AIR LIQUIDE

SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS Standards, European Union CLP EC 1272/2008, REACH, and the Global Harmonization Standard

1. SECTION 1 – IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

CHEMICAL NAME; CLASS: DIGERMANE

SYNONYMS: Digerman; λ^2-germanylidenegermanium; Germanium Hexahydride; Germanium Hydride, Germanium (III) Hydride, Germanium Trihydride

CHEMICAL FAMILY: Hydride

FORMULA: Ge_2H_6

	Document Number: 80019
PRODUCT USE:	Various
MANUFACTURED/SUPPLIED FOR:	AIR LIQUIDE
SUPPLIER/MANUFACTURER'S NAME:	AIR LIQUIDE AMERICA
ADDRESS:	2700 Post Oak Drive Houston, TX 77056-8229
EMAIL ADDRESS FOR PRODUCT INFORMATION:	webmaster.us@airliquide.com
EMERGENCY PHONE:	CHEMTREC: (U.S., Canada) 1-800-424-9300 (24 hrs) (International) +703-527-3887 (collect-24 hrs)
BUSINESS PHONE:	General MSDS Information: 1-713/896-2896 (8 am to 5 pm U.S. Central Time) Fax on Demand: 1-800/231-1366

ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-2004 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR. The product is also classified per all applicable European Union CLP EC 1272/2008 and the Global Harmonization Standard.

TSCA Status: This material is not included in the TSCA Inventory. In accordance with the conditions listed in 40 CFR 720.36 and 721.47, this product must be used only for research and development, pharmaceutical manufacture, or export. It must be used by, or directly under the supervision of, a technically qualified individual. The manufacturer should be consulted prior to using this material for other applications. Other requirements may apply.

2. HAZARD IDENTIFICATION

GLOBAL HARMONIZATION AND EU CLP REGULATION (EC) 1272/2208 LABELING AND CLASSIFICATION: This product has been classified per GHS Standards under European regulations. For information on EU classification under (67/548/EEC), see below. This is a self-classification based upon related compound, Germane.

Classification: Gases Under Pressure, Flammable Cat. 1, Acute Inhalation Toxicity Cat. 3, Acute Oral Toxicity Cat. 4, Acute Dermal Toxicity Cat. 4

Signal Word: Danger

Hazard Statement Codes: H280, H220, H331, H302 + H312

Precautionary Statement Codes: P260, P264, P270, P271, P280, P284, P377, P381, P37 + P378, P304 + P340 + P310, P301 + P312, P330, P302 + P352, P362 + P364, P312, P321, P410 + P403, P403 + P233, P405, P501

Hazard Symbols/Pictograms: GHS04, GHS02, GHS06, GHS07

EU 67/548/EEC LABELING AND CLASSIFICATION: This product meets the classification of hazardous, as defined by the European Union Council Directive 67/548/EEC or subsequent Directives. This is a self-classification based upon related compound, Germane.

Classification: Extremely Flammable, Toxic, Harmful

Risk Phrase Codes: R12, R23, R21/22

Safety Phrase Codes: S1/2, S16, S23, S26, S36/37/39, S33, S45

Hazard Symbols: F+, T

See Section 16 for a full definition of Hazard and Precautionary Statements and Risk and Safety Phrases

EMERGENCY OVERVIEW: **Product Description:** DANGER! Toxic liquid packaged in cylinders under pressure, which becomes gaseous as room temperature. **Health Hazards:** No specific toxicity is available for this material; health information is based upon related compound, Germane. Highly toxic by inhalation. Exposure to Digermane is considered to be similar to Arsine and would be primarily related to the destruction of red blood cells. May be harmful by skin contact. Although highly unlikely due to gaseous form at room temperature, ingestion may be harmful. Rapidly expanding gas can cause frostbite. **Flammability Hazards:** This material is extremely flammable. Releases of this material which have not ignited must be considered extremely dangerous, and should not be approached. When involved in a fire, this material will decompose to produce toxic fumes including germanium and germanium oxides, as well as hydrogen. **Reactivity Hazards:** Liquid Digermane has been observed to deflagrate without air (decompose to hydrogen and germanium) without an obvious source of initiation. Digermane may be a strong reducing agent and may react vigorously with mild to strong oxidizing agents, as with Germane. **Environmental Hazards:** This material may cause harm to terrestrial and aquatic organisms if accidentally released. **Emergency Response Considerations:** Persons who respond to releases of this product must protect themselves from inhalation of this product, especially in areas which are downwind of the release. Extreme caution must be used when responding to releases.

3. COMPOSITION and INFORMATION ON INGREDIENTS

Chemical Name	CAS #	EINECS or ELNICS #	MOLE %	EU Classification (67/548/EEC) GHS & EU Classification (1272/2008) Risk Phrases/Hazard Statements
Digermane	13818-89-8	For Germane: 231-961-6	100%	SELF CLASSIFICATION EU 67/548/EEC Classification: Extremely Flammable, Toxic, Harmful Risk Phrases: R12, R23, R21/22 Symbols: F+, T GHS & EU CLP: 1272/2008: Classification: Gases Under Pressure, Flammable Cat. 1, Acute Inhalation Toxicity Cat. 3, Acute Oral Toxicity Cat. 4, Acute Dermal Toxicity Cat. 4 Hazard Statement Codes: H280, H220, H331, H302 + H312 Hazard Symbols/Pictograms: GHS04, GHS02, GHS06, GHS07

See Section 16 for full text of Ingredient Risk Phrases and Hazard Statements

4. FIRST-AID MEASURES

PROTECTION OF FIRST AID RESPONDERS: RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS PRODUCT WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus and Fire-Retardant clothing must be worn. Adequate fire protection must be provided during rescue situations. Rescuers should be taken for medical attention, if necessary. Victim(s) must be taken for medical attention. Take copy of label and MSDS to physician or other health professional with victim(s).

