1040 - Ethylene oxide and UN1040 - Ethylene oxide with nitrogen
- UN1050 - Hydrogen chloride, anhydrous and UN2186 - Hydrogen chloride, refrigerated liquid
- UN1052 - Hydrogen fluoride, anhydrous
- UN1079 - Sulfur dioxide/Sulphur dioxide

The materials are presented in numerical order of UN number and provide Initial Isolation and Protective Action Distances **FOR LARGE SPILLS** (more than 208 litres or 55 US gallons) involving different container types (therefore different volume capacities) for day time and night time situations and different wind speeds.

- Rail car: 80,000 kg
- Highway tank truck or trailer: 20,000-25,000 kg
- Agricultural nurse tank: 3785 L
- Small cylinder: 72 L
- Ton cylinder: 757-1135 L

Estimating Wind Speed from Environmental Clues

mph	km/h	Wind Description	Specifications
< 6	< 10	Low wind	Wind felt on face; leaves rustle; ordinary vane moved by wind
6 - 12	10 - 20	Moderate wind	Raises dust, loose paper; small branches are moved
> 12	> 20	High wind	Large branches in motion; whistling heard in telephone wires; umbrellas used with difficulty

(Data taken from the Beaufort Wind Scale has been reworked in order to create 3 categories of wind speed: low, moderate and high)

TABLE 3 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES FOR LARGE SPILLS FOR DIFFERENT QUANTITIES OF SIX COMMON TIH (PIH in the US) GASES

	First ISOLATE in all Directions	Then PROTECT 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)		
TRANSPORT CONTAINER		UN1005 Ammonia, anhydrous: Large Spills							
Rail tank car	300 (1000)	1.9 (1.12)	1.5 (0.9)	1.1 (0.6)	4.5 (2.8)	2.5 (1.5)	1.4 (0.9)		
Highway tank truck or trailer	150 (500)	0.9 (0.6)	0.5 (0.3)	0.4 (0.3)	2.0 (1.3)	0.8 (0.5)	0.6 (0.4)		
Agricultural nurse tank	60 (200)	0.5 (0.3)	0.3 (0.2)	0.3 (0.2)	1.4 (0.9)	0.3 (0.2)	0.3 (0.2)		
Multiple small cylinders	30 (100)	0.3 (0.2)	0.2 (0.1)	0.1 (0.1)	0.7 (0.5)	0.3 (0.2)	0.2 (0.1)		
TRANSPORT CONTAINER		UN1017 Chlorine: Large Spills							
Rail tank car	1000 (3000)	10.1 (6.3)	6.8 (4.2)	5.3 (3.3)	11 (7)	9.2 (5.7)	6.9 (4.3)		
Highway tank truck or trailer	600 (2000)	5.8 (3.6)	3.4 (2.1)	2.9 (1.8)	6.7 (4.3)	5.0 (3.1)	4.1 (2.5)		
Multiple ton cylinders	300 (1000)	2.1 (1.3)	1.3 (0.8)	1.0 (0.6)	4.0 (2.5)	2.4 (1.5)	1.3 (0.8)		
Multiple small cylinders or single ton cylinder	150 (500)	1.5 (0.9)	0.8 (0.5)	0.5 (0.3)	2.9 (1.8)	1.3 (0.8)	0.6 (0.4)		

"+" 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

	First ISOLATE in all Directions	Then PROTECT 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)		
TRANSPORT CONTAINER									
UN1040 Ethylene oxide: Large Spills									
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)		
TRANSPORT CONTAINER									
UN1050 Hydrogen chloride, anhydrous: Large Spills UN2186 Hydrogen chloride, refrigerated liquid: Large Spills									
Rail tank car	500 (1500)	3.9 (2.5)	2.1 (1.2)	1.8 (1.2)	10.1 (6.3)	3.5 (2.2)	2.3 (1.5)		
Highway tank truck or trailer	200 (600)	1.5 (0.9)	0.8 (0.5)	0.6 (0.4)	3.9 (2.5)	1.5 (0.9)	0.8 (0.5)		
Multiple ton cylinders	30 (100)	0.4 (0.3)	0.2 (0.1)	0.1 (0.1)	1.1 (0.7)	0.3 (0.2)	0.2 (0.1)		
Multiple small cylinders or single ton cylinder	30 (100)	0.3 (0.2)	0.2 (0.1)	0.1 (0.1)	0.9 (0.6)	0.3 (0.2)	0.2 (0.1)		

