

Material Safety Data Sheet

Hydrogen Sulfide

1. Product and company identification

Product name	: Hydrogen Sulfide
Material uses	: Purification of acids, and wastewater and in the manufacture of sulfur and organosulfur compounds.
Headquarters	: Marsulex Inc. 111 Gordon Baker Road Suite 300 North York, ON M2H 3R1 (416) 496-9655 www.marsulex.com
MSDS authored by	: KMK Regulatory Services inc.
<u>In case of emergency</u>	: Canada: CANUTEC +1-613-996-6666 US: CHEMTREC +1-800-424-9300
Product type	: Gas.

2. Hazards identification

Emergency overview

Color	: Colorless.
Physical state	: Gas.
Odor	: Rotten eggs. [Strong]
Signal word	: DANGER!
Hazard statements	: FLAMMABLE GAS. MAY CAUSE FLASH FIRE. HIGH PRESSURE GAS. MAY BE FATAL IF INHALED. CAUSES RESPIRATORY TRACT AND EYE IRRITATION. CAN CAUSE TARGET ORGAN DAMAGE.
Precautions	: Keep away from heat, sparks and flame. Do not puncture or incinerate container. Do not breathe gas. Do not get on skin or clothing. Avoid contact with eyes. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.
OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Routes of entry	: Dermal contact. Eye contact. Inhalation.
<u>Potential acute health effects</u>	
<u>Inhalation</u>	: At concentrations of 0.13 to 30 ppm, the odor is obvious and unpleasant. At 50 ppm, marked dryness and irritation of the nose and throat occurs. Prolonged exposure may cause a runny nose, cough, hoarseness, shortness of breath and pneumonia. At 100-150 ppm, there is a temporary loss of smell. At 200 to 250 ppm, H ₂ S causes severe irritation as well as symptoms such as headache, nausea, vomiting and dizziness. Prolonged exposure may cause lung damage (build-up of fluid in the lungs). Exposure for 4 to 8 hours can cause death. Concentrations of 300-500 ppm cause these same effects sooner and more severely. Death can occur in 1 to 4 hours. At 500 ppm, excitement, headache, dizziness, staggering, unconsciousness and respiratory failure occur in 5 minutes to 1 hour. Death can occur in 30 minutes to 1 hour. Exposures above 500 ppm rapidly cause unconsciousness and death. Severe exposures, which do not result in death, may cause long-term symptoms such as memory loss, paralysis of facial muscles or nerve tissue damage.
<u>Ingestion</u>	: Since the product is a gas it is more probable that it will be inhaled rather than ingested.
<u>Skin</u>	: The first action is to look at treating and/or preventing inhalation of the material. Rarely, the gas may irritate the skin. Contact with liquid H ₂ S can cause frostbite (freezing of the tissue).

2. Hazards identification

Eyes : Inflammation and irritation of the eyes can occur at very low airborne concentrations (sometimes less than 10 ppm). Exposure over several hours or days may result in "gas eyes" or "sore eyes" with symptoms of scratchiness, irritation, tearing and burning. Above 50 ppm, there is intense tearing, blurring of vision and pain when looking at light. The victim may see rings around bright lights. Most symptoms disappear when exposure ceases. However, in serious cases the eye may be permanently damaged. Contact with liquid H₂S may freeze the eye and cause severe damage or blindness.

Potential chronic health effects

Chronic effects : Can cause target organ damage.
Carcinogenicity : No known significant effects or critical hazards.
Mutagenicity : No known significant effects or critical hazards.
Teratogenicity : No known significant effects or critical hazards.
Developmental effects : No known significant effects or critical hazards.
Fertility effects : No known significant effects or critical hazards.
Target organs : May cause damage to the following organs: lungs, upper respiratory tract, eyes, central nervous system (CNS).

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing

Ingestion : No specific data.

Skin : No specific data.

Eyes : Adverse symptoms may include the following:
pain or irritation
watering
redness

Medical conditions aggravated by over-exposure : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (section 11)

3. Composition/information on ingredients

United States

Name	CAS number	%
Hydrogen sulfide	7783-06-4	99.9

Canada

Name	CAS number	%
Hydrogen sulfide	7783-06-4	99.9

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

Eye contact : If irritation occurs, immediately flush eyes with running water for a minimum of 20 minutes. Hold eyelids open during flushing. Obtain medical attention IMMEDIATELY.