DESCRIPTION OF FIRST AID MEASURES: Remove victim(s) to fresh air, as quickly as possible. 100% oxygen should be administered to victims of exposure to this gas as soon as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary. Remove and isolate contaminated clothing and shoes. Seek immediate medical attention. Take copy of label and MSDS to physician or other health professional with victim(s).

THERMAL BURNS: In the event personnel are burned as a result a release of this product, if burns are first degree or second degree with closed blisters, flush area with cold water until pain subsides. Apply loose, moist, sterile dressings, and bandage. Treat for shock. If burns are second degree with open blisters or third degree, apply loose, dry, sterile dressings and bandage. Treat for shock. Transport victim immediately to hospital or emergency center. Burns over an area of 20% or more of body are life-threatening; medical attention should be immediately sought.

INHALATION: If this material is inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. If adverse effects continue after removal to fresh air, seek immediate medical attention.

SKIN EXPOSURE: If this gas contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 20 minutes. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek immediate medical attention. Remove any clothing that may restrict circulation to any frozen area. Do not rub frozen parts as tissue damage may occur. As soon as practicable, place any affected area in warm water bath which has a temperature that does not exceed 105°F (40°C). NEVER USE HOT WATER. NEVER USE DRY HEAT. If area of frostbite is extensive, and if possible, remove clothing while showering with warm water. If warm water is not available, or is impractical to use, wrap the affected parts gently in blankets. Alternatively, if the fingers or hands are frostbitten, place the affected area of the body in the armpit. Encourage victim to gently exercise the affected part while being warmed. Frozen tissue is painless and appears waxy, with a possible yellow color. Frozen tissue will become swollen, painful and prone to infection when thawed. If the frozen part of the body has been thawed by the time medical attention has been obtained, cover the area with a dry sterile dressing and a large bulky protective covering.

EYE EXPOSURE: If this compound enters the eyes, open victim's eyes while under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 20 minutes. Administer anesthetic eye drops after one minute of flushing if victim suffers from spasms to the eyes, in order to facilitate irrigation. Ice compresses should be applied when this is not irritating to the victim. An ophthalmologist should be sought as soon as possible.

IMPORTANT SYMPTOMS AND EFFECTS (Acute and Chronic/Delayed): See Sections 2 (Hazard Identification) and 11 (Toxicological Information).

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Skin conditions and respiratory disorders may be aggravated by exposures to this product and its decomposition products.

IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED: Treat symptoms and reduce over-exposure. The health effects of Germane and Digermane exposure are expected to be similar to Arsine and so will be related to the destruction of the blood's red cells. The oxygen transport capability may be diminished and there is a risk of kidney failure. Administer oxygen. Be observant for pulmonary edema. Exchange transfusion through heparinized femoral catheters is the standard treatment for severe Digermane over-exposures. Such transfusions may require 10-15 exchanges of whole blood. The plasma hemoglobin treatment is used as a guideline; attempts should be made to lower the concentration by 75-85% of the plasma hemoglobin and also return the hematocrit level to normal. Preservation of renal function is essential. Early intravenous Mannitol (25-50 g) is given if the patient is oliguric, and bicarbonate is used to alkalize the urine. Dialysis is a recommended treatment if renal failure supervenes. There is no specific treatment for Digermane poisoning; treatment with BAL (British Anti-Lewsite; Dimercaprol) is a suggested treatment (though its efficacy has been questioned). BAL will not prevent Digermane-induced hemolysis, BAL may bind with circulating oxidation products of Digermane after the red cells lyse, thus preventing acute and chronic toxicity to other organ systems. The dosage of BAL is 2.5 mg/kg body weight; this dosage should be repeated four to six time the first two days and reduced to twice daily for up to ten days. The use of EDTA as a chelating agent should be considered early in the course of treatment. EDTA is nephrotoxic and this should be considered when using this compound in treatment.

5. FIRE-FIGHTING MEASURES

FLASH POINT: Unknown, believed to be below -60°C (-76°F), based on vapor pressure and flammability limit.

AUTOIGNITION TEMPERATURE: 50°C (122°F)

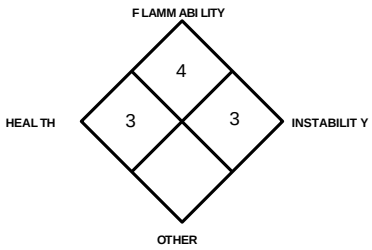
FLAMMABLE LIMITS (in air by volume, %)

Lower (LEL): 0.5% (est.) Upper (UEL): 100.0%

FIRE EXTINGUISHING MEDIA: Extinguish fires of this gas by shutting-off the source of the gas. Use a flooding quantity of water as a spray. Cool fire-exposed cylinders with water spray, from the maximum distance possible. Carbon Dioxide and dry chemical can also be used to extinguish fires of gas.

UNSUITABLE FIRE EXTINGUISHING MEDIA: Water should be used with care as Digermane may have similar reactive properties, as germane. Halogenated materials should not be used.

NFPA RATING



SPECIFIC HAZARDS ARISING FROM THE CHEMICAL: This material is toxic, and so presents a contact hazard to fire-fighters. Liquid Digermane has been observed to deflagrate without air (decompose to hydrogen and germanium) without an obvious source of initiation. An extreme explosion hazard exists in areas in which the gas has been released, but has not yet ignited. Digermane gas is 5.2 times heavier than air, can travel along the ground to a remote ignition point and fuel a vapor cloud explosion. Vapors can accumulate in low-lying areas creating a severe explosion hazard and toxicity hazard.

DANGER! Fires impinging (direct flame) on the outside surface of unprotected cylinders of this product can be very dangerous. Direct flame exposure on the cylinder wall can cause an explosion. The resulting fire and explosion can result in severe equipment damage and personnel injury or death over a large area around the cylinder. For massive fires in large areas, use unmanned hose holder or monitor nozzles; if this is not possible, withdraw from area and allow fire to burn.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: This material can readily form explosive mixtures with air, which are easily ignited by an electrostatic discharge.

