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CARBON DISULFIDE
CARBON DISULFIDE
CARBON DISULFIDE

MATERIAL SAFETY DATA SHEET

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SUBSTANCE IDENTIFICATION

SUBSTANCE: **CARBON DISULFIDE** CAS-NUMBER 75-15-0

TRADE NAMES/SYNONYMS:
CARBON BISULFIDE; CARBON BISULPHIDE; CARBON DISULPHIDE; CARBON SULFIDE;
DITHIOCARBONIC ANHYDRIDE; SULPHOCARBONIC ANHYDRIDE; RCRA P022; STCC 4908125;
UN 1131; C183; C184; C573; C185; ACC04280

CHEMICAL FAMILY:
ORGANIC SULFIDE

MOLECULAR FORMULA: C-S2

MOLECULAR WEIGHT: 76.13

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=3 REACTIVITY=0 PERSISTENCE=0
NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=3 REACTIVITY=0

COMPONENTS AND CONTAMINANTS

COMPONENT: CARBON DISULFIDE PERCENT: 99.9
CAS# 75-15-0

EXPOSURE LIMITS:
CARBON DISULFIDE:
4 PPM (12 MG/M3) OSHA TWA (SKIN); 12 PPM (36 MG/M3) OSHA STEL
10 PPM (30 MG/M3) ACGIH TWA (SKIN)
1 PPM (3 MG/M3) NIOSH RECOMMENDED TWA (SKIN);
10 PPM (30 MG/M3) NIOSH RECOMMENDED STEL
10 PPM (30 MG/M3) DFG MAK TWA (SKIN);
20 PPM (60 MG/M3) DFG MAK 30 MINUTE PEAK, AVERAGE VALUE, 4 TIMES/SHIFT

MEASUREMENT METHOD: CHARCOAL TUBE/DRYING TUBE; TOLUENE; GAS CHROMATOGRAPHY
WITH FLAME PHOTOMETRIC DETECTION FOR SULFUR; (NIOSH VOL. III # 1600).

10,000 POUNDS SARA SECTION 302 THRESHOLD PLANNING QUANTITY
100 POUNDS SARA SECTION 304 REPORTABLE QUANTITY
100 POUNDS CERCLA SECTION 103 REPORTABLE QUANTITY
SUBJECT TO SARA SECTION 313 ANNUAL TOXIC CHEMICAL RELEASE REPORTING
SUBJECT TO CALIFORNIA PROPOSITION 65 CANCER AND/OR REPRODUCTIVE TOXICITY
WARNING AND RELEASE REQUIREMENTS- (JULY 1, 1989)

**OSHA REVOKED THE FINAL RULE LIMITS OF JANUARY 19, 1989 IN RESPONSE TO THE
11TH CIRCUIT COURT OF APPEALS DECISION (AFL-CIO V. OSHA) EFFECTIVE
JUNE 30, 1993. SEE 29 CFR 1910.1000 (58 FR 35338)**

PHYSICAL DATA

DESCRIPTION: COLORLESS TO SLIGHTLY YELLOW LIQUID; NEARLY ODORLESS WHEN

PURE, UNPLEASANT ODOR IF IMPURE BOILING POINT: 115 F (46 C)

MELTING POINT: -169 F (-112 C) SPECIFIC GRAVITY: 1.3 VOLATILITY: 100%

VAPOR PRESSURE: 300 MMHG @ 20 C EVAPORATION RATE: (BUTYL ACETATE=1) 22.6

SOLUBILITY IN WATER: 0.22% @ 22 C VAPOR DENSITY: 2.6

SOLVENT SOLUBILITY: SOLUBLE IN ETHANOL, METHANOL, ETHER, BENZENE,
CHLOROFORM, CARBON TETRACHLORIDE, OILS

VISCOSITY: 0.367 CPS @ 20 C

FIRE AND EXPLOSION DATA

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FIRE AND EXPLOSION HAZARD:
DANGEROUS FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

DANGEROUS EXPLOSION HAZARD WHEN EXPOSED TO HEAT OR FLAME.

VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL A CONSIDERABLE DISTANCE TO A SOURCE
OF IGNITION AND FLASH BACK.

VAPOR-AIR MIXTURES ARE EXPLOSIVE.

DUE TO LOW ELECTROCONDUCTIVITY OF THE SUBSTANCE, FLOW OR AGITATION MAY
GENERATE ELECTROSTATIC CHARGES RESULTING IN SPARKS WITH POSSIBLE IGNITION.

