

## POTENTIAL HAZARDS

### HEALTH

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

### FIRE OR EXPLOSION

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

## PUBLIC SAFETY

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

### PROTECTIVE CLOTHING

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

### EVACUATION

#### Immediate precautionary measure

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

#### Spill

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

#### Fire

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



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

## EMERGENCY RESPONSE

### FIRE

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

#### Small Fire

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

#### Large Fire

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

#### Fire Involving Tanks

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

### SPILL OR LEAK

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

### FIRST AID

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



**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)					
			First ISOLATE in all Directions		Then PROTECT persons Downwind during				First ISOLATE in all Directions		Then PROTECT persons Downwind during			
ID No.	Guide	NAME OF MATERIAL	Meters	(Feet)	DAY Kilometers (Miles)		NIGHT Kilometers (Miles)		Meters	(Feet)	DAY Kilometers (Miles)		NIGHT Kilometers (Miles)	
—	119	SA (when used as a weapon)	300 m	(1000 ft)	1.9 km	(1.2 mi)	5.7 km	(3.6 mi)	1000 m	(3000 ft)	8.9 km	(5.6 mi)	11.0+ km	(7.0+ mi)
1016	119	Carbon monoxide	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	200 m	(600 ft)	1.2 km	(0.7 mi)	4.3 km	(2.7 mi)
1016	119	Carbon monoxide, compressed	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	200 m	(600 ft)	1.2 km	(0.7 mi)	4.3 km	(2.7 mi)
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)
1582	119	Chloropicrin and Methyl chloride mixture	30 m	(100 ft)	0.1 km	(0.1 mi)	0.4 km	(0.3 mi)	60 m	(200 ft)	0.4 km	(0.2 mi)	1.7 km	(1.1 mi)
1582	119	Methyl chloride and Chloropicrin mixture	30 m	(100 ft)	0.1 km	(0.1 mi)	0.4 km	(0.3 mi)	60 m	(200 ft)	0.4 km	(0.2 mi)	1.7 km	(1.1 mi)
1911	119	Diborane	60 m	(200 ft)	0.3 km	(0.2 mi)	1.2 km	(0.7 mi)	300 m	(1000 ft)	1.5 km	(1.0 mi)	4.6 km	(2.9 mi)
1911	119	Diborane, compressed	60 m	(200 ft)	0.3 km	(0.2 mi)	1.2 km	(0.7 mi)	300 m	(1000 ft)	1.5 km	(1.0 mi)	4.6 km	(2.9 mi)
1911	119	Diborane mixtures	60 m	(200 ft)	0.3 km	(0.2 mi)	1.2 km	(0.7 mi)	300 m	(1000 ft)	1.5 km	(1.0 mi)	4.6 km	(2.9 mi)
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)	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 B)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.4 km	(0.2 mi)	300 m	(1000 ft)	1.3 km	(0.8 mi)	3.4 km	(2.1 mi)
1953	119	Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.3 km	(0.2 mi)	150 m	(500 ft)	1.0 km	(0.6 mi)	2.9 km	(1.8 mi)
1953	119	Compressed gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	150 m	(500 ft)	0.8 km	(0.5 mi)	2.0 km	(1.3 mi)
1953	119	Compressed gas, toxic, flammable, n.o.s.	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 A)	150 m	(500 ft)	1.0 km	(0.6 mi)	3.8 km	(2.4 mi)	1000 m	(3000 ft)	5.7 km	(3.6 mi)	10.1 km	(6.3 mi)