Skin contact : If the liquid is splashed on the skin, flush contaminated area with lukewarm, gently running water for at least 20 minutes. Under running water, carefully cut around clothing that sticks to damaged skin and remove rest of garment. Obtain medical attention immediately. Completely decontaminate clothing, shoes and leather goods before re-use, or discard.

4. First aid measures

- Inhalation** : Remove source of contamination or move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give Cardiopulmonary Resuscitation (CPR) only if there is no pulse AND no breathing. Oxygen may be beneficial if administered by a person trained in its use, preferably on a physician's advice. Obtain medical attention IMMEDIATELY.
- Ingestion** : Not a typical route of exposure. Refer to the above 'Inhalation' sub-section.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
- Notes to physician** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

5. Fire-fighting measures

- Flammability of the product** : Contains gas under pressure. Flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.
- Extinguishing media**
- Suitable** : SMALL FIRE: Use dry chemical powder.
LARGE FIRE: Use water spray, fog or foam. Move vessels containing H₂S from fire area if without risk. Cool H₂S containing vessels with flooding quantities of water until well after fire is out. Cool H₂S containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion. Do not extinguish a leaking gas flame unless leak can be stopped. Extinguish secondary fire. Handle damaged cylinders with extreme care. Use extinguishing media suitable for surrounding materials.
- Not suitable** : Do not use water jet.
- Special exposure hazards** : Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
sulfur oxides
- Special protective equipment for fire-fighters** : H₂S is extremely toxic. Fight fires from safe distance or protected location. Stay upwind. Wear full protective equipment. H₂S may travel some distance along the ground to a source of ignition and flash back. It may collect in lower, poorly ventilated areas. Water or foam may cause frothing. Use water to keep fire-exposed containers cool, to flush spills away from populated areas and to dilute spills to non-combustible mixtures. Stop escaping flow of gas rather than extinguish the fire. If fire is extinguished and gas continues to escape, an explosive mixture could form. If necessary to extinguish the fire, use carbon dioxide or dry chemical extinguishers
- Special remarks on fire hazards** : Extremely flammable in the presence of the following materials or conditions: open flames, sparks and static discharge.
Highly flammable in the presence of the following materials or conditions: heat.
- Special remarks on explosion hazards** : Not available.

6. Accidental release measures

- Personal precautions** : Accidental releases pose a serious fire or explosion hazard. Immediately contact emergency personnel. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
- Environmental precautions** : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Hazardous to aquatic environment. May cause long-term adverse effects in the aquatic environment. Prevent leaking substances from running into the aquatic environment or the sewage system.
- Small spill** : See instructions below.
- Large spill** : Evacuate area immediately. Restrict access to area until completion of clean up. Ensure clean up is conducted by trained personnel only. Remove all ignition sources (no smoking, flares, sparks or flames). All equipment should be grounded. Ventilate area and stay upwind. Use appropriate Personal Protection Equipment. Stop or reduce leak if safe to do so.
- Liquid H₂S: Do not touch spilled material. Prevent material from entering sewers or confined spaces. Stop or reduce leak if safe to do so. If not, allow liquid to vaporize.
- Gaseous H₂S: Stop or reduce leak if safe to do so. If source of the leak is a cylinder and the leak cannot be stopped safely, move the cylinder to a safe place in the open air. If possible, repair the leak or allow the cylinder to empty.
- In the case of a large spill, evacuation of populated areas downwind may have to be considered. Deliberate ignition and controlled burn of escaping hydrogen sulfide should be considered in order to reduce the risk to adjacent areas.
- Comply with Federal, Provincial/State and local regulations on reporting releases.

7. Handling and storage

- Handling** : Keep away from heat, sparks and flame. Do not puncture or incinerate. Keep container closed. Use only with adequate ventilation. To avoid fire, eliminate ignition sources. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Never work alone when handling H₂S. Someone must be in communication at all times and be equipped and trained to rescue. If H₂S is released, immediately put on a respirator and leave the area until the severity of the release is determined. If necessary to enter an area contaminated with H₂S, follow precautions for confined space entry including use of a supplied-air respirator with full facepiece, adequate communication, safety belts and lifelines. People working with this chemical should be properly trained regarding its hazards and its safe use.
- Storage** : Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Segregate from oxidizing materials. Avoid all possible sources of ignition (spark or flame). Outside or detached storage is preferred. Store away from heat and ignition sources, incompatible materials, and cylinders or other containers under high pressure. Use grounded, non-sparking ventilation systems and electrical equipment that does not provide a source of ignition. Use corrosion-resistant structural materials, lighting and ventilation systems in storage area. Store cylinders at or above ground level, upright on a level, fireproof floor. Keep cylinders secured in position and protected from damage. Keep cylinder valve cover on. Label empty cylinders. Store full cylinders separately from empty ones. Consider leak detection and alarm systems, as required. Limit quantity in storage. Restrict access to storage area and post warning signs. Keep storage area separate from populated work areas. Inspect periodically for deficiencies such as damage or leaks. Have fire extinguishers available in and near the storage area. Comply with all applicable regulations for the storage and handling of compressed gases and flammable material.

