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

IDENTIFICATION of the SUBSTANCE or PREPARATION:
CHEMICAL NAME: BROMOTRIFLUOROMETHANE
OTHER MEANS OF IDENTIFICATION/SYNONYMS: Refrigerant gas, R 13B1; F 13B1; F-13B1; FC 13B1; Fluorocarbon 1301; Freon 13B1; Freon 13B1; R 13B1; Trifluorobromomethane; Frigen 13B1; Refrigerant 13B1; Halocarbon 13B1; Monobromotrifluoromethane; R 13B1; Refrigerant 13B1; Trifluorobromomethane; Trifluorobromomethane; CF3Br; Trifluoromethyl bromide; Trifluoromonobromomethane

RELEVANT PRODUCT USE: Fire Extinguishing Material

USES ADVISED AGAINST: Other than Relevant Use

COMPANY/UNDERTAKING IDENTIFICATION:
U.S. MANUFACTURER: H3R Clean Agents
ADDRESS: 103 H Street
Petaluma, CA 94952
PHONE: 1-800/249-4289 (8:00 a.m. to 4:30 p.m. PST)
FAX: 1-707/765-3395

EUROPEAN SUPPLIER/MANUFACTURER'S NAME:
ADDRESS:
BUSINESS PHONE:
WEB SITE: www.h3rcleanagents.com

EMERGENCY PHONE:
CHEMTREC: 1-800-424-9300 (U.S./Canada/Puerto Rico) [24-hours]
CHEMTREC: +1-703-527-3887 (Outside North America) [24-hours]

DATE OF PREPARATION: October 21, 2011
DATE OF REVISION: August 28, 2015

This gas has been classified in accordance with the hazard criteria of the Canadian CPR and the SDS contains all the information required by the CPR. The compound is also classified per all applicable U.S. OSHA Hazcom, the European Union CLP EC 1272/2008 and the Global Harmonization Standard.

SECTION 2. HAZARD IDENTIFICATION

Classification: Gases Under Pressure/Liquefied Gas
Signal Word: Warning
Hazard Statement Codes: H280
Precautionary Statement Codes: P410 + P403
Hazard Symbol/Pictogram: GHS04

See Section 16 for full product classification information for this product.

EMERGENCY OVERVIEW: Product Description: Halon 1301 is colorless and odorless or with a slightly ethereal odor and is shipped as liquid under its own vapor pressure. Health Hazards: The main acute health hazard associated with releases of this gas is asphyxiation by displacement of oxygen. This gas is heavier than air and will sink into low areas, creating an asphyxiation hazard. The main chronic health hazard associated with releases of this gas is possible adverse effects to the central nervous system and possible cardiac sensitization and arrhythmias. Chronic skin exposure may cause dermatitis. Flammability Hazards: This gas is not flammable, but can decompose at very high temperatures forming toxic gases such as hydrogen bromide, hydrogen fluoride and bromine. Cylinders or tanks may rupture and explode if heated. Reactivity Hazards: This material is not reactive. Environmental Hazards: This gas is a known ozone depletor and contributes to the destruction of the ozone. Emergency Response Considerations: Emergency responders must wear the proper personal protective equipment suitable for the situation to which they are responding. WARNING—If rescue personnel need to enter an area suspected of having a low level of Oxygen, they should be equipped with Self-Contained Breathing Apparatus (SCBA) and appropriate personal protective equipment.

SECTION 3. COMPOSITION and INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Chemical Formula</th>
<th>CAS #</th>
<th>EINECS #</th>
<th>% Composition</th>
<th>LABEL ELEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bromotrifluoromethane</td>
<td>CBrF₃</td>
<td>75-63-8</td>
<td>200-887-6</td>
<td>&gt; 99%</td>
<td>GHS Under U.S. OSHA &amp; EU Classification (1272/2008 EC) Hazard Statement Codes</td>
</tr>
</tbody>
</table>

See Section 16 for full product classification information.
SECTION 4. FIRST AID MEASURES

PROTECTION OF FIRST AID RESPONDERS: RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS GAS WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. Self-Contained Breathing Apparatus should be worn if the level of oxygen cannot be determined. Rescuers should be taken for medical attention, if necessary. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary.

DESCRIPTION OF FIRST AID MEASURES: Remove victim(s) to fresh air, as quickly as possible. Take copy of label and SDS to physician or other health professional with victim(s).

Inhalation Exposure: If inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Seek medical attention if adverse effect occurs after removal to fresh air.

Skin Exposure: If this gas contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 20 minutes. Remove any 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 mechanical injury occurs, cover eye with bandage and seek appropriate medical attention. If rapid release has caused frostbite, cover injured eye; an ophthalmologist should be sought as soon as possible.

Ingestion: Ingestion is an unlikely route of exposure for this gas.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: None are anticipated.

INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT IF NEEDED: Administer oxygen, if necessary, and treat symptoms. This gas is an asphyxiant and can induce cardiac muscle sensitization to circulating epinephrine-like compounds. Do NOT give adrenalin or similar sympathomimetic drugs. Do NOT allow victim to exercise until 24 hours following specific exposures. Freeze burns of mucosal tissue can develop following specific exposures.

SECTION 5. FIRE FIGHTING MEASURES

FLASH POINT: Not Applicable

AUTOIGNITION: Not Applicable

FLAMMABLE RANGE: Not Applicable

EXTINGUISHING MEDIA: This is a non-flammable gas; use fire-extinguishing media appropriate for the surrounding materials.

UNSUITABLE FIRE EXTINGUISHING MEDIA: None known.

SPECIFIC HAZARDS ARISING FROM THE CHEMICAL: Bromotrifluoromethane is not combustible. Bromotrifluoromethane, in ambient total-flooding fire extinguishing systems can produce a dense fog (if relative humidity is about 50%) which may reduce visibility for a few seconds and delay evacuation in occupational areas. Containers, when involved in fire, may rupture or burst in the heat of the fire. Most cylinders have a pressure release device, which will vent contents if the cylinder is exposed to high temperatures. This gas is heavier than air, creating an asphyxiation hazard in low areas.

EXPLOSION SENSITIVITY TO MECHANICAL IMPACT: Not sensitive.

EXPLOSION SENSITIVITY TO STATIC DISCHARGE: Not sensitive.

HAZARDOUS COMBUSTION PRODUCTS: Combustion or decomposition products above 538°C (1000.4°F) irritating/toxic gases such as hydrogen bromide, hydrogen fluoride and bromine may be generated. These by-products have a sharp irritating odor and are dangerous even in low concentrations and in sufficient concentrations can result in personal injury or death.

SPECIAL PROTECTIVE ACTIONS FOR FIRE-FIGHTERS: Move fire-exposed containers if it can be done without risk to firefighters. Use water spray to cool fire-exposed cylinders. 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.

SECTION 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. Vapors from liquefied gas are initially heavier than air and spread along ground, creating an oxygen-deficient atmosphere is low-lying areas or confined spaces. Detection systems should be available to monitor for level of oxygen. The level of oxygen should exceed 19.5% before personnel can be allowed in the area without SCBA.

PERSONAL PROTECTIVE EQUIPMENT: Proper protective equipment should be used.

All Releases: Minimum Personal Protective Equipment should be Level B: Self-Contained Breathing Apparatus. Note: chemically protective clothing may provide little or no thermal protection against the hazard of frostbite. The atmosphere must at least 19.5 percent Oxygen before non-emergency personnel can be allowed in the area without Self-Contained Breathing Apparatus and fire protection. If gas is leaking incidentally from the cylinder or its valve, contact your supplier.
METHODS FOR CLEAN-UP AND CONTAINMENT:

All Releases: In the event of a release of this product, operator should close the gas source if possible to do so safely. Evacuate area in the event of a significant release. Locate and seal the source of the leaking gas. If leak is in user’s gas handling equipment or system, close cylinder valve, and safely vent high pressure before attempting repairs. If leak is from the cylinder, cylinder valve or the valve pressure relief device (PRD), contact your supplier. 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. Call CHEMTREC (1-800-424-9300) for emergency assistance. Or if in Canada, call CANUTEC (613-996-6666).

