

MATERIAL SAFETY DATA SHEET

SECTION 01: CHEMICAL PRODUCT & COMPANY ID

PRODUCT PRIMARY NAME: SUVA 134A
PLANT SYNONYMS: REFRIGERANT-134A
> 12345922
> 12346138
> 12346150

SAFE USE CATEGORY AND DESCRIPTION: 01 -HALOGENATED SOLVENTS

LAST UPDATED DATE: 1999-03-23

MANUFACTURER'S ID (MID): 000533167
MANUFACTURER'S NAME: DUPONT
MANUFACTURER'S EMERGENCY PHONE NUMBER/TEXT: US 302-774-1000 MEDICAL EMERGENCY
MANUFACTURER'S MAILING ADDRESS:
1007 MARKET STREET
P.O. BOX 80709, CHESTNUT RUN
WILMINGTON DE 19898
US

SECTION 1 - OTHER INFORMATION: FORMULA: CH2FCF3. RESPONSIBILITY FOR MSDS: DUPONT CHEMICALS ENGINEERING AND PRODUCT SAFETY. ADDITIONAL INFORMATION: MEDICAL USE: CAUTION: DO NOT USE IN MEDICAL APPLICATIONS INVOLVING PERMANENT IMPLANTATION IN THE HUMAN BODY. FOR OTHER MEDICAL APPLICATIONS SEE DUPONT BULLETIN NO. H50102.

WHMIS CLASSIFICATION: REGULATED
A: COMPRESSED GAS

SECTION 02: COMPOSITION & INGREDIENT INFO

CAS# FORMULATION W/V CHEMICAL NAME
000811972 = 100.0000/ 0.0000% W Ethane, 1,1,1,2-tetrafluoro-

SECTION 03: HAZARDS IDENTIFICATION

PRIMARY ENTRY ROUTE INDICATORS:
SKIN PRIMARY ENTRY ROUTE INDICATOR = Y
EYE PRIMARY ENTRY ROUTE INDICATOR = Y
INHALATION PRIMARY ENTRY ROUTE INDICATOR = Y
INGESTION PRIMARY ENTRY ROUTE INDICATOR = Y

EFFECTS OF OVEREXPOSURE - SKIN: POTENTIAL HEALTH EFFECTS: ETHANE, 1,1,1,2-TETRAFLUORO- (HFC-134A) (811-97-2): IMMEDIATE EFFECTS OF OVEREXPOSURE MAY INCLUDE: FROSTBITE, IF LIQUID OR ESCAPING VAPOR CONTACTS THE SKIN.

EFFECTS OF OVEREXPOSURE - EYE: POTENTIAL HEALTH EFFECTS: ETHANE, 1,1,1,2-TETRAFLUORO- (HFC-134A) (811-97-2): FROSTBITE-LIKE EFFECTS MAY OCCUR IF THE LIQUID OR ESCAPING VAPORS CONTACT THE EYES.

EFFECTS OF OVEREXPOSURE - INHALATION: POTENTIAL HEALTH EFFECTS: ETHANE, 1,1,1,2-TETRAFLUORO- (HFC-134A) (811-97-2): GROSS OVEREXPOSURE MAY CAUSE: CENTRAL NERVOUS SYSTEM DEPRESSION WITH DIZZINESS, CONFUSION, INCOORDINATION, DROWSINESS OR UNCONSCIOUSNESS. IRREGULAR HEART BEAT WITH A STRANGE SENSATION IN THE CHEST, HEART THUMPING, APPREHENSION, LIGHTHEADEDNESS, FEELING OF FAINTING, DIZZINESS, WEAKNESS SOMETIMES PROGRESSING TO LOSS OF CONSCIOUSNESS AND DEATH. SUFFOCATION, IF AIR IS DISPLACED BY VAPORS.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: ADDITIONAL HEALTH EFFECTS: ETHANE, 1,1,1,2-TETRAFLUORO- (HFC-134A) (811-97-2): INCREASED SUSCEPTIBILITY TO THE EFFECTS OF THIS MATERIAL MAY BE OBSERVED IN PERSONS WITH PRE-EXISTING DISEASE OF THE: CENTRAL NERVOUS SYSTEM, CARDIOVASCULAR SYSTEM.

SECTION 04: FIRST AID MEASURES

EMERGENCY FIRST AID PROCEDURES - SKIN: IN CASE OF CONTACT, IMMEDIATELY FLUSH SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. CALL A PHYSICIAN. WASH CONTAMINATED CLOTHING BEFORE REUSE. TREAT FOR FROSTBITE IF NECESSARY BY GENTLY WARMING AFFECTED AREA.

