Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name: Chloropentafluoroethane (MSDS No. P-4669-G)

Trade Name: Halocarbon 115

Chemical Name: Chloropentafluoroethane

Synonyms: Halon 251, halocarbon 115, monochloropentafluoroethane, pentafluorochloroethane, refrigerant gas 115

Formula: C_2ClF_5

Chemical Family: Halogenated Alkane

Telephone:
Emergencies: 1-800-645-4633*
CHEMTREC: 1-800-424-9300*
Routine: 1-800-PRAXAIR

Company Name: Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113

** Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier, Praxair sales representative, or call 1-800-PRAXAIR (1-800-772-9247).*

2. Composition/Information on Ingredients

See section 16 for important information about mixtures.

INGREDIENT	CAS NUMBER	CONCEN-TRATION	OSHA PEL	ACGIH TLV-TWA (2004)
Chloropentafluoroethane	76-15-3	>99%*	None currently established	1000 ppm

** The symbol > means "greater than."*

3. Hazards Identification

EMERGENCY OVERVIEW

CAUTION! Liquid and gas under pressure.
Can cause rapid suffocation.
May cause frostbite.
May cause dizziness and drowsiness.
Self-contained breathing apparatus may be required by rescue workers.
Odor: Mild ether-like

THRESHOLD LIMIT VALUE: TLV-TWA, 1000 ppm (ACGIH, 2004). TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

Revised

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION–Asphyxiant. Effects are due to lack of oxygen. High concentrations may cause dizziness, nausea, vomiting, disorientation, confusion, incoordination, and narcosis. Effects are due to suffocation. Lack of oxygen can kill.

SKIN CONTACT–Liquid halocarbon 115 may cause frostbite. If skin contact is prolonged or widespread, harmful amounts may be absorbed by the skin.

SWALLOWING–An unlikely route of exposure; this product is a gas at normal temperature and pressure. 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: No harm expected.

OTHER EFFECTS OF OVEREXPOSURE: At very high concentrations, halocarbon 115 may produce cardiac arrhythmias or arrest due to sensitization of the heart to adrenaline and noradrenalin. 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: The toxicology and the physical and chemical properties of this product suggest that overexposure is unlikely to aggravate existing medical conditions.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: None known.

CARCINOGENICITY: Halocarbon 115 is not listed by NTP, OSHA, or IARC.

4. First Aid Measures

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

SKIN CONTACT: For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). In case of massive exposure, remove contaminated clothing while showering with warm water. Call a physician.

SWALLOWING: An unlikely route of exposure. 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*:** *Do not administer adrenaline; fluorocarbons have a sensitizing effect on the myocardium. Treatment of overexposure should be directed at the control of symptoms and the clinical condition. Exposure to fluorocarbon pyrolysis products should be considered in the diagnostic evaluation of occupationally related fever of short duration and unknown origin. Signs of exposure include tachycardia, hyperpnea, and pharyngeal congestion; investigation may reveal pulmonary edema and leucocytosis.*

5. Fire Fighting Measures

FLASH POINT (test method)	Not applicable	**AUTOIGNITION TEMPERATURE**	Not applicable
FLAMMABLE LIMITS IN AIR, % by volume	**LOWER** Not applicable	**UPPER**	Not applicable

EXTINGUISHING MEDIA: Halocarbon 115 cannot catch fire. Use media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES: CAUTION! Liquid and gas under pressure. Asphyxiant—lack of oxygen can kill. Evacuate all personnel from danger area. Immediately deluge cylinders with water from maximum distance until cool; then move them away from fire area if without risk. Self-contained breathing apparatus may be required by rescue workers. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Heat of fire can build pressure in cylinder and cause it to rupture. No part of cylinder should be subjected to a temperature higher than 125°F (52°C). Halocarbon 115 cylinders are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.) Toxic fumes may be produced when halocarbon 115 is heated. (See section 10.)

HAZARDOUS COMBUSTION PRODUCTS: Not applicable. Thermal decomposition may produce toxic fumes. (See section 10.)

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: CAUTION! Liquid and gas under pressure. Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Shut off flow if without risk. Ventilate area or move cylinder to a well-ventilated area. Before entering area, especially confined areas, check for sufficient oxygen with an 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. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. 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. 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 in using halocarbon 115, 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.

8. Exposure Controls/Personal Protection

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST–Use a local exhaust system with sufficient air flow velocity to maintain the concentration of halocarbon 115 vapors below the TLV in the worker's breathing zone.

MECHANICAL (general)–General exhaust ventilation may be acceptable if it can maintain an adequate supply of air.

SPECIAL–Use in a closed system.

OTHER–See SPECIAL.

RESPIRATORY PROTECTION: Use an air-supplied respirator or a full face, positive-pressure, self-contained breathing apparatus. Respiratory protection must conform to OSHA rules as specified in 29 CFR 1910.134. Select in accordance with 29 CFR 1910.134 and ANSI Z88.2.

SKIN PROTECTION: Wear work gloves when handling cylinders; insulated neoprene gloves where contact with product may occur.

EYE PROTECTION: Wear safety glasses when handling cylinders; safety goggles or a full face shield where contact with product may occur. Select eye protection in accordance with OSHA 29 CFR 1910.133.

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for container handling. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133. Regardless of protective equipment, never touch live electrical parts.

