

MATERIAL SAFETY DATA SHEET

ISSUED: December 30, 1993

JS # B92-087

B92-047

B92-045

Elf Atochem North America, Inc.
Fluorochemicals
2000 Market Street
Philadelphia, PA 19102-3222

EMERGENCY PHONE NUMBERS:

Bus. Hrs: 215-419-7695

Bus. Hrs: 215-419-7704

Other Hrs: 800-424-9300

Chemtrec: 800-424-9300

N/A= NOT APPLICABLE N/E= NOT ESTABLISHED

N/D= NOT DETERMINED

PRODUCT IDENTIFICATION

PRODUCT NAME: CAS NO.: MIXTURE

FORANE (R) 502

SYNONYMS: R-502

CHEMICAL NAME:

CHLORODIFLUOROMETHANE (R-22) AND CHLOROPENTAFLUOROETHANE (R-115) MIXTURE

MOLECULAR FORMULA:

CHCLF₂ AND CC1F₂CF₃

CHEMICAL FAMILY: CFC/HCFC MIXTURE

INGREDIENTS-----HAZARD CLASSIFICATIONS

COMPONENTS-HAZARDOUS:	CHLORODIFLUOROMETHANE (R-22)
CAS NO.:	75-45-6
% :	48.8
COMMENTS:	ACGIH(TLV):TWA=1,000PPM =3,540MG/M(3)
	OSHA FINAL LIMITS: TWA=1,000PPM =3,500MG/M(3)
	NFPA= 2-1-0
	*LISTED SARA SECTION 313
COMPONENTS-HAZARDOUS:	CHLOROPENTAFLUOROETHANE (R-115)
CAS NO.:	76-15-3
%:	51.2
COMMENTS:	ACGIH(TLV):TWA=1,000PPM =6,320MG/M(3)
	OSHA FINAL LIMITS: TWA=1,000PPM

=6,320MG/M(3)
LISTED SARA SECTION 313
NFPA= 2-0-0

SHIPPING INFORMATION

CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIXTURE
(R-502), 2.2 NONFLAMMABLE GAS, UN 1973

PHYSICAL PROPERTIES

BOILING POINT/RANGE: -45.6 C (-50.1 F)
MELTING POINT: NA
FREEZING POINT: NE
MOLECULAR WEIGHT: 111.6
SPECIFIC GRAVITY(H₂O-1): 1.22 @ 30/0 C
VAPOR PRESSURE(MM HG): 151.3 PSIA @ 70 F
VAPOR DENSITY(AIR=1): 3.8
SOLUBILITY IN H₂O: SLIGHT
% VOLATILES BY VOLUME: 100
APPEARANCE AND ODOR: CLEAR, COLORLESS LIQUEFIED GAS
WITH FAINT ETHEREAL (ETHER-LIKE)
ODOR

FIRE AND EXPLOSION DATA

FLASH POINT: NON FLAMMABLE
FLAMMABLE LIMITS: LOWER: NA
UPPER: NA
AUTOIGNITION TEMP.: NE
EXTINGUISHING MEDIA: USE EXTINGUISHING MEDIA
APPROPRIATE TO SURROUNDING FIRE
CONDITIONS

SPECIAL FIRE FIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING
APPARATUS IF FIGHTING FIRES NEAR THIS PRODUCT DUE TO TOXICITY OF
THERMAL DECOMPOSITION PRODUCTS. KEEP CONTAINERS COOL.

UNUSUAL FIRE AND EXPLOSION HAZARDS: MAY DECOMPOSE DURING CONTACT
WITH FLAMES, HEATING ELEMENTS, OR IN COMBUSTION ENGINES RELEASING
IRRITATING, TOXIC, AND CORROSIVE GASES. CONTAINER MAY EXPLODE IF
HEATED DUE TO RESULTING PRESSURE RISE.

REACTIVITY DATA

STABILITY: STABLE
CONDITIONS CONTRIBUTING
TO INSTABILITY: THERMAL DECOMPOSITION

THERMAL DECOMPOSITION DUE TO EXPOSURE TO HEAT (>800 F) OR FIRE.

INCOMPATIBILITY-AVOID CONTACT WITH: STRONG OXIDIZERS AND STRONG ALKALIS. AVOID CONTACT WITH STRONG ALKALI OR ALKALINE EARTH METALS, FINELY POWDERED METALS SUCH AS ALUMINUM, MAGNESIUM OR ZINC AND STRONG OXIDIZERS SINCE THEY MAY REACT WITH OR ACCELERATE DECOMPOSITION OF THIS MATERIAL.

HAZARDOUS DECOMPOSITION THERMAL AND OTHER: THERMAL DECOMPOSITION PRODUCTS INCLUDE HYDROGEN FLUORIDE, HYDROGEN CHLORIDE, CARBON MONOXIDE, CARBON DIOXIDE AND CHLORINE.

