



# GENETRON<sup>®</sup> 22 CHLORODIFLUOROMETHANE

## PRODUCT SAFETY DATA SHEET

### A. GENERAL INFORMATION

TRADE NAME (COMMON NAME) GENETRON <sup>®</sup> 22 chlorodifluoromethane		<input checked="" type="checkbox"/> C.A.S. NO.	<input type="checkbox"/> ALLIED PRODUCT CODE # 75-45-6
CHEMICAL NAME AND/OR SYNONYM Chlorodifluoromethane      Synonyms: Fluorocarbon 22; Refrigerant 22; Propellant 22.			
FORMULA CHClF <sub>2</sub>		MOLECULAR WEIGHT 86.47	
ADDRESS (No., STREET, CITY, STATE AND ZIP CODE) Allied-Signal Inc. Engineered Materials Sector P.O. Box 1139R Morristown, N.J. 07962-1139			
CONTACT Product Safety Department	PHONE NUMBER (201) 455-4157	LAST ISSUE DATE May, 1989	CURRENT ISSUE DATE November, 1990

### B. FIRST AID MEASURES

EMERGENCY PHONE NUMBER (201) 455-2000	
<p><b>INHALATION:</b> Remove immediately to fresh air. If breathing is stopped, give artificial respiration, preferably mouth-to-mouth. Use oxygen as required, provided a qualified operator is available. Do not give epinephrine (adrenaline).</p> <p><b>SKIN AND EYE CONTACT:</b> Immediately bathe (do not rub) any frostbite with lukewarm (not hot) water. In the absence of water, cover with soft wool or other suitable material. Contact a physician for any low temperature burns from liquid contact.</p> <p><b>INGESTION:</b> This is improbable due to the low (-40.8 °C) boiling point.</p>	

### C. HAZARDS INFORMATION

#### HEALTH

INHALATION This material is low in toxicity at concentrations as high as 4% (40,000 ppm). When oxygen levels in air are reduced to 12-14%, symptoms of asphyxiation will occur: loss of coordination, increased pulse rate, and deeper respiration. Narcotic effects have been seen at 200,000 ppm. For further discussion, see Section K, which covers possible cardiac effects.	
INGESTION Not applicable, since material is gaseous at normal temperature and pressure.	
SKIN Contact with liquid or escaping vapor can cause frostbite, indicated by pallor or redness, loss of sensation and swelling.	
EYES Same hazards as for skin.	
PERMISSIBLE CONCENTRATION: AIR (SEE SECTION J)	BIOLOGICAL None Established.
OSHA PEL: 1,000 ppm ACGIH TLV: 1,000 ppm	<u>TWA</u> NA <u>STEL</u> NA
UNUSUAL CHRONIC TOXICITY See Section K.	

### C. HAZARDS (Cont.)

#### FIRE AND EXPLOSION

FLASH POINT Non-flammable <input type="checkbox"/> OPEN CUP <input type="checkbox"/> CLOSED CUP	NA ° C	AUTO IGNITION TEMPERATURE Not applicable	° C	FLAMMABLE LIMITS IN AIR (% BY VOL.) LOWER - NA                      UPPER - NA
UNUSUAL FIRE AND EXPLOSION HAZARDS While not combustible itself, contact with certain metals and oxidizing materials (see Section G) may produce exothermic reactions or potential explosive combinations. See Section K: GENETRON 22/air mixtures under pressure; and Section G: toxic decomposition products.				