SPECIAL PROTECTIVE ACTIONS FOR FIRE-FIGHTERS: Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Appropriate chemically-protective clothing may be necessary. Keep away from low-lying areas. Stay upwind. Because of the potential for a cylinder rupture during a fire, evacuation of non-emergency personnel is essential. If possible to do so without endangering personnel, shut off the flow of gas supporting the fire. Immediately cool cylinders with water spray from maximum distance, taking care to NOT extinguish flames if source of gas has not been stopped. Stop the leak and flow of gas before extinguishing fire. If release is still occurring, explosive re-ignition may occur. In event that fire is extinguished before the leak is stopped, attempt to increase ventilation to area to prevent formation of explosive air/gas mixtures. Water should be used with care, as this compound may have some water reactivity and could increase the intensity of the fire by decomposing to produce hydrogen gas. Follow the guidelines of the North American Emergency Response Guidebook (Guide #115). When cool, move cylinders from fire area if this can be done without risk to firefighters. Reverse flow into cylinder may cause rupture. Take care not to block pressure relief valves. Stay away from ends of tanks (but realize that shrapnel may travel in any direction). Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. In an advanced or massive fire, the area should be evacuated; use unmanned hose-holders or monitor nozzles. This gas is an extremely hazardous, flammable, toxic and corrosive gas. Do not enter without wearing specialized protective equipment suitable for the situation. Chemically-resistant clothing may be necessary. If this gas is involved in a fire, run-off water should be contained to prevent possible environmental damage.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS AND EMERGENCY PROCEDURES: EVACUATE IMMEDIATE AREA. Uncontrolled releases should be responded to by trained personnel using pre-planned procedures.

PERSONAL PROTECTIVE EQUIPMENT:

All Releases: Minimum Personal Protective Equipment should be **Level A: triple-gloves (rubber gloves and nitrile gloves, over latex gloves), fully-encapsulating chemically resistant suit and boots, hard-hat, and Self Contained Breathing Apparatus.** The atmosphere must have less than half of the LEL for this gas (LEL = 0.5%) of this gas and 19.5 percent oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus.

METHODS FOR CLEAN-UP AND CONTAINMENT: Follow the guidelines of the North American Emergency Response Guidebook (Guide #115).

All Releases: In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation. Evacuate area of release. Locate and seal the source of the leaking gas. Protect personnel attempting the shut-off with water-spray. Allow the gas to dissipate, if it can be done to an area in which there are no personnel. Monitor the surrounding area combustible gas levels and oxygen level. Combustible gas concentration must be below 50% of the LEL (LEL = 0.5%) prior to entry. The atmosphere must have at least 19.5 percent oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus. Attempt to close the main source valve prior to entering the area. If this does not stop the release (or if it is not possible to reach the valve), allow the gas to release in-place or remove it to a safe area and allow the gas to be released there. Non-emergency personnel should not be allowed in area until a breathing oxygen level has been confirmed and this gas cannot be detected.

ENVIRONMENTAL PRECAUTIONS: Avoid release to the environment. Run-off water may be contaminated by other materials and should be contained to prevent possible environmental damage.

6. ACCIDENTAL RELEASE MEASURES (Continued)

REFERENCE TO OTHER SECTIONS: See information in Section 8 (Exposure Controls – Personal Protection) and Section 13 (Disposal Considerations) for additional information.

7. HANDLING and USE

PRECAUTIONS FOR SAFE HANDLING: This compound must be used under the supervision of a technically qualified individual. Avoid all contact with this material. All employees who handle this gas should be trained to handle it safely. Avoid breathing gas. Wash hands after handling chemicals. Do not eat or drink while handling chemicals. All work practices should minimize the release of this gas. Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of this gas could occur without any significant warning symptoms, due to oxygen deficiency. Non-sparking tools should be used. All work operations should be monitored in such a way that emergency personnel can be immediately contacted in the event of a release

All areas where this gas mixture is used should be monitored with very sensitive gas detection instruments. Detection of concentrations below 50% of the TLV level of 0.2 ppm (for Germane) should trigger immediate response and corrective action. Detection of higher levels should initiate an alarm calling for evacuation of all personnel with the potential to be exposed. Due to the toxic effects of Digermane, cylinders of this product should always be placed in a properly designed and constructed gas cabinet. Double wall piping should be used to deliver gas to the point of use. Exhaust from the cabinet and from the annular space of the tubing should be monitored. All contaminated clothing should be removed and placed in a sealed container for proper disposal.

Detection of any release should trigger immediate response and corrective action, with an alarm calling for evacuation of all personnel. Use a check valve in the discharge line to prevent hazardous backflow. Never tamper with pressure relief devices in valves and cylinders. Do not attempt to repair, adjust, or in any other way modify the cylinders containing this gas. If there is a malfunction, or another type of operational problem, contact nearest distributor immediately.

- Workers who handle this gas should wear protective clothing, as given in Section 8 (Exposure Controls and Personal Protection).
- Instant-acting showers should be available in the event of an emergency.
- Special eye-wash fountains or similar equipment should be available for eye irrigation.
- Proper respiratory protection equipment must be provided and workers using such equipment must be carefully trained in its operation and limitations.
- Precautions must always be taken to prevent suck-back of foreign materials into the cylinder by using a check-valve, or vacuum break, since suckback may cause dangerous pressure changes within the cylinder.

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: Compressed gases can present significant safety hazards. The following rules are applicable to work situations in which cylinders are being used.

Before Use: Move cylinders with a suitable hand-truck. Do not drag, slide or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap (where provided) in-place until cylinder is ready for use.

During Use: Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Do not use oils or grease on gas-handling fittings or equipment. Immediately contact the supplier if there are any difficulties associated with operating cylinder valve. Never insert an object (e.g., wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing a leak to occur. Use an adjustable strap wrench to remove over-tight or rusted caps. Never strike an arc, on a compressed gas cylinder or make a cylinder part of and electric circuit.

After Use: Close main cylinder valve. Replace valve protection cap. Mark empty cylinders "EMPTY".

