MAY 1 3 1994

AlliedSignal ENGINEERED MATERIALS

GENETRON® 11 (Trichlorofluoromethane)

PRODUCT SAFETY DATA SHEET

A. GENERAL INFORMATION

TRADE NAME (COMMON NAME)	☒ C.A.S. NO. ☐ ALLIED PRODUCT CODE #
GENETRON® 11 (Trichlorofluoromethane)	75-69-4

CHEMICAL NAME AND/OR SYNONYM

Trichlorofluoromethane Synonyms: Fluorocarbon 11; Refrigerant 11; Propellant 11; Fluorotrichloromethane

FORMULA	MOLECULAR WEIGHT
CCl_3F	137.4

ADDRESS (No., STREET, CITY, STATE AND ZIP CODE)

AlliedSignal
Engineered Materials
P.O. Box 1139
Morristown, NJ 07962-1139

CONTACT	PHONE NUMBER	LAST ISSUE DATE	CURRENT ISSUE DATE
Product Safety Department	(201) 455-4157	February, 1992	February, 1993

B. FIRST AID MEASURES

EMERGENCY PHONE NUMBER (201) 455-2000

INHALATION: Immediately remove patient to fresh air. If breathing has stopped, give mouth-to-mouth resuscitation. Give oxygen, as necessary, provided a qualified operator is available. Call a physician. Do not give adrenalin (epinephrine).

EYES: Promptly flush with large amounts of water, lifting eyelids occasionally, and continue flushing for 15 minutes. If irritation symptoms persist, consult a physician.

SKIN: Promptly wash with soap and water, then flush with water until all chemical is removed. Remove contaminated clothing and wash before reuse.

INGESTION: Ingestion is an unlikely route of exposure and is not expected to be hazardous. Do not induce vomiting unless instructed to do so by a physician.

C. HAZARDS INFORMATION

HEALTH

INHALATION

Vapors, when inhaled, are slightly irritating to lungs. Breathing concentrations approaching 10% in air can cause dizziness, difficult breathing, drowsiness and possibly narcosis. See Section K for a more detailed discussion.

INGESTION

This will upset and irritate the gastrointestinal tract. Estimated to have moderate toxicity (see Section K), it is likely to show most of the same symptoms as those for inhalation.

SKIN

Excessive contact may cause irritation (due to defatting action) and possible frostbite (due to refrigeration effect of evaporation).

EYES

Liquid contact will irritate. Rabbit test data are available -- Reference (a). Vapors are estimated to be mildly irritating.

PERMISSIBLE CONCENTRATION: AIR (SEE SECTION J)	TWA	STEL	BIOLOGICAL
OSHA PEL:	1,000 ppm (Ceiling)	NA	None Established.
ACGIH TLV:	1,000 ppm (Ceiling)	NA	

UNUSUAL CHRONIC TOXICITY

A NCI-sponsored bioassay on carcinogenicity (rats) gave negative results. Subacute data are available -- Reference (a).

C. HAZARDS (Cont.)

FIRE AND EXPLOSION

FLASH POINT	AUTO IGNITION TEMPERATURE	FLAMMABLE LIMITS IN AIR (% BY VOL.)
NA °C Non-flammable ☐ OPEN CUP ☐ CLOSED CUP	°C Not applicable	LOWER - Not applicable UPPER - Not applicable

UNUSUAL FIRE AND EXPLOSION HAZARDS

Though not combustible itself, contact with certain metals (see Section G) produces rapid exothermic reactions or potentially explosive combinations. See, also, Hazardous Decomposition Products, Section G.

D. PRECAUTIONS/PROCEDURES

FIRE EXTINGUISHING AGENTS **RECOMMENDED**

Any standard agent. Select the one most suitable for type of fire. Material itself is not flammable.

FIRE EXTINGUISHING AGENTS TO **AVOID**

Not pertinent.

SPECIAL FIRE FIGHTING PRECAUTIONS

Although not flammable, when this material is in a fire, firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against suffocation and possible toxic decomposition products. Use water spray to keep fire-exposed containers cool, and to keep any spillage away from fire and heat, and to knock down vapors.

VENTILATION

Ventilation should be adequate to meet TLV requirements and to minimize exposure to vapors.
Local Exhaust: At filling zones and where leakage is probable.
Mechanical (General): Adequate for storage areas.

NORMAL HANDLING

Avoid breathing vapor, liquid contact with eye, skin or clothing. Tank-cleaning personnel should use only a formal tank entry procedure based on recognized safety principles: e.g., see Reference (3). Follow precautions on label.

STORAGE

Storage areas should be clean, well-ventilated, away from heat or direct sunlight, and of low fire-risk. Protect containers from physical damage and keep closed. Special attention should be given to ventilation of low-lying areas or small enclosures where this material is stored or used to avoid possible hazards of asphyxiation.

