

TRIANGLE BIOMEDICAL SERVICES  
2604-G CARVER STREET  
DURHAM, NC 27705

EMERGENCY CONTACT # 1-800-255-3924

MATERIAL SAFETY DATA SHEET

CATALOG NO. H-FRZ-1

SECTION 1 - PRODUCT INGREDIENT INFORMATION      CAS #      WT.% RANGE

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1,1,1,2 TETRAFLUOROETHANE                      811-97-2              100%

SECTION 2 - HAZARD IDENTIFICATION

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EMERGENCY OVERVIEW: CLEAR, COLORLESS LIQUEFIED GAS. THIS PRODUCT IS  
NONFLAMMABLE. EXPOSURE TO LIQUID MAY CAUSE FROSTBITE.

POTENTIAL HEALTH EFFECTS:

EYES: CONTACT WITH LIQUID PRODUCT IS IRRITATING AND CAN CAUSE FROSTBITE.  
SKIN: CAN CAUSE FROSTBITE, PROLONGED CONTACT CAN CAUSE SKIN IRRITATION.  
INGESTION: UNLIKELY DUE TO VOLATILE NATURE OF PRODUCT. CONTACT WITH LIQUID  
PRODUCT MAY CAUSE FROSTBITE TO MOUTH AND THROAT TISSUES.  
INHALATION: HARMFUL IF INHALED. HIGH CONCENTRATION OF VAPORS IN IMMEDIATE  
AREA CAN DISPLACE OXYGEN AND CAN CAUSE DIZZINESS, UNCONSCIOUSNESS, AND EVEN  
DEATH WITH LONGER EXPOSURE. KEEP PEOPLE AWAY FROM SUCH VAPORS WITHOUT  
SELF-CONTAINED BREATHING APPARATUS.

PREEXISTING MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: HEART, LUNG, SKIN,  
EYE.

FIRST AID

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EYES: TREAT FOR POSSIBLE FROSTBITE, THEN FLUSH WITH PLENTY OF WATER. AFTER  
INITIAL FLUSHING, REMOVE ANY CONTACT LENSES AND CONTINUE TO FLUSH FOR AT LEAST  
15 MINUTES. HAVE EYES EXAMINED AND TESTED BY MEDICAL PERSONNEL IF IRRITATION  
DEVELOPS OR PERSISTS.  
SKIN: TREAT FOR POSSIBLE FROSTBITE, THEN WASH SKIN WITH SOAP AND WATER.  
REMOVE CONTAMINATED CLOTHING. GET MEDICAL ATTENTION IF IRRITATION DEVELOPS OR  
PERSISTS. WASH CLOTHING SEPARATELY BEFORE REUSE.  
INGESTION: TREAT FOR POSSIBLE FROSTBITE. SWALLOWING LESS THAN AN OUNCE WILL  
NOT CAUSE SIGNIFICANT HARM. FOR LARGER AMOUNTS, DO NOT INDUCE VOMITING.  
GET IMMEDIATE MEDICAL ATTENTION.  
INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL  
RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL ATTENTION.

FIRE AND EXPLOSION INFORMATION

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FLASH POINT: NONE TO BOILING (TCC)  
LEL/UEL: NON-FLAMMABLE  
EXTINGUISHING MEDIA: USE ALCOHOL FOAM, CARBON DIOXIDE, OR WATER SPRAY WHEN  
FIGHTING FIRES INVOLVING THIS MATERIAL.  
FIRE FIGHTING INSTRUCTIONS: AS IN ANY FIRE, WEAR SELF-CONTAINED BREATHING  
APPARATUS (PRESSURE-DEMAND, MSHA/NIOSH APPROVED OR EQUIVALENT) AND FULL  
PROTECTIVE GEAR.

PAGE 1

ACCIDENTAL RELEASE MEASURES

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LARGE SPILLS: SHUT OFF LEAK IF POSSIBLE AND SAFE TO DO SO. WEAR  
SELF-CONTAINED BREATHING APPARATUS AND APPROPRIATE PERSONAL PROTECTIVE  
EQUIPMENT. ABSORB SPILL WITH INERT MATERIAL (E.G. DRY SAND OR EARTH) THEN  
PLACE IN A CHEMICAL WASTE CONTAINER FOR PROPER DISPOSAL. DO NOT FLUSH TO  
SEWER. AVOID RUNOFF INTO STORM SEWERS AND DITCHES WHICH LEAD TO WATERWAYS.