1953	119	Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.4 km	(0.2 mi)	300 m	(1000 ft)	1.3 km	(0.8 mi)	3.4 km	(2.1 mi)
1953	119	Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.3 km	(0.2 mi)	150 m	(500 ft)	1.0 km	(0.6 mi)	2.9 km	(1.8 mi)
1953	119	Compressed gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	150 m	(500 ft)	0.8 km	(0.5 mi)	2.0 km	(1.3 mi)
2188	119	Arsine	150 m	(500 ft)	1.0 km	(0.6 mi)	3.8 km	(2.4 mi)	1000 m	(3000 ft)	5.7 km	(3.6 mi)	10.1 km	(6.3 mi)
2189	119	Dichlorosilane	30 m	(100 ft)	0.1 km	(0.1 mi)	0.4 km	(0.2 mi)	300 m	(1000 ft)	1.3 km	(0.8 mi)	3.4 km	(2.1 mi)
2192	119	Germane	150 m	(500 ft)	0.9 km	(0.5 mi)	3.3 km	(2.1 mi)	500 m	(1500 ft)	3.3 km	(2.1 mi)	7.5 km	(4.7 mi)
2199	119	Phosphine	60 m	(200 ft)	0.3 km	(0.2 mi)	1.1 km	(0.7 mi)	300 m	(1000 ft)	1.3 km	(0.8 mi)	3.7 km	(2.3 mi)
2204	119	Carbonyl sulfide	30 m	(100 ft)	0.1 km	(0.1 mi)	0.3 km	(0.2 mi)	300 m	(1000 ft)	1.6 km	(1.0 mi)	3.8 km	(2.4 mi)
2204	119	Carbonyl sulphide	30 m	(100 ft)	0.1 km	(0.1 mi)	0.3 km	(0.2 mi)	300 m	(1000 ft)	1.6 km	(1.0 mi)	3.8 km	(2.4 mi)
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)
2676	119	Stibine	60 m	(200 ft)	0.3 km	(0.2 mi)	1.6 km	(1.0 mi)	200 m	(600 ft)	1.3 km	(0.8 mi)	4.1 km	(2.6 mi)
3160	119	Liquefied 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)
3160	119	Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)	150 m	(500 ft)	1.0 km	(0.6 mi)	3.8 km	(2.4 mi)	1000 m	(3000 ft)	5.7 km	(3.6 mi)	10.1 km	(6.3 mi)
3160	119	Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.4 km	(0.2 mi)	300 m	(1000 ft)	1.3 km	(0.8 mi)	3.4 km	(2.1 mi)
3160	119	Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone C)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.3 km	(0.2 mi)	150 m	(500 ft)	1.0 km	(0.6 mi)	2.9 km	(1.8 mi)
3160	119	Liquefied gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone D)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	150 m	(500 ft)	0.8 km	(0.5 mi)	2.0 km	(1.3 mi)
3160	119	Liquefied gas, toxic, flammable, n.o.s.	150 m	(500 ft)	1.0 km	(0.6 mi)	3.8 km	(2.4 mi)	1000 m	(3000 ft)	5.7 km	(3.6 mi)	10.1 km	(6.3 mi)
3160	119	Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone A)	150 m	(500 ft)	1.0 km	(0.6 mi)	3.8 km	(2.4 mi)	1000 m	(3000 ft)	5.7 km	(3.6 mi)	10.1 km	(6.3 mi)
3160	119	Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone B)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.4 km	(0.2 mi)	300 m	(1000 ft)	1.3 km	(0.8 mi)	3.4 km	(2.1 mi)
3160	119	Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone C)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.3 km	(0.2 mi)	150 m	(500 ft)	1.0 km	(0.6 mi)	2.9 km	(1.8 mi)
3160	119	Liquefied gas, toxic, flammable, n.o.s. (Inhalation Hazard Zone D)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	150 m	(500 ft)	0.8 km	(0.5 mi)	2.0 km	(1.3 mi)
3305	119	Compressed gas, poisonous, flammable, corrosive, n.o.s.	100 m	(300 ft)	0.5 km	(0.3 mi)	2.5 km	(1.6 mi)	500 m	(1500 ft)	2.9 km	(1.8 mi)	9.2 km	(5.7 mi)
3305	119	Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	100 m	(300 ft)	0.5 km	(0.3 mi)	2.5 km	(1.6 mi)	500 m	(1500 ft)	2.9 km	(1.8 mi)	9.2 km	(5.7 mi)