ENVIRONMENTAL PRECAUTIONS: All release to the environment should be avoided as this material has an ozone depletion potential and a global warming potential. Run-off water may be contaminated by other materials and should be contained to prevent possible environmental damage.

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

SECTION 7. HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING: Releases of Halon 1301 can create an oxygen-deficient atmosphere. Be aware of any signs of dizziness or fatigue; exposures to fat concentrations of Helium-3 could occur without any significant warning symptoms, due to oxygen-deficiency. All work operations should be monitored in such a way that emergency personnel can be immediately contacted in the event of a release. Wearing contact lenses is not recommended when handling this gas.

Cylinder valves should be inspected regularly for physical damage or corrosion (apparent by discoloration or rust). Care should be taken to inspect the following valve locations for corrosion: neck (where valve inserts into cylinder); bonnet nut (where handle attaches to valve body). Close valve after each use and when empty.

Do not drag, roll, slide or drop cylinder. Use a suitable hand truck designed for cylinder movement. Never attempt to lift a cylinder by its cap. Secure cylinders at all times while in use. Use a pressure regulator to safely discharge product from cylinder. Use a check valve to prevent reverse flow into cylinder. Once cylinder has been connected to properly purged process, open cylinder valve slowly and carefully. If user experiences any difficulty operating cylinder valve, discontinue use and contact supplier. Never insert an object (e.g., wrench, screwdriver, etc.) into valve cap openings; doing so may damage valve, causing a leak to occur. Use an adjustable strap-wrench to remove overtight or rusted caps.

Do not heat cylinders by any means to increase the discharge rate of product from the cylinder. Never apply flame or localized heat directly to any part of the cylinder. Cylinders should not be artificially cooled as certain types of steel undergo property changes when cryogenically cooled, thus making the cylinder unstable.

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. 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. Do not allow area where cylinders are stored to exceed 52°C (125°F). Store containers 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 trafficked areas and emergency exits. Isolate from other non compatible chemicals (refer to Section 10, Stability and Reactivity). Store

and direct sunlight. Do not allow area where cylinders are stored to exceed 52°C (125°F). Store containers away from sources of heat, ignition...
SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

PERSONAL 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), equivalent standards of Canada (including CSA Standard Z94.4-02 and CSA Standard Z94.3-02), 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 oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection if oxygen level is below 19.5%, or during emergency response to a release of this product. 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 (1910.134-1998). The following are U.S. NIOSH respiratory protective equipment guidelines for this gas.

<table>
<thead>
<tr>
<th>CONCENTRATION</th>
<th>RESPIRATORY PROTECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 10,000 ppm:</td>
<td>Any Supplied-Air Respirator (SAR).</td>
</tr>
<tr>
<td>Up to 25,000 ppm:</td>
<td>Any SAR operated in a continuous-flow mode.</td>
</tr>
<tr>
<td>Up to 40,000 ppm:</td>
<td>Any SAR that has a tight-fitting facepiece and is operated in a continuous-flow mode, or any Self-Contained Breathing Apparatus (SCBA) with a full facepiece, or any SAR with a full facepiece.</td>
</tr>
</tbody>
</table>

Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Any SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any 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 organic vapor canister, or any appropriate escape-type, SCBA.

Eye Protection: Use approved safety goggles or safety glasses. If necessary, refer to appropriate regulations for further information.

Hand Protection: Wear leather gloves when handling cylinders of this gas. Otherwise, wear glove protection appropriate to the specific operation for which this gas is used. If necessary, refer to appropriate regulations.

Body Protection: Use body protection appropriate for task. Safety shoes are recommended when handling cylinders. 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 appropriate country regulations and standards.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Halon 1301</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>Liquefied gas</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless to slightly ethereal</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>148.91</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td>CBrF₃</td>
</tr>
<tr>
<td>Boiling Point @ 760 mmHg</td>
<td>-57.8°C (-27.6°F)</td>
</tr>
<tr>
<td>Freezing/Melting Point @ 1 atm</td>
<td>-172°C (-142.8°F)</td>
</tr>
<tr>
<td>Gas Specific Gravity [Relative Density] (water = 1)</td>
<td>Gas</td>
</tr>
<tr>
<td>Liquid Specific Gravity [Relative Density] (water = 1) @ 20°C</td>
<td>1.5800 g/mL</td>
</tr>
<tr>
<td>Solubility in Water @ 25°C</td>
<td>Practically insoluble (0.03% by weight)</td>
</tr>
<tr>
<td>Other Solubilities</td>
<td>Soluble in chloroform</td>
</tr>
<tr>
<td>Vapor Pressure @ 20°C</td>
<td>10755 mmHg (1434 kPa)</td>
</tr>
<tr>
<td>Vapor Density (air = 1)</td>
<td>5.7</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not determined</td>
</tr>
<tr>
<td>Critical Temperature</td>
<td>67°C (152.6°F)</td>
</tr>
<tr>
<td>Critical Pressure</td>
<td>4032 kPa (39.8 atm)</td>
</tr>
<tr>
<td>Liquid Viscosity @ 25°C</td>
<td>0.157 mPa.s</td>
</tr>
<tr>
<td>Octanol/Water Partition Coefficient</td>
<td>log Kow= 1.86</td>
</tr>
<tr>
<td>Henry's Law Constant @ 25°C</td>
<td>0.4994 atm·cu m/mole</td>
</tr>
</tbody>
</table>

WARNING PROPERTIES FOR THIS GAS: The odor is not a good a warning of a release. 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.

SECTION 10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable.

CONDITIONS TO AVOID: Cylinders should not be exposed to temperatures in excess of 125°F (52°C).

MATERIALS WITH WHICH GAS IS INCOMPATIBLE: Chemically active metals (e.g. sodium, potassium, calcium, powdered aluminum, zinc, magnesium).

HAZARDOUS DECOMPOSITION PRODUCTS: Combustion: Decomposes above 538°C (1000.4°F). Forms hydrogen bromide, hydrogen fluoride and free bromine. In air, carbonyl fluoride and carbonyl bromide may form. Hydrolysis: At high temperature and in the presence of water, this gas may form acids (by hydrolysis or by catalytic decomposition) which may attack metallic surfaces.

POSSIBILITY OF HAZARDOUS REACTION OR POLYMERIZATION: Will not occur.
SECTION 11. TOXICOLOGICAL INFORMATION

HALON 1301

ROUTES OF ENTRY, SYMPTOMS OF ACUTE EXPOSURE: WARNING-if rescue personnel need to enter an area in which a release of Halon 1301 has occurred they should be equipped with Self-Contained Breathing Apparatus (SCBA) and appropriate personal protective equipment. High concentration of this gas will create an oxygen-deficient atmosphere, creating the risk of asphyxiation.

Eye Contact: Release of a high-pressure gas may result in airborne objects.

Ingestion: Ingestion of this gas is not a likely route of industrial exposure.

Inhalation: Inhalation of high concentrations of this gas may lead to heart arrhythmias. High concentrations of this gas can cause an oxygen-deficient environment. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. The skin of a victim may have a blue color. Under some circumstances of over-exposure, death may occur, due to the displacement of oxygen. The effects associated with various levels of oxygen are described below.