CONDITIONS FOR SAFE STORAGE: Always store and handle compressed gas cylinders in accordance with Compressed Gas Association, Inc. at www.cganet.com pamphlet CGA P-1, *Safe Handling of Compressed Gases in Containers.* Local regulations may require specific equipment for storage and use. Emergency equipment should be available near the point of storage. Cylinders should be stored upright and be firmly secured to prevent falling or being knocked-over. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting. Cylinders should be stored in dry, well-ventilated areas away from sources of heat, ignition and direct sunlight. Cylinders should be separated from oxygen cylinders, or other oxidizers, by a minimum distance of 20 ft., or by a barrier of non-combustible material at least 5 ft. high, having a fire-resistance rating of at least 0.5 hours. Isolate from other incompatible chemicals, such as strong oxidizers, metals, and metal oxides (refer to Section 10, Stability and Reactivity, for more information). Storage areas must meet national electrical codes for Class 1 Hazardous Areas. Post "No Smoking or Open Flames" signs in storage or use areas. Consider installation of leak detection and alarm for storage and use areas. Have appropriate extinguishing equipment in the storage area (i.e. sprinkler system, portable fire extinguishers). Keep storage area clear of materials which can burn. Do not allow area where cylinders are stored to exceed 52°C (125°F). Store cylinders away from heavily trafficked areas and emergency exits. Isolate from other non-compatible chemicals (refer to Section 10, Stability and Reactivity). Store away from process and production areas, away from elevators, building and room exits or main aisles leading to exits. Protect cylinders against physical damage. Keep the smallest amount necessary on-site at any one time. Full and empty cylinders should be segregated. Use a first-in, first-out inventory systems to prevent full containers from being stored for long periods of time.

NOTE: Use only DOT or ASME code containers designed for flammable, toxic gas storage. Close valve after each use and when empty.

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA: Use the proper CGA connections**,** DO NOT USE ADAPTERS:

7. HANDLING and USE (Continued

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely. Purge gas handling equipment with inert gas (i.e. argon) before attempting repairs. Always use product in areas where adequate ventilation is provided.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS/CONTROL PARAMETERS:

VENTILATION AND ENGINEERING CONTROLS: This gas should be used in a fume hood or glove box. Because of the high hazard associated with this gas, stringent control measures such as a gas cabinet enclosure or isolation may be necessary. Use a non-sparking, grounded, explosion-proof ventilation system separate from other exhaust ventilation systems. Ductwork should be constructed of non-metallic material, or should be lined to resist corrosion. If appropriate, install automatic monitoring equipment to detect the level of the gas.

OCCUPATIONAL/WORKPLACE EXPOSURE LIMITS/GUIDELINES:

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR							
		ACGIH-TLVs		OSHA-PELs		NIOSH-RELs		NIOSH	OTHER
		TWA ppm	STEL ppm	TWA ppm	STEL ppm	TWA ppm	STEL ppm	IDLH ppm	
Digermane Exposure limits given are for germane	13818-89-8	0.2	NE	0.2 (Vacated 1989 PEL)	NE	0.2	NE	NE	NE

NE = Not Established

INTERNATIONAL EXPOSURE LIMITS: Currently, there are no international exposure limits in force this material. The following limits are in place for the related material Germane.

GERMANE:

Australia: TWA = 0.2 ppm (0.63 mg/m^3), JUL 2008
Belgium: TWA = 0.2 ppm (0.64 mg/m^3), MAR 2002
Denmark: TWA = 0.2 ppm (0.6 mg/m^3), OCT 2002
Finland: STEL = 0.2 ppm (0.64 mg/m^3), SEP 2009
France: VME = 0.2 ppm (0.6 mg/m^3), FEB 2006
Korea: TWA = .0.2 ppm (0.6 mg/m^3), 2006
Mexico: TWA = 0.2 ppm (0.6 mg/m^3); STEL = 0.6 ppm (1.8 mg/m^3), 2004

GERMANE (continued):

The Netherlands: MAC-TGG = 0.6 mg/m^3, 2003
New Zealand: TWA = 0.2 ppm (0.63 mg/m^3), JAN 2002
Norway: TWA = 0.2 ppm (0.6 mg/m^3), JAN 1999
Russia: STEL = 5 mg/m^3, JUN 2003
Switzerland: MAK-W = 0.2 ppm (0.6 mg/m^3), DEC 2006
United Kingdom: TWA = 0.2 ppm (0.64 mg/m^3); STEL = 0.6 ppm, 2005
In Argentina, Bulgaria, Colombia, Jordan, Singapore, Vietnam check ACGIH TLV

PROTECTIVE EQUIPMENT: *The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132, including* U.S. Federal OSHA Respiratory Protection (29 CFR 1910.134), OSHA Eye Protection 29 CFR 1910.133, OSHA Hard Protection 29 CFR 1910.138, OSHA Foot Protection 29 CFR 1910.136 and OSHA Body Protection 29 CFR1910.132)*, equivalent standards of Canada (including CSA Respiratory Standard Z94.4-02,* Z94.3-M1982, *Industrial Eye and Face Protectors and* CSA Standard Z195-02, *Protective Footwear), or standards of EU member states (including EN 529:2005 for respiratory PPE, CEN/TR 15419:2006 for hand protection, and CR 13464:1999 for face/eye protection). Please reference applicable regulations and standards for relevant details.*

RESPIRATORY PROTECTION: Maintain exposure levels of this gas below 50% of the recommended TLV for germane (0.2 ppm) and oxygen levels above 19.5% in the workplace. The use of supplied air respiratory protection is recommended when changing cylinders or working on systems containing this gas. Use supplied air respiratory protection when gas levels exceed 50% of the TLV or oxygen levels are below 19.5%, or during emergency response to a release of this product. During an emergency situation, before entering the area, check the concentration of this gas and oxygen. If necessary, use only respiratory protection authorized under appropriate regulations. In the U.S., oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard. The following NIOSH respiratory protection recommendations are for arsine, which has similar hazards to germane and Digermane.