“+” 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

	First ISOLATE in all Directions	Then PROTECT 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)
TRANSPORT CONTAINER							
		UN1052 Hydrogen fluoride, anhydrous: Large Spills					
Rail tank car	500 (1500)	3.5 (2.2)	2.1 (1.3)	1.8 (1.2)	6.6 (4.1)	3.1 (1.9)	2.0 (1.2)
Highway tank truck or trailer	200 (700)	2.0 (1.2)	1.0 (0.7)	0.9 (0.6)	3.7 (2.3)	1.6 (1.0)	0.9 (0.6)
Multiple small cylinders or single ton cylinder	100 (300)	0.8 (0.5)	0.4 (0.2)	0.3 (0.2)	1.7 (1.1)	0.5 (0.3)	0.3 (0.2)
TRANSPORT CONTAINER							
		UN1079 Sulfur dioxide/Sulphur dioxide: Large Spills					
Rail tank car	1000 (3000)	11 (7)	11 (7)	7.2 (4.5)	11 (7)	11 (7)	10.1 (6.3)
Highway tank truck or trailer	1000 (3000)	11 (7)	6.2 (3.8)	5.3 (3.3)	11 (7)	8.2 (5.1)	6.2 (3.9)
Multiple ton cylinders	500 (1500)	5.4 (3.4)	2.4 (1.5)	1.8 (1.1)	7.8 (4.8)	4.2 (2.6)	2.9 (1.8)
Multiple small cylinders or single ton cylinder	200 (600)	3.2 (2.0)	1.5 (0.9)	1.1 (0.7)	5.8 (3.6)	2.5 (1.6)	1.5 (0.9)

"+" means distance can be larger in certain atmospheric conditions

ANZ-ERG2021 USER'S GUIDE

The 2021 Australian & New Zealand Emergency Response Guidebook (ANZ-ERG2021) is based on the 2020 ERG which 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 CI UIME (Centro de Información u mica 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 transport operators and 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. ANZ-ERG2021 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. ANZ-ERG2021 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 UN Number. They do, however, appear under the general heading Explosives on the first page of the UN Number index (yellow-bordered pages) and alphabetically in the Name of Material index (blue-bordered pages). The letter (P) following the guide number in the yellow-bordered and blue-bordered pages identifies materials that present a polymerization hazard under certain conditions, for example: UN1092 Acrolein, stabilized 131P.

First responders at the scene of a dangerous goods incident should not solely rely on this guidebook. 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 transport document, or by consulting the information on or accompanying the transport 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!

Guidebook Contents

1-Yellow-bordered pages: Index list of dangerous goods in numerical order of UN number. This list displays the 4-digit UN number of the material followed by its assigned emergency response guide and the material name.

For example:	UN No.	GUIDE No.	Name of Material
	1090	127	Acetone

2-Blue-bordered pages: Index list of dangerous goods in alphabetical order of material name. This list displays the name of the material followed by its assigned emergency response guide and 4-digit UN number.

For example:	Name of Material	GUIDE No.	UN No.
	Sulfuric acid	137	1830

3-Orange-bordered pages: All safety recommendations are provided. It comprises a total of 62 individual guides in a two-page format. Each guide provides safety commendations 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 applies to 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. Primary potential hazard is listed first. The emergency responder should consult this section first to help you make decisions about 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 UN 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 litres (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 litres (55 US gallons) for liquids and more than 300 kilograms (660 pounds) for solids when spilled in water) for all highlighted materials. For entries marked (when used as a weapon) volumes vary, but in most cases, small spills include releases up to 2 kg (4.4. lbs), and large spills include releases up to 25 kg (55 lbs).

Within the initial isolation distance 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.

The protective action distance are downward distances from the spill or leak source within which responders could carry out protective actions to:

- preserve the health and safety of emergency responders and the public
- Evacuate and/or shelter in place people in this area (for more information consult pages 288 - 290)

The protective action distances are divided into daytime and nighttime incidents because varying atmospheric conditions affect the size of the hazardous area's size. In fact, the quantity or concentration of the material's vapour poses problems, not its mere presence. 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 is smaller (due to increased dispersion). Daytime is after sunrise and before sunset. Nighttime is between sunset and sunrise..