CONCENTRATION OF OXYGEN | EXPOSURE SYMPTOM
--- | ---
20.9% Oxygen: | Normal oxygen concentration in air.
15–19% Oxygen: | Decreased ability to perform tasks. May impair coordination and may induce early symptoms in persons with heart, lung, or circulatory problems.
12–15% Oxygen: | Breathing increases, especially in exertion. Pulse up. Impaired coordination, perception, and judgment.
10–12% Oxygen: | Breathing further increases in rate and depth, poor coordination and judgment, lips slightly blue.
8–10% Oxygen: | Mental failure, fainting, unconsciousness, ashen face, blueness of lips, nausea (upset stomach), and vomiting.
6–8% Oxygen: | 8 minutes, may be fatal in 50–100% of cases; 6 minutes, may be fatal in 25 to 50% of cases; 4–5 minutes, recovery with treatment.
4–6% Oxygen: | Coma in 40 seconds, followed by convolution, breathing failure, death.

WARNING: Exposure to atmospheres containing 8–10% or less oxygen will bring about unconsciousness without warning and so quickly that individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death.

Skin Contact: Transitory skin contact should not cause any adverse effects.

Other Acute Health Effects: Contact with rapidly expanding gases (which are released from under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain caused by frostbite can quickly subside, masking the injury. In addition, the sudden release of a pressurized gas (such as may occur in the event of a valve failure), presents a severe hazard of mechanical injury.

Acute Exposure Target Organs: Respiratory system.

ROUTES OF ENTRY, SYMPTOMS OF CHRONIC EXPOSURE:

Inhalation: No specific data are available for this gas. Chronic exposure to oxygen-deficient atmospheres (below 18% oxygen in air) may affect the heart and nervous system. Inhalation of very high concentration may cause adverse effects on the central nervous system.

Skin Contact: Prolonged contact may cause dermatitis (dry, red, cracked skin) due to defatting of the skin.

Chronic Exposure Target Organs: Skin, cardiac system, central nervous system.

CARCINOGENIC POTENTIAL: Halon 1301 is not listed as a carcinogen or as a potential carcinogen on EPA, NIOSH, GERMAN MAK, OSHA, NTP, IARC, or CAL/OSHA Carcinogen lists.

TOXICITY DATA: There are no toxicity data currently available for Halon 1301.

TCLo (Inhalation-Human) 399 gm/m³/3 minute: Peripheral Nerve and Sensation: paresthesia; Behavioral: ataxia, headache
TCLo (Inhalation-Human) 997.5 gm/m³/1 minute: Behavioral: ataxia
LC (Inhalation-Man) > 15 ppm/1 minute: Behavioral: hallucinations, distorted perceptions; Cardiac: pulse rate increase, without fall in BP
LC50 (Inhalation-Rat) 84,000 ppm/15 minutes
LC50 (Inhalation-Rat) 350 gm/m³/4 hours
LC50 (Inhalation-Mouse) 381 gm/m³
LC50 (Inhalation-Guinea Pig) 68,000 ppm/15 minutes
LC (Inhalation-Dog) > 30 ppm/15 minutes: Behavioral: tremor; Gastrointestinal: changes in structure or function of salivary glands
LC50 (Inhalation-Rat) 5054 gm/m³/15 minutes
LC50 (Inhalation-Dog) 4056 gm/m³/2 minutes: Behavioral: general anesthetic
LC50 (Inhalation-Dog) 2128 gm/m³/4 hours
LC50 (Inhalation-Rat) 2660 gm/m³/2 minutes: Behavioral: convulsions or effect on seizure threshold; Cardiac: arrhythmias (including changes in conduction); Vascular: BP lowering not characterized in autonomic section
LC50 (Inhalation-Monkey) 2660 gm/m³/2 minutes: Behavioral: convulsions or effect on seizure threshold, general anesthetic
LC50 (Inhalation-Monkey) 1330 gm/m³/15 minutes: Behavioral: convulsions or effect on seizure threshold, general anesthetic

ADDITIONAL TOXICOLOGICAL DATA:

Bromotrifluoromethane is low in toxicity. However, exposure to high concentrations (about 5–17% [50,000–170,000 ppm]) can affect the central nervous system and cause light-headedness, numbness, tingling and a feeling of drunkenness. Other symptoms reported include slight decrease in judgment, alertness or coordination, buzzing in the ears, and a feeling of gradual loss of consciousness. There are no experimental or occupational reports of unconsciousness. Effects are temporary with rapid recovery upon breathing fresh air. Exposure to high levels (over 15% [150,000 ppm] for 15 to 25 minutes) can cause irregular heartbeat (arrhythmia).
Bromotrifluoromethane biodegradation is expected to be slow. Hydrolysis is not expected to occur due to the lack of hydrolyzable groups. Based upon the high degree of stability, Bromotrifluoromethane is expected to be an important fate process based upon this compound’s Henry’s Law constant. Estimated volatilization half-lives for air are 2.16 days, and for water are greater than 7 years. Bromotrifluoromethane is not expected to adsorb to suspended solids and sediment in the water based upon the estimated Koc. Volatilization from water surfaces is estimated to be greater than 44 years. The primary decomposition process to occur in the stratosphere is UV photolysis. It has been observed that Bromotrifluoromethane will exist solely in the gas phase in the ambient atmosphere. Gas-phase Bromotrifluoromethane will be degraded slowly in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life of this reaction in air is estimated to be greater than 44 years. The primary decomposition process to occur in the stratosphere is UV photolysis. It has an estimated photolysis half-life of 72 yrs in the ambient atmosphere. If released to soil, Bromotrifluoromethane is expected to have very high mobility based upon an estimated Koc of 49. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry’s Law constant of 0.499 atm·cu m/mole. If released into water, Bromotrifluoromethane is not expected to adsorb to suspended solids and sediment in the water based upon the estimated Koc. Volatilization from water surfaces is expected to be an important fate process based upon this compound’s Henry’s Law constant. Estimated volatilization half-lives for a model river and model lake are 1.2 hrs and 4.8 days, respectively. Based upon this compound’s Henry’s Law constant, Bromotrifluoromethane is not expected to be an important fate process based upon this compound’s Henry’s Law constant. Estimated volatilization half-lives for air are 2.16 days, and for water are greater than 7 years. Bromotrifluoromethane is not expected to adsorb to suspended solids and sediment in the water based upon the estimated Koc. Volatilization from water surfaces is estimated to be greater than 44 years. The primary decomposition process to occur in the stratosphere is UV photolysis. It has been observed that Bromotrifluoromethane will exist solely in the gas phase in the ambient atmosphere. Gas-phase Bromotrifluoromethane will be degraded slowly in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life of this reaction in air is estimated to be greater than 44 years. The primary decomposition process to occur in the stratosphere is UV photolysis. It has an estimated photolysis half-life of 72 yrs in the ambient atmosphere. If released to soil, Bromotrifluoromethane is expected to have very high mobility based upon an estimated Koc of 49. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry’s Law constant of 0.499 atm·cu m/mole. If released into water, Bromotrifluoromethane is not expected to adsorb to suspended solids and sediment in the water based upon the estimated Koc. Volatilization from water surfaces is expected to be an important fate process based upon this compound’s Henry’s Law constant. Estimated volatilization half-lives for a model river and model lake are 1.2 hrs and 4.8 days, respectively. Based upon the high degree of stability, Bromotrifluoromethane biodegradation is expected to be slow. Hydrolysis is not expected to occur due to the lack of hydrolyzable functional groups.

**Potential to Bioaccumulate:** An estimated BCF of 5.4 suggests the potential for bioconcentration in aquatic organisms is low.

**Ecotoxicity:** Immediate adverse effect on plants would be related to oxygen-deficient environments or frost from rapidly expanding gases, unless exposure occurs in a confined space. There is currently no evidence of adverse effects from exposure to Halon 1301 on aquatic life.

**Ozone-Depletion Potential:** Halon 1301 is a Class I, Group II, Ozone Depleting Chemical per U.S. 40 CFR Part 82. Halon 1301 may contribute to global warming.