CONDITIONS TO AVOID: FLAMES, EXTREMELY HOT METAL SURFACES, HEATING ELEMENTS, COMBUSTION ENGINES, ETC.

TOXICITY

ROUTE ANIMAL

DATA

ORAL

NE. SEE TOXICITY COMMENTS

DERMAL

NE. SEE TOXICITY COMMENTS

INHALATION

NE. SEE TOXICITY COMMENTS

TOXIC EFFECTS/ROUTES OF ENTRY

EYE EFFECTS:

IRRITANT VAPOR IS IRRITATING TO EYES. LIQUID IS IRRITATING TO EYES AND MAY CAUSE TISSUES TO FREEZE.

SKIN EFFECTS:

CONTACT WITH LIQUID MAY CAUSE TISSUES TO FREEZE (FROST BITE). CHEMICAL ITSELF IS NOT IRRITATING.

OTHER TOXIC

EFFECTS:

THIS PRODUCT DOES NOT CONTAIN ANY COMPONENTS LISTED BY NTP OR IARC OR REGULATED BY OSHA AS CARCINOGENS.

TARGET ORGAN

TOXIN:

TARGET ORGANS AFFECTED BY EXPOSURE TO THIS MATERIAL ARE: EYES, SKIN, CENTRAL NERVOUS SYSTEM, RESPIRATORY SYSTEM, HEART.

TOXICITY COMMENTS:

DENSE VAPOR DISPLACES BREATHING AIR IN CONFINED OR UNVENTILATED AREAS. INHALING CONCENTRATED VAPORS CAN CAUSE DROWSINESS, UNCONSCIOUSNESS, RESPIRATORY DEPRESSION AND DEATH DUE TO ASPHYXIATION. THIS COMPOUND ALSO INCREASES THE SENSITIVITY OF THE HEART TO ADRENALIN, POSSIBLY RESULTING IN RAPID HEARTBEAT (TACHYCARDIA), IRREGULAR

HEARTBEAT (CARDIAC ARRHYTHMIAS), AND DEPRESSION OF CARDIAC FUNCTION. PERSONS WITH PRE-EXISTING HEART DISEASE MAY BE AT INCREASED RISK FROM EXPOSURE.

CHRONIC TOXICITY (HCFC-22)

LIFETIME EXPOSURE OF RATS AND MICE TO 5% HCFC-22 IN AIR CAUSED REDUCED BODY WEIGHT GAIN IN MALE RATS BUT NO CLINICAL OR HISTOPATHOLOGIC EVIDENCE OF ADVERSE EFFECTS. NO EFFECTS WERE NOTED AT 1%. MICE, AT 58 AND BELOW, SHOWED NO SIGNIFICANT ADVERSE EFFECTS ATTRIBUTABLE TO EXPOSURE.

CARCINOGENICITY (HCFC-22)

LIFETIME EXPOSURE OF RATS TO 5% HCFC-22 IN AIR RESULTED IN A SLIGHTLY HIGHER INCIDENCE OF FIBROSARCOMAS (A MALIGNANT CONNECTIVE-TISSUE TUMOR) IN MALE RATS COMPARED TO CONTROLS. SOME OF THESE TUMORS INVOLVED THE SALIVARY GLANDS. THIS EFFECT WAS NOT SEEN IN FEMALE RATS AT THE SAME DOSE LEVEL OR IN RATS OF EITHER SEX AT THE LOWER DOSE LEVEL OF 1%. RATS GIVEN HCFC-22 ORALLY ALSO SHOWED NO INCREASED INCIDENCE OF TUMORS. IN ADDITION, MICE EXPOSED TO 5 AND 1% HCFC-22 IN A SIMILAR FASHION SHOWED NO INCREASED INCIDENCE OF TUMORS. SPONTANEOUSLY OCCURRING FIBROSARCOMAS ARE NOT UNCOMMON IN AGING RATS AND THE INCREASE SEEN IN MALE RATS MAY HAVE BEEN DUE TO A WEAK TUMOR-PROMOTING EFFECT OR OTHER NON-SPECIFIC EFFECT (STRESS, ETC.) OF R-22.

MUTAGENICITY (HCFC-22)

THIS CHEMICAL HAS BEEN SHOWN TO CAUSE MUTATIONS IN THE BACTERIUM SALMONELLA. THIS MAY BE DUE TO THE UNUSUAL METABOLIC CAPABILITIES OF THIS ORGANISM. R-22 IS NOT MUTAGENIC IN YEAST CELL, HAMSTER CELL, OR IN VIVO MOUSE AND RAT CELL ASSAYS (DOMINANT LETHAL AND BONE MARROW CYTOGENIC TOXICITY TESTS).

