

## Praxair Material Safety Data Sheet

### 1. Chemical Product and Company Identification

<b>Product Name:</b> Compressed gas, flammable, n.o.s. (methane, tetrafluoromethane) (MSDS No. P-19-6413)	<b>Trade Names:</b> Not applicable.
<b>Chemical Name:</b> Mixture of methane & tetrafluoromethane	<b>Synonyms:</b> Not applicable.
<b>Chemical Family:</b> Not applicable.	<b>Product Grades:</b> None assigned.
<b>Telephone:</b> <b>Emergencies:</b> 1-800-645-4633* <b>CHEMTREC:</b> 1-800-424-9300* <b>Routine:</b> 1-800-PRAXAIR	<b>Company Name:</b> 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. Hazards Identification

#### EMERGENCY OVERVIEW

**DANGER! Flammable high-pressure gas.**

**Can form explosive mixtures with air.**

**Can cause rapid suffocation.**

**May cause dizziness and drowsiness.**

**Self-contained breathing apparatus may be required by rescue workers.**

**Under ambient conditions, this is a colorless odorless gas.**

**OSHA REGULATORY STATUS:** This material is considered hazardous by the OSHA Hazard Communications Standard (29 CFR 1910.1200).

#### POTENTIAL HEALTH EFFECTS:

##### Effects of a Single (Acute) Overexposure

**Inhalation.** Asphyxiant. High concentrations can cause dizziness, nausea, vomiting, disorientation, confusion, incoordination, and narcosis. Very high concentrations may cause suffocation. Lack of oxygen can kill.

**Skin Contact.** No harm expected.

**Swallowing.** An unlikely route of exposure, this product is a gas at normal temperature and pressure.

**Eye Contact.** No harm expected.

**Effects of Repeated (Chronic) Overexposure.** No harm expected.

**Other Effects of Overexposure.** At high concentrations, tetrafluoromethane 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.

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**Medical Conditions Aggravated by Overexposure.** The toxicology and the physical and chemical properties of tetrafluoromethane suggest that overexposure is unlikely to aggravate existing medical conditions.

**CARCINOGENICITY:** The components of this mixture are not listed by NTP, OSHA, or IARC.

**POTENTIAL ENVIRONMENTAL EFFECTS:** None known. For further information, see section 12, Ecological Information.

### 3. Composition/Information on Ingredients

See section 16 for important information about mixtures.

COMPONENT	CAS NUMBER	CONCENTRATION
Methane	74-82-8	15%
Tetrafluoromethane	75-73-0	85%

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

### 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:** No harm expected.

**SWALLOWING:** An unlikely route of exposure. This product is a gas at normal temperature and pressure.

**EYE CONTACT:** No harm expected.

**NOTES TO PHYSICIAN:** Do not administer adrenaline due to the sensitizing effect of fluorocarbons on the myocardium. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. 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

**FLAMMABLE PROPERTIES:** Flammable gas

**SUITABLE EXTINGUISHING MEDIA:** CO<sub>2</sub>, dry chemicals, water spray, or fog.

**PRODUCTS OF COMBUSTION:** Carbon monoxide, carbon dioxide. At temperatures above 1832°F (1000°C), carbon dioxide reacts with tetrafluoromethane to form toxic carbonyl fluoride. See section 10.

**PROTECTION OF FIREFIGHTERS: DANGER! Flammable, high-pressure gas.** Evacuate all personnel from danger area. Immediately spray cylinders with water from maximum distance until cool, taking care not to extinguish flames. Remove ignition sources if without risk. Remove all cylinders from area of fire if without risk, while continuing cooling water spray. Do not extinguish any flames emitted from cylinders. Stop flow of gas if without risk, or allow flames to burn out. Self-contained breathing apparatus may be required by rescue workers. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

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**Specific Physical and Chemical Hazards.** Forms explosive mixtures with air and oxidizing agents. Heat of fire can build pressure in the cylinder and cause it to rupture. No part of cylinder should be subjected to a temperature higher than 125°F (52°C). Cylinders are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.) If venting or leaking gas catches fire, do not extinguish flames. Flammable gas may spread from leak, creating an explosive re-ignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering area, especially confined areas, check the atmosphere with an appropriate device.

**Protective Equipment and Precautions for Firefighters.** Firefighters should wear self-contained breathing apparatus and full fire-fighting turnout gear.

