

Mer Services

Fluorocarbon 11

PRODUCT: UCON® Fluorocarbon 11

L-4783-B
November 1988

MATERIAL SAFETY DATA SHEET

L-4783-B
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VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type): Select in accordance with OSHA 29 CFR 1910.134 and ANSI Z89.2. For concentrations up to 10 times the applicable exposure limit say **NIOSH/MSHA approved supplied air respirator** is recommended. Up to 50 times a **NIOSH/MSHA approved respirator fitted with a full face piece or self-contained breathing apparatus** is recommended. For higher concentrations use only self-contained breathing apparatus operated in the pressure-demand mode.

VENTILATION	LOCAL EXHAUST — Preferred. Use local exhaust ventilation to maintain exposure below the applicable limit. See SPECIAL .
	MECHANICAL (general) — Acceptable. See SPECIAL .
	SPECIAL — Use in a closed system.
	OTHER — Not applicable. See SPECIAL .

PROTECTIVE GLOVES: Neoprene.

EYE PROTECTION: Select in accordance with OSHA 29 CFR 1910.133

OTHER PROTECTIVE EQUIPMENT: Motivated chock for cylinder handling. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133.

IX. SPECIAL PRECAUTIONS

CAUTION: Liquefied gas under pressure. Can cause rapid asphyxiation due to oxygen deficiency. Use piping and equipment adequately designed to withstand pressures to be encountered. Store and use with adequate ventilation at all times. Use only in a closed system. Close cylinder valve when not in use and when empty. Do not smoke in areas where fluorocarbons are used. Wash hands thoroughly after handling fluorocarbons or materials sprayed with fluorocarbons especially before eating or smoking.

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

NOTE: Compatibility with plastics should be confirmed prior to use. For safety information on general handling of compressed gas cylinders, obtain a copy of pamphlet P-1, "Safe Handling of Compressed Gases in Containers" from the Compressed Gas Association, Inc., 1235 Jefferson Davis Highway, Arlington, VA 22202.

OTHER HANDLING AND STORAGE CONDITIONS: Never work on a pressurized system. If there is a leak, close the cylinder valve, blow down the system by venting to a safe place, then repair the leak.

The opinions expressed herein are those of qualified experts within Union Carbide Industrial Gases. 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 these opinions and the conditions of use of the product are not within the control of Union Carbide Industrial Gases it is the user's obligation to determine the conditions of safe use of the product.

UNION CARBIDE INDUSTRIAL GASES INC.
LINDE DIVISION

IN THE USA: 30 Old Ridgeway Pl.
Danbury, CT 06817-0001

IN CANADA: 123 Eglinton Avenue East
Toronto, Ontario M4P 1J3

Other offices in principal cities all over the world.

An explanation of the hazard level levels may be found in OSHA 29 CFR 1910.1205, available from OSHA regional or area offices.
(Refer to U.S. Department of Labor Form OSHA No. 1216-0892 and generally accepted in Canada for information purposes.)
Do Not Duplicate This Form. Request an Original.



I. PRODUCT IDENTIFICATION

PRODUCT	UCON® Fluorocarbon 11		
CHEMICAL NAME	Trichlorofluoromethane	SYNONYMS	Fluorocarbon 11, F-11, FC-11, Monotrifluoro-methane, Fluorocarbon 11, Trichlorofluoromethane
FORMULA	CCl ₃ F	CHEMICAL FAMILY	Fluorocarbon
		MOLECULAR WEIGHT	137.37
TRADE NAME	UCON® Fluorocarbon 11		

II. HAZARDOUS INGREDIENTS

For mixtures of this product request the respective component Material Safety Data Sheets (See Section IX).

MATERIAL (CAS NO.)	Vol. (%)	1987-1988 ACGIH TLV-TWA (OSHA-PEL)	
Trichlorofluoromethane (75-69-4)	100	Ceiling 1800 ppm	(1000 ppm)

III. PHYSICAL DATA

BOLING POINT, 760 mm. Hg	23.77°C (74.79°F)	FREEZING POINT	-111.8°C (-167.8°F)
SPECIFIC GRAVITY (d ₄ ²⁰ = 1)	1.484 @ 17.2°C	VAPOR PRESSURE AT 21°C.	13.4 psia
VAPOR DENSITY (air = 1)	5.04 @ 25°C	SOLUBILITY IN WATER, % by wt.	Negligible
PERCENT VOLATILES BY VOLUME	100	EMBOSSMENT RATE (Butyl Acetate = 1)	19gh

APPEARANCE AND ODOR: Colorless liquid and vapor at normal temperature and pressure; slightly ethereal odor.

