

# MATERIAL SAFETY DATA SHEET

## SECTION 1. PRODUCT IDENTIFICATION

**PRODUCT NAME:** Tetrafluoromethane

**CHEMICAL NAME:** Tetrafluoromethane **FORMULA:** CF<sub>4</sub>

**SYNONYMS:** Halocarbon-14, Carbon Tetrafluoride

**MANUFACTURER:** Air Products and Chemicals, Inc.

7201 Hamilton Boulevard

Allentown, PA 18195-1501

**PRODUCT INFORMATION:** (800) 752-1597

**MSDS NUMBER:** 1089 **REVISION:** 5

**REVIEW DATE:** October 1999 **REVISION DATE:** October 1999

## SECTION 2. COMPOSITION / INFORMATION ON INGREDIENTS

Tetrafluoromethane is sold as pure product (>99%).

**CAS NUMBER:** 75-73-0

**EXPOSURE LIMITS:**

**OSHA:** None established **ACGIH:** None established **NIOSH:** None established

## SECTION 3. HAZARD IDENTIFICATION

### EMERGENCY OVERVIEW

Tetrafluoromethane is a nonflammable, colorless, odorless compressed gas packaged in cylinders at pressures up to 2000 psig. It can cause rapid suffocation when concentrations are sufficient to reduce oxygen levels below 19.5%. Self Contained Breathing Apparatus (SCBA) may be required for rescue workers.

### EMERGENCY TELEPHONE NUMBERS

(800) 523-9374 Continental U.S., Canada, and Puerto Rico

(610) 481-7711 other locations

**ACUTE POTENTIAL HEALTH EFFECTS:**

**ROUTES OF EXPOSURE:**

**EYE CONTACT:** No adverse effect

**INGESTION:** Ingestion is not a possible route of exposure for Tetrafluoromethane.

**INHALATION:** This product may cause suffocation by displacing the oxygen in air. Exposure to an oxygen deficient atmosphere (less than 19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing less than 12% oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help themselves. Inhalation of high concentrations may also cause mild central nervous system depression and cardiac arrhythmias (heartbeat irregularities).

**SKIN CONTACT:** No adverse effect

**POTENTIAL HEALTH EFFECTS OF REPEATED EXPOSURE:**

**ROUTE OF ENTRY:** Inhalation

**SYMPTOMS:** None

**TARGET ORGANS:** Heart, central nervous system.

**MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:** Persons with preexisting cardiac or central nervous system disorders may have increased susceptibility to the effects of overexposure.

**CARCINOGENICITY:** Tetrafluoromethane is not listed as a carcinogen or potential carcinogen by NTP, IARC, or OSHA.

## SECTION 4. FIRST AID MEASURES

**EYE CONTACT:** Not applicable

**INGESTION:** Ingestion is not a possible route of exposure for Tetrafluoromethane.

**INHALATION:** Remove person to fresh air. If not breathing, administer artificial respiration. If breathing is difficult, administer oxygen. Obtain prompt medical attention.

**SKIN CONTACT:** Not applicable

**NOTES TO PHYSICIAN:** The use of catecholamine drugs, such as epinephrine, should be considered only as a last resort in life-threatening emergencies, due to the possibility of cardiac rhythm disturbances.

## SECTION 5. FIRE FIGHTING MEASURES

**FLASH POINT: AUTOIGNITION: FLAMMABLE RANGE:**

Not applicable Not applicable Nonflammable

**EXTINGUISHING MEDIA:** This product is nonflammable and does not support combustion. Use extinguishing media appropriate for the surrounding fire.

**SPECIAL FIRE FIGHTING INSTRUCTIONS:** Evacuate all personnel from area. If possible, without risk, remove cylinders from fire area or cool with water. The products of combustion may be toxic; self-contained breathing apparatus (SCBA) may be required by rescue workers.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** Most cylinders are designed to vent contents when exposed to elevated temperatures. Pressure in a cylinder can build up due to heat and it may rupture if pressure relief devices should fail to function.

**HAZARDOUS COMBUSTION PRODUCTS:** Carbon monoxide, hydrogen fluoride and other toxic fluoride compounds.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Evacuate immediate area. Increase ventilation to release area and monitor oxygen level. Use appropriate protective equipment (SCBA). Shut off source of leak if possible. Isolate any leaking cylinder. If leak is from container, pressure relief device or its valve, contact your supplier. If leak is in user's system, close cylinder valve, safely vent pressure and purge with inert gas before attempting repairs.

## SECTION 7. HANDLING AND STORAGE

**STORAGE:** Store cylinders in a well-ventilated, secure area, protected from the weather. Cylinders should be stored upright with valve outlet seals and valve protection caps in place. Do not allow storage temperature to exceed 125 ° F (52 ° C). Storage should be away from heavily traveled areas and emergency exits. Full and empty cylinders should be segregated. Use a first-in first-out inventory system to prevent full containers from being stored for long periods of time.

**HANDLING:** 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 reducing regulator to safely discharge gas from cylinder. Use a check valve to prevent reverse flow into cylinder. Use piping and equipment adequately designed to withstand pressures to be encountered. Never apply flame or localized heat directly to any part of the cylinder. Do not allow any part of the cylinder to exceed 125 ° F (52° C). Once cylinder has been connected to 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 over-tight or rusted caps.

This product is compatible with all common materials of construction. Pressure requirements should be considered when selecting materials and designing systems.

**SPECIAL PRECAUTIONS:** Always store and handle compressed gas cylinders in accordance with Compressed Gas Association, Inc. (telephone 703-412-0900) pamphlet CGA P-1, *Safe Handling of Compressed Gases in Containers*. Local regulations may require specific equipment for storage or use.