**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.

**Section 13. Disposal Considerations**

**Precautions to be Followed during Waste Handling:** Wear proper protective equipment when handling waste materials.

**Unused Product / Empty Container:** Do not dispose of residual product. Return used product in cylinders to H3R Clean Agents.

**Disposal Information:** Relative to the environment, this material has an ozone depletion potential and a global warming potential. Refer to the regulations of the U.S. EPA or the State-specific regulations for proper waste disposal, regulations of Canada and its Provinces, or regulations of EU member states.

**U.S. EPA Waste Number:** Not applicable.

**European (EWC) Waste Codes:** 16 05 04* gases in pressure containers (including halons) containing dangerous substances

**Section 14. Transport Information**

The following classification applies when this product is supplied as a fire extinguisher.

**U.S. Shipping Information:** This gas is classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.

**UN Identification Number:** UN 1044

**U.S. DOT Proper Shipping Name:** Fire extinguisher with compressed or liquefied gas

**Hazard Class Number and Description:** 2.2 (Non-Flammable Gas)

**U.S. DOT Shipping Label(s) Required:** Class 2.2 (Non-Flammable Gas)

**Packaging Group:** Not Applicable

**Placard (When required):** Class 2.2 (Non-Flammable Gas)

**Special Shipping Information:** Cylinders should be transported in a secure position in a well-ventilated truck (never transport in passenger compartment of a vehicle). Ensure cylinder valve is properly closed, valve outlet cap has been reinstalled, and valve protection cap is secured before shipping cylinder.
The following classification applies when this product is supplied as a fire extinguisher.

**U.S. SHIPPING INFORMATION (continued):**

- **Caution:** Compressed gas cylinders shall not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with the owner’s written consent is a violation of Federal law (49 CFR 173.301).

**ERG (Emergency Response Guidebook) #:** 126

**Special Provisions:** T50 Portable tanks - Applies to various liquefied compressed gases: Consult the regulations for specific requirements Sec. 172.102 Special Provision Portable Tank Code T50.

**TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:** This product 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.

<table>
<thead>
<tr>
<th>UN Identification Number:</th>
<th>UN 1044</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper Shipping Name:</td>
<td>Fire extinguisher with compressed or liquefied gas</td>
</tr>
<tr>
<td>Hazard Class Number and Description:</td>
<td>2.2 (Non-Flammable Gas)</td>
</tr>
<tr>
<td>Packing Group:</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Excepted Quantities:</td>
<td>E0</td>
</tr>
<tr>
<td>Hazard Shipping Label(s) Required:</td>
<td>Class 2.2 (Non-Flammable Gas)</td>
</tr>
<tr>
<td>Special Provisions:</td>
<td>109</td>
</tr>
<tr>
<td>Explosive Limit &amp; Limited Quantity Index:</td>
<td>0.125 L</td>
</tr>
<tr>
<td>ERAP Index:</td>
<td>None</td>
</tr>
<tr>
<td>Passenger Carrying Ship Index:</td>
<td>None</td>
</tr>
<tr>
<td>Passenger Carrying Road Or Rail Vehicle Index:</td>
<td>75</td>
</tr>
</tbody>
</table>

**INTERNATIONAL AIR TRANSPORT ASSOCIATION SHIPPING INFORMATION (IATA):** This gas is classified as dangerous goods, per the International Air Transport Association.

<table>
<thead>
<tr>
<th>UN Identification Number:</th>
<th>UN 1044</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper Shipping Name/Description:</td>
<td>Fire extinguisher with compressed or liquefied gas</td>
</tr>
<tr>
<td>Hazard Class or Division:</td>
<td>2.2 (Non-Flammable Gas)</td>
</tr>
<tr>
<td>Hazard Label(s) Required:</td>
<td>Class 2.2 (Non-Flammable Gas)</td>
</tr>
<tr>
<td>Packing Group:</td>
<td>None</td>
</tr>
<tr>
<td>Excepted Quantities:</td>
<td>E0</td>
</tr>
<tr>
<td>Passenger and Cargo Aircraft Packing Instruction:</td>
<td>213</td>
</tr>
<tr>
<td>Passenger and Cargo Aircraft Maximum Net Quantity per Pkg.:</td>
<td>75 Kg</td>
</tr>
<tr>
<td>Passenger and Cargo Aircraft Limited Quantity Packing Instruction:</td>
<td>Forbidden</td>
</tr>
<tr>
<td>Passenger and Cargo Aircraft Limited Quantity Maximum Net Quantity per Pkg.:</td>
<td>Forbidden</td>
</tr>
<tr>
<td>Cargo Aircraft Only Packing Instruction:</td>
<td>213</td>
</tr>
<tr>
<td>Cargo Aircraft Only Maximum Net Quantity per Pkg.:</td>
<td>150 Kg</td>
</tr>
<tr>
<td>Special Provisions:</td>
<td>A19</td>
</tr>
<tr>
<td>ERG CODE:</td>
<td>2L</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>UN No.:</th>
<th>1044</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper Shipping Name:</td>
<td>Fire extinguisher with compressed or liquefied gas</td>
</tr>
<tr>
<td>Hazard Class Number:</td>
<td>2.2</td>
</tr>
<tr>
<td>Packing Group:</td>
<td>None</td>
</tr>
<tr>
<td>Special Provisions:</td>
<td>None</td>
</tr>
<tr>
<td>Limited Quantities:</td>
<td>120 mL</td>
</tr>
<tr>
<td>Excepted Quantities:</td>
<td>E0</td>
</tr>
<tr>
<td>Packing:</td>
<td>Instructions: P200; Provisions: None</td>
</tr>
<tr>
<td>IBCs:</td>
<td>Instructions: None; Provisions: None</td>
</tr>
<tr>
<td>Tanks:</td>
<td>Instructions: None; Provisions: None</td>
</tr>
<tr>
<td>EmS:</td>
<td>F-C, S-V</td>
</tr>
<tr>
<td>Stowage Category:</td>
<td>Category A</td>
</tr>
<tr>
<td>Marine Pollutant:</td>
<td>This gas does not meet the criteria of a Marine Pollutant</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>UN No.:</th>
<th>1044</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name and Description:</td>
<td>Fire extinguisher with compressed or liquefied gas</td>
</tr>
<tr>
<td>Class:</td>
<td>2</td>
</tr>
<tr>
<td>Classification Code:</td>
<td>6A</td>
</tr>
<tr>
<td>Packing Group:</td>
<td>None</td>
</tr>
<tr>
<td>Labels:</td>
<td>2.2</td>
</tr>
<tr>
<td>Special Provisions:</td>
<td>225, 594</td>
</tr>
<tr>
<td>Limited Quantities:</td>
<td>120 mL</td>
</tr>
</tbody>
</table>
SECTION 14. TRANSPORT INFORMATION (Continued)

The following classification applies when this product is supplied as a fire extinguisher.

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (continued):

- **Excepted Quantities:** E0
- **Packing Instructions:** P200
- **Special Packing Instructions:** PP91
- **Mixed Packing Provisions:** MP9
- **Portable Tank and Bulk Container:** Instructions: None; Special Provisions: None
- **Hazard Identification No.:** None

The following classification applies when this product is charged with nitrogen, carbon dioxide or air.

**U.S. SHIPPING INFORMATION:** This gas is classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.

- **UN Identification Number:** UN 1058
- **U.S. DOT Proper Shipping Name:** Liquefied gas, non-flammable, charged with nitrogen, carbon dioxide or air
- **Hazard Class Number and Description:** 2.2 (Non-Flammable Gas)
- **U.S. DOT Shipping Label(s) Required:** Class 2.2 (Non-Flammable Gas)
- **Packing Group:** Not Applicable
- **Placard (When required):** Class 2.2 (Non-Flammable Gas)

**Special Shipping Information:** Cylinders should be transported in a secure position in a well-ventilated truck (never transport in passenger compartment of a vehicle). Ensure cylinder valve is properly closed, valve outlet cap has been reinstalled, and valve protection cap is secured before shipping cylinder.