9. Physical and Chemical Properties

MOLECULAR WEIGHT:	154.467
SPECIFIC GRAVITY (H_2O = 1) at 70°F (21.1°C)**:**	1.3
SPECIFIC GRAVITY (Air = 1) at 70°F (21.1°C) and 1 atm**:**	5.334
VAPOR PRESSURE at 70°F (21.1°C)**:**	119.1 psia (821.2 kPa abs)
SOLUBILITY IN WATER, % by wt at 77°F (25°C)**:**	0.0058%
PERCENT VOLATILES BY VOLUME:	100
EVAPORATION RATE (Butyl Acetate = 1)**:**	High
BOILING POINT at 1 atm**:**	-38.4°F (-39.11°C)
MELTING POINT at 1 atm**:**	-146.99°F (-99.44°C)

APPEARANCE, ODOR, AND STATE: Colorless gas at normal temperature and pressure; mild ether-like odor.

10. Stability and Reactivity

STABILITY: ☐ **Unstable** ☒ **Stable**

INCOMPATIBILITY (materials to avoid): Polystyrene, natural rubber, and alloys of more than 2% magnesium in the presence of water

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may produce toxic fumes of fluorides.

HAZARDOUS POLYMERIZATION: ☐ **May Occur** ☒ **Will Not Occur**

CONDITIONS TO AVOID: Elevated temperatures. The presence of certain metals may promote catalytic decomposition of the gas.

11. Toxicological Information

See section 3.

12. Ecological Information

Halocarbon 115 is listed as a Class I ozone-depleting chemical.

WARNING: Contains chloropentafluoroethane, a substance which harms public health and environment by destroying ozone in the upper atmosphere.

Halocarbon 115 is not listed as a marine pollutant by DOT.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

14. Transport Information

DOT/IMO SHIPPING NAME: Chloropentafluoroethane

HAZARD CLASS: 2.2	**IDENTIFICATION NUMBER:** UN 1020	**PRODUCT RQ:** None
SHIPPING LABEL(s):	NONFLAMMABLE GAS	
PLACARD (when required):	NONFLAMMABLE GAS	

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of a vehicle can present serious safety hazards.

Shipment of compressed gas cylinders that have been filled without the owner's consent is a violation of federal law [49 CFR 173.301(b)].

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, state, and local regulations.

U.S. FEDERAL REGULATIONS:

EPA (ENVIRONMENTAL PROTECTION AGENCY)

CERCLA: COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): None

SARA: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT:

SECTIONS 302/304: Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of Extremely Hazardous Substances (EHS) (40 CFR Part 355):

TPQ: None
EHS RQ: None

SECTIONS 311/312: Require submission of MSDSs and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows:

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

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Halocarbon 115 is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40CFR Part 372.

40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION: Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Halocarbon 115 is not listed.

TSCA: TOXIC SUBSTANCES CONTROL ACT: Halocarbon 115 is listed on the TSCA inventory.

OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION**:**

29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Halocarbon 115 is not listed in Appendix A as a highly hazardous chemical.

STATE REGULATIONS:

CALIFORNIA: Halocarbon 115 is not listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

PENNSYLVANIA: Halocarbon 115 is subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

16. Other Information

Be sure to read and understand all labels and instructions supplied with all containers of this product.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE: ***Liquid and gas under pressure.*** Use piping and equipment adequately designed to withstand pressures to be encountered. ***Gas can cause rapid suffocation due to oxygen deficiency.*** Store and use with adequate ventilation. Use in a closed system. Close valve after each use; keep closed even when empty. ***Do not smoke in areas where fluorocarbons are used.*** Wash hands thoroughly after handling fluorocarbons or materials sprayed with them, especially before eating or smoking. ***Never work on a pressurized system.*** If there is a leak, close the cylinder valve. Blow the system down in an environmentally safe manner in compliance with all federal, state, and local laws; then repair the leak. ***Never place a compressed gas cylinder where it may become part of an electrical circuit.***

NOTE: *Prior to using any plastics, confirm their compatibility with halocarbon 115.*

MIXTURES: When you mix two or more gases or liquefied gases, you can 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 evaluate the end product. Remember, gases and liquids have properties that can cause serious injury or death.

HAZARD RATING SYSTEMS:

NFPA RATINGS:		**HMIS RATINGS:**	
HEALTH	= 2	HEALTH	= 1
FLAMMABILITY	= 0	FLAMMABILITY	= 0
INSTABILITY	= 1	PHYSICAL HAZARD	= 2
SPECIAL	= None		

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED:	CGA-660
PIN-INDEXED YOKE:	Not applicable.
ULTRA-HIGH-INTEGRITY CONNECTION:	CGA-716

Use the proper CGA connections. **DO NOT USE ADAPTERS.** Additional limited-standard connections may apply. See CGA pamphlet V-1 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, http://www.cganet.com/Publication.asp.

AV-1	*Safe Handling and Storage of Compressed Gases*
P-1	*Safe Handling of Compressed Gases in Containers*
SB-2	*Oxygen-Deficient Atmospheres*
V-1	*Compressed Gas Cylinder Valve Inlet and Outlet Connections*
—	*Handbook of Compressed Gases, Fourth Edition*

Praxair asks users of this product to study this MSDS and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, 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, Inc., it is the user's obligation to determine the conditions of safe use of the product.

Praxair MSDSs are furnished on sale or delivery by Praxair or the independent distributors and suppliers who package and sell our products. To obtain current Praxair MSDSs for these products, contact your Praxair sales representative or local distributor or supplier, or download from www.praxair.com. If you have questions regarding Praxair MSDSs, would like the form number and date of the latest MSDS, or would like the names of the Praxair suppliers in your area, phone or write the Praxair Call Center (**Phone:** 1-800-PRAXAIR; **Address:** Praxair Call Center, Praxair, Inc., PO Box 44, Tonawanda, NY 14151-0044).

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