FLASH POINT: -22 F (-30 C) (CC) UPPER EXPLOSIVE LIMIT: 50.0%

LOWER EXPLOSIVE LIMIT: 1.0% AUTOIGNITION TEMP.: 194 F (90 C)

FLAMMABILITY CLASS(OSHA): IB

FIREFIGHTING MEDIA:
DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR ALCOHOL-RESISTANT FOAM
(1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5).

FOR LARGER FIRES, USE WATER SPRAY, FOG OR ALCOHOL-RESISTANT FOAM
(1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5).

FIREFIGHTING:
MOVE CONTAINER FROM FIRE AREA IF YOU CAN DO IT WITHOUT RISK. DIKE FIRE-CONTROL
WATER FOR LATER DISPOSAL; DO NOT SCATTER THE MATERIAL. APPLY COOLING WATER TO
SIDES OF CONTAINERS THAT ARE EXPOSED TO FLAMES UNTIL WELL AFTER FIRE IS OUT.
STAY AWAY FROM ENDS OF TANKS. WITHDRAW IMMEDIATELY IN CASE OF RISING SOUND
FROM VENTING SAFETY DEVICE OR ANY DISCOLORATION OF TANK DUE TO FIRE. ISOLATE
FOR 1/2 MILE IN ALL DIRECTIONS IF TANK, RAIL CAR OR TANK TRUCK IS INVOLVED IN
FIRE (1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5, GUIDE PAGE 28).

EXTINGUISH ONLY IF FLOW CAN BE STOPPED. USE FLOODING AMOUNTS OF WATER AS A
FOG; SOLID STREAMS MAY BE INEFFECTIVE. WATER SHOULD BE APPLIED FROM AS FAR A
DISTANCE AS POSSIBLE. KEEP CONTAINERS COOL WITH FLOODING QUANTITIES OF WATER.
AVOID CONTAMINATING WATER SOURCES AND SEWERS; USE DIKES TO CONTAIN FLOW.
AVOID BREATHING VAPORS OR CONTACTING MATERIAL; KEEP UPWIND.

WATER MAY BE INEFFECTIVE EXCEPT AS A BLANKET (NFPA 325M, FIRE HAZARD
PROPERTIES OF FLAMMABLE LIQUIDS, GASES, AND VOLATILE SOLIDS, 1984)

TRANSPORTATION DATA

DEPARTMENT OF TRANSPORTATION HAZARD CLASSIFICATION 49-CFR 172.101:
FLAMMABLE LIQUID

DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS 49-CFR 172.101 AND
SUBPART E:
FLAMMABLE LIQUID

DEPARTMENT OF TRANSPORTATION PACKAGING REQUIREMENTS: 49-CFR 173.121
EXCEPTIONS: NONE

FINAL RULE ON HAZARDOUS MATERIALS REGULATIONS (HMR, 49 CFR PARTS 171-180),
DOCKET NUMBERS HM-181, HM-181A, HM-181B, HM-181C, HM-181D AND HM-204
EFFECTIVE DATE OCTOBER 1, 1991. HOWEVER, COMPLIANCE WITH THE REGULATIONS IS
AUTHORIZED ON AND AFTER JANUARY 1, 1991. (55 FR 52402, 12/21/90)

EXCEPT FOR EXPLOSIVES, INHALATION HAZARDS, AND INFECTIOUS SUBSTANCES, THE
EFFECTIVE DATE FOR HAZARD COMMUNICATION REQUIREMENTS IS EXTENDED TO
OCTOBER 1, 1993. (56 FR 47158, 09/18/91)

U.S. DEPARTMENT OF TRANSPORTATION SHIPPING NAME-ID NUMBER, 49 CFR 172.101:
CARBON DISULFIDE-UN 1131

U.S. DEPARTMENT OF TRANSPORTATION HAZARD CLASS OR DIVISION, 49 CFR 172.101:
3 - FLAMMABLE LIQUID

U.S. DEPARTMENT OF TRANSPORTATION PACKING GROUP, 49 CFR 172.101:
PG I

U.S. DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS, 49 CFR 172.101
AND SUBPART E:
FLAMMABLE LIQUID, POISON

U.S. DEPARTMENT OF TRANSPORTATION PACKAGING AUTHORIZATIONS:
EXCEPTIONS: NONE
NON-BULK PACKAGING: 49 CFR 173.201
BULK PACKAGING: 49 CFR 173.243

U.S. DEPARTMENT OF TRANSPORTATION QUANTITY LIMITATIONS 49 CFR 172.101:
PASSENGER AIRCRAFT OR RAILCAR: FORBIDDEN
CARGO AIRCRAFT ONLY: FORBIDDEN