**Caution:** Compressed gas cylinders shall not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with the owner's written consent is a violation of Federal law (49 CFR 173.301).

**ERG (Emergency Response Guidebook) #:** 126
**Special Provisions:** T50 Portable tanks - Applies to various liquefied compressed gases: Consult the regulations for specific requirements Sec. 172.102 Special Provision Portable Tank Code T50.

**INTERNATIONAL AIR TRANSPORT ASSOCIATION SHIPPING INFORMATION (IATA):** This gas is classified as dangerous goods, per the International Air Transport Association.

- **UN Identification Number:** UN 1058
- **Proper Shipping Name/Description:** Liquefied gas, non-flammable, charged with nitrogen, carbon dioxide or air
- **Hazard Class or Division:** 2.2 (Non-Flammable Gas)
- **Hazard Label(s) Required:** Class 2.2 (Non-Flammable Gas)
- **Packing Group:** None
- **Excepted Quantities:** E1
- **Passenger and Cargo Aircraft Packing Instruction:** 213
- **Passenger and Cargo Aircraft Maximum Net Quantity per Pkg.:** 75 Kg
- **Passenger and Cargo Aircraft Limited Quantity Packing Instruction:** Forbidden
- **Passenger and Cargo Aircraft Limited Quantity Maximum Net Quantity per Pkg.:** Forbidden
- **Cargo Aircraft Only Packing Instruction:** 213
- **Cargo Aircraft Only Maximum Net Quantity per Pkg.:** 150 Kg
- **Special Provisions:** A19
- **ERG CODE:** 2L

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

- **UN No.:** 1058
- **Proper Shipping Name:** Liquefied gas, non-flammable, charged with nitrogen, carbon dioxide or air
- **Hazard Class Number:** 2.2
- **Packing Group:** None
- **Special Provisions:** 225
### SECTION 14. TRANSPORT INFORMATION (Continued)

The following classification applies when this product is charged with nitrogen, carbon dioxide or air.

**INTERNATIONAL MARITIME ORGANIZATION SHIPPING INFORMATION (continued):**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited Quantities:</td>
<td>120 mL</td>
</tr>
<tr>
<td>Excepted Quantities:</td>
<td>E1</td>
</tr>
<tr>
<td>Packing:</td>
<td>Instructions: P003; Provisions: None</td>
</tr>
<tr>
<td>IBCs:</td>
<td>Instructions: None; Provisions: None</td>
</tr>
<tr>
<td>Tanks:</td>
<td>Instructions: None; Provisions: None</td>
</tr>
<tr>
<td>Stowage Category:</td>
<td>Category A.</td>
</tr>
<tr>
<td>Marine Pollutant:</td>
<td>This gas does not meet the criteria of a Marine Pollutant.</td>
</tr>
</tbody>
</table>

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

- **UN No.:** 1058
- **Name and Description:** Liquefied gas, non-flammable, charged with nitrogen, carbon dioxide or air
- **Classification Code:** 2A
- **Packing Group:** None
- **Special Provisions:** 662
- **Limited Quantities:** 120 mL
- **Excepted Quantities:** E1
- **Packaging Instructions:** P200
- **Special Packing Instructions:** None
- **Mixed Packing Provisions:** MP9
- **Portable Tank and Bulk Container:** Instructions: (M); Special Provisions: None
- **Hazard Identification No.:** None

The following shipping classification applies when the product is supplied in types of cylinders other than fire extinguishers:

**U.S. SHIPPING INFORMATION:** This gas is classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.

- **UN Identification Number:** UN 1009
- **U.S. DOT Proper Shipping Name:** Bromotrifluoromethane (Refrigerant gas R 13B1)
- **Hazard Class Number and Description:** 2.2 (Non-Flammable Gas)
- **U.S. DOT Shipping Label(s) Required:** Class 2.2 (Non-Flammable Gas)
- **Packing Group:** Not Applicable
- **Placard (When required):** Class 2.2 (Non-Flammable Gas)
- **ERG (Emergency Response Guidebook) #:** 126
- **Special Shipping Information:** Cylinders should be transported in a secure position in a well-ventilated truck (never transport in passenger compartment of a vehicle). Ensure cylinder valve is properly closed, valve outlet cap has been reinstalled, and valve protection cap is secured before shipping cylinder.
- **Caution:** Compressed gas cylinders shall not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with the owner’s written consent is a violation of Federal law (49 CFR 173.301).
- **Special Provisions:** T50 Portable tanks - Applies to various liquefied compressed gases: Consult the regulations for specific requirements Sec. 172.102 Special Provision Portable Tank Code T50.

**TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:** This product 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 1009
- **Proper Shipping Name:** Bromotrifluoromethane (Refrigerant gas R 13B1)
- **Hazard Class Number and Description:** 2.2 (Non-Flammable Gas)
- **Packing Group:** Not Applicable
- **Excepted Quantities:** E1
- **Hazard Shipping Label(S) Required:** Class 2.2 (Non-Flammable Gas)
- **Special Provisions:** None
- **Explosive Limit & Limited Quantity Index:** 0.125 l
- **ERAP Index:** None
- **Passenger Carrying Ship Index:** None
- **Passenger Carrying Road or Rail Vehicle Index:** 75

**INTERNATIONAL AIR TRANSPORT ASSOCIATION SHIPPING INFORMATION (IATA):** This gas is classified as dangerous goods, per the International Air Transport Association.

- **UN Identification Number:** UN 1009
- **Proper Shipping Name/Description:** Bromotrifluoromethane (Refrigerant gas R 13B1)
- **Hazard Class or Division:** 2.2 (Non-Flammable Gas)
SECTION 14. TRANSPORT INFORMATION (Continued)

The following shipping classification applies when the product is supplied in types of cylinders other than fire extinguishers:

INTERNATIONAL AIR TRANSPORT ASSOCIATION SHIPPING INFORMATION (continued):

<table>
<thead>
<tr>
<th>Hazard Label(s) Required:</th>
<th>Class 2.2 (Non-Flammable Gas)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packing Group:</td>
<td>None</td>
</tr>
<tr>
<td>Excepted Quantities:</td>
<td>E1</td>
</tr>
<tr>
<td>Passenger and Cargo Aircraft Packing Instruction:</td>
<td>200</td>
</tr>
<tr>
<td>Passenger and Cargo Aircraft Maximum Net Quantity per Pkg.:</td>
<td>75 kg</td>
</tr>
<tr>
<td>Passenger and Cargo Aircraft Limited Quantity Packing Instruction:</td>
<td>Forbidden</td>
</tr>
<tr>
<td>Passenger and Cargo Aircraft Limited Quantity Maximum Net Quantity per Pkg.:</td>
<td>Forbidden</td>
</tr>
<tr>
<td>Cargo Aircraft Only Packing Instruction:</td>
<td>200</td>
</tr>
<tr>
<td>Cargo Aircraft Only Maximum Net Quantity per Pkg.:</td>
<td>150 kg</td>
</tr>
<tr>
<td>Special Provisions:</td>
<td>None</td>
</tr>
<tr>
<td>ERG Code:</td>
<td>2L</td>
</tr>
</tbody>
</table>

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

| UN No.:                  | 1009                          |
| Proper Shipping Name:    | Bromotrifluoromethane (Refrigerant gas R 13B1) |
| Hazard Class Number:     | 2.2                           |
| Packing Group:           | None                          |
| Special Provisions:      | None                          |
| Limited Quantities:      | 120 mL                        |
| Excepted Quantities:     | E1                            |
| Packing:                 | Instructions: P200; Provisions: None |
| IBCs:                    | Instructions: None; Provisions: None |
| Tanks:                   | Instructions: T50; Provisions: None |
| EmS:                     | F-C, S-V                      |
| Stowage Category:        | Category A.                   |
| Marine Pollutant:        | This gas does not meet the criteria of a Marine Pollutant. |

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

| UN No.:                  | 1009                          |
| Name and Description:    | Bromotrifluoromethane (Refrigerant gas R 13B1) |
| Class:                   | 2                             |
| Classification Code:     | 2A                            |
| Packing Group:           | None                          |
| Labels:                  | 2.2                           |
| Special Provisions:      | None                          |
| Limited Quantities:      | 120 mL                        |
| Excepted Quantities:     | E1                            |
| Packing Instructions:    | P200                          |
| Special Packing Instructions: | None               |
| Mixed Packing Provisions:| MP9                           |
| Portable Tank and Bulk Container: | Instructions: (M) T50; Special Provisions: None |
| HAZARD IDENTIFICATION No.: | None                         |

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

ENVIRONMENTAL HAZARDS: This gas 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.