### D. PRECAUTIONS/PROCEDURES

FIRE EXTINGUISHING AGENTS RECOMMENDED Any standard agent -- choose the one most suitable for surrounding fire. This 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.
VENTILATION Ventilation should be adequate to meet TLV requirements and minimize exposure should material be released into the atmosphere. Provide <b>local exhaust</b> at filling zones and where leakage is probable. <b>Mechanical (General)</b> ventilation is adequate for other operating areas and for storage areas.
NORMAL HANDLING Do not breathe gas; avoid contact with eyes, skin and clothing. Do not puncture or drop cylinders or expose them to open flame or excessive heat. Use authorized containers only. Follow label instructions and observe standard safety precautions for handling cylinders of compressed gas -- Reference (d).
STORAGE Store in a cool, dry, well-ventilated area away from heat, flame or combustibles. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. See Reference (d) for further details on storage.
SPILL OR LEAK (ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT - SECTION E) Using a self-contained air supply and protection against frostbite, personnel should attempt to close valves or repair source of leak if without risk. If a large quantity is released, evacuate personnel and allow to dissipate. (Note Sections C and K for health hazards involved with inhalation and contact exposure.)
SPECIAL: PRECAUTIONS/PROCEDURES/LABEL INSTRUCTIONS <b>SIGNAL WORD - WARNING!</b> This product can cause death or serious personal injury if not handled properly. Follow OSHA regulations for compressed gases (29 CFR 1910.101) and Reference (d) for cylinder handling. If use in pressure testing is contemplated, it is imperative to follow limitation set forth in Section K.

### E. PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION None generally required for normally vented situations. For unusual situations, wear a supplied-air respirator or a self-contained breathing apparatus, NIOSH-approved. At high concentrations, add a full facepiece.
EYES AND FACE Wear chemical safety goggles if there is any reasonable probability of contact with liquid. In this case, do not wear contact lenses.
HANDS, ARMS, AND BODY Wear protective, impervious gloves with PVA outer layer (2nd choice: neoprene) in situations where leakage or handling of liquid is a possibility. Impervious shoes and clothing should also be worn where leakage is probable. Gloves, clothing and shoes should be thermally insulated to prevent freezing.
OTHER CLOTHING AND EQUIPMENT Provide convenient water source for first-aid treatment in case of frostbite (see Section B).

### F. PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS): <input type="checkbox"/> LIQUID <input type="checkbox"/> SOLID <input checked="" type="checkbox"/> GAS <input type="checkbox"/> _____		APPEARANCE AND ODOR Colorless liquefied gas with faint ethereal odor at higher concentrations.	
BOILING POINT                      -40.8 °C MELTING POINT                      -160 °C	SPECIFIC GRAVITY (H <sub>2</sub> O = 1) (liquid) @ 21.1° C (pressurized) 1.21		VAPOR DENSITY (AIR = 1) 2.98
SOLUBILITY IN WATER (% by Weight) 0.3 @ 25° C and 1 atmosphere	pH Unknown but believed to be neutral.		VAPOR PRESSURE (mm Hg at 20°C) <input type="checkbox"/> (PSIG) <input type="checkbox"/> 136 psia @ 21.1° C (70° F)
EVAPORATION RATE (Butyl Acetate = 1) <input type="checkbox"/> (Ether = 1) <input type="checkbox"/> NA (gas)	% VOLATILES BY VOLUME (At 20°C) 100		

### G. REACTIVITY DATA

STABILITY <input type="checkbox"/> UNSTABLE <input checked="" type="checkbox"/> STABLE	CONDITIONS TO AVOID Flames, lighted cigarettes, hot spots, welding. Decomposes at high temperatures, yielding toxic gases.		
INCOMPATIBILITY (MATERIALS TO AVOID) (1) Strong oxidants, including oxygen, greatly increase the risk of fire or explosion in case conditions should favor such. (2) Alkali metals, such as sodium: cause exothermic reaction. (3) Alkali earth metals, such as magnesium: cause exothermic reaction. (4) Freshly exposed aluminum surfaces; e.g., in mechanical devices, in grinding, abrasion, or comminution: cause exothermic reaction - Ref. (c).			
HAZARDOUS DECOMPOSITION PRODUCTS Halogens, halogen acids, carbon dioxide, carbon monoxide, and possibly carbonyl halides such as phosgene.			
HAZARDOUS POLYMERIZATION <input type="checkbox"/> MAY OCCUR <input checked="" type="checkbox"/> WILL NOT OCCUR	CONDITIONS TO AVOID None known.		