TOXICITY

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CARBON DISULFIDE:

TOXICITY DATA: 10 GM/M3/2 HOURS INHALATION-MOUSE LC50; 25 GM/M3/2 HOURS INHALATION-RAT LC50; 4000 PPM/30 MINUTES INHALATION-HUMAN LCLO; 2000 PPM/5 MINUTES INHALATION-HUMAN LCLO; 2000 PPM/5 MINUTES INHALATION-MAMMAL LCLO; 186 MG/KG UNREPORTED-MAN LDLO; 3188 MG/KG ORAL-RAT LD50; 2780 MG/KG ORAL-MOUSE LD50; 2550 MG/KG ORAL-RABBIT LD50; 2125 MG/KG ORAL-GUINEA PIG LD50; 400 MG/KG INTRAPERITONEAL-GUINEA PIG LDLO; MUTAGENIC DATA (RTECS); REPRODUCTIVE EFFECTS DATA (RTECS). CARCINOGEN STATUS: NONE.

LOCAL EFFECTS: IRRITANT- EYE, SKIN, INHALATION.

ACUTE TOXICITY LEVEL: MODERATELY TOXIC BY INHALATION AND INGESTION.

TARGET EFFECTS: CENTRAL NERVOUS SYSTEM DEPRESSANT; NEUROTOXIN. POISONING MAY ALSO AFFECT THE HEART, LIVER, KIDNEYS, AND BRAIN.

AT INCREASED RISK FROM EXPOSURE: PERSONS WITH CENTRAL NERVOUS SYSTEM, PERIPHERAL NERVOUS SYSTEM, EYE, CARDIOVASCULAR, KIDNEY OR LIVER DISTURBANCES.

ADDITIONAL DATA: MAY CROSS THE PLACENTA. ALCOHOL MAY ENHANCE THE TOXIC EFFECTS.

HEALTH EFFECTS AND FIRST AID

INHALATION:

CARBON DISULFIDE:

IRRITANT/NARCOTIC/NEUROTOXIN.

500 PPM IMMEDIATELY DANGEROUS TO LIFE OR HEALTH.

ACUTE EXPOSURE- MAY CAUSE IRRITATION AND TRACHEOBRONCHITIS WITH SORE THROAT AND CHEST PAIN. THE CENTRAL AND PERIPHERAL NERVOUS SYSTEMS MAY BE AFFECTED AT THE SAME TIME. EXPOSURE TO 160-230 PPM PRODUCED NO ACUTE SYMPTOMS IN MAN; 320-390 PPM WAS BEARABLE FOR SEVERAL HOURS WITH HEADACHES AND UNPLEASANT FEELING APPEARING AFTER 8 HOURS; 1150 PPM PRODUCED GIDDINESS; 2000-3200 PPM PRODUCED LIGHT INTOXICATION, PARESTHESIAS, AND IRREGULAR BREATHING WITHIN 30-60 MINUTES; AND 4800 PPM WAS LETHAL AFTER 30 MINUTES. EXPOSURE TO HIGHER CONCENTRATIONS MAY RESULT IN DEEP UNCONSCIOUSNESS AND LACK OF CORNEAL AND TENDON REFLEXES AFTER SEVERAL BREATHS. DEATH MAY BE DUE TO RESPIRATORY PARALYSIS AND MAY OCCUR DURING COMA, OR AFTER A CONVULSION. NON-FATAL EXPOSURES MAY RESULT IN LATE SEQUELAE INCLUDING MOTOR AGITATION, DISORIENTATION, PSYCHIC DISTURBANCES, NARCOSIS, DELIRIUM, AREFLEXIA, MYDRIASIS, AND PERMANENT DAMAGE TO THE CENTRAL AND PERIPHERAL NERVOUS SYSTEMS.