8. Exposure controls/personal protection

United States

Ingredient	Exposure limits
Hydrogen sulfide	<p>ACGIH TLV (United States, 1/2009). STEL: 21 mg/m³ 15 minute(s). STEL: 15 ppm 15 minute(s). TWA: 14 mg/m³ 8 hour(s). TWA: 10 ppm 8 hour(s).</p> <p>NIOSH REL (United States, 6/2008). CEIL: 15 mg/m³ 10 minute(s). CEIL: 10 ppm 10 minute(s).</p> <p>OSHA PEL Z2 (United States, 11/2006). AMP: 50 ppm 10 minute(s). CEIL: 20 ppm</p>

Canada

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			Notations
Ingredient	List name	ppm	mg/m ³	Other	ppm	mg/m ³	Other	ppm	mg/m ³	Other	
Hydrogen sulfide	US ACGIH 1/2009	10	14	-	15	21	-	-	-	-	
	AB 6/2008	10	14	-	-	-	-	15	21	-	
	BC 6/2008	-	-	-	10	-	-	-	-	-	
	ON 6/2008	10	14	-	15	21	-	-	-	-	
	QC 6/2008	10	14	-	15	21	-	-	-	-	

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : Personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Engineering control methods to reduce hazardous exposures are preferred. Methods include mechanical ventilation (dilution and local exhaust) and process or personnel enclosure. Administrative controls and personal protective equipment may also be required. Because of the high potential hazard associated with this substance, stringent control measures such as enclosure or isolation may be necessary. A continuous monitoring system with alarm is recommended in areas where H₂S is used. Use a nonsparking, grounded, corrosion-resistant ventilation system separate from other exhaust ventilation systems. Exhaust through a scrubber directly to the outside. Supply sufficient replacement air to make up for air removed by exhaust systems.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory : NIOSH recommendations for hydrogen sulfide concentrations in air.
 -Up to 100 ppm: Powered air-purifying respirator with cartridge(s) to protect against hydrogen sulfide; or gas mask with canister to protect against hydrogen sulfide; or SAR*; or full-facepiece SCBA.
 -Emergency or planned entry into unknown concentrations or IDLH conditions: Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.
 -ESCAPE: Gas mask with canister to protect against hydrogen sulfide; or escape-type SCBA.
 -NOTE: The IDLH concentration for hydrogen sulfide is 100 ppm.
 *NOTE: Substance reported to cause eye irritation or damage; may require eye protection.
 ABBREVIATIONS: SAR = supplied-air respirator; SCBA = self-contained breathing apparatus.
 IDLH = Immediately Dangerous to Life or Health.

8. Exposure controls/personal protection

- Hands** : Use gloves appropriate for work or task being performed. Recommended: Neoprene, PVC, vinyl or rubber.
- Eyes** : A face shield may also be necessary if there is potential for contact with liquid H₂S.
- Skin** : Recommendations are valid for permeation rates reaching 0.1 ug/cm²/min or 1 mg/m²/min and over. Resistance of specific materials can vary from product to product. Breakthrough times are obtained under conditions of continuous contact, generally at room temperature. Evaluate resistance under conditions of use and maintain clothing carefully.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

- Physical state** : Gas.
- Auto-ignition temperature** : 259.85°C (499.7°F)
- Flammable limits** : Lower: 4%
Upper: 44%
- Color** : Colorless.
- Odor** : Rotten eggs. [Strong]
- Molecular weight** : 34.08 g/mole
- Molecular formula** : H₂S
- Boiling/condensation point** : -59.99°C (-76°F)
- Melting/freezing point** : -82.77°C (-117°F)
- Vapor pressure** : 250 kPa (1875 mm Hg)
- Vapor density** : 1.19 [Air = 1]
- Odor threshold** : 0.13 ppm
- Solubility** : 437 mL of gas in 100 mL of water at 0°C; 186 mL of gas in 100 mL of water at 40°C. Soluble in hydrocarbon solvents, ether, alcohol, glycerol and carbon disulfide.