ARSINE

CONCENTRATION RESPIRATORY PROTECTION

At Concentrations above the NIOSH REL, or Where There is No REL, at Any Detectable Concentration: Any Self-Contained Breathing Apparatus (SCBA) that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any Supplied-Air Respirator (SAR) that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in pressure-demand or other positive-pressure mode.

Escape: Any Air-Purifying, Full-Facepiece Respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern, or any appropriate escape-type, SCBA.

EYE PROTECTION: Splash goggles or safety glasses, with a face shield for additional protection. If necessary, refer to appropriate regulations for further information.

HAND PROTECTION: Wear leather gloves when handling cylinders of this product. Wear appropriate gloves for industrial use. Use triple gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this MSDS. If necessary, refer to appropriate regulations.

BODY PROTECTION: When chemical contact is possible, use splash apron, work uniform, and shoes or coverlets to prevent skin contact. Cotton clothing is recommended for use to prevent static electric build-up. Full-body chemical protective clothing is recommended for emergency response procedures. For emergency response operations, clothing resistant to the toxic effects of this gas is required. If necessary, refer to the OSHA Technical Manual (Section VII: Personal Protective Equipment) or appropriate Standards of Canada for further information. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136 and the Canadian CSA Standard Z195-M1984, *Protective Footwear*.

9. PHYSICAL and CHEMICAL PROPERTIES

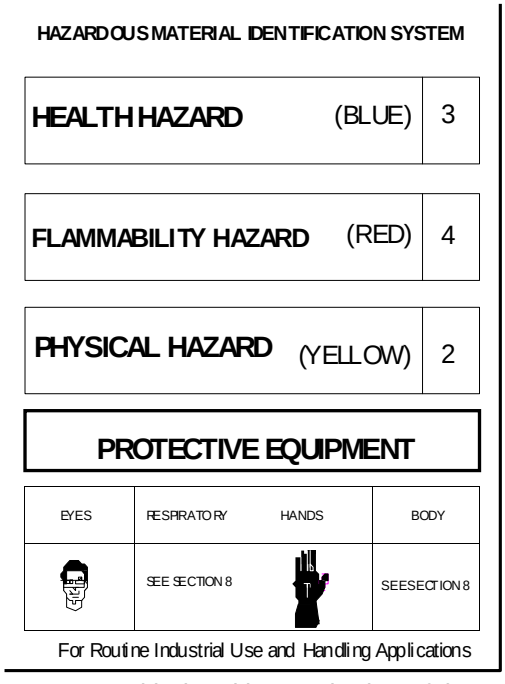
FORM: Liquid at controlled temperature, gas at room temperature. **COLOR:** Colorless.
MOLECULAR FORMULA: Ge_2H_6 **MOLECULAR WEIGHT:** 151.3 g/mol
ODOR: Pungent. **ODOR THRESHOLD:** Not available.
MELTING POINT: -109°C (-164.2°F) **BOILING POINT @ 1 atm:** 31.5°C (88.7°F)
LIQUID SPECIFIC GRAVITY @ -100°C (WATER = 1): 1.98 g/cm^3 **SPECIFIC VOLUME (ft^3/lb)**: Not available.
GAS DENSITY @ 21.1°C: Not available. **VAPOR DENSITY @ 0°C:** 6.22 g/L
VAPOR PRESSURE @ -21°C: 10.7 psia **VAPOR PRESSURE @ -20.3°C:** 100 mmHg
FLASH POINT: ~ -60°C (~ -76°F) **AUTOIGNITION:** 50°C (122°F)
LOWER FLAMMABILITY LIMIT (LEL): 0.5% (est.) **UPPER FLAMMABILITY LIMIT (UEL):** 100.0%
PERCENT VOLATILE: 100% **pH:** Not available.
EVAPORATION RATE (nBuAc = 1): Not applicable. **EXPANSION RATIO:** Not available.
CRITICAL PRESSURE: Not available. **CRITICAL TEMPERATURE:** Not available.
SOLUBILITY IN WATER: Insoluble. **OTHER SOLUBILITIES:** Not available.
COEFFICIENT WATER/OIL DISTRIBUTION: Log Kow = 2.01 (est.)
HOW TO DETECT THIS SUBSTANCE (identification properties): The odor may be distinctive warning properties. Monitoring systems should be used for detection of this gas. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.

10. STABILITY and REACTIVITY

CHEMICAL STABILITY: Liquid not stable at room temperature. Can decompose exothermically into germanium metal and hydrogen gas.
DECOMPOSITION PRODUCTS: *Combustion:* Hydrogen, germanium oxide. *Hydrolysis:* Not known.
MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: This compound, as with Germane, may be a strong reducing agent and may react with mild to strong oxidizers. May ignite and generate hydrogen gas on contact with water, as with the related germane compound.
POSSIBILITY OF POLYMERIZATION OR OTHER HAZARDOUS REACTION: This compound may have reactivity to water as per the related germane compound.
CONDITIONS TO AVOID: Avoid contact with incompatible materials and moisture or water. Cylinders exposed to high temperatures or direct flame can rupture or burst.