For example, in the case of a small spill of UN1955-compressed gas, toxic, n.o.s., the isolation distance is 100 metres (300 feet), therefore, its initial isolation zone is 200 metres (600 feet) in diameter. Its protective action distance is 0.5 kilometres (0.3 miles) for a daytime incident and 2.5 kilometres (1.6 miles) for a nighttime incident.

Note 1: Some water-reactive materials have 2 entries in Table 1. They are identified by (when spilled on land) since they are TIH products and (when spilled in water) because they produce additional toxic gases when spilled in water.

For example: UN1746 - Bromine trifluoride and UN1836 - Thionyl chloride.

Note 2: If a water-reactive material only has one entry in Table 1 for (when spilled in water) and the product is NOT spilled in water, Table 1 and Table 2 do not apply. You will find safe distances in the appropriate orange-bordered guide.

For example: UN1183 - Ethyldichlorosilane and UN1898 Acetyl iodide.

Table 2 Water-Reactive Materials which produce toxic gases lists, by UN 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)**.

NOTE: The TIH gases indicated in Table 2 are for information purposes only. These TIH gases have already been taken into account in the distances of Table 1. For example, Table 2 indicates that UN1689 sodium cyanide, when spilled in water, will generate hydrogen cyanide gas (HCN). In Table 1, you must refer to the distances for sodium cyanide, solid and not the distances for hydrogen cyanide gas.

Table 3 Initial isolation and protective action distances for large spills for different quantities of six common TIH gases. The selected materials are:

- UN1005 - Ammonia, anhydrous
- UN1017 - Chlorine
- UN1040 - Ethylene oxide and UN1040 Ethylene oxide with nitrogen
- UN1050 - Hydrogen chloride, anhydrous and UN2186 - Hydrogen chloride, refrigerated liquid
- UN1052 - Hydrogen fluoride, anhydrous
- UN1079 - Sulfur dioxide/Sulphur dioxide

The table provides Initial Isolation and Protective Action Distances for large spills (more than 208 litres or 55 US gallons) involving different container types (therefore different volume capacities) for day-time and night-time situations and different wind speeds

How to choose the appropriate isolation and protective action distances

ANZ-ERG2021 lists the isolation or evacuation in 2 places: The individual guides (orange-bordered pages) and in the Table 1 - Initial Isolation and Protective Action Distances (green-bordered pages).

If you are dealing with a non-TIH (PIH in the US) (not highlighted in green in the yellow bordered or blue bordered pages), go to the assigned guide. Under EVACUATION you will find: initial isolation distance as an immediate precautionary measure. Specific distances for spill or fire situations (fragment hazard). Please note that certain guides may also refer to Table 1. This is just a reminder for green highlighted materials only.

If you are dealing with a TIH, water-reactive or chemical warfare material (green highlighted entries in the yellow or blue bordered pages):

If there is no fire go directly to Table 1 - Initial Isolation and Protective Action Distances (green-bordered pages) and consult the assigned guide the material (orange-bordered pages).

If a fire is involved go directly to the assigned guide (orange-bordered pages) and apply the distances found under EVACUATION- Fire and consult Table 1 distances for residual material release.

PROTECTIVE CLOTHING

Street Clothing and Work Uniforms. These garments, such as uniforms worn by police and emergency medical services personnel, provide almost no protection from the harmful effects of 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 AS/NZS ISO 2801:2008 and AS/NZS 4967:2009. Structural fire fighters protective clothing provides limited protection from heat and cold. It may not provide adequate protection from the harmful vapours 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 controller 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 bushland 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. SCBA should, at a minimum, meet the AS/NZS 1715:2009 and AS/NZS 1716:2012. Chemical-cartridge respirators or other filtering masks are not acceptable substitutes for positive pressure self-contained breathing apparatus. The three most common Air Purifying Respirators (ARPS) are P2, P3 and Powered Air Purifying Respirators (PAPR.) Consult your organisational policy and procedure before considering their use.

Chemical Protective Clothing and Equipment. Safe use of this type of protective clothing and equipment requires specific skills developed through training and experience. These chemical suits should at a minimum, meet AS/NZS ISO 6529:2006.

This type of special clothing may protect against one chemical but 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) Gas Tight Chemical Protective Suit (EN 943-1:2002) Level A protection and (2) Protective clothing against liquid chemicals (EN 14605:2005) is sometimes referred to as Level B or C protection. 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. Consult glossary for additional protection levels under the heading Protective Clothing.