10. Stability and reactivity

- Chemical stability** : The product is stable.
- Conditions to avoid** : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
- Materials to avoid** : Reactive or incompatible with the following materials: oxidizing materials, acids and alkalis.
- Hazardous decomposition products** : Toxic oxides of sulfur.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.

11. Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Hydrogen sulfide	LC50 Inhalation Vapor	Rat	700 mg/m3	4 hours

Chronic toxicity : No specific data.

IDLH : 100 ppm

12. Ecological information

Environmental effects : Very toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
Hydrogen sulfide	Acute EC50 540 ug/L Fresh water	Crustaceans - Crangonyx richmondensis lauren - 10 mm	48 hours
	Acute LC50 <2 ug/L Fresh water	Fish - Perca flavescens - Yolk-sac fry	96 hours

Mobility : When it is spilled onto soil, much will evaporate. However, since it is very soluble in water, the presence of water in soil or falling as precipitation at the time of the spill may contribute to movement in the soil. If the soil surface is saturated with moisture at the time of the spill as might be the case after a rainfall, the spilled chemical will run off and/or evaporate away.

Products of degradation : Products of degradation: sulfur oxides (SO₂, SO₃ etc.).

Special remarks on the products of biodegradation : Microorganisms in soil and water are involved in oxidation-reduction reactions, which oxidize hydrogen sulfide to elemental sulfur. Abiotic Degradation: Hydrogen sulfide does not absorb solar radiation reaching the troposphere. It does not, therefore, undergo photolysis or react photochemically with oxygen. The primary chemical transformation of hydrogen sulfide in the atmosphere is oxidation by oxygen containing radicals to sulfur dioxide and sulfates.



13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. This material and its container must be disposed of in a safe way. Do not puncture or incinerate container. Empty pressure vessels should be returned to the supplier. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.










Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
DOT Classification	UN1053	HYDROGEN SULFIDE	2.3 (2.1)	-	 	<p>Reportable quantity 100 lbs. (45.4 kg)</p> <p>Limited quantity Yes.</p> <p>Packaging instruction Passenger aircraft Quantity limitation: Forbidden.</p> <p>Cargo aircraft Quantity limitation: Forbidden.</p> <p>Special provisions 2, B9, B14</p>

14 . Transport information

TDG Classification	UN1053	HYDROGEN SULFIDE	2.3 (2.1)	-	  	Special provisions 102
IMDG Class	UN1053	HYDROGEN SULFIDE. Marine pollutant	2.3 (2.1)	-	  	-
IATA-DGR Class	UN1053	HYDROGEN SULFIDE	2.3 (2.1)	-	  	Passenger and Cargo Aircraft Quantity limitation: Forbidden Cargo Aircraft Only Quantity limitation: Forbidden

PG* : Packing group

AERG : 117

Exemption to the above classification may apply.

15 . Regulatory information

United States

HCS Classification

- : Highly toxic material
- Flammable gas
- Compressed gas
- Irritating material
- Target organ effects

U.S. Federal regulations

- : **United States inventory (TSCA 8b)**: This material is listed or exempted.
- SARA 302/304/311/312 extremely hazardous substances**: Hydrogen sulfide
- SARA 302/304 emergency planning and notification**: Hydrogen sulfide
- SARA 302/304/311/312 hazardous chemicals**: Hydrogen sulfide
- SARA 311/312 MSDS distribution - chemical inventory - hazard identification**: Hydrogen sulfide: Fire hazard, Sudden release of pressure, Immediate (acute) health hazard, Delayed (chronic) health hazard
- Clean Water Act (CWA) 307**: No products were found.
- Clean Water Act (CWA) 311**: No products were found.
- Clean Air Act (CAA) 112 accidental release prevention**: Hydrogen sulfide
- Clean Air Act (CAA) 112 regulated flammable substances**: No products were found.
- Clean Air Act (CAA) 112 regulated toxic substances**: Hydrogen sulfide

15 . Regulatory information

- Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)** : Listed
- Clean Air Act Section 602 Class I Substances** : Not listed
- Clean Air Act Section 602 Class II Substances** : Not listed
- DEA List I Chemicals (Precursor Chemicals)** : Not listed
- DEA List II Chemicals (Essential Chemicals)** : Not listed