CHRONIC EXPOSURE- PROLONGED OR REPEATED EXPOSURE MAY CAUSE NEUROLOGIC EFFECTS INCLUDING HEADACHE, APPREHENSION, LETHARGY, SLEEPINESS, HEARING AND POSITION SENSE LOSS, PARESTHESIAS, MUSCLE PAIN, TREMORS, ATAXIA, STAGGERING GAIT, WEAKNESS, LOSS OF LOWER EXTREMITY REFLEXES, AND PARALYSIS. RETROBULAR NEURITIS MAY OCCUR AND BE CHARACTERIZED BY CENTRAL SCOTOMA, DECREASED VISUAL ACUITY, IMPAIRED RECOGNITION OF RED AND GREEN, OPTIC NERVE ATROPHY, NYSTAGMUS, DIPLOPIA, AND DISTURBED PUPILLARY REACTION TO LIGHT. A DECREASE IN CORNEAL REFLEX MAY BE AN EARLY INDICATION OF CHRONIC INTOXICATION. CONCENTRATIONS AS LOW AS 20 PPM HAVE BEEN SHOWN TO PRODUCE NEUROLOGIC DAMAGE. WOMEN MAY BE MORE SENSITIVE TO THE NEUROTOXIC EFFECTS THAN MEN. PSYCHIATRIC SYMPTOMS MAY INCLUDE MEMORY LOSS, BAD DREAMS LEADING TO INSOMNIA, MENTAL DETERIORATION, ACOUSTICAL AND VISUAL HALLUCINATIONS, AND RAPID MOOD CHANGES RANGING FROM IRRITABILITY TO MANIC-DEPRESSIVE PSYCHOSES, ESPECIALLY MANIACAL. SUICIDAL TENDENCIES HAVE ALSO BEEN REPORTED. FUNCTIONAL MODIFICATIONS IN MUSCULAR AND NERVOUS SYSTEMS HAVE BEEN REPORTED FOLLOWING EXPOSURE TO 1-10 PPM/9 MONTHS. LIVER DAMAGE MAY BE INDICATED BY PALPABLE, TENDER LIVER AND MINOR DERANGEMENTS OF LIVER FUNCTION. INTERFERENCE WITH TRACE MINERALS AND INHIBITION OF ENZYME SYSTEMS MAY RESULT FROM LONG-TERM EXPOSURES. CHOLESTEROL AND LIPID SUBSTANCES MAY ACCUMULATE IN VESSEL WALLS AND STIMULATE ATHEROSCLEROSIS, WHICH MAY AFFECT THE BRAIN, KIDNEY, HEART, AND RETINAL VESSELS. SIGNS OF ATHEROSCLEROSIS WITH HYPERTENSION HAVE BEEN REPORTED TO OCCUR AT 7-20 PPM, AND DIABETOGENIC CHANGES AT 20 PPM. VASCULAR ENCEPHALOPATHY HAS BEEN REPORTED TO OCCUR AT 10-482 PPM. SECONDARY NEUROLOGIC AND NEUROPSYCHOLOGIC EFFECTS MAY OCCUR DUE TO THE ENCEPHALOPATHY. CHRONIC RENAL DYSFUNCTION MAY OCCUR FROM LONG-TERM EXPOSURE TO CONCENTRATIONS THAT ARE NOT INTENSE ENOUGH TO INDUCE NEUROLOGIC DEFICIENCIES. ANGINA PECTORIS, HYPERTENSION, ARRHYTHMIAS, AND ECG CHANGES CONSISTENT WITH ISCHEMIA HAVE BEEN REPORTED IN WORKERS, AS WELL AS AN INCREASED MORTALITY FROM CORONARY HEART DISEASE. GASTRIC OR DUODENAL ULCERS MAY ALSO BE EVIDENT. PERIODONTIC CHANGES HAVE BEEN REPORTED TO OCCUR AT 6-22 PPM. PATHOLOGIC FINDINGS INCLUDE DEGENERATION OF THE GREY MATTER IN THE BRAIN AND CEREBELLUM, CHANGES IN THE PONS AND SPINAL CORD, DEGENERATIVE CHANGES IN PERIPHERAL NERVES AND SHEATHS, AND ATROPHY, HYPERTROPHY, AND HYALIN DEGENERATION OF MUSCLE FIBERS. DISTURBANCES OF SEXUAL DYNAMICS INCLUDING LOSS OF LIBIDO AND IMPOTENCE, AND EFFECTS ON SPERM HAVE BEEN REPORTED IN WORKERS EXPOSED TO 13-26 PPM WITH PEAKS UP TO 250 PPM. EXPOSURE TO 3 PPM HAS PRODUCED MENSTRUAL AND OVARIAN FUNCTION DISORDERS IN WOMEN, AND AN INCREASED RISK OF SPONTANEOUS ABORTION AROUND 9 PPM. THE OCCURRENCE OF IRREGULAR MENSES INCREASED WITH THE LENGTH OF EXPOSURE. REPRODUCTIVE EFFECTS HAVE ALSO BEEN REPORTED IN ANIMALS.

FIRST AID- REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. MAINTAIN AIRWAY AND BLOOD PRESSURE AND ADMINISTER OXYGEN IF AVAILABLE. KEEP AFFECTED PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. ADMINISTRATION OF OXYGEN SHOULD BE PERFORMED BY QUALIFIED PERSONNEL. GET MEDICAL ATTENTION IMMEDIATELY.