Standards referenced in the section

Structural Firefighters Protective Clothing:

AS/NZS ISO 2801:2008 - Clothing for protection against heat and flame

General recommendations for selection, care and use of protective clothing

AS/NZS 4967:2009 - Protective clothing for firefighters Requirements and test methods for protective clothing used for structural firefighting

Positive Pressure Self-Contained Breathing Apparatus (SCBA):

AS/NZS 1715:2009 - Selection, use and maintenance of respiratory protective equipment

AS/NZS 1716:2012 - Respiratory protective devices

Chemical Protective Clothing and Equipment:

AS/NZS ISO 6529:2006 - Protective clothing Protection against chemicals

Determination of resistance of protective clothing materials to permeation by liquids and gases

EN943-1:2002 Protective clothing against dangerous solid, liquid and gaseous chemicals including liquid and solid aerosols- Part 1: performance requirements for type 1 (gas-tight) chemical protective suits.

EN14605:2005 Protective clothing against liquid chemicals: performance requirements for clothing with liquid tight (Type 3) or spray tight (Type 4) connections, including items protection to parts of the body only (Types PB 3 and PB 4)

DECONTAMINATION

The ways to decontaminate people and equipment can vary. If you need help with decontamination, contact the emergency response telephone number provided on the transport documents or the appropriate emergency service. These resources may be able to put you in contact with the chemical manufacturer to determine the appropriate procedure if not otherwise available.

Decontamination is the process of removing or neutralising hazardous materials/dangerous goods that have contaminated people and equipment during an incident.

Contamination happens in the area generally referred to as the Hot Zone. Everything and everyone entering this zone should be decontaminated when leaving, including emergency response personnel. This reduces the chances that more contamination will occur.

There are two main types of contamination:

- **Direct contamination** happens in the Hot Zone.
- **Cross contamination** happens when someone or something outside the Hot Zone was not properly decontaminated and comes in contact with another object or person, usually in the Warm or Cold Zone.

To decontaminate, you must: physically remove contaminants and/or chemically neutralise contaminants .

The NFPA, describes the following four kinds of decontamination.

- (1) **Gross decontamination:** quickly removing surface contamination, which usually happens by mechanically removing the contaminant or rinsing with water from handheld hose lines, emergency showers, or other nearby water sources.
- (2) **Technical decontamination:** Reducing contamination to a level as low as possible by chemical or physical methods. A hazmat team will perform this kind of decontamination.
- (3) **Mass decontamination:** Reducing or removing surface contaminants as fast as possible from a large number of people in potentially life-threatening situations.
- (4) **Emergency decontamination:** Immediately reducing contamination of people in potentially life-threatening situations with or without formally setting up a decontamination corridor. This process should be performed upwind and uphill from victims. Responders should avoid contact with victims, runoff or spray from the decontamination process.

Emergency and mass decontamination can be done with firefighting and rescue operations equipment. Nozzles can be put on wide-angle fog patterns and sprayed towards the ground to create a decontamination shower. Responders can also place nozzles on the discharge ports of engines.

Contaminated clothing and equipment must be removed after use and stored in a controlled area (Warm Zone) until cleanup procedures can begin. Sometimes protective clothing and equipment cannot be decontaminated and must be disposed of properly.

Chemical neutralisation releases heat. Do not perform on a victim.

FIRE AND SPILL CONTROL

FIRE CONTROL

Water is the most common and generally most available fire extinguishing agent. 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.

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 Standard 11 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 transport 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.

Contact the contact the emergency response telephone number provided on the transport documents or the appropriate emergency service, as soon as possible for guidance on the proper fire extinguishing agent to use.

WATER REACTIVE MATERIALS

Water is sometimes used to flush spills and to reduce or direct vapours 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.

VAPOUR CONTROL

Limiting the amount of vapour 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 vapour control, get advice from an authoritative source as to the proper tactics. There are several ways to minimize the amount of vapours escaping from pools of spilled liquids, such as special foams, adsorbing agents, absorbing agents, and neutralising agents. To be effective, these vapour 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 vapour 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 vapour seal, care must be taken not to churn or further spread the spill during application. Vapours 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 vapour emission or to suppress ignition, obtain technical advice, based on specific chemical name identification.