11. TOXICOLOGICAL INFORMATION

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant routes of exposure for this product are by inhalation, eye and skin contact.
INHALATION: Inhalation of high concentration may be fatal. Inhalation can cause severe health effects, even at relatively low concentrations. Effects from low-level inhalation may include headache, fatigue, increased breathing rate, dizziness, muscular incoordination, nausea, vomiting and loss of consciousness. High levels may cause potentially fatal pulmonary edema (accumulation of fluid in the lungs), which can be delayed. Germanium compounds are considered to have hemolytic effects with similar health effects as arsine. Both chronic and acute over-exposures to material should be considered dangerous. Development of symptoms may be delayed for up to 24 hours. The effects of an acute exposure are expected to be related hemolysis (destruction of red blood cells), due to the reaction of the Digermane molecule with hemoglobin within red blood cells. Symptoms of such exposure may include the following: blood in urine, malaise, dizziness, headache, nausea, vomiting, abdominal pain, pain in the lower back (as a result of kidneys effects), liver dysfunction, heart damage, diarrhea, collapse, and coma. Hemolysis may continue for 96 hours after the over-exposure ends. In severe over-exposures, the mucous membranes, the rear side of the lips, and the flesh under the finger nails, may have a bluish discoloration. Pulmonary edema may occur



CONTACT WITH SKIN or EYES: Contact with the eyes may cause irritation. Contact with the skin may be harmful or cause irritation. No specific information is available for this compound.
SKIN ABSORPTION: No specific information is available on possible skin absorption.
HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Overexposure to this compound may cause the following health effects:

11. TOXICOLOGICAL INFORMATION (Continued)

HEALTH EFFECTS OR RISKS FROM EXPOSURE (continued):

ACUTE: Toxic by inhalation; inhalation may cause severe health effects or be fatal. May be harmful by skin contact or if accidentally ingested. Eye and skin contact may cause irritation. Sudden release of material from a cylinder may cause frostbite. Sudden release may result in an oxygen-deficient atmosphere.

CHRONIC: Chronic skin exposure may cause dermatitis.

TARGET ORGANS: Acute: Respiratory system, skin, eyes, blood system. Chronic: By analogy to Germane and therefore, Arsine, target organs should be considered to be the red blood cells and the blood system, circulatory system, nervous system, kidneys, liver.

TOXICITY DATA: Currently, there are no toxicity data available for this material. The following are data for the related material, Germane.

GERMANE:

LD_{50} (Oral-Mouse) 1250 mg/kg: Behavioral: excitement, ataxia, muscle contraction or spasticity

LC_{50} (Inhalation-Rat) 1380 mg/m^3: Behavioral: coma; Brain and Coverings: other degenerative changes

LC_{50} (Inhalation-Mouse) 1380 mg/m^3: Behavioral: excitement, ataxia, muscle contraction or spasticity

LC_{50} (Inhalation-Guinea Pig) 260 mg/m^3/4 hours: Brain and Coverings: other degenerative changes

GERMANE (continued):

LCLo (Inhalation-Rat) 2000 mg/m^3/4 hours: Behavioral: convulsions or effect on seizure threshold; Nutritional and Gross Metabolic: body temperature decrease

LCLo (Inhalation-Mouse) 2000 mg/m^3/2 hours: Behavioral: convulsions or effect on seizure threshold; Nutritional and Gross Metabolic: body temperature decrease

TCLo (Inhalation-Rat) 13 mg/m^3/4 hours/30 days-intermittent: Brain and Coverings: changes in circulation (hemorrhage, thrombosis, etc.), other degenerative changes

CARCINOGENIC POTENTIAL: This material is not found on the following lists: U.S. EPA, U.S. NTP, U.S. OSHA, U.S. NIOSH, IARC, GERMAN MAK, and ACGIH, and is therefore not considered to be, nor suspected to be, a cancer-causing agent by these agencies. The decomposition product hydrogen chloride is listed by agencies tracking the carcinogenic potential of chemical compounds, as follows:

Hydrogen Chloride: ACGIH TLV-A4 (Not Classifiable as a Human Carcinogen); IARC-3 (Unclassifiable as to Carcinogenicity in Humans)

IRRITANCY OF PRODUCT: This material may be irritating to contaminated tissue, depending on concentration and duration of exposure.

SENSITIZATION TO THE PRODUCT: This compound is not known to be a human skin or respiratory sensitizer.

REPRODUCTIVE TOXICITY INFORMATION: Currently, there is no information on the potential human mutagenic, embryotoxic, teratogenic or reproductive effects of this compound.

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, no Biological Exposure Indices (BEIs) have been determined for this gas.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

MOBILITY: No specific information is available. The following estimated values are available from the EPA's EPISuite™ database.

Soil Adsorption Coefficient (PCKOCWIN v1.66):
Koc: 14.3 Log Koc: 1.155

PERSISTENCE AND BIODEGRADABILITY: No specific information is available. The following estimated values are available from the EPA's EPISuite™ database.

Probability of Rapid Biodegradation (BIOWIN v4.10):
Biowin1 (Linear Model): 0.6755 Biowin2 (Non-Linear Model): 0.7028
Expert Survey Biodegradation Results:
Biowin3 (Ultimate Survey Model): 2.8649 weeks Biowin4 (Primary Survey Model): 3.6295 (days-weeks)
MITI Biodegradation Probability:
Biowin5 (MITI Linear Model): 0.2621 Biowin6 (MITI Non-Linear Model): 0.1369
Anaerobic Biodegradation Probability:
Biowin7 (Anaerobic Linear Model): 0.8361
Ready Biodegradability Prediction: NO
Atmospheric Oxidation (25°C) [AopWin v1.92]: Structure incompatible with current estimation method.
Hydroxyl Radicals Reaction:
Overall OH Rate Constant = 0.0000 E-12 cm^3/molecule-sec
Half-Life = Not applicable
Ozone Reaction:
No Ozone Reaction Estimation
Fraction sorbed to airborne particulates (phi) [Junge,Mackay]: 0.84
Note: the sorbed fraction may be resistant to atmospheric oxidation
Volatilization from Water:
Henry LC: 3.26E-014 atm-m^3/mole (estimated by Bond SAR Method)
Half-Life from Model River: 1.465E+010 hours (6.104E+008 days)
Half-Life from Model Lake: 1.598E+011 hours (6.659E+009 days)
Removal in Wastewater Treatment:
Total removal = 2.25%
Total Biodegradation: 0.10%
Total Sludge Adsorption: 2.16%
Total to Air: 0.00%, (using 10000 hr Bio P,A,S)

12. ECOLOGICAL INFORMATION (Continued)

PERSISTENCE AND BIODEGRADABILITY (continued):

Level III Fugacity Model:

	Mass Amount (percent)	Half-Life (hr)	Emissions (kg/hr)
Air	6.87e-005	1e+005	1000
Water	22.7	360	1000
Soil	77.2	720	1000
Sediment	0.0809	3.24e+003	0

Persistence Time: 7111 hours

BIO-ACCUMULATION POTENTIAL: No specific information is available. The following estimated values are available from the EPA's EPISuite™ database.

Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):

Log BCF from regression-based method = 0.847 (BCF = 7.03)

ECOTOXICITY: All release to terrestrial, atmospheric and aquatic environments should be avoided as this gas can cause harm to terrestrial and aquatic organisms.

OTHER ADVERSE EFFECTS: This gas is not expected to have any ozone depletion potential.

ENVIRONMENTAL EXPOSURE CONTROLS: Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

RESULTS OF PBT and vPvB ASSESSMENT: No data available. PBT and vPvB assessments are part of the chemical safety report required for some substances in European Union Regulation (EC) 1907/2006, Article 14.

13. DISPOSAL CONSIDERATIONS

PRECAUTIONS TO BE FOLLOWED DURING WASTE HANDLING: Wear proper protective equipment when handling waste materials.

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Return cylinders with any residual product to Air Liquide. Do not dispose of locally. For emergency disposal, secure the cylinder and slowly discharge the gas to the atmosphere in a well-ventilated area or outdoors.

EMERGENCY DISPOSAL: Disposal of unused quantities in air is strongly discouraged. Waste gas can be burned in an approved incinerator equipped with an afterburner and scrubber. Treat process and other exhaust streams appropriately before release to the atmosphere.

U.S. EPA WASTE NUMBER: D001 (Waste Characteristic-Ignitability), D003 (Waste Characteristic-Reactivity)

EUROPEAN (EWC) WASTE CODES: 16 05 07: Gases in pressure containers and discarded chemicals; inorganic chemicals consisting of or containing dangerous substances

14. TRANSPORTATION INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION REGULATIONS: This material is classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.

UN IDENTIFICATION NUMBER: UN 2929
PROPER SHIPPING NAME: Toxic liquid, flammable, n.o.s. (Digermane)
HAZARD CLASS NUMBER and DESCRIPTION: 6.1 (Toxic); 3 (Flammable)
PACKING GROUP: PG I
DOT LABEL(S) REQUIRED: Class 6.1 (Toxic); Class 3 (Flammable)
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2008): 119
SPECIAL PROVISION: This material is poisonous by inhalation. Shipments must be properly described as "Poison Inhalation Hazard - ZONE B".
MARINE POLLUTANT: This gas is not specifically listed by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B).
SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles present serious safety hazards and should be discouraged.
NOTE: Shipment of compressed gas cylinders which have not been filled with the owners consent is a violation of Federal law (49 CFR, Part 173.301 (b).

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This compound is classified as Dangerous Goods, per regulations of Transport Canada. The use of the above U.S. DOT information from the U.S. 49 CFR regulations is allowed for shipments that originate in the U.S. For shipments via ground vehicle or rail that originate in Canada, the following information is applicable.

UN IDENTIFICATION NUMBER: UN 2929
PROPER SHIPPING NAME: Toxic liquid, flammable, n.o.s. (Digermane)
HAZARD CLASS and DESCRIPTION: 6.1 (Toxic); 3 (Flammable)
HAZARD LABEL(S) REQUIRED: Class 6.1 (Toxic); Class 3 (Flammable)
PACKING GROUP: I
SPECIAL PROVISION: 16, 38
EXPLOSIVE LIMIT & LIMITED QUANTITY INDEX: None
ERAP INDEX: None
PASSENGER CARRYING SHIP INDEX: Forbidden
PASSENGER CARRYING ROAD OR RAIL VEHICLE INDEX: Forbidden
MARINE POLLUTANT: This compound is not listed as a marine pollutant.

14. TRANSPORTATION INFORMATION (Continued)

INTERNATIONAL AIR TRANSPORT ASSOCIATION SHIPPING INFORMATION (IATA): This material is classified as dangerous goods, per the International Air Transport Association. This compound is forbidden for air transport.

INTERNATIONAL MARITIME ORGANIZATION SHIPPING INFORMATION (IMO): This compound is classified as dangerous goods, per the International Maritime Organization.

UN No.:	2929
PROPER SHIPPING NAME:	Toxic liquid, flammable, n.o.s. (Digermane)
HAZARD CLASS NUMBER:	6.1 (Toxic); 3 (Flammable)
LABELS:	Class 6.1 (Toxic); Class 3 (Flammable)
PACKING GROUP:	I
SPECIAL PROVISIONS:	274, 315
LIMITED QUANTITIES:	0
EXCEPTED QUANTITIES:	E5
PACKING:	Instructions: P201; Provisions: None
IBCs:	Instructions: None; Provisions: None
TANKS:	Instructions: T14; Provisions: TP2, TP13, TP22
EmS:	F-E, S-D

STOWAGE CATEGORY: Category B. Clear of living quarters.

MARINE POLLUTANT: This compound is not listed as a Marine Pollutant.

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR): This product is classified by the Economic Commission for Europe to be dangerous goods.

UN NO.:	2929
PROPER SHIPPING NAME:	Toxic liquid, flammable, n.o.s. (Digermane)
CLASS:	6.1
CLASSIFICATION CODE:	TF1
PACKING GROUP:	I
LABELS:	6.1 + 3
SPECIAL PROVISIONS:	274
LIMITED QUANTITIES:	0
EXCEPTED QUANTITIES:	E5
PACKING INSTRUCTIONS:	P201
SPECIAL PACKING INSTRUCTIONS:	None
MIXED PACKING PROVISIONS:	MP8, MP17
PORTABLE TANK and BULK CONTAINER:	Instructions: TP2; Special Provisions: TP27
HAZARD IDENTIFICATION No.:	663

TRANSPORT IN BULK ACCORDING TO THE IBC CODE: See the information under the individual jurisdiction listings for IBC information.