EMERGENCY FIRST AID PROCEDURES - EYES: IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. CALL A PHYSICIAN.

EMERGENCY FIRST AID PROCEDURES - INHALATION: IF HIGH CONCENTRATIONS ARE INHALED, IMMEDIATELY REMOVE TO FRESH AIR. KEEP PERSON CALM. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

EMERGENCY FIRST AID PROCEDURES - INGESTION: INGESTION IS NOT CONSIDERED A POTENTIAL ROUTE OF EXPOSURE.

NOTES TO PHYSICIAN: BECAUSE OF POSSIBLE DISTURBANCES OF CARDIAC RHYTHM, CATECHOLAMINE DRUGS, SUCH AS EPINEPHRINE, SHOULD ONLY BE USED WITH SPECIAL CAUTION IN SITUATIONS OF EMERGENCY LIFE SUPPORT.

SECTION 05: FIRE-FIGHTING MEASURES

SPECIAL FIRE FIGHTING PROCEDURES: EXTINGUISHING MEDIA: USE MEDIA APPROPRIATE FOR SURROUNDING MATERIAL. FIRE FIGHTING INSTRUCTIONS: COOL

TANK/CONTAINER WITH WATER SPRAY. SELF-CONTAINED BREATHING APPARATUS (SCBA) MAY BE REQUIRED IF CYLINDERS RUPTURE OR RELEASE UNDER FIRE CONDITIONS.

UNUSUAL FIRE AND EXPLOSION HAZARDS: CYLINDERS MAY RUPTURE UNDER FIRE CONDITIONS. DECOMPOSITION MAY OCCUR. CONTACT OF WELDING OR SOLDERING TORCH FLAME WITH HIGH CONCENTRATIONS OF REFRIGERANT CAN RESULT IN VISIBLE CHANGES IN THE SIZE AND COLOR OF TORCH FLAMES. THIS FLAME EFFECT WILL ONLY OCCUR IN CONCENTRATIONS OF PRODUCT WELL ABOVE THE RECOMMENDED EXPOSURE LIMIT, THEREFORE STOP ALL WORK AND VENTILATE TO DISPERSE REFRIGERANT VAPORS FROM THE WORK AREA BEFORE USING ANY OPEN FLAMES. POTENTIAL COMBUSTIBILITY: HFC-134A IS NOT FLAMMABLE AT TEMPERATURES UP TO 100 DEG C. (212 DEG F) AT ATMOSPHERIC PRESSURE. HOWEVER, MIXTURES OF HFC-134A WITH HIGH CONCENTRATIONS OF AIR AT ELEVATED PRESSURE AN BECOME COMBUSTIBLE AT AMBIENT TEMPERATURE. AS THE TEMPERATURE OF THE MIXTURE IS INCREASED, LOWER PRESSURE (BUT STILL GREATER THAN ATMOSPHERIC PRESSURE) CAN CREATE THE SAME EFFECT. THEREFORE, HFC-134A SHOULD NOT BE MIXED WITH AIR UNDER PRESSURE FOR LEAK TESTING OR OTHER PURPOSES. IN GENERAL, HFC-134A SHOULD NOT BE USED OR ALLOWED TO EXIST WITH HIGH CONCENTRATIONS OF AIR ABOVE ATMOSPHERIC PRESSURE. EXPERIMENTAL DATA HAVE ALSO BEEN REPORTED WHICH INDICATE COMBUSTIBILITY OF HFC-134A IN THE PRESENCE OF CERTAIN CONCENTRATIONS OF CHLORINE. FIRE AND EXPLOSION HAZARDS: CYLINDERS MAY RUPTURE UNDER FIRE CONDITIONS. DECOMPOSITION MAY OCCUR. CONTACT OF WELDING OR SOLDERING TORCH FLAME WITH HIGH CONCENTRATIONS OF REFRIGERANT CAN RESULT IN VISIBLE CHANGES IN THE SIZE AND COLOR OF THE TORCH FLAME. THIS FLAME EFFECT WILL ONLY OCCUR IN CONCENTRATIONS OF PRODUCT WELL ABOVE THE RECOMMENDED EXPOSURE LIMIT, THEREFORE STOP ALL WORK AND VENTILATE THE AREA BEFORE PROCEEDING. USE FORCED VENTILATION TO DISPERSE REFRIGERANT VAPORS FROM THE WORK AREA BEFORE USING ANY OPEN FLAMES.