TERATOGENICITY (HCFC-22)

OFFSPRING BORN TO RATS EXPOSED TO 5% OF R-22 FOR 6 HOURS PER DAY DURING PREGNANCY SHOWED STUNTED GROWTH AND A SMALL, BUT STATISTICALLY SIGNIFICANT, INCIDENCE OF ABSENT EYES. HOWEVER, THIS DOSE LEVEL ALSO CAUSED MATERNAL TOXICITY. AN INCREASED INCIDENCE OF ABSENT EYES DID NOT OCCUR IN RABBITS EXPOSED AT 5% AND BELOW OR IN RATS AT 1% AND BELOW WHERE MATERNAL TOXICITY WAS NOT OBSERVED.

HEALTH HAZARD INFORMATION

PERMISSIBLE EXPOSURE LIMITS

ACGIH 1990 TLV/TWA : 1000 PPM (22 AND 115)

OSHA 1988 PEL/TWA : 1000 PPM (22 AND 115)

EMERGENCY FIRST AID

INGESTION: N/A - PRODUCT IS A GAS AT AMBIENT CONDITIONS. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

DERMAL: FLUSH EXPOSED SKIN WITH LUKEWARM WATER (NOT HOT) - OR USE OTHER MEANS TO WARM SKIN SLOWLY. GET MEDICAL ATTENTION IF FROSTBITTEN BY LIQUID OR IF IRRITATION OCCURS.

EYE CONTACT: IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL ATTENTION.

SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS: USE WITH ADEQUATE VENTILATION. CHECK AIR FOR CONTAMINANT AND FOR OXYGEN DEFICIENCY. WHERE VENTILATION IS INADEQUATE, USE A LOCAL EXHAUST SYSTEM TO REMOVE VAPORS.

EYE: GOGGLES TO PROTECT EYES.

HAND (GLOVE TYPE): USE SYNTHETIC RUBBER GLOVES SUCH AS NEOPRENE. LINED GLOVES ARE RECOMMENDED FOR PROTECTION FROM COLD.

RESPIRATOR TYPE: IN INADEQUATELY VENTILATED AREAS, A NIOSH/MSHA APPROVED (TC-19C) SUPPLIED AIR RESPIRATOR OR SELF-CONTAINED BREATHING APPARATUS IS REQUIRED.

OTHER PROTECTIVE EQUIPMENT: PROTECT ALL EXPOSED SKIN FROM LIQUID CONTACT.

SPECIAL HANDLING AND STORAGE CONDITIONS

DO NOT GET IN EYES, ON SKIN OR CLOTHING. DO NOT BREATHE VAPOR, MIST OR GAS. KEEP CONTAINER CLOSED. KEEP AWAY FROM HEAT, SPARKS AND FLAMES. STORE IN TIGHTLY CLOSED CONTAINERS. EMPTY CONTAINER MAY CONTAIN HAZARDOUS RESIDUE. DO NOT DROP, REUSE OR REFILL CONTAINER. DO NOT SMOKE. READ LABEL BEFORE USE. DO NOT CUT, GRIND OR WELD ON OR NEAR CONTAINER DUE TO POSSIBLE TOXIC FUME GENERATION.

SPILL MANAGEMENT

REMOVE OR EXTINGUISH IGNITION OR COMBUSTION SOURCES. EVACUATE ENCLOSED SPACES UNTIL GAS IS DISPERSED. KEEP UPWIND. STOP LEAK IF POSSIBLE WITHOUT RISK. DISPERSE GAS WITH FLOOR-LEVEL FORCED-AIR VENTILATION. EXHAUST VAPORS OUTDOORS. REMOVE ALL FLAMES, HEATING ELEMENTS AND GAS ENGINES. WASH CONTAMINATED CLOTHES BEFORE USE. DESTROY CONTAMINATED SHOES.

DISPOSAL PROCEDURES

RECYCLE OR RECLAIM IF POSSIBLE. RECLAIMED MATERIAL MAY BE INCINERATED BUT TOXIC AND CORROSIVE COMBUSTION PRODUCTS (HF AND HCL) MUST BE HANDLED APPROPRIATELY.

CONSULT FEDERAL, STATE, OR LOCAL AUTHORITIES FOR PROPER DISPOSAL PROCEDURES

ADDITIONAL INFORMATION

THIS CHEMICAL (OR CHEMICALS) IS REPORTED ON THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY TOXIC SUBSTANCES CONTROL ACT INVENTORY. THIS PRODUCT CONTAINS SUBSTANCE(S) WHICH ARE DEFINED AS TOXIC CHEMICALS UNDER, AND ARE SUBJECT TO THE REPORTING REQUIREMENTS OF, SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372. SEE 'INGREDIENTS - HAZARD CLASSIFICATIONS' SECTION OF THIS MSDS FOR CHEMICAL IDENTITIES AND CONCENTRATIONS.

MSDS PREPARED BY PRODUCT SAFETY DEPT.

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NA - NOT APPLICABLE NE - NOT ESTABLISHED

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