BLEVE (Boiling Liquid Expanding Vapour 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.

A BLEVE occurs when a fire impinged, or damaged tank car fails to contain its internal pressure and explodes with a sudden pressure release. This catastrophic failure is more likely to occur with damaged pressure tank cars, even in the absence of an active fire.

What are the main hazards from a BLEVE

The main hazards from a propane or LPG BLEVE are:

- fire: if the released substance is ignited there is an immediate fireball.

- thermal radiation: at a distance of about 4 times the radius of a fireball, the heat radiated from a fireball is enough to burn exposed skin in 2 seconds. Wearing protective clothing limits the thermal radiation dose.

- Blast: A concussive force caused by the sudden release of the pressurized substance. For a BLEVE occurring out in the open, the blast strength at a distance of 4 times the radius of a fireball can break window glass and may cause minor damage to buildings.

- Projectiles: tank failure metal fragments over large distances. These fragments can and have been deadly.

The danger from these decreases as you move away from the BLEVE centre. The furthest reaching hazard is projectiles.

For a video with information on critical safety issues concerning BLEVEs, please visit <http://www.tc.gc.ca/eng/tdg/publications-menu-1238.html>. 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.

HEAT INDUCED TEAR (HIT)

A heat induced tear (HIT) is a rupture of a NON-PRESSURE tank car containing flammable liquids when exposed to the intense heat of a fire. The metal will soften and the pressure in the tank car will increase which can lead to containment failure. The tear generally occurs at the vapor space (upper side) of the container, venting large quantities of flammable liquid and vapors at high speed. A fireball and an intense heat wave will occur.

Compared to BLEVEs, HITs rarely result in the projection of tank car fragments. Heat induced tearing has occurred within 20 minutes of the derailment and as long as 10 hours following the initial fire.

Responding to these types of incidents (BLEVE and HIT) requires specialized training, equipment and a tactical approach.

BLEVE – SAFETY PRECAUTIONS

Use with caution. The following table gives a summary of tank properties, critical times, critical distances and cooling water flow rates for various tank sizes. This table is provided to give responders some guidance but it should be used with caution.

Tank dimensions are approximate and can vary depending on the tank design and application.

Minimum time to failure is based on **severe torch fire impingement** on the vapour 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 $9.75(\sqrt{\text{capacity (litres)}})$ = litres/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.

BLEVE (USE WITH CAUTION)											
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)	metres (Feet)	metres (Feet)	Kilograms(Pounds)	Minutes	Minutes	metres (Feet)	metres (Feet)	metres (Feet)	metres (Feet)	Litres/min	USgal/min
100 (26.4)	0.3 (1)	1.5 (4.9)	40 (88)	4	8	10 (33)	90 (295)	154 (505)	307 (1007)	97	26
400 (106)	0.61 (2)	1.5 (4.9)	160 (353)	4	12	16 (53)	90 (295)	244 (801)	488 (1601)	195	51
2000 (528)	0.96 (3.2)	3 (9.8)	800 (1764)	5	18	28 (92)	111 (364)	417 (1368)	834 (2736)	435	115
4000 (1057)	1 (3.3)	4.9 (16.1)	1600 (3527)	5	20	35 (115)	140 (459)	525 (1722)	1050 (3445)	615	163
8000 (2113)	1.25 (4.1)	6.5 (21.3)	3200 (7055)	6	22	44 (144)	176 (577)	661 (2169)	1323 (4341)	870	230
22000 (5812)	2.1 (6.9)	6.7 (22)	8800 (19400)	7	28	62 (203)	247 (810)	926 (3038)	1852 (6076)	1443	381
42000 (11095)	2.1 (6.9)	11.8 (38.7)	16800 (37037)	7	32	77 (253)	306 (1004)	1149 (3770)	2200 (7218)	1994	527
82000 (21662)	2.75 (9)	13.7 (45)	32800 (72310)	8	40	96 (315)	383 (1257)	1435 (4708)	2200 (7218)	2786	736
140000 (36984)	3.3 (10.8)	17.2 (56.4)	56000 (123457)	9	45	114 (374)	457 (1499)	1715 (5627)	2200 (7218)	3640	962

Improvised Explosive Device (IED) SAFE STAND-OFF DISTANCE

Threat Description		Explosives Capacity¹		Mandatory Evacuation Distance²		Shelter-in-Place Zone		Preferred Evacuation Distance³		
High Explosives (TNT Equivalent)		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

¹ Based on the maximum amount of material that could reasonably fit into a container or vehicle. Variations possible.