HMIS CODES:

HMIS REACTIVITY CODE =	1
HMIS HEALTH CODE =	1
HMIS FLAMMABILITY CODE =	0

AUTO-IGNITION TEMPS: > 743.00C/ 1369.00F

FLASH POINT TEXT: WILL NOT BURN.

SECTION 5 - OTHER INFORMATION: NFPA NOT YET DETERMINED. FLAMMABLE LIMITS IN AIR, % BY VOLUME: LEL AND UEL: NOT APPLICABLE. HAZARDOUS DECOMPOSITION PRODUCTS: DECOMPOSITION PRODUCTS ARE HAZARDOUS. THIS MATERIAL CAN BE DECOMPOSED BY HIGH TEMPERATURES (OPEN FLAMES, GLOWING METAL SURFACES, ETC.) FORMING HYDROFLUORIC ACID AND POSSIBLY CARBONYL FLUORIDE. NPCA RATING: HEALTH: 1, FLAMMABILITY: 0, REACTIVITY: 1. NPCA-HMIS RATING: PERSONAL PROTECTION RATING TO BE SUPPLIED BY USER DEPENDING ON USE CONDITIONS.

SECTION 06: ACCIDENTAL RELEASE MEASURES

SPILL OR LEAK PROCEDURES: SAFEGUARDS (PERSONNEL): NOTE: REVIEW FIRE FIGHTING MEASURES (SECTION 5) AND HANDLING (PERSONNEL) SECTION 7 BEFORE PROCEEDING WITH CLEAN-UP. USE APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT DURING CLEAN-UP. VENTILATE AREA, ESPECIALLY LOW OR ENCLOSED PLACES WHERE HEAVY VAPORS MIGHT COLLECT. REMOVE OPEN FLAMES. USE SELF-CONTAINED BREATHING APPARATUS (SCBA) IF LARGE SPILL OR LEAK OCCURS.

SECTION 07: HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: HANDLING (PERSONNEL): USE WITH SUFFICIENT VENTILATION TO KEEP EMPLOYEE EXPOSURE BELOW RECOMMENDED LIMITS. HANDLING (PHYSICAL ASPECTS): HFC-134A SHOULD NOT BE MIXED WITH AIR FOR LEAK TESTING OR USED FOR ANY OTHER PURPOSE ABOVE ATMOSPHERIC PRESSURE. SEE FLAMMABLE PROPERTIES SECTION (SECTION 5). CONTACT WITH CHLORINE OR OTHER STRONG OXIDIZING AGENTS SHOULD ALSO BE AVOIDED. STORAGE: STORE IN A CLEAN, DRY PLACE. DO NOT HEAT ABOVE 52 C (126 F).

SECTION 08: EXPOSURE CONTROLS - PROTECTION

EYE PROTECTION: CHEMICAL SPLASH GOGGLES SHOULD BE USED WHEN HANDLING LIQUID.

RESPIRATORY PROTECTION: UNDER NORMAL MANUFACTURING CONDITIONS, NO RESPIRATORY PROTECTION IS REQUIRED WHEN USING THIS PRODUCT. SELF-CONTAINED BREATHING APPARATUS (SCBA) IS REQUIRED IF A LARGE RELEASE OCCURS.

ENGINEERING CONTROLS: NORMAL VENTILATION FOR STANDARD MANUFACTURING PROCEDURES IS GENERALLY ADEQUATE. LOCAL EXHAUST SHOULD BE USED WHEN LARGE AMOUNTS ARE RELEASED. MECHANICAL VENTILATION SHOULD BE USED IN LOW OR ENCLOSED PLACES. REFRIGERANT CONCENTRATION MONITORS MAY BE NECESSARY TO DETERMINE VAPOR CONCENTRATIONS IN WORK AREAS PRIOR TO USE OF TORCHES OR OTHER OPEN FLAMES, OR IF EMPLOYEES ARE ENTERING ENCLOSED AREAS.

PROTECTIVE GLOVES (SPECIFY TYPE): CHEMICALLY IMPERVIOUS GLOVES SHOULD BE USED WHEN HANDLING LIQUID.

SECTION 09: PHYSICAL & CHEMICAL PROPERTIES

BOILING POINT TEMPS: = - 26.50C/- 15.70F
BOILING POINT TEXT: AT 736 MMHG.

SPECIFIC GRAVITY VALUES: = 1.2080
SPECIFIC GRAVITY TEXT: AT 77 F (25 C).