SECTION 15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

EPA - ENVIRONMENTAL PROTECTION AGENCY:


Section 302/304: Emergency Planning and Notification (40 CFR Part 355)

Sections 311/312: Hazardous Chemical Reporting (40 CFR Part 370)

IMMEDIATE HEALTH: No PRESSURE: Yes DELAYED HEALTH: No REACTIVITY: No FIRE: No

Section 313: Toxic Chemical Release Reporting (40 CFR 372)

Releases of Halon 1301 require reporting under Section 313.
U.S. FEDERAL REGULATIONS (continued):

CLEAN AIR ACT:

Section 112 (r): Risk Management Programs for Chemical Accidental Release (40 CFR Part 68)
- Threshold Planning Quantity (TPQ): Not Applicable

OSHA - Occupational Safety and Health Administration:
  - Threshold Planning Quantity (TPQ): Not Applicable

Other U.S. Federal Regulations: Requirements under (40 CFR Part 82) may be applicable as Halon 1301 is designated as an ozone-depleting compound.

U.S. State Regulatory Information:
- California Proposition 65: Halon 1301 is NOT listed on the California Proposition 65 lists.

CANADIAN FEDERAL REGULATIONS:

Canadian DSL Inventory Status: Halon 1211 is listed on the DSL Inventory.
Other Canadian Regulations: Halon 1211 is not on the CEPA Priorities Substances Lists.
Canadian WHMIS Classification and Symbols: Halon 1211 is categorized as a Controlled Product, Hazard Class A, as per the Controlled Product Regulations. Class A: Compressed Gas

EUROPEAN REGULATIONS:

Safety, Health, and Environmental Regulations/Legislation Specific for the Product: Currently, there is no specific legislation pertaining to this product.


GLOBAL HARMONIZATION AND EU CLP REGULATION (EC) 1272/2008 LABELING AND CLASSIFICATION:

Classification: Gas under Pressure/Liquefied Gas
Signal Word: Warning
Hazard Statement: H280: Contains gas under pressure; may explode if heated.
Prevention Statements:
- Precautionary: None.
- Response: None
- Storage: P410 + P403: Protect from sunlight. Store in a well-ventilated place.
- Disposal: P501: Dispose of contents/containers in accordance with all local, regional, national and international regulations.

Hazard Symbol: GHS04

Information contained in this Safety Data Sheet is provided to our customers so they may comply with 29 CFR 1910.1200, Hazard Communication Standard, the Canadian WHMIS Standard, and the requirements of the European Union Directives. The intent of this Material Safety Data Sheet is to provide end users of this product with the health and physical hazards associated with possible exposure to this product. All statements, technical data and recommendations are based on readily available texts and data that H3R Clean Agents believes to be reliable and accurate. H3R Clean Agents makes no warranties, guarantees or representations of any kind with respect to this product or this data. It is the responsibility of the user to obtain and use the most recent version of this MSDS.

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc. • PO Box 1961, Hilo, HI 96721 • 800/441-3365
REFERENCES AND DATA SOURCES: Contact the supplier for information.
METHODS OF EVALUATING INFORMATION FOR THE PURPOSE OF CLASSIFICATION: Bridging principles were used to classify this product.

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number that uniquely identifies each constituent.

EXPOSURE LIMITS IN AIR:

CEILING LEVEL: The concentration that shall not be exceeded during any part of the working exposure.

DGF MAK Germ Cell Mutagen Categories: 1. Germ cell mutagens which have been shown to increase the mutant frequency in the progeny of exposed humans. 2. Germ cell mutagens which have been shown to increase the mutant frequency in the progeny of exposed mammals. 3A: Substances which have been shown to induce genetic damage in germ cells of human of animals, or which produce mutagenic effects in somatic cells of mammals in vivo and have been shown to reach the germ cells in an active form. 3B: Substances which are suspected of being germ cell mutagens because of their genotoxic effects in mammalian somatic cell in vivo; in exceptional cases, substances for which there are no in vivo data, but which are clearly mutagenic in vitro and structurally related to known in vivo mutagens. 4: Not applicable (Category 4 carcinogenic substances are those with non-genotoxic mechanisms of action.

EXPOSURE LIMITS IN AIR (continued):

DGF MAK Germ Cell Mutagen Categories (continued): 4 (continued): By definition, germ cell mutagens are genotoxic. Therefore, a Category 4 for germ cell mutagens cannot apply. At some time in the future, it is conceivable that a Category 4 could be established for genotoxic substances with primary targets other than DNA [e.g. purely aneugenic substances] if research results make this seem sensible.) 5: Germ cell mutagens, the potency of which is considered to be so low that, provided the MAK value is observed, their contribution to genetic risk for humans is expected not to be significant.

DGF MAK Pregnancy Risk Group Classification: Group A: A risk of damage to the developing embryo or fetus has been unequivocally demonstrated. Exposure of pregnant women can lead to damage of the developing organism, even when MAK and BAT (Biological Tolerance Value for Working Materials) values are observed. Group B: Currently available information indicates a risk of damage to the developing embryo or fetus must be considered to be probable. Damage to the developing organism cannot be excluded when pregnant women are exposed, even when MAK and BAT values are observed.
DEFINITIONS OF TERMS (Continued)

EXPOSURE LIMITS IN AIR (continued):
DGF MAK Pregnancy Risk Group Classification (continued): Group C: There is no reason to fear a risk of damage to the developing embryo or fetus when MAK and BAT values are observed. Group B: Classification in this group A-C is not strictly followed because, although the data available may indicate a trend, they are not sufficient for final evaluation.

IDLH: Immediately Dangerous to Life and Health: This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury.

LC50: Limit of Quantitation.

MAK: Federal Republic of Germany Maximum Concentration Values in the workplace.

NE: Not Established. When no exposure guidelines are established, an entry of NE is made for reference.

NCC: Not Considered Change.

NIOSH Ceiling: The exposure that shall not be exceeded during any part of the workday. If instantaneous monitoring is not feasible, the ceiling shall be assumed as a 15-minute TWA exposure (unless otherwise specified) that shall not be exceeded at any time during a workday.

NIOSH RELs: NIOSH's Recommended Exposure Limits.

PEL-Permissible Exposure Limit: OSHA's Permissible Exposure Limits. This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limit (PEL) was adopted in the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35331 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL that was vacated by OSHA.

SKIN: Used when there is a danger of cutaneous absorption.

STEL-Short Term Exposure Limit: Short Term Exposure Limit, usually a 15-minute time-weighted average (TWA) exposure that should not be exceeded at any time during a workday, even if the 8-hr TWA is within the TLV-TWA, PEL-TWA, or REL-TWA.

TWA: Time Weighted Average: An airborne concentration of a substance that represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed over an 8-hour workday. The duration must be considered, including the 8-hour workday.

TWA-Time Weighted Average: Time Weighted Average exposure concentration for a continuous 8-hr (TLV, PEL) or up to a 10-hr (REL) workday and a 40-hr workweek.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued): This rating system was developed by the National Fire Protection Association and has been adopted by industry to identify the degree of chemical hazards.

