

## Praxair Material Safety Data Sheet

### 1. Chemical Product and Company Identification

<b>Product Name:</b> Halocarbon 1113	<b>Trade Name:</b> Halocarbon 1113
<b>Product Use:</b> Many.	
<b>Chemical Name:</b> Chlorotrifluoroethylene	<b>Synonym:</b> Trifluorochloroethylene, Chlorotrifluoroethene, Trifluoromonochloroethylene, 1,1,2-Trifluoroethene-2-chloroethylene, Trifluorovinyl Chloride, Refrigerant Gas R1113
<b>Chemical Formula:</b> C <sub>2</sub> ClF <sub>3</sub>	<b>Chemical Family:</b> Halocarbon
<b>Telephone:</b> <b>Emergencies:</b> * 1-800-363-0042	<b>Supplier /Manufacture:</b> Praxair Canada Inc. 1 City Centre Drive Suite 1200 Mississauga, ON L5B 1M2  <b>Phone:</b> 905-803-1600 <b>Fax:</b> 905-803-1682

*\*Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier or Praxair sales representative.*

### 2. Composition and Information on Ingredients

INGREDIENTS	% (VOL)	CAS NUMBER	LD <sub>50</sub> (Species & Routes)	LC <sub>50</sub> (Rat, 4 hrs.)	TLV-TWA (ACGIH)
Chlorotrifluoroethylene (inhibited with 1% Tributylamine)	100	79-38-9	Not available.	1000 ppm	None currently established.

### 3. Hazards Identification

#### Emergency Overview

**DANGER!** Toxic, flammable gas. May be fatal if inhaled. May form explosive mixtures with air. May cause eye, skin, and respiratory tract burns. may cause liver and kidney damage. Symptoms may be delayed. Self-contained breathing apparatus and protective clothing must be required by rescue workers.

#### ROUTES OF EXPOSURE:

Inhalation. Swallowing. Skin absorption. Skin contact. Eye contact.

#### EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

##### INHALATION:

Moderately toxic. May cause skin irritation and pulmonary edema. Asphyxiant. Effects are due to lack of oxygen. High concentrations may cause headaches, drowsiness, dizziness, nausea, vomiting, disorientation, confusion, uncoordination and narcosis. Lack of oxygen can kill.

**SKIN CONTACT:** Liquid can cause frostbite.

**SKIN ABSORPTION:** Prolonged or widespread skin contact with the liquid may result in the absorption of harmful amounts of material.

**SWALLOWING:** An unlikely route of exposure, but frostbite of the lips and mouth may result from contact with the liquid.

**EYE CONTACT:** Liquid may cause severe corneal injury.

**EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE:** Repeated exposure may cause kidney damage.

**OTHER EFFECTS OF OVEREXPOSURE:**

At very high concentrations may produce cardiac arrhythmia or arrest due to sensitization of the heart to adrenalin and nor-adrenalin. Exposure to fluorocarbon thermal decomposition products may produce flu-like symptoms including chills, fever, weakness, muscular aches, headache, chest discomfort, sore throat, and dry cough. Complete recovery usually occurs within 24 hours after exposure.

**MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:**

A knowledge of the available toxicology information and of the physical and chemical properties of the material suggests that overexposure is unlikely to aggravate existing medical conditions.

**SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION:**

None.

**CARCINOGENICITY:**

Not listed as carcinogen by OSHA, NTP or IARC.

**4. First Aid Measures**

**INHALATION:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**SKIN CONTACT:**

If exposed to liquid, avoid breathing vapour. Immediately warm frostbite area with warm water (not to exceed 40 C). In case of massive exposure, remove clothing and shoes while showering with warm water. Get medical attention immediately.

**SWALLOWING:**

This product is a gas at normal temperature and pressure.

**EYE CONTACT:**

For contact with the liquid, immediately flush eyes thoroughly with warm water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. See a physician, preferably an ophthalmologist, immediately.

**NOTES TO PHYSICIAN:**

Not available.

**5. Fire Fighting Measures**

<b>FLAMMABLE :</b> Yes.	<b>IF YES, UNDER WHAT CONDITIONS?</b>	Not available. Forms explosive mixtures with air and oxidizing agents.
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<b>FLASH POINT (test method)</b> Not applicable.	<b>AUTOIGNITION TEMPERATURE</b> None currently known.
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<b>FLAMMABLE LIMITS IN AIR, % by volume:</b>	<b>LOWER:</b> 16	<b>UPPER:</b> 34
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**EXTINGUISHING MEDIA:**

CO2, dry chemical, water spray or fog.

**SPECIAL FIRE FIGHTING PROCEDURES:**

**DANGER!** Evacuate all personnel from danger area. Immediately cool cylinders with water spray from maximum distance taking care not to extinguish flames. Remove ignition source if without risk. If flames are accidentally extinguished. Explosive re-ignition may occur; therefore, appropriate measures should be taken; e.g., total evacuation. Re-approach with extreme caution. Use self-contained breathing apparatus. Stop flow of gas if without risk while continuing cooling water spray. Remove all containers from area if without risk. Allow fire to burn out.