DENSITY VALUES/UOM: = 1.2100G/CC
DENSITY TEXT: AT 25 C (77 F).

VAPOR DENSITY VALUES: = 3.6000
VAPOR DENSITY TEXT: (AIR= 1.0) AT 25 C (77 F).
VAPOR PRESSURE TEXT: 96 PSIA AT 25 C (77 F).

PERCENT VOLATILE BY WEIGHT VALUES: = 100.0000

EVAPORATION RATE VALUES: > 1.00
EVAPORATION RATE TEXT: (CCL4= 1).

SOLUBILITY IN WATER TEXT: 0.15 WT PERCENT AT 25 C (77 F). AT 14.7 PSIA.

APPEARANCE: LIQUIFIED GAS. COLOR: COLORLESS.

ODOR: ETHER (SLIGHT) ODOR.

PHYSICAL STATE: GAS

SECTION 10: STABILITY & REACTIVITY

STABILITY INDICATOR: Y
STABILITY - TEXT: CONDITIONS TO AVOID: AVOID OPEN FLAMES AND HIGH
TEMPERATURES. INCOMPATIBILITY WITH OTHER MATERIALS: INCOMPATIBLE WITH
ALKALI OR ALKALINE EARTH METALS-POWDERED AL, ZN, BE, ETC.

HAZARDOUS DECOMPOSITION PRODUCTS: DECOMPOSITION PRODUCTS ARE HAZARDOUS.
THIS MATERIAL CAN BE DECOMPOSED BY HIGH TEMPERATURES (OPEN FLAMES,
GLOWING METAL SURFACES, ETC.) FORMING HYDROFLUORIC ACID AND POSSIBLY
CARBONYL FLUORIDE.

HAZARDOUS POLYMERIZATION INDICATOR: N

SECTION 11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA UNLIMITED TEXT: ADDITIONAL TOXICOLOGY DATA ON INDIVIDUAL INGREDIENTS IS AVAILABLE AT THE MSDS PROCESSING CENTER.

CARCINOGENICITY: CARCINOGENICITY INFORMATION: NONE OF THE COMPONENTS PRESENT IN THIS MATERIAL ARE LISTED BY IARC, NTP, OSHA OR ACGIH AS A CARCINOGEN.

SECTION 12: ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: ECOTOXICOLOGICAL INFORMATION: AQUATIC TOXICITY: 48 HOUR EC50: DAPHNIA MAGNA: 980 MG/L. 96 HOUR LC50: RAINBOW TROUT: 450 MG/L.

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: CONTAMINATED HFC-134A CAN BE RECOVERED BY DISTILLATION OR REMOVED TO A PERMITTED WASTE DISPOSAL FACILITY. COMPLY WITH FEDERAL, STATE, AND LOCAL REGULATIONS.

SECTION 14: TRANSPORT INFORMATION

DOT INFORMATION: SHIPPING INFORMATION: DOT: PROPER SHIPPING NAME: 1,1,1,2-TETRAFLUOROETHANE. HAZARD CLASS: 2.2. UN NO. UN3159. DOT LABEL: NONFLAMMABLE GAS. SHIPPING CONTAINERS: TANK CARS, TANK TRUCKS, TON TANKS, CYLINDERS.

SECTION 14 - OTHER INFORMATION: SHIPPING INFORMATION: IMO: PROPER SHIPPING NAME: 1,1,1,2-TETRAFLUOROETHANE. HAZARD CLASS: 2.2. UN NO. UN3159. IMO LABEL: NONFLAMMABLE GAS. SHIPPING CONTAINERS: TANK CARS, TANK TRUCKS, TON TANKS, CYLINDERS.

SECTION 15: REGULATORY INFORMATION

SARA 311/312 HAZARD INDICATORS:
IMMEDIATE HEALTH INDICATOR = Y
DELAYED HEALTH INDICATOR = Y
FIRE INDICATOR = N
SUDDEN PRESSURE RELEASE INDICATOR = Y
REACTIVITY INDICATOR = N

SECTION 15 - OTHER INFORMATION: U.S. FEDERAL REGULATIONS: TSCA INVENTORY STATUS: REPORTED/INCLUDED. HAZARDOUS CHEMICAL LISTS: SARA EXTREMELY HAZARDOUS SUBSTANCE: NO. CERCLA HAZARDOUS SUBSTANCE: NO. SARA TOXIC CHEMICAL: NO.

*** END OF DATA SHEET ***