HEALTH HAZARD:
0: Minimum Hazard: No significant health risk, irritation of skin or eyes not anticipated. Skin Irritation: Essentially non-irritating. PEL or Draize = "0". Eye Irritation: Essentially non-irritating. PEL or Draize = "0". Minimal effective, when clinical in < 24 hours (e.g. mechanical irritation). Draize = "0". Oral Toxicity LD50 Rat or Rabbit: > 2000 mg/kg. Inhalation Toxicity 4-hrs LOS Rat or Rabbit: > 20 mg/L. (1) Slight Hazard: Minor reversible injury may occur; slightly or mildly irritating. Skin Irritation: Slighty or mildly irritating. Skin Irritation: Draize = "1". Oral Toxicity LD50 Rat or Rabbit: > 500-2000 mg/kg. Inhalation Toxicity LOS Rat or Rabbit: > 2000 mg/kg. Inhalation Toxicity 4-hrs Rat or Rabbit: > 20-200 mg/L. (2) Moderate Hazard: Temporary or transitory injury may occur. Skin Irritation: Modification of skin irritation. With dermal contact, irritant. Sensitizer. Draize = "2". Oral Toxicity LD50 Rat or Rabbit: 50-500 mg/kg. Inhalation Toxicity LOS Rat or Rabbit: > 200-1000 mg/kg. Inhalation Toxicity LD50 Rat or Rabbit: > 50-500 mg/kg. Inhalation Toxicity 4-hrs Rat or Rabbit: > 20 mg/L. (3) Severe Hazard: Severe irritation and/or corrosive; may destroy dermal tissue, cause burns, dermal necrosis. Draize = "3". Skin Irritation: Severe dermal destruction of ocular tissue; corneal involvement or irritation persisting for more than 21 days. Draize > 80 with effects irreversible in 21 days. Oral Toxicity LD50 Rat or Rabbit: > 1-50 mg/kg. Inhalation Toxicity LOS Rat or Rabbit: > 20-200 mg/kg. Inhalation Toxicity LD50 Rat or Rabbit: > 0.05-10 mg/kg. Inhalation Toxicity 4-hrs Rat or Rabbit > 0.5 mg/L. (4) Extreme Hazard: Materials that are extremely likely unless proper protective measures are taken and medical treatment is given; high level of toxicity; corrosive. Skin Irritation: Severely irritating and/or corrosive; may destroy dermal tissue, cause burns, dermal necrosis. Draize = "4". Skin Irritation: Materials that must be pre-heated before ignition can occur. Material require considerable pre-heating, under all ambient temperature conditions before ignition and combustion can occur, including: Materials that will burn in air when exposed to a temperature of 815°C (1500°F) for a period of 5 minutes or less. Liquids, solids or semisolids having a flash point at or below 150°F (31°C) or boiling point below 212°F (99°C). Solid materials in a semisolid state that will not burn in air when exposed to a temperature of 200°F (93°C). Materials that will burn rapidly and create flash fire hazards (e.g. cotton, sisal, hemp; solids and semisolids that readily give off flammable vapors). 3 (Serious Hazard - Liquids and solids that can cause severe dermal exposure). Inhalation Toxicity 4-hrs Rat or Rabbit: > 5 mg/L. Inhalation Toxicity LD50 Rat or Rabbit: < 2 mg/kg. Inhalation Toxicity LOS Rat or Rabbit: > 0.5 mg/L.

FLAMMABILITY HAZARD: 0 (Minimal Hazard—Materials that will not burn in air when exposed to a temperature of 815°C (1500°F) for a period of 5 minutes or less). 1 (Slight Hazard—Materials that will burn in air when exposed to a temperature of 815°C (1500°F) for a period of 5 minutes or less. Liquids, solids or semisolids having a flash point at or below 150°F (31°C) or boiling point below 212°F (99°C). Solid materials in a semisolid state that will not burn in air when exposed to a temperature of 200°F (93°C). Materials that will burn rapidly and create flash fire hazards (e.g. cotton, sisal, hemp; solids and semisolids that readily give off flammable vapors). 3 (Serious Hazard - Liquids and solids that can cause severe dermal exposure). Inhalation Toxicity 4-hrs Rat or Rabbit: > 5 mg/L. Inhalation Toxicity LD50 Rat or Rabbit: < 2 mg/kg. Inhalation Toxicity LOS Rat or Rabbit: > 0.5 mg/L.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

FLAMMABILITY HAZARD (continued): 4 (Severe Hazard-Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are highly flammable in air, and which can react violently with other flammable or oxygen-containing organic materials; Any liquid or gaseous material that is liquid while under pressure and has a flash point below 22.8°C (73°F) and a boiling point below 37.8°C (100°F) [e.g. OSHA Classification B]. Material that ignite spontaneously when exposed to air at a temperature of 54.4°C (130°F) or below (e.g. pyrophoric).

PHYSICAL HAZARD: 0 (Water Reactivity: Materials that do not react with water. Organic Peroxides: Materials that are normally stable, even under fire conditions and will not react with water. Explosives: Substanes that are Not appropriate. Unlisted: Uncompressed Gases: No Rating. Pyrophysics: No Rating. Oxizers: No "0" rating allowed. Unstable Reactibles: Substances that will not polymerize, decompose, condense or self-react.); 1 (Water Reactivity: Materials that change or decompose upon exposure to moisture. Organic Peroxides: Materials that are normally stable, but will react at high temperatures and pressures. These materials may react with water, but will not release energy. Explosives: Division 1.5 & 1.6 substances that are very insensitive explosives or insensitive mixtures. 2 (Explosives: those mixtures that in either concentration tested, exhibits a mean burning time less than or equal to the mean burning time of a 3.7 potassium bromate/cellulose mixture and the scaling for Packing Group I and II are not met. Liquids: any material whose LD 50 for acute dermal toxicity is greater than 200 mg/kg. Materials whose LD 50 for acute oral toxicity is greater than 500 mg/kg but less than or equal to 2000 mg/kg.); 3 (Explosives: those mixtures that in either concentration tested, exhibits a mean burning time less than or equal to the mean burning time of a 2.3 potassium bromate/cellulose mixture and the criteria for Packing Group I are not met. Liquids: any material whose LD 50 for acute dermal toxicity is greater than 500 mg/kg but less than or equal to 2000 mg/kg.); 4 (Explosives: those mixtures that in either concentration tested, exhibits a mean burning time less than or equal to the mean burning time of a 1.1 nitric acid (65%)/cellulose mixture and the criteria for Packing Group II are not met. Liquids: any material whose LD 50 for acute dermal toxicity is greater than 200 mg/kg. Materials whose LD 50 for acute oral toxicity is greater than 500 mg/kg but less than or equal to 2000 mg/kg.); 5 (Explosives: those mixtures that in either concentration tested, exhibits a mean burning time less than or equal to the mean burning time of a 1.1 aqueous sodium chloride solution (40%)/cellulose mixture and the criteria for Packing Group II are not met. Liquids: any material whose LD 50 for acute dermal toxicity is greater than 200 mg/kg. Materials whose LD 50 for acute oral toxicity is greater than 500 mg/kg but less than or equal to 2000 mg/kg.); 6 (Explosives: those mixtures that in either concentration tested, exhibits a mean burning time less than or equal to the mean burning time of a 1.1 perchloric acid (50%)/cellulose mixture.