SPILL OR LEAK (ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT - SECTION E)

Evacuate unprotected personnel from area. Protected personnel, using a self-contained air supply (see Section E), should remove any flames, shut off leak, and provide ventilation. They should then absorb liquid with commercial absorbent and shovel into metal drums and close. Store as above. Large spills: Dike up with inert material or commercial absorbent and pump into drums, making sure pump does not overheat. Attempt to keep out of sewer. Any release to the environment of this product may be subject to Federal and/or state reporting requirements. Check with appropriate agencies.

SPECIAL: PRECAUTIONS/PROCEDURES/LABEL INSTRUCTIONS

SIGNAL WORD - WARNING!

This product can cause death from inhalation if misused or if not handled properly. Tanks probably cannot be effectively flushed of vapor if sumps contain liquid. "Empty" cylinders may contain hazardous residues. See directions on label. Workers with cardiovascular or pulmonary problems should have medical evaluation before exposure.

E. PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION

None required for normally-vented work situations. For accidental or non-ventilated situations, where concentration of vapors may be high, use a self-contained breathing apparatus or supplied-air respirator, NIOSH-approved.

EYES AND FACE

Wear chemical safety goggles if there is any possibility of contact with liquid. Do not wear contact lenses. Add a face shield if there is danger of liquid splashing while handling.

HANDS, ARMS, AND BODY

Wear protective, impervious gloves and clothing (preferably made of PVA or neoprene) if there is repeated or prolonged contact with liquid.

OTHER CLOTHING AND EQUIPMENT

Provide eyewash stations and quick-drench shower facilities. For tank cleaning, see Reference (3).

F. PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS):	APPEARANCE AND ODOR	
☒ LIQUID ☐ SOLID ☐ GAS ☐ _____	Colorless liquid with faint ether-like odor.	
BOILING POINT 23.8 °C MELTING POINT -111 °C	SPECIFIC GRAVITY (H20 = 1) @ 21.1 °C (liquid) 1.49	VAPOR DENSITY (AIR = 1) @ 30° C and 1 atm. 5.06
SOLUBILITY IN WATER (% by Weight) Approximately 0.11 (@ 25 °C, 1 atmosphere)	pH ND	VAPOR PRESSURE (mm Hg at 20°C) ☐ (PSIG) ☐ 13.4 psia @ 70 °F 690 mm Hg @ 70 °F
EVAPORATION RATE (Butyl Acetate = 1) ☐ (Ether = 1) ☒ (time to evaporate): 0.4	% VOLATILES BY VOLUME (At 20°C) 100	

G. REACTIVITY DATA

STABILITY	CONDITIONS TO AVOID
☐ UNSTABLE ☒ STABLE	Flames, lighted cigarettes, hot spots, welding. (Decomposes, liberating hazardous gases.)

INCOMPATIBILITY (MATERIALS TO AVOID)
Aluminum in the form of freshly abraded surface (strong exothermic reaction); aluminum powder mixed with this material will flash or spark on heavy impact – Reference (d). Granular barium mixed with this material is susceptible to detonation -- Ref. (e). Lithium shavings mixed with this material: impact-sensitive and can detonate -- Ref. (d). The following are also incompatible: Chemically-active metals, such as sodium, potassium, and calcium, and powdered magnesium and zinc – Ref. (f).

HAZARDOUS DECOMPOSITION PRODUCTS
Halogens, halogen acids, and possibly carbonyl halides, such as phosgene.

HAZARDOUS POLYMERIZATION	CONDITIONS TO AVOID
☐ MAY OCCUR ☒ WILL NOT OCCUR	None known.

H. HAZARDOUS INGREDIENTS (Mixtures Only)

MATERIAL OR COMPONENT / C.A.S. #	WT.%	HAZARD DATA (SEE SECT. J)
NOT APPLICABLE.		

* = PROPRIETARY - TRADE SECRET

I. ENVIRONMENTAL

DEGRADABILITY/AQUATIC TOXICITY

Degradability: None
Aquatic Toxicity: None.

OCTANOL/WATER PARTITION COEFFICIENT: Unknown

EPA HAZARDOUS SUBSTANCES (CLEAN WATER ACT SEC. 311) ☒ YES ☐ NO — IF SO REPORTABLE QUANTITY: 5000 # — 40 CFR 116-117

WASTE DISPOSAL METHODS (DISPOSER MUST COMPLY WITH FEDERAL, STATE AND LOCAL DISPOSAL OR DISCHARGE LAWS)

Disposal of GENETRON® 11 which has been used as a solvent may be subject to Federal, state and local regulations (EPA spent halogenated solvent -- F001 & F002). Users should review their operations in terms of applicable Federal, state and local laws and regulations, then consult with appropriate regulatory agencies before discharging or disposing of waste material.

RCRA STATUS OF UNUSED MATERIAL IF DISCARDED: EPA "hazardous waste", if discarded unused.