3305	119	Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	30 m	(100 ft)	0.2 km	(0.2 mi)	1.0 km	(0.7 mi)	400 m	(1250 ft)	2.3 km	(1.4 mi)	5.1 km	(3.2 mi)
3305	119	Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.5 km	(0.3 mi)	300 m	(1000 ft)	1.6 km	(1.0 mi)	3.2 km	(2.0 mi)
3305	119	Compressed gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	150 m	(500 ft)	0.8 km	(0.5 mi)	2.0 km	(1.3 mi)
3305	119	Compressed gas, toxic, flammable, corrosive, n.o.s.	100 m	(300 ft)	0.5 km	(0.3 mi)	2.5 km	(1.6 mi)	500 m	(1500 ft)	2.9 km	(1.8 mi)	9.2 km	(5.7 mi)
3305	119	Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	100 m	(300 ft)	0.5 km	(0.3 mi)	2.5 km	(1.6 mi)	500 m	(1500 ft)	2.9 km	(1.8 mi)	9.2 km	(5.7 mi)
3305	119	Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	30 m	(100 ft)	0.2 km	(0.2 mi)	1.0 km	(0.7 mi)	400 m	(1250 ft)	2.3 km	(1.4 mi)	5.1 km	(3.2 mi)
3305	119	Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.5 km	(0.3 mi)	300 m	(1000 ft)	1.6 km	(1.0 mi)	3.2 km	(2.0 mi)
3305	119	Compressed gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	150 m	(500 ft)	0.8 km	(0.5 mi)	2.0 km	(1.3 mi)
3309	119	Liquefied gas, poisonous, flammable, corrosive, n.o.s.	100 m	(300 ft)	0.5 km	(0.3 mi)	2.5 km	(1.6 mi)	500 m	(1500 ft)	2.9 km	(1.8 mi)	9.2 km	(5.7 mi)
3309	119	Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	100 m	(300 ft)	0.5 km	(0.3 mi)	2.5 km	(1.6 mi)	500 m	(1500 ft)	2.9 km	(1.8 mi)	9.2 km	(5.7 mi)
3309	119	Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	30 m	(100 ft)	0.2 km	(0.2 mi)	1.0 km	(0.7 mi)	400 m	(1250 ft)	2.3 km	(1.4 mi)	5.1 km	(3.2 mi)
3309	119	Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.5 km	(0.3 mi)	300 m	(1000 ft)	1.6 km	(1.0 mi)	3.2 km	(2.0 mi)
3309	119	Liquefied gas, poisonous, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	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.	100 m	(300 ft)	0.5 km	(0.3 mi)	2.5 km	(1.6 mi)	500 m	(1500 ft)	2.9 km	(1.8 mi)	9.2 km	(5.7 mi)
3309	119	Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone A)	100 m	(300 ft)	0.5 km	(0.3 mi)	2.5 km	(1.6 mi)	500 m	(1500 ft)	2.9 km	(1.8 mi)	9.2 km	(5.7 mi)
3309	119	Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone B)	30 m	(100 ft)	0.2 km	(0.2 mi)	1.0 km	(0.7 mi)	400 m	(1250 ft)	2.3 km	(1.4 mi)	5.1 km	(3.2 mi)
3309	119	Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone C)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.5 km	(0.3 mi)	300 m	(1000 ft)	1.6 km	(1.0 mi)	3.2 km	(2.0 mi)
3309	119	Liquefied gas, toxic, flammable, corrosive, n.o.s. (Inhalation Hazard Zone D)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	150 m	(500 ft)	0.8 km	(0.5 mi)	2.0 km	(1.3 mi)
3355	119	Insecticide 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)
3355	119	Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone A)	150 m	(500 ft)	1.0 km	(0.6 mi)	3.8 km	(2.4 mi)	1000 m	(3000 ft)	5.7 km	(3.6 mi)	10.1 km	(6.3 mi)
3355	119	Insecticide gas, poisonous, flammable, n.o.s. (Inhalation Hazard Zone B)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.4 km	(0.2 mi)	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.	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 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)