² Governed by the ability of an unreinforced building to withstand severe damage or collapse.

³ 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

LPG- Butane or Propane	Threat Description	LPG Mass / Volume ¹		Fireball Diameter ²	Safe Distance ^{3, 4}
	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

¹Based on the maximum amount of LPG that could reasonably fit into a container or vehicle. Variations possible.

²Assuming efficient mixing of the flammable gas with ambient air.

³Determined by U.S. firefighting practices wherein safe distances are approximately 4 times the flame height.

⁴ This table is for a loaded LPG tank with explosives on the exterior. Note that an LPG tank filled with high explosives would require a significantly greater stand-off distance than if it were filled with LPG.

GLOSSARY

Adsorbed gas

A gas which sticks (adsorbs) to the surface of a solid and porous material (such as activated charcoal) contained within a metal cylinder. This results in an internal cylinder pressure of less than 101.3 kPa at 20 °C (14 psi at 68 °F) and less than 300 kPa at 50 °C (43 psi at 122 °F). These pressures are much lower than those of conventional cylinders containing compressed or liquified gases.

AEGL(s)

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.

AEGL-1

AEGL-1 is the airborne concentration (expressed as parts per million or milligrams per cubic meter [ppm or mg/m³]) 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.

AEGL-2

AEGL-2 is the airborne concentration (expressed as ppm or mg/m³) 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.

AEGL-3

AEGL-3 is the airborne concentration (expressed as ppm or mg/m³) of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

Alcohol-resistant foam

A foam that is resistant to “polar” chemicals such as ketones and esters which may break down other types of foam.

Biological agents

Living organisms that cause disease, sickness and mortality in humans. Anthrax and Ebola are examples of biological agents.
Refer to GUIDE 158.

Blister agents (vesicants)

Substances that cause blistering of the skin. Exposure is through liquid or vapour contact with any exposed tissue (eyes, skin, lungs). Mustard (H), Distilled Mustard (HD), Nitrogen Mustard (HN) and Lewisite (L) are blister agents.

Symptoms: Red eyes, skin irritation, burning of skin, blisters, upper respiratory damage, cough, hoarseness.

GLOSSARY

Blood agents	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. Symptoms: Respiratory distress, headache, unresponsiveness, seizures, coma.
Boil over	A sudden increase in fire intensity associated with the expulsion of burning flammable liquid caused by the boiling of water that has accumulated in the bottom of a tank car.
Burn	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.
Carcinogen	A substance or mixture which induces cancer or increases its incidence.
Category A	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.
Category 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.
CBRN	Chemical, biological, radiological or nuclear warfare agent.
Choking agents	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. Symptoms: Irritation to eyes/nose/throat, respiratory distress, nausea and vomiting, burning of exposed skin.
CO₂	Carbon dioxide gas.
Cold zone	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).
Combustible liquid	Any liquid that has a flash point greater than 60.5°C, and has a fire point that is less than its boiling point.

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

Control zones	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).
Cryogenic liquid	A refrigerated, liquefied gas that has a boiling point colder than -90°C (-130°F) at atmospheric pressure.
Decomposition products	Products of a chemical or thermal break-down of a substance.
Decontamination	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 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.
Dry chemical	A preparation designed for fighting fires involving flammable liquids, pyrophoric substances and electrical equipment. Common types contain sodium bicarbonate or potassium bicarbonate.
Edema	The accumulation of an excessive amount of watery fluid in cells and tissues. Pulmonary edema is an excessive build up of water in the lungs, for instance, after inhalation of a gas that is corrosive to lung tissue.
ERPG(s)	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

ERPG-1	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 odour.
ERPG-2	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.
ERPG-3	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.
Flammable liquid	A liquid that has a flash point of 60°C (140°F) or lower.
Flash point	Lowest temperature at which a liquid or solid gives off vapour in such a concentration that, when the vapour 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.
Flooding quantities	Minimum of 1900 L/min (500 US gal/min) of water.
Hazard zones (Inhalation Hazard Zones)	HAZARD ZONE A: 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, HAZARD ZONE 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. HAZARD ZONE C: LC50 greater than 1000 ppm and less than or equal to 3000 ppm, HAZARD ZONE D: LC50 greater than 3000 ppm and less than or equal to 5000 ppm.
High expansion foam	Foams that have a high expansion ratio (over 1:200) with a low water content.