HAZARDOUS WASTE NUMBER: (IF APPLICABLE) U121 — 40 CFR 261

J. REFERENCES

PERMISSIBLE CONCENTRATION REFERENCES

1. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices for 1991-1992, ACGIH.
2. 29 CFR 1910.1000 "Z1A Table", OSHA, 1989.

REGULATORY STANDARDS — D.O.T. CLASSIFICATION: Not regulated — 49 CFR 173

(3) OSHA tank entry regulations: 29 CFR 1910.94 (8 through 11).

GENERAL

(a) AIHA Hygienic Guide, "Trichlorofluoromethane", 1968 American Industrial Hygiene Association.
(b) NIOSH Registry (RTECS), 1981-82, Accession No PB6125000.
(c) Aviado, D.M., **Toxicology, 1975,** 3: 321-332.
(d) NFPA Manual, 491M (1975), "Manual of Hazardous Chemical Reactions", 8th ed., 1984.
(e) Bretherick, L., "Handbook of Reactive Chemical Hazards", 2nd ed., 1979, Butterworths, Boston.
(f) NIOSH/OSHA: "Pocket Guide to Chemical Hazards", 1978, 8/80 printing.
(g) Trochimowicz, H.J., Reinhart, C.F., et al., J. Occ. Med., 1976, 18:26.

K. ADDITIONAL INFORMATION

C. **HAZARDS INFORMATION -- Health -- Inhalation -- Ingestion** (continued)

The estimate of moderate toxicity is based on the moderate toxicity reported for the intraperitoneal route: LD_{50} (mouse): 1743 mg/kg -- Reference (b).

This material is low in toxicity: Its predominant hazard is simple asphyxia. However, it must not be considered inert! High concentrations in air (in the order of 20 times the TLV) have been shown to reduce ventilatory capacity of the lungs temporarily and to produce monior cardiac effects.* Material is less toxic than carbon dioxide, but it may have narcotic effects at high concentrations. Also, published animal studies report that cardiac arrhythmia, which in humans is possibly fatal, is produced by the vapor if inhaled five minutes at airborne concentrations of 25,000 ppm (monkey and rat) or 100,000 ppm (mouse).* -- Reference (c).

> *The probability of incurring cardiac arrhythmia is greatly increased by the presence of a second agent, epinephrine (adrenalin). Inhalation of vapor at levels as low as 5000 ppm can produce cardiac sensitization to epinephrine in dogs, resulting in cardiac arrhythmias that can be fatal. -- Reference (g).

[The ACGIH recommended ceiling value of 1000 ppm should provide a substantial margin of safety to prevent organic injury as well as cardiac sensitization.] -- Ref. ACGIH: Documentation of TLVs -- 5th edition.

ALLIED-SIGNAL INC.

ENVIRONMENTAL DATA SHEET

SUPPLEMENT TO PSDS: GENETRON® 11

CURRENT ISSUE DATE: 02-1993 PSDS #: 872

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SARA -- TITLE III (40 CFR 300)

1. THIS PRODUCT CONTAINS THE FOLLOWING EXTREMELY HAZARDOUS SUBSTANCE(S) (SECTIONS 302 AND 304):

COMPONENT	TPQ (LBS.)	RQ (LBS.)
None Listed	NA	NA

2. THIS PRODUCT CONTAINS THE FOLLOWING CERCLA HAZARDOUS SUBSTANCE(S) (SECTION 302 AND 304):

COMPONENT	WT %	RQ (LBS.)
Trichlorofluoromethane	100	5000

NOTE: **THE INFORMATION PROVIDED IN SECTION 1 AND 2 IS REQUIRED FOR EMERGENCY RESPONSE REPORTING.**

3. THIS PRODUCT HAS THE FOLLOWING HAZARDS (SECTIONS 311 AND 312):

	YES	NO
IMMEDIATE	X	
DELAYED		X
FIRE		X
PRESSURE		X
REACTIVE		X

4. THIS PRODUCT CONTAINS THE FOLLOWING TOXIC CHEMICALS (SECTION 313):

COMPONENT	CAS #	WT %
Trichlorofluoromethane	75-69-4	100

5. WARNING

DO NOT VENT TO THE ATMOSPHERE. TO COMPLY WITH PROVISIONS OF THE U.S. CLEAN AIR ACT, ANY RESIDUAL MUST BE RECOVERED.

CONTAINS GENETRON® 11, A CFC, A SUBSTANCE WHICH HARMS PUBLIC HEALTH AND ENVIRONMENT BY DESTROYING OZONE IN THE UPPER ATMOSPHERE. DESTRUCTION OF THE OZONE LAYER CAN LEAD TO INCREASED ULTRAVIOLET RADIATION WHICH, WITH EXCESS EXPOSURE TO SUNLIGHT, CAN LEAD TO AN INCREASE IN SKIN CANCER AND EYE CATARACTS.

FOR ADDITIONAL INFORMATION ON THE ABOVE CHEMICALS, SEE THE MATERIAL SAFETY DATA SHEET.

DATE: 02-1993