

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- **HIGHLY FLAMMABLE:** Will be easily ignited by heat, sparks or flames.
- Vapors form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.
- Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).
- Vapors may travel to source of ignition and flash back.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Substance will react with water (some violently) releasing flammable, toxic or corrosive gases and runoff.
- Contact with metals may evolve flammable hydrogen gas.
- Containers may explode when heated or if contaminated with water.

HEALTH

- **TOXIC:** inhalation, ingestion or contact (skin, eyes) with vapors, dusts or substance may cause severe injury, burns or death.
- **Bromoacetates and chloroacetates are extremely irritating/lachrymators (cause eye irritation and flow of tears).**
- Reaction with water or moist air will release toxic, corrosive or flammable gases.
- Reaction with water may generate much heat that will increase the concentration of fumes in the air.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination.

PUBLIC SAFETY

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

PROTECTIVE CLOTHING

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

EVACUATION

Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

Spill

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

Fire

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



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

EMERGENCY RESPONSE

FIRE

- Note: Most foams will react with the material and release corrosive/toxic gases.
- **CAUTION: For Acetyl chloride (UN1717), use 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.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Avoid aiming straight or solid streams directly onto the product.

Fire Involving Tanks or Car/Trailer Loads

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

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- A vapor-suppressing foam may be used to reduce vapors.
- **FOR CHLOROSILANES,** use AFFF alcohol-resistant medium-expansion foam to reduce vapors.
- **DO NOT GET WATER on spilled substance or inside containers.**
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Prevent entry into waterways, sewers, basements or confined areas.

Small Spill

- Cover with DRY earth, DRY sand or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain.
- Use clean, non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal.

FIRST AID

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

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)					
			First ISOLATE in all Directions		Then PROTECT persons Downwind during				First ISOLATE in all Directions		Then PROTECT persons Downwind during			
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)
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)
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)
1250	155	Methyltrichlorosilane (when spilled in water)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.1 km	(0.1 mi)	60 m	(200 ft)	0.8 km	(0.5 mi)	2.5 km	(1.6 mi)
1298	155	Trimethylchlorosilane (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)	1.4 km	(0.9 mi)
1541	155	Acetone cyanohydrin, stabilized (when spilled in water)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.1 km	(0.1 mi)	60 m	(200 ft)	0.2 km	(0.2 mi)	0.8 km	(0.5 mi)
1717	155	Acetyl chloride (when spilled in water)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.1 km	(0.1 mi)	100 m	(300 ft)	0.9 km	(0.6 mi)	2.6 km	(1.6 mi)
1722	155	Allyl chlorocarbonate	100 m	(300 ft)	0.3 km	(0.2 mi)	0.8 km	(0.5 mi)	400 m	(1250 ft)	1.4 km	(0.9 mi)	2.4 km	(1.5 mi)
1722	155	Allyl chloroformate	100 m	(300 ft)	0.3 km	(0.2 mi)	0.8 km	(0.5 mi)	400 m	(1250 ft)	1.4 km	(0.9 mi)	2.4 km	(1.5 mi)
1724	155	Allyltrichlorosilane, stabilized (when spilled in water)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.1 km	(0.1 mi)	60 m	(200 ft)	0.5 km	(0.3 mi)	1.7 km	(1.1 mi)
1728	155	Amyltrichlorosilane (when spilled in water)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.1 km	(0.1 mi)	60 m	(200 ft)	0.5 km	(0.3 mi)	1.7 km	(1.0 mi)
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)
1767	155	Diethylchlorosilane (when spilled in water)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.1 km	(0.1 mi)	30 m	(100 ft)	0.3 km	(0.2 mi)	0.9 km	(0.5 mi)
1816	155	Propyltrichlorosilane (when spilled in water)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.1 km	(0.1 mi)	60 m	(200 ft)	0.5 km	(0.3 mi)	1.9 km	(1.2 mi)
2407	155	Isopropyl chloroformate	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.2 mi)	60 m	(200 ft)	0.5 km	(0.3 mi)	0.9 km	(0.6 mi)
2478	155	Isocyanate solution, flammable, poisonous, 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	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.	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, 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)
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)
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)
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)
2605	155	Methoxymethyl isocyanate	30 m	(100 ft)	0.2 km	(0.1 mi)	0.2 km	(0.2 mi)	60 m	(200 ft)	0.6 km	(0.4 mi)	0.9 km	(0.6 mi)
2606	155	Methyl orthosilicate	30 m	(100 ft)	0.2 km	(0.1 mi)	0.3 km	(0.2 mi)	60 m	(200 ft)	0.7 km	(0.4 mi)	1.1 km	(0.7 mi)
2740	155	n-Propyl chloroformate	30 m	(100 ft)	0.1 km	(0.1 mi)	0.3 km	(0.2 mi)	60 m	(200 ft)	0.6 km	(0.4 mi)	1.0 km	(0.7 mi)
2742	155	sec-Butyl chloroformate	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	30 m	(100 ft)	0.4 km	(0.2 mi)	0.5 km	(0.3 mi)
2742	155	Chloroformates, poisonous, corrosive, flammable, n.o.s.	30 m	(100 ft)	0.2 km	(0.1 mi)	0.2 km	(0.2 mi)	60 m	(200 ft)	0.5 km	(0.3 mi)	0.7 km	(0.5 mi)
2742	155	Chloroformates, toxic, corrosive, flammable, n.o.s.	30 m	(100 ft)	0.2 km	(0.1 mi)	0.2 km	(0.2 mi)	60 m	(200 ft)	0.5 km	(0.3 mi)	0.7 km	(0.5 mi)
2742	155	Isobutyl chloroformate	30 m	(100 ft)	0.1 km	(0.1 mi)	0.1 km	(0.1 mi)	30 m	(100 ft)	0.3 km	(0.2 mi)	0.5 km	(0.3 mi)
2743	155	n-Butyl chloroformate	30 m	(100 ft)	0.1 km	(0.1 mi)	0.1 km	(0.1 mi)	30 m	(100 ft)	0.3 km	(0.2 mi)	0.4 km	(0.3 mi)
2826	155	Ethyl chlorothioformate	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)
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)
3362	155	Chlorosilanes, poisonous, corrosive, flammable, n.o.s. (when spilled in water)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	60 m	(200 ft)	0.5 km	(0.3 mi)	1.6 km	(1.0 mi)
3362	155	Chlorosilanes, toxic, corrosive, flammable, n.o.s. (when spilled in water)	30 m	(100 ft)	0.1 km	(0.1 mi)	0.2 km	(0.1 mi)	60 m	(200 ft)	0.5 km	(0.3 mi)	1.6 km	(1.0 mi)
3490	155	Poisonous by inhalation liquid, water-reactive, flammable, n.o.s. (Inhalation Hazard Zone A)	60 m	(200 ft)	0.5 km	(0.3 mi)	1.5 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)	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)
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)	0.3 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)	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)