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SKIN CONTACT:

CARBON DISULFIDE:

IRRITANT/NARCOTIC/NEUROTOXIN.

ACUTE EXPOSURE- CONTACT WITH CONCENTRATED SOLUTIONS OF CARBON DISULFIDE MAY CAUSE BURNING PAIN, ERYTHEMA, AND EXFOLIATION. IF THE LIQUID REMAINS IN CONTACT WITH THE SKIN FOR SEVERAL MINUTES, SECOND DEGREE BURNS MAY RESULT. UNDER SOME CONDITIONS CARBON DISULFIDE MAY BE DIRECTLY TOXIC TO CUTANEOUS NERVES. IT MAY BE ABSORBED THROUGH INTACT SKIN TO CAUSE A VARIETY OF SYSTEMIC EFFECTS AS DETAILED IN ACUTE INHALATION.

CHRONIC EXPOSURE- PROLONGED OR REPEATED EXPOSURE MAY CAUSE DERMATITIS, AND POSSIBLY NEUROLOGIC AND PSYCHIATRIC DISORDERS, RETROBULAR NEURITIS, ENZYME INHIBITION, AND HEART, LIVER AND KIDNEY DAMAGE. REPRODUCTIVE EFFECTS HAVE BEEN REPORTED IN ANIMALS.

FIRST AID- REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT:

CARBON DISULFIDE:

IRRITANT.

ACUTE EXPOSURE- EXPOSURE TO VAPORS MAY CAUSE IRRITATION, AND DIRECT CONTACT WITH THE LIQUID MAY CAUSE REDNESS, PAIN AND BLURRED VISION.

CHRONIC EXPOSURE- PROLONGED OR REPEATED CONTACT MAY CAUSE CONJUNCTIVITIS.

FIRST AID- WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE. OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:

CARBON DISULFIDE:

NARCOTIC/NEUROTOXIN.

ACUTE EXPOSURE- INGESTION OF SMALL AMOUNTS MAY CAUSE NUMBNESS OF THE LIPS, NAUSEA, VOMITING, DYSPNEA, DIZZINESS, SPASMODIC TREMOR, HYPERACTIVE TENDON REFLEXES, HYPERSTHESIA, CARDIAC ARRHYTHMIAS, HALLUCINATIONS, PROSTRATION, PERIPHERAL VASCULAR COLLAPSE, HYPOTHERMIA, CYANOSIS, MYDRIASIS, CONVULSIONS, COMA, AND DEATH IN A FEW HOURS FROM RESPIRATORY PARALYSIS. PATHOLOGIC FINDINGS INCLUDE MILD GASTROINTESTINAL IRRITATION AND VISCERAL CONGESTION. NON-FATAL EXPOSURES MAY RESULT IN LATE SEQUELAE INCLUDING MOTOR AGITATION, DISORIENTATION, PSYCHIC DISTURBANCES, NARCOSIS, DELIRIUM, AREFLEXIA, MYDRIASIS, AND PERMANENT DAMAGE TO THE CENTRAL AND PERIPHERAL NERVOUS SYSTEMS.

CHRONIC EXPOSURE- PROLONGED OR REPEATED INGESTION IS NOT LIKELY TO OCCUR BUT MAY RESULT IN NEUROLOGIC AND PSYCHIATRIC DISORDERS, RETROBULAR NEURITIS, ENZYME INHIBITION, AND HEART, LIVER AND KIDNEY DAMAGE. REPRODUCTIVE EFFECTS HAVE BEEN REPORTED IN ANIMALS.

FIRST AID- REMOVE BY GASTRIC LAVAGE OR EMESIS. MAINTAIN BLOOD PRESSURE AND AIRWAY. GIVE OXYGEN IF RESPIRATION IS DEPRESSED. DO NOT PERFORM GASTRIC LAVAGE OR EMESIS IF VICTIM IS UNCONSCIOUS. GET MEDICAL ATTENTION IMMEDIATELY (DREIBACH, HANDBOOK OF POISONING, 12TH ED.). ADMINISTRATION OF GASTRIC LAVAGE OR OXYGEN SHOULD BE PERFORMED BY QUALIFIED MEDICAL PERSONNEL.

ANTIDOTE:

THE FOLLOWING ANTIDOTE HAS BEEN RECOMMENDED. HOWEVER, THE DECISION AS TO WHETHER THE SEVERITY OF POISONING REQUIRES ADMINISTRATION OF ANY ANTIDOTE AND ACTUAL DOSE REQUIRED SHOULD BE MADE BY QUALIFIED MEDICAL PERSONNEL.