SMALL SPILLS: ABSORB SPILL WITH INERT MATERIAL (E.G. DRY SAND OR EARTH), THEN  
PLACE IN A CHEMICAL WASTE CONTAINER FOR PROPER DISPOSAL.

HANDLING AND STORAGE INFORMATION

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AVOID PROLONGED OR REPEATED CONTACT WITH EYES, SKIN AND CLOTHING. WASH HAND

BEFORE EATING. USE WITH ADEQUATE VENTILATION. AVOID BREATHING VAPOR OR MIST. DO NOT REUSE THIS CONTAINER. STORE IN A COOL, DRY PLACE AWAY FROM HEAT, SPARKS AND FLAME. KEEP CONTAINER CLOSED WHEN NOT IN USE. DO NOT STORE IN DIRECT SUNLIGHT.

EXPOSURE INFORMATION/PERSONNEL PROTECTION

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EXPOSURE GUIDELINES:           ACGIH TWA           OSHA PEL           DUPONT  
TETRAFLUOROETHANE            NA                NA                1,000 PPM

WORK/HYGIENIC PRACTICES: GOOD GENERAL VENTILATION SHOULD BE SUFFICIENT TO CONTROL AIRBORNE LEVELS. LOCAL EXHAUST VENTILATION MAY BE NECESSARY TO CONTROL ANY AIR CONTAMINANTS TO WITHIN THEIR TLV'S DURING THE USE OF THIS PRODUCT. THIS MATERIAL DOES NOT HAVE ESTABLISHED EXPOSURE LIMIT. WEAR A POSITIVE PRESSURE AIR-SUPPLIED RESPIRATOR IN SITUATIONS WHERE THERE MAY BE POTENTIAL FOR AIRBORNE EXPOSURE. WEAR SAFETY GLASSES WITH SIDE SHIELDS (OR GOGGLES) AND A FULL FACE SHIELD. WEAR RUBBER OR OTHER CHEMICALLY RESISTANT GLOVES WHEN HANDLING THIS MATERIAL.

NFPA AND HMIS CODES:           NFPA                HMIS  
HEALTH                        2                    2  
FLAMMABILITY                0                    0  
REACTIVITY                   1                    1  
PERSONAL PROTECTION        B

TOXICOLOGICAL INFORMATION (NIOSH RTECS 1985-1986)

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INHALATION:  
TETRAFLUOROETHANE: RATS ALC: 567,000 PPM/4 HRS  
CANCER INFORMATION: NO INGREDIENTS LISTED AS HUMAN CARCINOGENS BY NTP OR IARC.

PAGE 2

PHYSICAL AND CHEMICAL PROPERTIES

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BOILING POINT (DEG. F): -15.7 F  
SPECIFIC GRAVITY (WATER=1): 1.21  
VAPOR PRESSURE (AIR=1): 82 PSIG @ 77 F  
VAPOR DENSITY (AIR=1): 3.18 @ 77 F  
EVAPORATION RATE: 1  
SOLUBILITY IN WATER: 0.10% BY WEIGHT @ 77 F/1 ATM  
APPEARANCE AND ODOR: CLEAR, COLORLESS LIQUEFIED GAS WITH SLIGHT ETHER-LIKE ODOR.  
VISCOSITY: NA

STABILITY AND CHEMICAL PROPERTIES

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STABILITY: THIS PRODUCT IS STABLE.  
CONDITIONS TO AVOID: DO NOT SPRAY NEAR OPEN FLAMES, RED HOT SURFACES OR OTHER SOURCES OF IGNITION.

INCOMPATIBILITY: DO NOT MIX WITH POWDERED ALKALINE EARTH METALS OR STRONG OXIDIZING AGENTS.

