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**GENETRON® 502
AZEOTROPE**

**PRODUCT SAFETY
DATA SHEET**

A. GENERAL INFORMATION

TRADE NAME (COMMON NAME) GENETRON® 502 Azeotrope		<input type="checkbox"/> C.A.S. NO.		<input checked="" type="checkbox"/> ALLIED PRODUCT CODE # 096-009570	
See Section H for CAS Nos. for components					
CHEMICAL NAME AND/OR SYNONYM Chlorodifluoromethane/Chloropentafluoroethane. Synonym: Fluorocarbon 115/Fluorocarbon 22.					
FORMULA CHClF₂ /CClF₂ CF₃				MOLECULAR WEIGHT 111.6 (average)	
ADDRESS (No., STREET, CITY, STATE AND ZIP CODE) AlliedSignal Engineered Materials P.O. Box 1139 Morristown, NJ 07962-1139					
CONTACT Product Safety Department		PHONE NUMBER (201) 455-4157	LAST ISSUE DATE May, 1989	CURRENT ISSUE DATE February, 1993	

B. FIRST AID MEASURES

EMERGENCY PHONE NUMBER (201) 455-2000	
<p>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 epinephrine (adrenalin).</p> <p>SKIN AND EYE CONTACT: Immediately bathe any frostbite (do not rub) 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. If no frostbite, immediately flush contact areas with large amounts of water to clean. In the case of eye contact, lift eyelids occasionally during washing to assist irrigation, and continue for 15 minutes. Remove any clothing contaminated with liquid material and wash before reuse.</p>	

C. HAZARDS INFORMATION

HEALTH

<p>INHALATION</p> <p>Vapors can asphyxiate at high concentrations by displacement of oxygen in air for breathing. Exposure to very high concentrations may produce narcosis, heart palpitations or arrhythmias. See Section K for further discussion of cardiac effects.</p>	
<p>INGESTION</p> <p>Not pertinent, since material is gaseous at normal temperatures and pressure.</p>	
<p>SKIN</p> <p>Contact with cold liquid or escaping gas can cause frostbite, indicated by pallor or redness, loss of sensation and swelling of affected areas. If no frostbite, irritation caused by defatting of tissue may be experienced.</p>	
<p>EYES</p> <p>Same effect from liquid contact as for skin.</p>	
<p>PERMISSIBLE CONCENTRATION: AIR (SEE SECTION J)</p> <p>None established for mixture. See Section H for PEL and TLV values for components.</p>	<p>BIOLOGICAL</p> <p>None Established.</p>
<p>UNUSUAL CHRONIC TOXICITY</p> <p>None known.</p>	

C. HAZARDS (Cont.)**FIRE AND EXPLOSION**

FLASH POINT	NA ° C	AUTO IGNITION TEMPERATURE	° C	FLAMMABLE LIMITS IN AIR (% BY VOL.)
Non-flammable		Not applicable		LOWER - NA UPPER - NA
<input type="checkbox"/> OPEN CUP	<input type="checkbox"/> CLOSED CUP			
UNUSUAL FIRE AND EXPLOSION HAZARDS Containers may rupture in fire due to overpressurization, releasing large volume of gas or vapor. Contact with certain metals and oxidizing materials (see Section G) may produce exothermic reactions or potential explosive combinations. Also, see hazardous decomposition products in Section G.				

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

None known.

SPECIAL FIRE FIGHTING PRECAUTIONS

When this material is involved in a fire, firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against suffocation and possible toxic decomposition products. Proper eye protection and protective clothing should be provided. Cool fire-exposed containers with large amounts of water, applied from as far a distance as possible. Water spray will help knock down gas or vapors.

VENTILATION

Ventilation should be adequate to meet ACGIH/TLV requirements and minimize exposure should material be released into the atmosphere. Provide local exhaust at filling zones and where leakage is probable. Mechanical (General) ventilation may be adequate for other operating and 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 gases -- 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. Keep valve tightly closed after use and when empty. 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, involved personnel should attempt to close valves or repair source of leak, remove any open flames, if without risk, and provide adequate ventilation. Unprotected personnel should be removed from area.

If a large quantity is released, evacuate personnel and allow to dissipate at a rate, if possible, that will not exceed TLV limits. Any release to the environment of this material 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 serious personal injury, or death, if not handled properly. Follow OSHA regulations for compressed gases and for airborne contaminants (29 CFR 1910.101) and Reference (d) for cylinder handling.

E. PERSONAL PROTECTIVE EQUIPMENT**RESPIRATORY PROTECTION**

None generally required for adequately vented work situations. For accidental or non-ventilated situations, where concentrations exceed 1000 ppm, use a self-contained breathing apparatus or supplied-air respirator, approved by NIOSH. At high concentrations, add a full facepiece.