GLOSSARY

Hot zone	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).
IED	See “Improvised Explosive Device”.
Immiscible	In this guidebook, means that a material does not mix readily with water.
Improvised Explosive Device	A bomb that is manufactured from commercial, military or homemade explosives.
Large spill	A spill that involves quantities that are greater than 208 litres for liquids and greater than 300 kilograms for solids.
LC50	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 ³).
Mass explosion	Explosion which affects almost the entire load virtually instantaneously.
MAWP	Maximum Allowable Working Pressure: The maximum allowable internal pressure that the tank may experience during normal operations
mg/m³	Milligrams of a material per cubic metre of air.
Miscible	In this guidebook, means that a material mixes readily with water.
mL/m³	Millilitres of a material per cubic meter of air. (1 mL/m ³ equals 1 ppm).
Mutagen	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.
Narcotic	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.

GLOSSARY

Nerve agents

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 vapour. Tabun (GA), Sarin (GB), Soman (GD) and VX are nerve agents.

Symptoms: Pinpoint pupils, extreme headache, severe tightness in the chest, dyspnea, runny nose, coughing, salivation, unresponsiveness, seizures.

n.o.s.

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 Transport Documents.

Noxious

In this guidebook, means that a material may be harmful or injurious to health or physical well-being.

Organic Peroxide

An organic (carbon-containing) compound having two oxygen atoms joined together. Organic peroxides are thermally unstable chemicals. They may have one or more of the following properties: be liable to explosive decomposition burn rapidly be sensitive to impact or friction react dangerously with other substances.

Oxidizer

A chemical which supplies its own oxygen and which helps other combustible material burn more readily.

P

See "Polymerisation".

Packing Group

The Packing Group (PG) is assigned based on the degree of danger presented by the hazardous material:

PG I : High danger

PG II : Medium danger

PG III : Low danger

PG

See "Packing Group".

pH

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.

PIH

Poison Inhalation Hazard. Term used to describe gases and volatile liquids that are toxic when inhaled. (Same as TIH).

Polar

See “Miscible”.

GLOSSARY

Polymerization

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 **(P)** following a guide number in the yellow-bordered and blue-bordered pages identifies a material that may polymerise violently under high temperature conditions or contamination with other products. It is also used to identify materials that have a strong potential for polymerisation in the absence of an inhibitor due to depletion of this inhibitor caused by accident conditions.

ppm

Parts per million. (1 ppm equals 1 mL/m³).

Protective clothing

Includes both respiratory and physical protection. One cannot assign a level of protection to clothing or respiratory devices separately. These levels were accepted and defined by response organizations such as U.S. Coast Guard, NIOSH, and U.S. EPA.

Level A: SCBA plus totally encapsulating chemical resistant clothing (permeation resistant).

Level B: SCBA plus hooded chemical resistant clothing (splash suit).

Level C: Full or half-face respirator plus hooded chemical resistant clothing (splash suit).

Level D: Coverall with no respiratory protection.

Pyrophoric

A material which ignites spontaneously upon exposure to air (or oxygen).

Radiation Authority

As referred to in GUIDES 161 through 166 for radioactive materials, the Radiation Authority is either a Federal, state/territory agency or state/territory designated official. The responsibilities of this authority include evaluating radiological hazard conditions during normal operations and during emergencies.

Radioactivity

The property of some substances to emit invisible and potentially harmful radiation.

Refrigerated liquid

See "Cryogenic liquid".

Regrigerated liquified gas

a gas which when packaged for transport is made partially because of its low temperature. See Cryogenic liquid.

Respiratory sensitizer

A substance that induces hypersensitivity of the airways following inhalation of the substance.