**UNUSUAL FIRE AND EXPLOSION HAZARD:**

Forms explosive mixture with air and oxidizing agents. Container may rupture due to heat of fire. Do not extinguish flames due to possibility of explosive re-ignition. Flammable vapours may spread from spill. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with appropriate device. No part of a container should be subjected to a temperature higher than 52 C. Vapours form from this product may travel or be moved by air currents and ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharges, or other ignition sources at locations distant from product handling point. Most containers are provided with a pressure relief device designed to vent contents when they are exposed to elevated temperature.

**HAZARDOUS COMBUSTION PRODUCTS:**

These products are carbon oxides (CO, CO<sub>2</sub>), halogenated compounds, hydrogen fluoride.

**SENSITIVITY TO IMPACT:**

Avoid impact against container.

**SENSITIVITY TO STATIC DISCHARGE:**

Possible, ground container.

## 6. Accidental Release Measures

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:**

**DANGER!** Poisonous, flammable gas. Immediately evacuate all personnel from danger area. Forms explosive mixtures with air. Use self-contained breathing apparatus and protective clothing where needed. Remove all sources of ignition if without risk. Reduce vapours with fog or fine water spray. Shut off leak if without risk. Ventilate area of leak or move leaking container to well ventilated area. Prevent runoff from contaminating surrounding environment. **CAUTION:** Poisonous, flammable vapours may spread from spill. Before entering area, especially confined areas, check atmosphere with appropriate device.

**WASTE DISPOSAL METHOD:**

Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

## 7. Handling and Storage

**PRECAUTIONS TO BE TAKEN IN STORAGE:**

Store and use with adequate ventilation. Separate flammable cylinders from oxygen, chlorine, and other oxidizers by at least 20 ft. (6.1 m) or use a barricade of non-combustible material. This barricade should be at least 5 ft (1.53 m) high and have a fire resistance rating of at least ½ hour. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Post "No Smoking or Open Flames" signs in storage and use areas. There must be no sources of ignition. All electrical equipment in storage areas must be explosion-proof. Storage areas must meet national electric codes for Class 1 hazardous areas. Store only where temperature will not exceed 125°F (52°C). Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

**PRECAUTIONS TO BE TAKEN IN HANDLING:**

Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Electrical equipment must be non-sparking or explosion-proof. Leak check system with soapy water; never use a flame. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Open valve slowly. If valve is hard to open, discontinue use and contact your supplier. For other precautions, see section 16.

For additional information on storage and handling, refer to Compressed Gas Association (CGA) pamphlet P-1, *Safe Handling of Compressed Gases in Containers*, available from the CGA. Refer to section 16 for the address and phone number along with a list of other available publications.

#### OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE:

**Flammable liquid and gas under pressure.** Do not get liquid or vapours in eyes, on skin, or clothing. Safety showers and eyewash fountains should be immediately available. Use only in a closed system. Use piping and equipment adequately designed to withstand pressures to be encountered. Use only spark-proof tools and explosion-proof equipment. Keep away from heat, sparks, and open flame. **May form explosive mixtures with air.** Ground all equipment. Store and use with adequate ventilation at all times. Close valve after each use; keep closed even when empty. **Prevent reverse flow.** Reverse flow into cylinder may cause rupture. Use a check valve or other protective device in any line or piping from the cylinder. **When returning cylinder to supplier,** be sure valve is closed, then install valve outlet plug tightly. **Never work on a pressurized system.** If there is a leak, close the cylinder valve. Vent the system down in a safe and environmentally sound manner in compliance with all federal, provincial, and local laws; then repair the leak. **Never place a compressed gas cylinder where it may become part of an electrical circuit.**

### 8. Exposure Controls/Personal Protection

#### VENTILATION/ENGINEERING CONTROLS:

**LOCAL EXHAUST:** An explosion-proof local exhaust system is acceptable.  
See SPECIAL.

**MECHANICAL (general):** Inadequate. See SPECIAL.

**SPECIAL:** Use only in a closed system. A corrosion-resistant, forced-draft fume hood is preferred.

**OTHER:** See SPECIAL.

#### PERSONAL PROTECTION:

**RESPIRATORY PROTECTION:** Use respirable fume respirator or air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select in accordance with the provincial regulations or guidelines. Selection should also be based on the current CSA standards Z94.4, "Selection, care and use of respirators". Respirators should be approved by NIOSH and MSHA.

**SKIN PROTECTION:** Wear work gloves when handling cylinders. Neoprene gloves.

**EYE PROTECTION:** Wear safety glasses when handling cylinders.

Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

**OTHER PROTECTIVE EQUIPMENT:** Metatarsal shoes for cylinder handling. Protective clothing where needed. Cuffless trousers should be worn outside the shoes. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines.