EMERGENCY PHONE NUMBER

IN CASE OF EMERGENCIES involving this material, further information is available at all times:
In the USA 1-800-UCC-HELP (1-800-922-4357)
In Canada 314-540-6400
For routine information contact your local supplier.

Union Carbide Industrial Gases requests the users of this product to study this Material Safety 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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VI. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: See Section II.

EFFECTS OF SINGLE (ACUTE) OVEREXPOSURE:

- SWALLOWING** — An unlikely route of exposure. This product is a gas at normal temperature and pressure, but bubbles of the lips and mouth may result from contact with the liquid.
- SKIN ABSORPTION** — Prolonged or widespread skin contact with the liquid may result in the absorption of harmful amounts of material.
- INHALATION** — Asphyxiant. High concentrations can cause dizziness, nausea, vomiting, disorientation, confusion, incoordination, and ataxia. Very high concentrations may cause suffocation. Lack of oxygen can cause death.
- SKIN CONTACT** — An unlikely route of exposure. This product is a gas at normal temperature and pressure. Liquid may cause frostbite.
- EYE CONTACT** — An unlikely route of exposure. This product is a gas at normal temperature and pressure. Liquid may cause some corneal injury.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: No evidence of adverse effects from available information.

OTHER EFFECTS OF OVEREXPOSURE: At high concentrations may produce cardiac arrhythmias or arrest due to sensitization of the heart to adrenaline and nor-adrenaline. This product is an asphyxiant. Lack of oxygen can cause death. 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 currently known.

EMERGENCY AND FIRST AID PROCEDURES:

- SWALLOWING** — This product is a gas at normal temperature and pressure.
- SKIN** — For exposure to liquid, immediately remove frostbite area with warm water (not to exceed 105°F). In case of massive exposure, remove clothing while showering with warm water. Call a physician.
- RESPIRATION** — Remove to fresh air. Give artificial respiration if not breathing. Give oxygen if breathing is difficult. Call a physician.
- EYES** — For contact with the liquid, immediately flush eyes thoroughly with water for at least 15 minutes. See a physician, preferably an ophthalmologist, immediately.

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. Exposure to fluorocarbon pyrolysis products should be considered in the diagnostic evaluation of occupationally related illness of short duration and unknown origin. Signs of exposure include tachycardia, hypoxemia, and pharyngeal congestion; investigation may reveal pulmonary edema and leukocytosis.

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V. FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA: UCON[®] Fluorocarbon 11 cannot catch fire. Use media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES: Evacuate all personnel from danger area. Immediately deluge containers with water spray from maximum distance until cool, then move containers away from the area if without risk.

UNUSUAL FIRE AND EXPLOSION HAZARDS: UCON[®] Fluorocarbon 11 cannot catch fire. Container may rupture due to heat of fire. No part of a container should be subjected to a temperature higher than 82°C (approximately 185°F). Most containers are provided with pressure-relief devices that are designed to vent currents when they are subjected to unusual temperatures. Toxic fumes may be produced when heated.

VI. REACTIVITY DATA

STABILITY		CONDITIONS TO AVOID: Elevated temperature (the presence of certain metals may promote catalytic decomposition of the gas).
UNSTABLE	STABLE	
	X	

INCOMPATIBILITY (materials to avoid): Magnesium and alloys of more than 2% Mg in presence of H₂O. Natural rubber, Aluminum, Lithium and Barium.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may produce toxic fumes of fluorides and chlorides, possibly carbonyl halides.

HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID: None currently known.
May Occur	Will not Occur	
	X	

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Shut off leak if without risk. Ventilate area of leak or move leaking container to well-ventilated area. Test area, especially confined areas, for sufficient oxygen content prior to permitting re-entry of personnel.

WASTE DISPOSAL METHOD: Prevent waste from contaminating 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.