### H. HAZARDOUS INGREDIENTS (Mixtures Only)

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

## I. ENVIRONMENTAL

DEGRADABILITY/AQUATIC TOXICITY		OCTANOL/WATER PARTITION COEFFICIENT	
Degradability: No data found. Aquatic Toxicity: TLm96: over 1000 ppm. TLm96 = Lethal concentration, 50% kill (96 hours).		Unknown	
EPA HAZARDOUS SUBSTANCES (CLEAN WATER ACT SEC. 311)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	IF SO REPORTABLE QUANTITY: _____ #	40 CFR 116-117
WASTE DISPOSAL METHODS (DISPOSER MUST COMPLY WITH FEDERAL, STATE AND LOCAL DISPOSAL OR DISCHARGE LAWS)			
Disposal of GENETRON® 22 chlorodifluoromethane may be subject to state and local regulations. Users should review their operations in terms of applicable 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		HAZARDOUS WASTE NUMBER: (IF APPLICABLE)	40 CFR 261
Not a "hazardous waste".		NA	

## J. REFERENCES

PERMISSIBLE CONCENTRATION REFERENCES		
1. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices for 1990-1991. 2. 29 CFR 1910.1000 "Z1A Table", OSHA, 1989.		
REGULATORY STANDARDS	D.O.T. CLASSIFICATION: Nonflammable gas I.D. No.: UN1018	49 CFR 173
D.O.T. Classification: 49 CFR 172.101; entry: Chlorodifluoromethane.		
GENERAL (a) NIOSH Registry (RTECS), 1981-82, Accession No. PA6390000. (b) Belej, M.A. et al., <b>Toxicology</b> 2, (1974), 381-395. (c) Bretherick, L., "Handbook of Reactive Chemical Hazards", 2nd ed., 1979, Butterworths, Boston. (d) CGA Pamphlet P-1, "Safe Handling of Compressed Gases in Containers", 1974, Compressed Gas Association (1980 printing). (e) Reinhardt, C.F., as reported in ACGIH Documentation of TLV's, 4th edition. (f) ICI, Mond Division (UK), April, 1981.		

## K. ADDITIONAL INFORMATION

SECTION C -- HAZARDS INFORMATION -- continued
<b>Health - Inhalation (continued)</b> Published animal studies report this material reduces heart efficiency at concentrations of 25,000 ppm or more -- Ref. (b). In addition, cardiac sensitization* to epinephrine has been observed at concentrations of 50,000 ppm -- Ref. (e). *Cardiac sensitization can cause death in animals and in man.
<b>Health - Chronic</b> A 2-year inhalation study indicated a slight increase in salivary gland tumors (rat) at the highest level of exposure tested (50,000 ppm). There were no observable results in rats at exposure levels of 1000 ppm and 10,000 ppm, and none in mice at any dose level. No changes in the current TLV (1000 ppm) have been recommended as a result of this study -- Reg. (f).
<b>Fire and Explosion - Unusual Fire and Explosion Hazards (continued):</b> Mixtures of GENETRON® 22 and air (or oxygen), under pressures of 200 psig or higher, have been observed to ignite and to burn, generating explosive pressures. Therefore, GENETRON® 22 / air mixtures should be depressurized and removed from refrigeration systems and piping before welding.

PSDS FILE NO. 883

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ALLIED-SIGNAL INC.

ENVIRONMENTAL DATA SHEET

SUPPLEMENT TO PSDS: GENETRON<sup>®</sup> 22

CURRENT ISSUE DATE: 11-1990 PSDS #: 883

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SARA -- TITLE III (40 CFR 300)

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

<u>COMPONENT</u>	<u>TPO (LBS.)</u>	<u>RO (LBS.)</u>
None Listed	NA	NA

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

<u>COMPONENT</u>	<u>WT %</u>	<u>RO (LBS.)</u>
None Listed	NA	NA

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):

	<u>YES</u>	<u>NO</u>
IMMEDIATE	X	
DELAYED	X	
FIRE		X
PRESSURE	X	
REACTIVE		X

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

<u>COMPONENT</u>	<u>CAS #</u>	<u>WT %</u>
None Listed	NA	NA

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<sup>®</sup> 22, A HCFC, 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: 03/16/92