NATIONAL FIRE PROTECTION ASSOCIATION HAZARDOUS RATING:

0: Non Rating.
1: Packing Group II - Solids: any material that, when in concentration tested, exhibits a mean burning time less than the mean burning time of a 2.3 potassium bromate/cellulose mixture and the criteria for Packing Group I are not met. Liquids: any material whose LD 50 for acute dermal toxicity is greater than 200 mg/kg. Materials whose LD 50 for acute oral toxicity is greater than 500 mg/kg but less than or equal to 2000 mg/kg. 2: Packing Group I - Solids: any material that, when in concentration tested, exhibits a mean burning time less than the mean burning time of a 1.1 aqueous sodium chloride solution (40%)/cellulose mixture and the criteria for Packing Group II are not met. Liquids: any material whose LD 50 for acute dermal toxicity is greater than 200 mg/kg. Materials whose LD 50 for acute oral toxicity is greater than 500 mg/kg but less than or equal to 2000 mg/kg. 3: Packing Group I - Solids: any material that, when in concentration tested, exhibits a mean burning time less than the mean burning time of a 1.1 perchloric acid (50%)/cellulose mixture.
DEFINITIONS OF TERMS (Continued):

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

HEALTH HAZARD (continued): 3 (continued): Materials whose LD₅₀ for acute oral toxicity is greater than 5 mg/kg but less than or equal to 50 mg/kg. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC₃₀ for acute inhalation toxicity, if its LC₅₀ is less than or equal to 3000 ppm and that does not meet the criteria for degree of hazard 4. Compressed liquefied gases with boiling points between -30°C (-22°F) and -55°C (-65.5°F) that cause frostbite and irreversible tissue damage. Materials that are respiratory irritants. Cryogenic gases that cause frostbite and irreversible tissue damage. Materials that are corrosive to the respiratory tract.

Degree of Hazard 4: Materials and irreversible tissue damage. Materials that are corrosive to the eyes or cause irreversible corneal opacity. Materials that are corrosive to the skin. 4 (materials that, under emergency conditions, can be lethal): Gases and vapors whose LC₃₀ for acute inhalation toxicity is less than or equal to 1,000 ppm. Dusts and mists whose LC₃₀ for acute inhalation toxicity is less than or equal to 0.5 mg/L. Materials whose LD₅₀ for acute dermal toxicity is less than or equal to 40 mg/kg. Materials whose LC₅₀ for acute oral toxicity is less than or equal to 5 mg/kg. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC₃₀ for acute inhalation toxicity, if its LC₅₀ is less than or equal to 1000 ppm. Any liquid that causes damage to a developing embryo (i.e., within the first eight weeks of pregnancy in humans) or that the changes will propagate through generational lines. An embryotoxin.

FLAMMABILITY HAZARD: 0 Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand: Materials that will not burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in accordance with Annex D. 1 Materials that must be preheated before ignition can occur. Materials in this degree require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur: Materials that will burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in accordance with Annex D. Liquids, solids and semisolids having a flash point at or above 93.4°C (200°F) (i.e. Class IIIIB liquids). Liquids with a flash point greater than 35°C (95°F) that do not sustain combustion when tested using the Method of Testing for Sustained Combustibility, per 49 CFR 173, Appendix H or the UN Recommendation on the Transport of Dangerous Goods, Model Regulations (current edition) and the related Manual of Tests and Criteria (current edition). Liquids with a flash point greater than 35°C (95°F) in a water-miscible solution or dispersion with a water non-combustible liquid/solid content of more than 85 percent by weight. Liquids that have no fire point when tested by ASTM D 92 Standard Test Method for Flash and Fire Points by Cleveland Open Cup, up to a boiling point of the liquid or up to a temperature at which the sample being tested shows an obvious change. Combustible pellets with a representative diameter of greater than 2 mm (10 mesh). Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed up flash point of the solvent. Most ordinary combustible materials. 2 Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not under normal conditions form hazardous atmospheres with air, but under high ambient temperatures or under moderate heating could release vapor in sufficient quantities to produce hazardous atmospheres with air. Liquids having a flash point at or above 37.8°C (100°F) and below 93.4°C (200°F) (i.e. Class II and Class IIIIB liquids.) Solid materials in the form of powders or coarse dusts of representative diameter between 420 microns (40 mesh) and 2 mm (10 mesh) that burn rapidly but that generally do not form explosive mixtures in air. Solid materials in fibrous or shredded form that burn rapidly and create flash fire hazards, such as cotton, sisal and hemp. Solids and semisolids that readily give off flammable vapors. Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are ranked by the closed-up flash point of the solvent. 3 Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions. Liquids having a flash point below 22.8°C (73°F) and having a boiling point at or above 37.8°C (100°F) and those liquids having a flash point at or above 22.8°C (73°F) and below 37.8°C (73°F) and below 37.8°C (100°F) (i.e. Class IB and IC liquids). Materials that, on account of their physical form or environment of combustion, have a flash point above 22.8°C (73°F) and air and are normally heated in air. Flammable or combustible dusts with a representative diameter less than 420 microns (40 mesh). Materials that burn with extreme rapidity, usually by reason of self-contained oxygen (e.g. dry nitrocellulose and many organic peroxides). Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are ranked by the closed-up flash point of the solvent. 4 Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and will burn rapidly: Flammable gases. Flammable cryogenic materials. Any liquid or gaseous materials that is liquid while under pressure and has a flash point below 22.8°C (73°F) and a boiling point below 37.8°C (100°F) (i.e. Class IA liquids). Materials that ignite when exposed to air. Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are ranked by the closed-up flash point of the solvent.

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

INSTABILITY HAZARD: 0 Materials that in themselves are normally stable, even under fire conditions. Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) before 0.01 W/mL. Materials that undergo violent chemical change at elevated temperatures and pressures: Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 0.01 W/mL and below 10 W/mL. Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 10 W/mL and below 100W/mL. Any liquid that, in itself, causes damage to a developing fetus, but the damage does not propagate through generational lines. An embryotoxin.

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (NFPA). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature - The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Human and Animal Toxicology: Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Data presented include some terms used in NFPA, i.e., LEL (Lower Explosive Limit - solids & liquids) which is the flammable limits of the exposed animals; LC₅₀ - Lethal Concentration (gases) which kills 50% of the exposed animals; ppm concentration expressed in parts of material per million parts of air or water; mg/m³ concentration expressed in weight of substance per volume of air; mg/kg quantity of material, by weight, administered to a test subject, based on their body weight in kg. Other measures of toxicity include TLCd, the lowest dose to cause a symptom and TCLc the lowest concentration to cause a symptom; TDo, LdDo, and Lo, or TC, Tc, Lc, and LcO, the lowest dose (or concentration) to cause lethal or toxic effects.

Cancer Information: The sources are: IARC - the International Agency for Research on Cancer; NTP - the National Toxicology Program, RTECS - the Registry of Toxic Effects of Chemical Substances, OSHA and CAL/OSHA. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other Information: BEI - ACGIH Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.

REPRODUCTIVE TOXICITY INFORMATION:

A mutagen is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An antineoplastic is a chemical that damages or destroys a developing fetus (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical that causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance that interferes in any way with the reproductive process.

ECOLOGICAL INFORMATION:

EC is the effect concentration in water. BCF = Bioconcentration Factor, which is used to determine if a substance will concentrate in lifeforms which consume contaminated plant or animal matter. TL₅₀ = median threshold limit; Coefficient of Oil/Water Distribution is represented by log Kₒw or log Kₐw and is used to assess a substance’s behavior in the environment.

REGULATORY INFORMATION:

U.S. and CANADA: ACGIH American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. This section explains the impact of various laws and regulations on the material. EPA is the U.S. Environmental Protection Agency. NIOSH is the National Institute for Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (OSHA). WHMIS is the Canadian Workplace Hazardous Materials Information System. DOT and TC are the U.S. Department of Transportation and the Transportation Canada, respectively. Amendments and Revocation Act (SARA) the Canadian Domestic/Non-Domestic Substances List (DSL/NDDSL), the U.S. Toxic Substance Control Act (TSCA): Marine Pollutant status according to the DOT, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund), and various state regulations. This section explains the impact of various laws and regulations on the precautionary warnings which appear on the material’s package label.