### 9. Physical and Chemical Properties

<b>PHYSICAL STATE:</b> Gas.	<b>FREEZING POINT:</b> -157.7°C (-251.9°F)	<b>pH:</b> Not applicable.
<b>BOILING POINT</b> -26.2°C (-15.2°F)	<b>VAPOUR PRESSURE</b> 528.6 kPa (@ 20°C)	<b>MOLECULAR WEIGHT:</b> 116.47 g/mole
<b>SPECIFIC GRAVITY: LIQUID ( Water = 1)</b> 1.54 @ -60°C	<b>SOLUBILITY IN WATER,</b> Slowly hydrolyzes.	
<b>SPECIFIC GRAVITY: VAPOUR (air = 1)</b> 4.13	<b>EVAPORATION RATE (Butyl Acetate=1):</b> >1 compared to Butyl acetate.	<b>COEFFICIENT OF WATER/OIL DISTRIBUTION:</b> Not applicable.
<b>VAPOUR DENSITY:</b> Not available.	<b>% VOLATILES BY VOLUME:</b> 100% (v/v).	<b>ODOUR THRESHOLD:</b> Not available.

**APPEARANCE & ODOUR:** Colorless. Ethereal.

### 10. Stability and Reactivity

<b>STABILITY:</b>	Unstable.
<b>CONDITIONS OF CHEMICAL INSTABILITY:</b>	Removal of inhibitor, contact with air or water. High mechanical shear forces in the presence of aluminum.
<b>INCOMPATIBILITY (materials to avoid):</b>	The product may undergo hazardous decomposition, condensation or polymerization, it may react violently with water to emit toxic gases or it may become self-reactive under conditions of shock or increase in temperature or pressure.
<b>HAZARDOUS DECOMPOSITION PRODUCTS:</b>	Thermal decomposition may produce toxic fumes of fluorides and chlorides.
<b>HAZARDOUS POLYMERIZATION:</b>	Yes.
<b>CONDITIONS OF REACTIVITY:</b>	Removal of inhibitor, contact with air or water.

### 11. Toxicological Information

See section 3.

### 12. Ecological Information

**WARNING:** This product is classified as a Class 1 ozone-depleting chemical. This material is not listed as a marine pollutant by TDG regulations.

### 13. Disposal Considerations

**WASTE DISPOSAL METHOD:**

Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

### 14. Transport Information

**TDG/IMO SHIPPING NAME:**

Trifluorochloroethylene, stabilized

**HAZARD CLASS:**

Class 2.3(2.1) Toxic and flammable gas.

**IDENTIFICATION #:**

UN 1082

**PRODUCT REPORTABLE QUANTITY (PRQ):**

Any accidental release in a quantity that can pose a danger to public safety or any sustained release of 10 minutes or more.

**SHIPPING LABEL(s):**

Toxic gas, Flammable gas

**PLACARD (when required):**

Toxic gas

**SPECIAL SHIPPING INFORMATION:**

Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, non-ventilated compartment of a vehicle can present serious safety hazards.

### 15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, provincial, and local regulations.

**DSL (Canada)**

This product is on the DSL list

**WHMIS (Canada)**

Class A: Compressed gas.  
 Class B-1: Flammable gas.  
 Class D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).  
 Class F: Dangerously reactive material.

**International Regulations**
**EINECS**

Not available.

**DSCL (EEC)**

R20- Harmful by inhalation.

**International Lists**

No products were found.

### 16. Other Information

**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.

**HAZARD RATING SYSTEM:**
**HMIS RATINGS:**

HEALTH 1

FLAMMABILITY 4

PHYSICAL HAZARD 2

\*An Asterisk used in conjunction with HMIS health hazards ratings designates a carcinogenic or reproductive hazard.

**STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:**

<b>THREADED:</b>	Not available.
<b>PIN-INDEXED YOKE:</b>	Not available.
<b>ULTRA-HIGH-INTEGRITY CONNECTION:</b>	Not available.

Use the proper CGA connections. **DO NOT USE ADAPTERS.** Additional limited-standard connections may apply. See CGA pamphlets V-1 and V-7 listed below.

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information about this product can be found in the following pamphlets published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923, Telephone (703) 788-2700, Fax (703) 961-1831, website: www.cganet.com.

Not available.

**PREPARATION INFORMATION:**

<b>DATE:</b>	<b>October 15, 2013</b>
<b>DEPARTMENT:</b>	<b>Safety and Environmental Services</b>
<b>TELEPHONE:</b>	<b>905-803-1600</b>

The opinions expressed herein are those of qualified experts within Praxair Canada Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair Canada Inc., it is the user's obligation to determine the conditions of safe use of the product.

Praxair Canada Inc. requests the users of this product to study this Material Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety information, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

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