SARA 313

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration</u>
Form R - Reporting requirements	Hydrogen sulfide	7783-06-4	99.9
Supplier notification	Hydrogen sulfide	7783-06-4	99.9

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

- State regulations** :
- Connecticut Carcinogen Reporting:** This material is not listed.
 - Connecticut Hazardous Material Survey:** This material is not listed.
 - Florida substances:** This material is not listed.
 - Illinois Chemical Safety Act:** This material is not listed.
 - Illinois Toxic Substances Disclosure to Employee Act:** This material is not listed.
 - Louisiana Reporting:** This material is not listed.
 - Louisiana Spill:** This material is not listed.
 - Massachusetts Spill:** This material is not listed.
 - Massachusetts Substances:** This material is listed.
 - Michigan Critical Material:** This material is not listed.
 - Minnesota Hazardous Substances:** This material is not listed.
 - New Jersey Hazardous Substances:** This material is listed.
 - New Jersey Spill:** This material is not listed.
 - New Jersey Toxic Catastrophe Prevention Act:** This material is not listed.
 - New York Acutely Hazardous Substances:** This material is listed.
 - New York Toxic Chemical Release Reporting:** This material is not listed.
 - Pennsylvania RTK Hazardous Substances:** This material is listed.
 - Rhode Island Hazardous Substances:** This material is not listed.

California Prop. 65

No products were found.

Canada

- WHMIS (Canada)** :
- Class A: Compressed gas.
 - Class B-1: Flammable gas.
 - Class D-1A: Material causing immediate and serious toxic effects (Very toxic).
 - Class D-2B: Material causing other toxic effects (Toxic).
- Canadian lists** :
- CEPA Toxic substances:** This material is not listed.
 - Canadian ARET:** This material is not listed.
 - Canadian NPRI:** This material is listed.
 - Alberta Designated Substances:** This material is not listed.
 - Ontario Designated Substances:** This material is not listed.
 - Quebec Designated Substances:** This material is not listed.
- Canada inventory** : This material is listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

15 . Regulatory information

- International lists** : **Australia inventory (AICS):** This material is listed or exempted.
China inventory (IECSC): This material is listed or exempted.
Japan inventory: This material is listed or exempted.
Korea inventory: This material is listed or exempted.
New Zealand Inventory of Chemicals (NZIoC): This material is listed or exempted.
Philippines inventory (PICCS): This material is listed or exempted.
- Chemical Weapons Convention List Schedule I Chemicals** : Not listed
- Chemical Weapons Convention List Schedule II Chemicals** : Not listed
- Chemical Weapons Convention List Schedule III Chemicals** : Not listed

16 . Other information

United States

- Label requirements** : FLAMMABLE GAS. MAY CAUSE FLASH FIRE. HIGH PRESSURE GAS. MAY BE FATAL IF INHALED. CAUSES RESPIRATORY TRACT AND EYE IRRITATION. CAN CAUSE TARGET ORGAN DAMAGE.

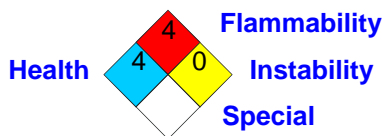
Hazardous Material Information System (U.S.A.)

Health	*	4
Flammability		4
Physical hazards		0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

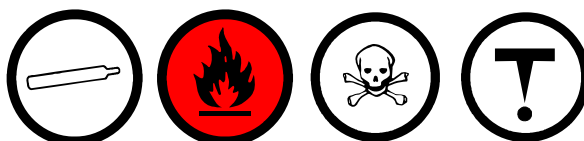
The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



Canada

WHMIS (Canada)



References

- 29CFR Part1910.1200 OSHA MSDS Requirements. - 49CFR Table List of Hazardous Materials, UN#, Proper Shipping Names, PG. ANSI Z400.1, MSDS Standard, 2004. - Canada Gazette Part II, Vol. 122, No. 2. Registration SOR/88-64, 31 December 1987. Hazardous Products Act "Ingredient Disclosure List" - Canadian Transport of Dangerous Goods, Regulations and Schedules, Clear Language version 2005. - Manufacturer's Material Safety Data Sheet.

16 . Other information

Date of issue : 11/15/2009
Date of previous issue : 11/15/2008
Version : 5

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