EYES AND FACE

Under normal conditions, wear safety glasses. Where there is a probability of liquid contact, wear chemical safety goggles. Contact lenses should not be worn under such conditions.

HANDS, ARMS, AND BODY

Wear protective gloves and clothing with an impervious outer layer of MYLAR® - coated Durafab (2nd choices: PVA or neoprene) and thermal insulation underneath to prevent frostbite whenever leakage of liquid or a strong blast of gas are potential hazards. Remove immediately any wet non-impervious clothing and wash before reuse.

OTHER CLOTHING AND EQUIPMENT

Impervious boots or shoes with similar lining as for other clothing, worn under the same conditions as described above, may be advisable. Provide water source for frostbite in case first-aid is needed (see Section B).



I. ENVIRONMENTAL

DEGRADABILITY/AQUATIC TOXICITY		OCTANOL/WATER PARTITION COEFFICIENT
Not considered biodegradable; 100% volatile. Aquatic Toxicity: No data found for chloropentafluoroethane. Chlorodifluoromethane: TLm96: over 1000 ppm. [TLm96 = Lethal concentration, 50% kill (96 hours)]		ND (100% volatile)
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® 502 Azeotrope may be subject to federal, state and local regulations. 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	HAZARDOUS WASTE NUMBER: (IF APPLICABLE)	40 CFR 261
Not a "hazardous waste".	NA	

J. REFERENCES

PERMISSIBLE CONCENTRATION REFERENCES		
Applicable to components. 1. Threshold Limit Values and Biological Exposure Indices for 1991-1992, ACGIH. 2. 29 CFR 1910.1000 "Z1A Table", OSHA, 1989.		
REGULATORY STANDARDS	D.O.T. CLASSIFICATION: Nonflammable gas	49 CFR 173
I.D. No.: UN1078		
DOT classification of components (Section H). Hazardous Materials Table, 49 CFR 172.101. Classification of mixture by Allied, based on DOT definitions and tests, 49 CFR 173.300.		
GENERAL		
(a) NIOSH Registry (RTECS), 1981-82, Accession Nos. PA6390000 and KH7877500. (b) Belej, M.A. et al., Toxicology 2 , (1974), 381-395. (c) Aviado, D.M., Toxicology 3 , (1975), 321-332 and his references. (d) CGA Pamphlet P-1, "Safe Handling of Compressed Gases in Containers", 1974, Compressed Gas Association (1980 printing). (e) Compressed Gas Assoc., Inc.: "Handbook of Compressed Gases", 2nd ed., 1981, Van Nostrand Reinhold Co.		

K. ADDITIONAL INFORMATION

<p>SECTION H - Hazard Data (Acute Effects) -- continued</p> <p>Asphyxiant Effect: This material is low in toxicity at concentrations in air as high as 4% (40,000 ppm); however, when oxygen levels in air are reduced to 12-14%, symptoms of asphyxiation, loss of coordination, increased pulse rate, and deeper respiration will occur. (This information applies to the chlorodifluoromethane component and was also developed for dichlorotetrafluoroethane but not for the other component, chloropentafluoroethane. However, toxicological research indicates that the latter component is probably less toxic than dichlorotetrafluoroethane due to the greater fluorine proportion in its halogen content.)</p> <p>Cardiac Effect: Published animal studies (anesthetized monkey) report that the GENETRON® 22 component reduces heart efficiency if inhaled 5 minutes at airborne concentrations of 25,000 - 100,000 ppm [Ref. (b), Section J]. [The substituted ethane component is expected to be somewhat less toxic.] A 2-year study with chlorodifluoromethane (GENETRON® 22) 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 change in the current TLV of 1000 ppm has been recommended as a result of this study [ICI, Mond Div. (UK), April, 1981]. In addition, cardiac sensitization (dog) has been observed with both components at concentrations of 50,000 ppm (GENETRON® 22) and 100,000 - 150,000 ppm (GENETRON® 115). [Reference (c), Section J; and Reinhardt, C.F., as reported in ACGIH Documentation of TLVs, 5th edition.]</p>

PSDS FILE NO. 961

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ENVIRONMENTAL DATA SHEET

SUPPLEMENT TO PSDS: GENETRON[®] 502 Azeotrope

CURRENT ISSUE DATE 02-1993 PSDS #: 961

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>
Chloropentafluoroethane	76-15-3	51.2

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[®] 22, A HCFC, AND GENETRON[®] 115, A CFC, SUBSTANCES WHICH HARM 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