GLOSSARY

Right-of-way	A defined area on a property containing one or more high-pressure natural gas pipelines.
Shelter in-place	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 vapours are flammable; (b) 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.
Skin corrosion	The production of irreversible damage to the skin following the application of a test substance for up to 4 hours.
Skin irritation	The production of reversible damage to the skin following the application of a test substance for up to 4 hours.
Skin sensitiser	A substance that will induce an allergic response following skin contact.
Small fire	A fire involving less than a surface area of 5 m ² and/or less than 20 L/kg of a material, or a fire with characteristics within and not exceed the capabilities of a person other than a fire-fighter to safely.
Small spill	A spill that involves quantities that are less than 208 litres for liquids and less than 300 kilograms for solids.
Specific gravity	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

Straight (solid) stream	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.
TIH	Toxic Inhalation Hazard. Term used to describe gases and volatile liquids that are toxic when inhaled.
Vapour concentration	Saturated vapour concentration in air of a material in mL/m ³ (volatility) at 20°C and standard atmospheric pressure.
Vapour density	Weight of a volume of pure vapour or gas (with no air present) compared to the weight of an equal volume of dry air at the same temperature and pressure. A vapour density less than 1 (one) indicates that the vapour is lighter than air and will tend to rise. A vapour density greater than 1 (one) indicates that the vapour is heavier than air and may travel along the ground.
Vapour pressure	Pressure at which a liquid and its vapour are in equilibrium at a given temperature. Liquids with high vapour pressures evaporate rapidly.
Viscosity	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.
Warm zone	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).
Water Reactive Material	For the purpose of this guidebook, produces significant toxic gas when it comes in contact with water.
Water-sensitive	Substances which may produce flammable and/or toxic decomposition products upon contact with water.

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 vapours, knock-down vapours or disperse vapours. Direct a water spray (fog), rather than a straight (solid) stream, into the vapour 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.

AUSTRALIAN APPROVAL

The Australian & New Zealand Emergency Response Guide (ANZ-ERG2021) is approved as emergency information satisfying the requirements of the Australian Code for the transport of Dangerous Goods by Road and Rail (ADG Code) and associated legislation. The approval was given national effect by Competent Authorities Panel decision number APP2021/114.

NEW ZEALAND APPROVAL

Supported by reference for use in New Zealand by the NZ Transport Agency - Waka Kotahi, and endorsed by the NZ chemical industry 'Responsible Care NZ', in consultation with representatives from the transport industry, logistics and freight forwarding, and the committee responsible for the NZS 5433 Transport of Dangerous Goods on Land. The ANZ-ERG is recommended for the transport of sector and emergency responders as an appropriate means to assist with initial response to a dangerous goods incident.

REPRODUCTION AND RESALE

In Australia, the ANZ-ERG2021 is available free of charge at the website of the National Transport Commission. <https://www.ntc.gov.au/>. In New Zealand, the ANZ-ERG2021 is available free of charge at the website of Responsible Care NZ. <https://www.responsiblecarenz.com/> It may be reproduced without further permission only if the copy accurately reproduces the entire content (text, format and colouration) of this document without modification. Modified copies are not approved emergency information satisfying obligations of the ADG code and associated legislation.

NOTES

EMERGENCY NUMBERS AND INFORMATION

AUSTRALIA

IN EVERY EMERGENCY call 000 or 112 (Mobile)

FOR EMERGENCY SERVICES
(FIRE BRIGADE, AMBULANCE, POLICE)

Help them to help you by providing the information in the shaded box below

IN CASE OF POISONING..... call 131 126

Information to provide to Emergency Services

IDENTIFICATION:

Your name / Organisation
Call back number / Location

EVENT:

Deaths / Injuries
Product(s) involved
Quantity
Type of vehicle / Container
Time / Exact location
Help: On site / To be called

OTHER HELPFUL INFORMATION:

Consignor / Origin
Carrier
Consignee / Destination
Car / Truck / Trailer / Flight No.
Bill of Lading / Waybill No.

NEW ZEALAND

IN EVERY EMERGENCY call 111

FOR EMERGENCY SERVICES
(FIRE BRIGADE, AMBULANCE, POLICE)

Help them to help you by providing the information in the shaded box on the previous page

IN CASE OF

POISONING call 0800 764 766
NATIONAL POISONS CENTRE

EMERGENCY INVOLVING
RADIOACTIVE MATERIALcall 021 393 632 (24/7)
NATIONAL RADIATION LABORATORY

OTHER CHEMICAL
EMERGENCYcall 0800 243622 (0800 CHEMCALL)
RESPONSIBLE CARE NZ - CHEMICAL EMERGENCY RESPONSE

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

Transport of Dangerous Goods



Competent Authorities Panel

This document should not be used to determine compliance with the dangerous goods/hazardous material regulations or to create worker safety documents for specific chemicals.