## 6. Accidental Release Measures

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

**DANGER! Flammable high-pressure gas.**

**Personal Precautions.** Asphyxiant—lack of oxygen can kill. Forms explosive mixtures with air. Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Remove all sources of ignition if without risk. Reduce vapors with fog or fine water spray. Shut off flow if without risk. Ventilate area or move cylinder to a well-ventilated area. Flammable vapors may spread from leak. Test for sufficient oxygen, especially in confined spaces, before allowing reentry.

**Environmental Precautions.** 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 HANDLING:** Gas can cause rapid suffocation because of oxygen deficiency. May form explosive mixtures with air. Use only spark-proof tools and explosion-proof equipment. Ground all equipment. Keep away from heat, sparks, and open flame. Gas can cause rapid suffocation because of oxygen deficiency. Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. All piped methane systems and associated equipment must be grounded. 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. Slowly open the valve. If valve is hard to open, discontinue use and contact your supplier. Close cylinder valve after each use; keep closed even when empty. Do not smoke in areas where this mixture is used. Thoroughly wash hands after handling fluorocarbons or materials sprayed with them, especially before eating or smoking. For other precautions, see section 16.

**PRECAUTIONS TO BE TAKEN IN STORAGE:** Store and use with adequate ventilation. Separate methane cylinders from oxygen, chlorine, and other oxidizers by at least 20 ft (6.1 m) or use a barricade of noncombustible material. This barricade should be at least 5 ft (1.53 m)

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high and have a fire resistance rating of at least a ½ hour. Firmly secure cylinders upright to keep them from falling or being knocked over. Install cap when not in use. 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.

**RECOMMENDED PUBLICATIONS:** For further information on storage, handling, and use, see Praxair publication P-14-153, *Guidelines for Handling Gas Cylinders and Containers*. Obtain from your local supplier.

## 8. Exposure Controls/Personal Protection

COMPONENT	OSHA PEL	ACGIH TLV-TWA (2010)
Methane	Not Established,	1000 ppm
Tetrafluoromethane	Not Established.	Not Established.

IDLH = Not available.

### 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.

**Other.** None

### PERSONAL PROTECTIVE EQUIPMENT:

**Skin Protection.** Wear work gloves when handling cylinders. Metatarsal shoes for cylinder handling. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133. Regardless of protective equipment, never touch live electrical parts.

**Eye/Face Protection.** Wear safety glasses when handling cylinders. Select eye protection in accordance with OSHA 29 CFR 1910.133.

**Respiratory Protection.** A respiratory protection program that meet OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable) requirements must be followed whenever workplace conditions warrant respirator use. Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure (e.g., an organic vapor cartridge). For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus.

## 9. Physical and Chemical Properties

<b>APPEARANCE:</b>	Colorless gas
<b>ODOR:</b>	Odorless
<b>ODOR THRESHOLD:</b>	Not applicable.
<b>PHYSICAL STATE:</b>	Gas at normal temperature and pressure
<b>pH:</b>	Not applicable.

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<b>FREEZING POINT</b> at 1 atm:	Not available.	
<b>BOILING POINT</b> at 101.325 kPa (1 atm):	Not available.	
<b>FLASH POINT</b> (test method):	Not applicable.	
<b>EVAPORATION RATE</b> (Butyl Acetate = 1):	Not available.	
<b>FLAMMABILITY:</b>	Flammable	
<b>FLAMMABLE LIMITS IN AIR</b> , % by volume: (based on methane component)	<b>LOWER:</b> 5.0%	<b>UPPER:</b> 15.0%
<b>VAPOR PRESSURE</b> at 68°F (20°C):	Not available.	
<b>LIQUID DENSITY</b> at -112°F (-80°C):	Not available.	
<b>GAS DENSITY</b> at 70°F (21.1°C) and 1 atm:	Not available.	
<b>SPECIFIC GRAVITY</b> (H <sub>2</sub> O = 1) at 19.4°F (-7°C):	Not available.	
<b>SPECIFIC GRAVITY</b> (Air = 1) at 70°F (21.1°C) and 1 atm:	Not available.	
<b>SOLUBILITY IN WATER</b> % by wt at 77°F (25°C) and 1 atm:	Negligible	
<b>PARTITION COEFFICIENT: n-octanol/water:</b>	Not available.	
<b>AUTOIGNITION TEMPERATURE:</b> (based on methane component)	1112°F (600°C)	
<b>DECOMPOSITION TEMPERATURE:</b>	Not available.	
<b>PERCENT VOLATILES BY VOLUME:</b>	100	
<b>MOLECULAR WEIGHT:</b>	Not applicable.	
<b>MOLECULAR FORMULA:</b>	Mixture of CH <sub>4</sub> & CF <sub>4</sub>	