PRODUCTS OF DECOMPOSITION: THERMAL DECOMPOSITION MAY RELEASE HYDROFLUORIC ACID AND POSSIBLE CARBONYL HALIDES.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.  
CONDITIONS TO AVOID: NA

DISPOSAL CONSIDERATIONS

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DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS. WATER RUNOFF CAN CAUSE ENVIRONMENTAL DAMAGE.

TRANSPORTATION INFORMATION

GROUND SHIPMENTS:  
PROPER SHIPPING NAME UN# HAZARD CLASS PKG GROUP LABEL REQ'D RISK GROUP  
CONSUMER COMMODITY N/A N/A N/A N/A N/A  
ORM-D

IATA AIR SHIPMENTS:  
PROPER SHIPPING NAME UN# HAZARD CLASS PKG GROUP LABEL REQ'D RISK GROUP  
1,1,1,2 TETRAFLUOROETHANE UN3159 NON-FLAMMABLE GAS N/A NON-FLAMMABLE GAS N/A

UPS AIR SHIPMENTS:  
PROPER SHIPPING NAME UN# HAZARD CLASS PKG GROUP LABEL REQ'D RISK GROUP  
REFRIGERANT GAS, N.O.S. UN1078 NON-FLAMMABLE GAS N/A NON-FLAMMABLE GAS N/A

PAGE 3

REGULATORY INFORMATION

SECTION 313 SUPPLIER NOTIFICATION:  
THIS PRODUCT CONTAINS THE FOLLOWING TOXIC CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT OF 1986 (40 CFR 372). PRODUCT DOES NOT CONTAIN ANY SECTION 313 LISTED CHEMICALS. THIS INFORMATION SHOULD BE INCLUDED ON ALL MSDS COPIED AND DISTRIBUTED FOR THIS MATERIAL.

TOXIC SUBSTANCES CONTROL ACT (TSCA):  
ALL INGREDIENTS OF THIS PRODUCT ARE LISTED ON THE TSCA INVENTORY.

OTHER INFORMATION

PRODUCT IS A LEVEL I AEROSOL. DO NOT PUNCTURE OR INCINERATE CONTAINERS. NORMAL VENTILATION FOR STANDARD MANUFACTURING PRACTICES IS USUALLY ADEQUATE. LOCAL EXHAUST SHOULD BE USED WHEN LARGE AMOUNTS ARE RELEASED.

LABEL INFORMATION: CARTONS SHOULD CARRY A HAZARD LABEL: NONFLAMMABLE GAS.

ENVIRONMENTAL IMPACT INFORMATION: AVOID RUNOFF INTO STORM SEWERS AND DITCHES WHICH LEAD INTO WATERWAYS. WATER RUNOFF CAN CAUSE ENVIRONMENTAL DAMAGE.

REPORTING

US REGULATIONS REQUIRE REPORTING SPILLS OF THIS MATERIAL THAT COULD REACH ANY SURFACE WATERS. THE TOLL FREE NUMBER FOR THE US COAST GUARD NATIONAL RESPONSE CENTER IS: 1-800-424-8802.

ENVIRONMENTAL IMPACT DATA:  
PERCENT BY WEIGHT

CFC	0.0%	VOC	0.0%
HCFC	0.0%	HFC	100.0%
Cl.SOLV.	0.0%	ODP	0.0

FOR MORE INFORMATION, CALL: 1-800-645-5244

TO THE BEST OF OUR KNOWLEDGE, THE INFORMATION CONTAINED HEREIN IS ACCURATE. HOWEVER, ALL MATERIALS MAY PRESENT UNKNOWN HAZARDS AND SHOULD BE USED WITH CAUTION. IN PARTICULAR, IMPROPER USE OF OUR PRODUCTS AND THEIR INAPPROPRIATE COMBINATION WITH OTHER PRODUCTS AND SUBSTANCES MAY PRODUCE HARMFUL RESULTS WHICH CANNOT BE ANTICIPATED. FINAL DETERMINATION OF THE SUITABILITY OF ANY MATERIAL IS THE SOLE RESPONSIBILITY OF THE USER. ALTHOUGH CERTAIN HAZARDS ARE DESCRIBED HEREIN, WE CANNOT GUARANTEE THAT THESE ARE THE ONLY HAZARDS THAT

MAY EXIST.

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PAGE 4 (LAST PAGE)