ENVIRONMENTAL HAZARDS: This compound does not meet the criteria of environmentally hazardous according to the criteria of the UN Model Regulations (as reflected in the IMDG Code, ADR, RID, and ADN); this gas is not specifically listed in Annex III under MARPOL 73/78.

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: This compound is not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA SECTION 302 EXTREMELY HAZARDOUS THRESHOLD PLANNING QUANTITY (TPQ): There are no specific Threshold Planning Quantities for this compound. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20.

U.S. SARA SECTION 304 EXTREMELY HAZARDOUS REPORTABLE QUANTITY (RQ): Not applicable.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

U.S. TSCA INVENTORY STATUS: This material is not included in the TSCA Inventory. In accordance with the conditions listed in 40 CFR 720.36 and 721.47, this product must be used only for research and development, pharmaceutical manufacture, or export. This compound must be used by, or directly under the supervision of, a technically qualified individual. The manufacturer should be consulted prior to using this product for other applications.

U.S. SARA HAZARD CATEGORIES (SECTION 311/312, 40 CFR 370-21): ACUTE: Yes; CHRONIC: Yes; FIRE: Yes; REACTIVE: Yes; SUDDEN RELEASE: Yes

OTHER U.S. FEDERAL REGULATIONS: This compound is not listed in Appendix A as a highly hazardous chemical. However, any process that involves a flammable material on site in one location in quantities of 10,000 lb (4536 kg) or greater is covered under this regulation unless the gas is used as a fuel.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): This material is not on the California Proposition 65 lists.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: This compound is not included in the DSL or NDSL Inventories. This product must be used only for research and development purposes. Other requirements may apply.

15. REGULATORY INFORMATION (Continued)

ADDITIONAL CANADIAN REGULATIONS (continued):

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: This compound is not listed on the CEPA Priority Substances List.

CANADIAN WHMIS REGULATIONS: This gas is classified as a Controlled Product, Hazard Classes A, B1, C, D1A and D2A as per the Controlled Product Regulations.

ADDITIONAL EUROPEAN REGULATIONS:

SAFETY, HEALTH, AND ENVIRONMENTAL REGULATIONS/LEGISLATION SPECIFIC FOR THE PRODUCT: Currently, there is no specific legislation pertaining to this product.

CHEMICAL SAFETY ASSESSMENT: No data available. The chemical safety assessment is required for some substances according to European Union Regulation (EC) 1907/2006, Article 14.

16. OTHER INFORMATION

GLOBAL HARMONIZATION AND EU CLP REGULATION (EC) 1272/2208 LABELING AND CLASSIFICATION: Classified in accordance with CLP Regulation (EC) 1272/2008. This is a self-classification. For information on classification under (67/548/EEC), see below.

Classification: Gases Under Pressure, Flammable Cat. 1, Acute Inhalation Toxicity Cat. 3, Acute Oral Toxicity Cat. 4, Acute Dermal Toxicity Cat. 4

Signal Words: Danger

Hazard Statements: H280: Contains gas under pressure; may explode if heated. H220: Extremely flammable gas. H331: Toxic if inhaled. H302 + H3121: Harmful if ingested or in contact with skin.

Prevention Statements:

Precautionary: P210: Keep away from heat/sparks/open flames/hot surfaces. — No smoking. P233: Keep container tightly closed. P260: Do not breathe gas/fume. P262: Do not get in eyes, on skin, or on clothing. P264: Wash thoroughly after handling. P270: Do not eat, drink or smoke when using this product. P271: Use only outdoors or in a well-ventilated area. P280: Wear protective gloves/protective clothing/eye protection/face protection. P284: Wear respiratory protection.

Response: P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely. P381: Eliminate all sources of ignition if it is safe to do so. P370 + P378: In case of fire: Use materials appropriate for surrounding fire for extinction. Do not use halogenated materials. P304 + P340 + P310: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician. P301 + P312: If swallowed, Call a POISON CENTER or doctor/physician if you feel unwell. P330: Rinse mouth. P302 + P352: IF ON SKIN: Wash with plenty of soap and water. P362 + P364: Take off contaminated clothing and wash it before reuse. P312: Call a POISON CENTER or doctor/physician if you feel unwell. P321: Specific treatment (remove from exposure and treat symptoms).

Storage: P410 + P403: Protect from sunlight. Store in a well-ventilated place. P403 + P233: Store in a well-ventilated place. Keep container tightly closed. P405: Store locked up.

Disposal: P501: Dispose of contents/containers in accordance with all local, regional, national and international regulations.

Hazard Symbol: GHS02, GHS04, GHS06, GHS07

EU 67/548/EEC LABELING AND CLASSIFICATION: This product is classified as per European Union Council Directive 67/548/EEC or subsequent Directives. This is a published classification.

Classification: Extremely Flammable, Toxic, Harmful

Risk Phrases: R12: Extremely flammable. R23: Toxic by inhalation. R21/22: Harmful in contact with skin and if swallowed.

Safety Phrases: S1/2: Keep locked up and out of the reach of children. S16: Keep away from sources of ignition - No smoking. S23: Do not breathe gas/fumes. S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36/37/39: Wear suitable protective clothing, gloves and eye/face protection. S33: Take precautionary measures against static discharges. S45: In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).

Hazard Symbol: F+, T

MIXTURES: When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

Further information about gas mixtures can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 4221 Wainey Road, 5th Floor, Chantilly, VA 20151-2923 Telephone: (703) 788-2700.

P-1 *"Safe Handling of Compressed Gases in Containers"*
AV-1 *"Safe Handling and Storage of Compressed Gases"*
"Handbook of Compressed Gases"

REFERENCES AND DATA SOURCES: Contact the supplier for information. **REVISION DETAILS:** New

METHODS OF EVALUATING INFORMATION FOR THE PURPOSE OF CLASSIFICATION: Bridging principles were used to classify this product.

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc. PO Box 1961, Hilo, HI 96721 • (800) 441-3365 (808) 969-4846
Fax on Demand: 1-800/231-1366

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