FOR SULFIDE AND MERCAPTAN POISONING:

IN SEVERE POISONINGS TREAT WITH AMYL NITRITE (AMYL NITRITE PERLES) BY INHALATION FOR 15 TO 30 SECONDS OF EVERY MINUTE, WHILE SODIUM NITRITE SOLUTION IS BEING PREPARED. DISCONTINUE AMYL NITRITE AND IMMEDIATELY INJECT 10 ML OF A 3% SOLUTION SODIUM NITRITE INTRAVENOUSLY OVER A PERIOD OF 2 TO 4 MINUTES. IF NECESSARY, INJECT A NON-STERILE SOLUTION. DO NOT REMOVE THE NEEDLE.

CAUTION: APPROPRIATE ADJUSTMENTS IN THE DOSE SHOULD BE MADE ON A BODY WEIGHT BASIS. OXYGEN THERAPY MAY BE OF VALUE IN COMBINATION WITH NITRITE THERAPY (GOSSELIN, SMITH, HODGE, CLINICAL TOXICOLOGY OF COMMERCIAL PRODUCTS, 5TH ED.). PYRIDOXINE, 25 MG/KG INTRAVENOUSLY, OR 10% UREA, 1 GM/KG INTRAVENOUSLY, HAS BEEN SUGGESTED AS A SULFIDE ACCEPTOR (DREIBACH, HANDBOOK OF POISONING, 12TH ED.). ANTIDOTE SHOULD BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL. GET MEDICAL ATTENTION IMMEDIATELY.

REACTIVITY

REACTIVITY:

STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.

INCOMPATIBILITIES:

CARBON DISULFIDE:

ALUMINUM (POWDERED): IGNITES IN THE VAPOR.

AZIDES: PRODUCES VIOLENTLY EXPLOSIVE, EXTREMELY SENSITIVE SALTS.

CHLORINE (LIQUID): EXPLOSIVE REACTION IN THE PRESENCE OF IRON.

CHLORINE MONOXIDE: EXPLODES ON CONTACT WITH VAPOR.

ETHYLENE DIAMINE: TEMPERATURE AND PRESSURE INCREASE IN CLOSED CONTAINER.

ETHYLENEIMINE: TEMPERATURE AND PRESSURE INCREASE IN CLOSED CONTAINER.

FLUORINE: IGNITION.

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IRON OXIDES (RUST): MAY IGNITE MIXTURES WITH AIR.
 NITRIC OXIDE: VIOLENT EXPLOSION.
 NITROGEN DIOXIDE (NITROGEN TETROXIDE): FORMS EXPLOSIVE COMPOUNDS.
 OXIDIZERS (STRONG): FIRE AND EXPLOSION HAZARD.
 PERMANGANATES + SULFURIC ACID: MAY EXPLODE ON CONTACT.
 PHENYLCOPPER-TRIPHENYLPHOSPHINE COMPLEXES: VIOLENT EXOTHERMIC REACTION.
 PLASTICS, RUBBER, AND COATINGS: MAY BE ATTACKED.
 POTASSIUM: FORMS SHOCK-SENSITIVE MIXTURE.
 POTASSIUM-SODIUM ALLOY: VIOLENTLY EXPLOSIVE, SHOCK-SENSITIVE MIXTURE.
 SODIUM: FORMS SHOCK-SENSITIVE MIXTURE.
 ZINC: INCANDESCENT REACTION.

DECOMPOSITION:
 THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE TOXIC OXIDES OF SULFUR AND CARBON.

POLYMERIZATION:
 HAZARDOUS POLYMERIZATION HAS NOT BEEN REPORTED TO OCCUR UNDER NORMAL TEMPERATURES AND PRESSURES.

 STORAGE AND DISPOSAL

OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE.

STORAGE

STORE IN ACCORDANCE WITH 29 CFR 1910.106.

PROTECT AGAINST PHYSICAL DAMAGE. STORE WELL DETACHED AND ISOLATED FROM OTHER BUILDINGS, OTHER MATERIALS AND POSSIBLE SOURCES OF IGNITION, PREFERABLY IN A BUILDING OF NONCOMBUSTIBLE OR BETTER CONSTRUCTION WITH FLOOR LEVEL VENTILATION. AVOID DIRECT SUNLIGHT DURING HOT WEATHER. SPRAY DRUMS WITH WATER TO KEEP VAPOR PRESSURE DOWN. TANKS SHOULD BE SUBMERGED IN WATER OR LOCATED OVER CONCRETE BASINS CONTAINING WATER OF SUFFICIENT CAPACITY TO HOLD ALL OF THE TANK CONTENTS IN ADDITION TO THE WATER. WATER OR INERT GAS SHOULD BE PROVIDED OVER THE CARBON DISULFIDE IN ALL TANKS. NO ELECTRICAL INSTALLATIONS OR HEATING FACILITIES SHOULD BE PERMITTED IN OR NEAR STORAGE AREA. PROTECT AGAINST LIGHTNING AND STATIC ELECTRICITY (NFPA 49, HAZARDOUS CHEMICALS DATA, 1975).

BONDING AND GROUNDING: SUBSTANCES WITH LOW ELECTROCONDUCTIVITY, WHICH MAY BE IGNITED BY ELECTROSTATIC SPARKS, SHOULD BE STORED IN CONTAINERS WHICH MEET THE BONDING AND GROUNDING GUIDELINES SPECIFIED IN NFPA 77-1983, RECOMMENDED PRACTICE ON STATIC ELECTRICITY.

STORE AWAY FROM INCOMPATIBLE SUBSTANCES.

THRESHOLD PLANNING QUANTITY (TPQ):
 THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) SECTION 302 REQUIRES THAT EACH FACILITY WHERE ANY EXTREMELY HAZARDOUS SUBSTANCE IS PRESENT IN A QUANTITY EQUAL TO OR GREATER THAN THE TPQ ESTABLISHED FOR THAT SUBSTANCE NOTIFY THE STATE EMERGENCY RESPONSE COMMISSION FOR THE STATE IN WHICH IT IS LOCATED. SECTION 303 OF SARA REQUIRES THESE FACILITIES TO PARTICIPATE IN LOCAL EMERGENCY RESPONSE PLANNING (40 CFR 355.30).

DISPOSAL

DISPOSAL MUST BE IN ACCORDANCE WITH STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE, 40CFR 262. EPA HAZARDOUS WASTE NUMBER P022.

 CONDITIONS TO AVOID

AVOID CONTACT WITH HEAT, SPARKS, FLAMES OR OTHER IGNITION SOURCES. VAPORS MAY BE EXPLOSIVE. MATERIAL IS POISONOUS; AVOID INHALATION OF VAPORS OR CONTACT WITH SKIN. DO NOT ALLOW MATERIAL TO CONTAMINATE WATER SOURCES.

 SPILL AND LEAK PROCEDURES

SOIL SPILL:
 DIG A HOLDING AREA SUCH AS A PIT, POND OR LAGOON TO CONTAIN SPILL AND DIKE SURFACE FLOW USING BARRIER OF SOIL, SANDBAGS, FOAMED POLYURETHANE OR FOAMED CONCRETE. ABSORB LIQUID MASS WITH FLY ASH OR CEMENT POWDER.

DIMINISH VAPOR AND FIRE HAZARD BY APPLICATION OF APPROPRIATE FOAM.

AIR SPILL:
 KNOCK DOWN VAPORS WITH WATER SPRAY. KEEP UPWIND.

COMBUSTION PRODUCTS INCLUDE CORROSIVE OR TOXIC VAPORS.

WATER SPILL:
 NEUTRALIZE WITH AGRICULTURAL LIME, SLAKED LIME, CRUSHED LIMESTONE, OR SODIUM BICARBONATE.

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IF DISSOLVED, AT A CONCENTRATION OF 10 PPM OR GREATER, APPLY ACTIVATED CARBON AT TEN TIMES THE AMOUNT THAT HAS BEEN SPILLED.

USE MECHANICAL DREDGES OR LIFTS TO EXTRACT IMMOBILIZED MASSES OF POLLUTION AND PRECIPITATES.

THE CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (PROPOSITION 65) PROHIBITS CONTAMINATING ANY KNOWN SOURCE OF DRINKING WATER WITH SUBSTANCES KNOWN TO CAUSE CANCER AND/OR REPRODUCTIVE TOXICITY.

OCCUPATIONAL SPILL:
 SHUT OFF IGNITION SOURCES. DO NOT TOUCH SPILLED MATERIAL. STOP LEAK IF YOU CAN DO IT WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER ABSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR LATER DISPOSAL. FOR LARGER SPILLS, DIKE FAR AHEAD OF SPILL FOR LATER DISPOSAL. NO SMOKING, FLAMES OR FLARES IN HAZARD AREA! KEEP UNNECESSARY PEOPLE AWAY; ISOLATE HAZARD AREA AND DENY ENTRY.

REPORTABLE QUANTITY (RQ): 100 POUNDS
 THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) SECTION 304 REQUIRES THAT A RELEASE EQUAL TO OR GREATER THAN THE REPORTABLE QUANTITY FOR THIS SUBSTANCE BE IMMEDIATELY REPORTED TO THE LOCAL EMERGENCY PLANNING COMMITTEE AND THE STATE EMERGENCY RESPONSE COMMISSION (40 CFR 355.40). IF THE RELEASE OF THIS SUBSTANCE IS REPORTABLE UNDER CERCLA SECTION 103, THE NATIONAL RESPONSE CENTER MUST BE NOTIFIED IMMEDIATELY AT (800) 424-8802 OR (202) 426-2675 IN THE METROPOLITAN WASHINGTON, D.C. AREA (40 CFR 302.6).

 PROTECTIVE EQUIPMENT

VENTILATION:
 PROVIDE LOCAL EXHAUST VENTILATION TO MEET PUBLISHED EXPOSURE LIMITS.
 VENTILATION EQUIPMENT MUST BE EXPLOSION-PROOF.

RESPIRATOR:
 THE FOLLOWING RESPIRATORS AND MAXIMUM USE CONCENTRATIONS ARE RECOMMENDATIONS BY THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, NIOSH POCKET GUIDE TO CHEMICAL HAZARDS; NIOSH CRITERIA DOCUMENTS OR BY THE U.S. DEPARTMENT OF LABOR, 29 CFR 1910 SUBPART Z.
 THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAMINATION LEVELS FOUND IN THE WORK PLACE, MUST NOT EXCEED THE WORKING LIMITS OF THE RESPIRATOR AND BE JOINTLY APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH AND THE MINE SAFETY AND HEALTH ADMINISTRATION (NIOSH-MSHA).

CARBON DISULFIDE:

10 PPM- ANY CHEMICAL CARTRIDGE RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE(S).
 ANY SUPPLIED-AIR RESPIRATOR.
 ANY SELF-CONTAINED BREATHING APPARATUS.

25 PPM- ANY SUPPLIED-AIR RESPIRATOR OPERATED IN A CONTINUOUS-FLOW MODE.
 ANY POWERED, AIR-PURIFYING RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE.

50 PPM- ANY CHEMICAL CARTRIDGE RESPIRATOR WITH A FULL FACEPIECE AND ORGANIC VAPOR CARTRIDGE(S).
 ANY POWERED, AIR-PURIFYING RESPIRATOR WITH TIGHT-FITTING FACEPIECE ORGANIC VAPOR CARTRIDGE(S).
 ANY AIR-PURIFYING, FULL-FACEPIECE RESPIRATOR (GAS MASK) WITH A CHIN-STYLE, FRONT- OR BACK-MOUNTED ORGANIC VAPOR CANISTER.
 ANY SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE.
 ANY SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE.

500 PPM- ANY SUPPLIED-AIR RESPIRATOR OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

ESCAPE- ANY AIR-PURIFYING, FULL-FACEPIECE RESPIRATOR (GAS MASK) WITH A CHIN-STYLE, FRONT- OR BACK-MOUNTED ORGANIC VAPOR CANISTER.
 ANY APPROPRIATE ESCAPE-TYPE, SELF-CONTAINED BREATHING APPARATUS.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

ANY SELF-CONTAINED BREATHING APPARATUS THAT HAS A FULL FACEPIECE AND IS OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE.

ANY SUPPLIED-AIR RESPIRATOR THAT HAS A FULL FACEPIECE AND IS OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE IN COMBINATION WITH AN AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE.

CLOTHING:
 EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE (IMPERVIOUS) CLOTHING AND EQUIPMENT TO PREVENT ANY POSSIBILITY OF SKIN CONTACT WITH THIS SUBSTANCE.

GLOVES:
 EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT CONTACT WITH THIS SUBSTANCE.

EYE PROTECTION:
 EMPLOYEE MUST WEAR SPLASH-PROOF OR DUST-RESISTANT SAFETY GOGGLES AND A FACESHIELD TO PREVENT CONTACT WITH THIS SUBSTANCE.

DATE: 08/14/93

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PO NBR: N/A

EMERGENCY WASH FACILITIES:
WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES AND/OR SKIN MAY BE
EXPOSED TO THIS SUBSTANCE, THE EMPLOYER SHOULD PROVIDE AN EYE WASH FOUNTAIN
AND QUICK DRENCH SHOWER WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

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