## 10. Stability and Reactivity

**CHEMICAL STABILITY:**  Unstable  Stable

**CONDITIONS TO AVOID:** None known.

**INCOMPATIBLE MATERIALS:** Oxidizing agents. Mixtures with bromine pentafluoride, chlorine, and yellow mercuric oxide, nitrogen trifluoride, liquid oxygen, or oxygen difluoride may explode. Aluminum, CO<sub>2</sub> above 1832°F (1000°C), alloys of more than 2% Mg in the presence of water.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Thermal decomposition may produce fluorine, carbonyl fluoride, and/or CO/CO<sub>2</sub>. At temperatures exceeding 1292°F (700°C) and in the absence of oxygen or air, methane may decompose to form hydrogen.

**POSSIBILITY OF HAZARDOUS REACTIONS:**  May Occur  Will Not Occur

Thermal decomposition may produce fluorine, carbonyl fluoride, and/or CO/CO<sub>2</sub>.

## 11. Toxicological Information

**ACUTE DOSE EFFECTS:** None known.

**STUDY RESULTS:** None known.

## 12. Ecological Information

**ECOTOXICITY:** No known effects.

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**OTHER ADVERSE EFFECTS:** This mixture does not contain any Class I or Class II ozone-depleting chemicals.

### 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:** Compressed gas, flammable, n.o.s. (methane, tetrafluoromethane)

HAZARD CLASS:	PACKING GROUP/Zone:	IDENTIFICATION NUMBER:	PRODUCT RQ:
2.1	NA*	UN1954	None

**SHIPPING LABEL(s):** FLAMMABLE GAS

**PLACARD (when required):** FLAMMABLE GAS

\*NA—Not applicable.

**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)].

**MARINE POLLUTANTS:** Tetrafluoromethane is not listed as a marine pollutant by DOT.

### 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 (40 CFR 355):** 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

**DELAYED:** No

**PRESSURE:** Yes

**REACTIVITY:** No

**FIRE:** Yes

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

The components of this mixture are not subject to reporting under Section 313.

**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.

Methane is listed as a regulated substance in quantities of 10,000 lb (4536 kg) or greater.

**TSCA: TOXIC SUBSTANCES CONTROL ACT:** The components of this mixture are 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.

The components of this mixture are not listed in Appendix A as a highly hazardous chemical. However, any process that involves a flammable gas on site in one location in quantities of 10,000 lb (4536 kg) or greater is covered under this regulation unless the gas is used as a fuel.

#### STATE REGULATIONS:

**CALIFORNIA:** The components of this mixture are not listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

**PENNSYLVANIA:** The components of this mixture are subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

## 16. Other Information

Read and understand all labels and instructions supplied with all containers of this product.

**OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE: *Flammable high-pressure gas.*** Use piping and equipment adequately designed to withstand pressures to be encountered. Use a backflow prevention device in any piping. Use only in a closed system. Store and use away from oxygen and oxidizing agents. Store and use with adequate ventilation. Close the cylinder valve after each use; keep closed even when empty. Never work on a pressurized system. If there is a leak, blow down the system in an environmentally safe manner in compliance with all federal, state, and local laws; then repair the leak. Follow safe practices when returning cylinder to supplier. Ensure that the valve is closed; then install valve outlet cap or plug, leak-tight. Never place a compressed gas cylinder where it may become part of an electrical circuit.

**NOTE:** Before using any plastics, confirm their compatibility with this mixture.

**Mixtures.** When you mix two or more chemicals, 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, chemicals have properties that can cause serious injury or death.

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#### HAZARD RATING SYSTEMS:

##### NFPA RATINGS:

HEALTH = 1  
FLAMMABILITY = 4  
INSTABILITY = 0  
SPECIAL = None

##### HMIS RATINGS:

HEALTH = 0  
FLAMMABILITY = 4  
PHYSICAL HAZARD = 3

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

**THREADED:** CGA-350  
**PIN-INDEXED YOKE:** Not applicable.  
**ULTRA-HIGH-INTEGRITY CONNECTION:** CGA-724

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 can be found in the following materials published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5<sup>th</sup> 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*



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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.

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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.

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