Caution: Users of this product must be aware of the hazards caused by the accumulation of high concentrations, especially in confined spaces. Compliance with OSHA regulations, especially 29CFR1910.146 (confined space entry), is essential.

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### ENGINEERING CONTROLS:

**VENTILATION:** Provide adequate general ventilation and/or local exhaust to prevent accumulation of high concentrations of gas. Oxygen levels in work area should be monitored to ensure they do not fall below 19.5%.

### RESPIRATORY PROTECTION:

**Emergency Use:** Use self-contained breathing apparatus (SCBA) or positive pressure air line with mask and escape pack in areas where oxygen concentration is less than 19.5%. Air purifying respirators will not provide protection.

**EYE PROTECTION:** Safety glasses with side shields.

**SKIN PROTECTION:** Work gloves are recommended when handling cylinders.

**OTHER PROTECTIVE EQUIPMENT:** Safety shoes are recommended when handling cylinders.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

**APPEARANCE, ODOR AND STATE:** Colorless, odorless gas

**MOLECULAR WEIGHT:** 88.0

**BOILING POINT (At 1 atm):** -198.5 ° F (-128.1 ° C)

**SPECIFIC GRAVITY (also called vapor density) (Air =1):** 3.038

**FREEZING POINT / MELTING POINT:** -298.5 ° F (-183.6 ° C)

**VAPOR PRESSURE (At 70 ° F (21.1 ° C):** Not applicable at 70 ° F

**GAS DENSITY (At 70 ° F (21.1 ° C) and 1 atm):** 0.229 lb/ft<sup>3</sup>

**SOLUBILITY IN WATER (Wt./Wt. at 77 ° F (25 ° C) and 1 atm):** 0.0015

## 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).

**INCOMPATIBILITY (Materials to Avoid):** Alkali and alkaline earth metals - powdered aluminum, zinc, etc.

### REACTIVITY:

**A) HAZARDOUS DECOMPOSITION PRODUCTS:** Tetrafluoromethane can undergo thermal decomposition forming hydrogen fluoride.

**B) HAZARDOUS POLYMERIZATION:** Will not occur

## SECTION 11. TOXICOLOGICAL INFORMATION

**LC<sub>50</sub> (Inhalation):** Simple asphyxiant

**LD<sub>50</sub> (Oral):** Not applicable

**LD<sub>50</sub> (Dermal):** Not applicable

**SKIN CORROSIVITY:** Tetrafluoromethane is not corrosive to the skin.

**ADDITIONAL NOTES:** Effects observed in animals from exposure to >89% include central nervous system depression and death. No adverse effects were observed when animals were exposed to 22.4% Tetrafluoromethane.

## SECTION 12. ECOLOGICAL INFORMATION

**AQUATIC TOXICITY:** Not available

**MOBILITY:** Not available

**PERSISTENCE AND BIODEGRADABILITY:** Not available

**POTENTIAL TO BIOACCUMULATE:** Not available

**REMARKS:** Tetrafluoromethane does not contain any Class I or Class II ozone depleting chemicals.

## SECTION 13. DISPOSAL CONSIDERATIONS

**UNUSED PRODUCT / EMPTY CONTAINER:** Return container and unused product to supplier. Do not attempt to dispose of residual or unused quantities.

**DISPOSAL INFORMATION:** For emergency disposal, secure the cylinder and slowly discharge gas to the atmosphere in a well ventilated area or outdoors.

## SECTION 14. TRANSPORT INFORMATION

**DOT SHIPPING NAME:** Tetrafluoromethane, compressed

**HAZARD CLASS:** 2.2

**IDENTIFICATION NUMBER:** UN1982

**SHIPPING LABEL(s):** Nonflammable Gas

**PLACARD (When required):** Nonflammable Gas

**SPECIAL SHIPPING INFORMATION:** Cylinders should be transported in a secure upright 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 in violation of federal law (49 CFR 173.301).

**NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK (NAERG) #:** 126

## SECTION 15. REGULATORY INFORMATION

**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 TITLE III:** Superfund Amendment and Reauthorization Act

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

Extremely Hazardous Substances: Tetrafluoromethane is not listed.

Threshold Planning Quantity (TPQ): None

Reportable Quantity (RQ): None

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

IMMEDIATE HEALTH: Yes PRESSURE: Yes

DELAYED HEALTH: No REACTIVITY: No

FIRE: No

**SECTION 313:** Toxic Chemical Release Reporting (40 CFR Part 372)

Tetrafluoromethane does not require reporting under Section 313.

**CLEAN AIR ACT:**

**SECTION 112 (r):** Risk Management Programs for Chemical Accidental Release

(40 CFR PART 68)

Tetrafluoromethane is not listed as a regulated substance.

Threshold Quantity (TQ): None

**TSCA:** Toxic Substance Control Act

Tetrafluoromethane is listed on the TSCA inventory.

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

**29 CFR Part 1910.119:** Process Safety Management of Highly Hazardous Chemicals

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

Threshold Quantity (TQ): None

**STATE REGULATIONS:**

**CALIFORNIA:**

Proposition 65: Tetrafluoromethane is not a listed substance which the State of California requires warning under this statute.

**SECTION 16. OTHER INFORMATION**

**NFPA RATINGS: HMIS RATINGS:**

HEALTH: = 1 HEALTH: = 0

FLAMMABILITY: = 0 FLAMMABILITY: = 0

REACTIVITY: = 0 REACTIVITY: = 0

SPECIAL: