

\*\*\*TOLUENE\*\*\*

PAGE 01 OF 05

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MATERIAL SAFETY DATA SHEET  
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FISHER SCIENTIFIC  
CHEMICAL DIVISION  
1 REAGENT LANE  
FAIR LAWN NJ 07410  
(201) 796-7100

EMERGENCY CONTACTS:  
GASTON L. PILLORI: (201) 796-7100  
AFTER BUSINESS HOURS; HOLIDAYS:  
(201) 796-7523  
CHEMTREC ASSISTANCE: (800) 429-9300

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SUBSTANCE IDENTIFICATION  
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CAS-NUMBER 108-88-3

SUBSTANCE: \*\*\*TOLUENE\*\*\*

TRADE NAMES/SYNONYMS:  
BENZENE, METHYL-, METHYLBENZENE; TOLUOL; METHYLBENZOL; PHENYLMETHANE;  
METHACIDE; STCC +909305; RCRA U220; UN 1294;  
T290; T289; T330; T324; T324-S; T324-SK; T323; T232-S; C7H8;

CHEMICAL FAMILY:  
HYDROCARBON, AROMATIC

MOLECULAR FORMULA: C6-H5-C-H3

MOLECULAR WEIGHT: 92.14

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=3 REACTIVITY=0 PERSISTENCE=1  
NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=3 REACTIVITY=0  
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COMPONENTS AND CONTAMINANTS

COMPONENT: TOLUENE

PERCENT: 100.0

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:

TOLUENE:  
100 PPM (375 MG/M3) OSHA TWA; 150 PPM (560 MG/M3) OSHA STEL  
100 PPM (375 MG/M3) ACGIH TWA; 150 PPM (560 MG/M3) ACGIH STEL  
100 PPM NIOSH RECOMMENDED TWA; 200 PPM NIOSH RECOMMENDED 10 MINUTE CEILING

1000 POUNDS CERCLA SECTION 103 REPORTABLE QUANTITY  
SUBJECT TO SARA SECTION 313 ANNUAL TOXIC CHEMICAL RELEASE REPORTING  
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PHYSICAL DATA

DESCRIPTION: CLEAR, COLORLESS LIQUID WITH AN AROMATIC ODOR.

BOILING POINT: 231 F (111 C) MELTING POINT: -139 F (-95 C)

SPECIFIC GRAVITY: 0.8667 VOLATILITY: 100% VAPOR PRESSURE: 22 MMHG @ 20 C

EVAPORATION RATE: (BUTYL ACETATE=1) 2.24 SOLUBILITY IN WATER: 0.05% @ 20 C

ODOR THRESHOLD: 10-15 PPM VAPOR DENSITY: 3.14

SOLVENT SOLUBILITY: SOLUBLE IN ALCOHOL, ETHER, BENZENE, PETROLEUM ETHER,  
CHLOROFORM, GLACIAL ACETIC ACID, CARBON DISULFIDE.  
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FIRE AND EXPLOSION DATA

FIRE AND EXPLOSION HAZARD:  
DANGEROUS FIRE 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: 40 F (4 C) (CC) UPPER EXPLOSIVE LIMIT: 7.1%

LOWER EXPLOSIVE LIMIT: 1.2% AUTOIGNITION TEMP.: 896 F (480 C)

FLAMMABILITY CLASS(OSHA): IB

FIREFIGHTING MEDIA:  
DRY CHEMICAL, CARBON DIOXIDE, HALON, WATER SPRAY OR STANDARD FOAM  
(1987 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.4).

FOR LARGER FIRES, USE WATER SPRAY, FOG OR STANDARD FOAM

**FIREFIGHTING:**  
MOVE CONTAINER FROM FIRE AREA IF POSSIBLE. COOL FIRE-EXPOSED CONTAINERS WITH WATER FROM SIDE UNTIL WELL AFTER FIRE IS OUT. STAY AWAY FROM STORAGE TANK ENDS. FOR MASSIVE FIRE IN STORAGE AREA, USE UNMANNED HOSE HOLDER OR MONITOR NOZZLES, ELSE WITHDRAW FROM AREA AND LET FIRE BURN. WITHDRAW IMMEDIATELY IN CASE OF RISING SOUND FROM VENTING SAFETY DEVICE OR ANY DISCOLORATION OF STORAGE TANK DUE TO FIRE (1987 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.4, GUIDE PAGE 27).

EXTINGUISH ONLY IF FLOW CAN BE STOPPED; USE WATER IN FLOODING QUANTITIES AS FOG, SOLID STREAMS MAY SPREAD FIRE. COOL CONTAINERS WITH FLOODING AMOUNTS OF WATER, APPLY FROM AS FAR A DISTANCE AS POSSIBLE. AVOID BREATHING TOXIC VAPORS, KEEP UPWIND.

WATER MAY BE INEFFECTIVE (NFPA FIRE PROTECTION GUIDE ON HAZARDOUS MATERIALS, EIGHTH EDITION).

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**TRANSPORTATION DATA**

DEPARTMENT OF TRANSPORTATION HAZARD CLASSIFICATION 49CFR172.101:  
FLAMMABLE LIQUID

DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS 49CFR172.101 AND 172.402:  
FLAMMABLE LIQUID

DEPARTMENT OF TRANSPORTATION PACKAGING REQUIREMENTS: 49CFR173.119  
EXCEPTIONS: 49CFR173.118

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**TOXICITY**

**TOLUENE:**  
IRRITATION DATA: 300 PPM EYE-HUMAN; 870 UG EYE-RABBIT MILD; 2 MG/24 HOURS EYE-RABBIT SEVERE; 100 MG/ 30 SECONDS RINSED EYE-RABBIT MILD; 435 MG SKIN-RABBIT MILD; 500 MG SKIN-RABBIT MODERATE; 20 MG/24 HOURS SKIN-RABBIT MODERATE.

TOXICITY DATA: 200 PPM INHALATION-HUMAN TCLO; 100 PPM INHALATION-MAN TCLO; 4000 PPM/4 HOURS INHALATION-RAT LCLO; 5320 PPM/8 HOURS INHALATION-MOUSE LC50; 1600 PPM INHALATION-GUINEA PIG LCLO; 12124 MG/KG SKIN-RABBIT LD50; 50 MG/KG ORAL-HUMAN LDLO; 5000 MG/KG ORAL-RAT LD50; 2250 MG/KG SUBCUTANEOUS-MOUSE LD50; 1960 MG/KG INTRAVENOUS-RAT LD50; 1332 MG/KG INTRAPERITONEAL-RAT LD50; 1126 MG/KG INTRAPERITONEAL-MOUSE LD50; 6900 MG/KG UNREPORTED-RAT LD50; 2000 MG/KG UNREPORTED-MOUSE LD50; REPRODUCTIVE EFFECTS DATA (RTECS); MUTAGENIC DATA (RTECS).

CARCINOGEN STATUS: NONE.

LOCAL EFFECTS: IRRITANT- SKIN, EYE, INHALATION.

ACUTE TOXICITY LEVEL: MODERATELY TOXIC BY INHALATION, INGESTION; SLIGHTLY TOXIC BY DERMAL ABSORPTION.

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

AT INCREASED RISK FROM EXPOSURE- ASTHMATICS AND PERSONS WITH OTHER RESPIRATORY DIFFICULTIES OR CARDIOVASCULAR DISEASE, SMOKERS, AND CHRONIC ALCOHOL DRINKERS.

ADDITIONAL DATA: STIMULANTS SUCH AS EPINEPHRINE MAY INDUCE VENTRICULAR FIBRILLATION. TOLUENE INHIBITS MITOCHONDRIAL OXIDATIVE PHOSPHORYLATION. ALCOHOL MAY ENHANCE THE TOXIC EFFECTS.

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**HEALTH EFFECTS AND FIRST AID**

**INHALATION:**

**TOLUENE:**

IRRITANT/NARCOTIC/NEUROTOXIN.

2000 PPM IMMEDIATELY DANGEROUS TO LIFE OR HEALTH.

ACUTE EXPOSURE- THE LEVEL REQUIRED TO PRODUCE NARCOSIS CAN EXIST WITHOUT ASSOCIATED RESPIRATORY TRACT IRRITATION. ODOR DETECTION IS INSUFFICIENT FOR WARNING DUE TO OLFACTORY FATIGUE. 200-600 PPM FOR UP TO 8 HOURS CAUSED MILD UPPER RESPIRATORY TRACT IRRITATION, FATIGUE, WEAKNESS, CONFUSION, HEADACHE, NAUSEA, IMPAIRED COORDINATION AND REACTION TIME, PARESTHESIAS OF THE SKIN, EUPHORIA, DIZZINESS, AND DILATED PUPILS. 800 PPM CAUSED RAPID IRRITATION, NASAL MUCOUS SECRETION, METALLIC TASTE, DROWSINESS, AND IMPAIRED BALANCE. AFTEREFFECTS INCLUDING NERVOUSNESS, MUSCULAR FATIGUE, AND INSOMNIA LASTED FOR SEVERAL DAYS. A WORKER FOUND UNCONSCIOUS AFTER EXPOSURE TO HIGH VAPOR CONCENTRATIONS FOR 18 HOURS DEVELOPED HEPATIC AND RENAL DAMAGE WITH MYOGLOBINURIA. RECOVERY WAS COMPLETE WITHIN 6 MONTHS. HEMATOLOGIC EFFECTS OCCUR RARELY WITH EXPOSURE TO HIGH CONCENTRATIONS. RECOVERY USUALLY FOLLOWS REMOVAL FROM EXPOSURE. EXTREME INHALATION MAY CAUSE DEATH BY PARALYSIS OF THE RESPIRATORY CENTER.

CHRONIC EXPOSURE- REPEATED OR PROLONGED EXPOSURE MAY CAUSE MUCOUS MEMBRANE IRRITATION, VOMITING, INSOMNIA, NOSEBLEEDS, CHEST PAIN, EUPHORIA, HEADACHE, VERTIGO, NAUSEA, ANOREXIA, BAD TASTE, MOMENTARY LOSS OF MEMORY, PALPITATIONS, EXTREME WEAKNESS, LOSS OF COORDINATION AND IMPAIRMENT OF REACTION TIME, TINNITUS, ALCOHOL INTOLERANCE, PETECHIAE AND ABNORMAL BLEEDING. SYSTEMIC OCULAR DISTURBANCES, SUCH AS "REDDENING OF THE VISION HAVE OCCURRED. LEUKOPENIA WITH BONE MARROW HYPOPLASIA HAS BEEN REPORTED OCCASIONALLY, BUT MAY BE DUE TO BENZENE CONTAMINATION. EXAMINATION OF WORKERS EXPOSED TO 100-1100 PPM REVEALED HEPATOMEGALY, MILD MACROCYTOSIS, MODERATE ERYTHROPENIA, AND ABSOLUTE LYMPHOCYTOSIS, BUT NO LEUKOPENIA. OTHER WORKERS EXPOSED TO TOLUENE FUMES DEVELOPED LEUKOPENIA AND ESPECIALLY NEUTROPENIA. WITHIN 6 MONTHS, THEY SHOWED INCREASED COAGULATION TIME AND DECREASED PROTHROMBIN LEVEL. PERIODONTAL EFFECTS WERE ALSO NOTED. CARDIAC SENSITIZATION MAY OCCUR AND MAY RESULT IN CARDIAC ARREST DUE TO VENTRICULAR FIBRILLATION. REPEATED INHALATION OF TOLUENE TO THE POINT OF EUPHORIA HAS CAUSED IRREVERSIBLE ENCEPHALOPATHY WITH CEREBELLAR ATAXIA.

**\*\*TOLUENE\*\***

RHYTHMIC LIMB MOVEMENTS, UNSTEADINESS, BIZZARE BEHAVIOR, EMOTIONAL LABILITY AND OPTIC ATROPHY, AND DIFFUSE CEREBRAL ATROPHY. OTHER NEUROPSYCHIATRIC EFFECTS MAY INCLUDE LETHARGY, HALLUCINATIONS, COMA, DIZZINESS, SYNCOPE, PARESTHESIAS, AND PERIPHERAL NEUROPATHY. INTENTIONAL SNIFFING CAN PRODUCE RENAL TUBULAR DEFECTS WITH METABOLIC ACIDOSIS, ELECTROLYTE ABNORMALITIES AND POTASSIUM LOSS. SEVERE MUSCLE WEAKNESS LEADING TO LIMB PARALYSIS AND CARDIAC ARRHYTHMIAS MAY RESULT FROM THE HYPOKALEMIA; HOWEVER, SENSORY FUNCTION AND TENDON REFLEXES ARE NOT IMPAIRED. GASTROINTESTINAL EFFECTS MAY INCLUDE ABDOMINAL PAIN, NAUSEA, VOMITING, AND HEMATEMESIS. CHROMOSOME CHANGES WERE OBSERVED IN SOME WORKERS UP TO TWO YEARS AFTER CESSATION OF EXPOSURE TO TOLUENE. WOMEN OCCUPATIONALLY EXPOSED TO TOLUENE AND OTHER VARNISH SOLVENTS HAVE REPORTED MENSTRUAL DISORDERS, UNDERWEIGHT OFFSPRING WHO DID NOT NURSE WELL, AND FETAL ASPHYXIA. DYSMENORRHEA HAS BEEN REPORTED IN WOMEN OCCUPATIONALLY EXPOSED TO TOLUENE LEVELS OF 60-100 PPM. REPRODUCTIVE EFFECTS HAVE BEEN REPORTED IN ANIMALS.

FIRST AID- REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY.

**SKIN CONTACT:**

TOLUENE:

IRRITANT.

ACUTE EXPOSURE- CONTACT WITH THE LIQUID MAY CAUSE IRRITATION, SCALING, CRACKING AND DERMATITIS. SKIN ABSORPTION DOES OCCUR, BUT IT IS GENERALLY TOO SLOW TO PRODUCE SIGNS OF ACUTE SYSTEMIC TOXICITY. PARESTHESIAS OF THE SKIN MAY OCCUR FROM VAPOR EXPOSURE.

CHRONIC EXPOSURE- REPEATED OR PROLONGED CONTACT WITH THE LIQUID MAY CAUSE DEFATTING OF THE SKIN, RESULTING IN A DRY, FISSURED DERMATITIS. TEN TO TWENTY APPLICATIONS TO RABBIT SKIN PRODUCED SLIGHT TO MODERATE IRRITATION AND SLIGHT NECROSIS.

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:**

TOLUENE:

IRRITANT.

ACUTE EXPOSURE- CONTACT WITH THE LIQUID MAY CAUSE CORNEAL BURNS IF NOT PROMPTLY REMOVED. VAPORS MAY CAUSE NOTICABLE IRRITATION AND LACRIMATION AT 300-800 PPM, AND EXTREMELY HIGH CONCENTRATIONS MAY CAUSE BLURRING OF VISION. CORNEAL LESIONS, VERY FINE VACUOLES, HAVE BEEN REPORTED IN WORKERS EXPOSED TO A SOLVENT MIXTURE CONTAINING TOLUENE. THE LESIONS SUBSIDED FOLLOWING SEVERAL DAYS OF NON-EXPOSURE. SIMILAR LESIONS HAVE BEEN PRODUCED IN CATS FOLLOWING EXPOSURE TO TOLUENE.

CHRONIC EXPOSURE- REPEATED OR PROLONGED CONTACT MAY CAUSE CONJUNCTIVITIS. RARELY, SYSTEMIC OCULAR DISTURBANCES, SUCH AS "REDDENING OF THE VISION", HAVE OCCURRED.

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:**

TOLUENE:

NARCOTIC.

ACUTE EXPOSURE- MAY CAUSE NAUSEA, VOMITING, COLIC, DIARRHEA, BURNING SENSATION IN THE EPIGASTRIUM, HEADACHE, TINNITUS, DIZZINESS, WEAKNESS, EUPHORIA, DROWSINESS AND INCOORDINATION. IF LARGE AMOUNTS ARE INGESTED, SYMPTOMS MAY PROGRESS TO INCLUDE SHALLOW, RAPID RESPIRATION, TREMORS, VENTRICULAR IRREGULARITIES WITH FIBRILLATION, CONVULSIONS, STUPOR AND UNCONSCIOUSNESS. METABOLIC ACIDOSIS AND LIVER AND KIDNEY DAMAGE MAY OCCUR. APPROXIMATELY 15-30 MILLILITERS IS THE HUMAN LETHAL DOSE. ASPIRATION OF THE LIQUID INTO THE LUNGS MAY CAUSE COUGHING, GAGGING, ACUTE HEMORRHAGIC PNEUMONITIS AND RAPIDLY PULMONARY EDEMA.

CHRONIC EXPOSURE- NO EFFECTS WERE REPORTED IN RATS FED UP TO 590 MG/KG/DAY FOR 193 DAYS. REPRODUCTIVE EFFECTS HAVE BEEN REPORTED IN ANIMALS.

FIRST AID- EXTREME CARE MUST BE USED TO PREVENT ASPIRATION. USE GASTRIC LAVAGE WITH ACTIVATED CHARCOAL AND A CUFFED ENDOTRACHEAL TUBE WITHIN 15 MINUTES. IN THE ABSENCE OF DEPRESSION OR CONVULSIONS OR IMPAIRED GAG REFLEX, IPECAC EMESIS CAN BE DONE. WHEN VOMITING BEGINS, KEEP HEAD BELOW THE HIPS TO PREVENT ASPIRATION. AFTER VOMITING STOPS, GIVE 30-60 MILLILITERS OF FLEET'S PHOSPHO-SODA DILUTED 1:4 IN WATER. MAINTAIN AIRWAY, BLOOD PRESSURE AND RESPIRATION. (DREISBACH, HANDBOOK OF POISONING, 11TH ED.) GET MEDICAL ATTENTION. TREATMENT MUST BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL.

**ANTIDOTE:**

NO SPECIFIC ANTIDOTE. TREAT SYMPTOMATICALLY AND SUPPORTIVELY.

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**REACTIVITY**

**REACTIVITY:**

STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.

**INCOMPATIBILITIES:**

TOLUENE:

ALLYL CHLORIDE + DICHLOROETHYL ALUMINUM OR ETHYLALUMINUM SESQUICHLORIDE: POSSIBLE EXPLOSION.

BROMINE TRIFLUORIDE (SOLID): VIOLENT REACTION.

1,3-DICHLORO-5,5-DIMETHYL-2,4-IMIDAZOLIDIDIONE: EXPLOSION REACTION.

DINITROGEN TETRAFLUORIDE: FORMS EXPLOSIVE MIXTURE.



**\*\*TOLUENE\*\***

NITRIC ACID: VIGOROUS REACTION.  
 NITRIC ACID + SULFURIC ACID: VIOLENT DECOMPOSITION POSSIBLE.  
 NITROGEN TETROXIDE: EXPLOSIVE REACTION.  
 OXIDIZERS (STRONG): FIRE AND EXPLOSION HAZARD.  
 PLASTICS, RUBBER, AND COATINGS: MAY BE ATTACKED.  
 SILVER PERCHLORATE: FORMS SHOCK-SENSITIVE MIXTURE.  
 SULFURIC ACID: EXOTHERMIC REACTION.  
 TETRANITROMETHANE: FORMS EXPLOSIVE MIXTURE.  
 URANIUM HEXAFLUORIDE: VIOLENT REACTION.

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

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

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**STORAGE AND DISPOSAL**

OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE. FOR ASSISTANCE, CONTACT THE DISTRICT DIRECTOR OF THE ENVIRONMENTAL PROTECTION AGENCY.

**\*\*STORAGE\*\***

STORE IN ACCORDANCE WITH 29 CFR 1910.106.

PROTECT AGAINST PHYSICAL DAMAGE. OUTSIDE OR DETACHED STORAGE IS PREFERABLE. INSIDE STORAGE SHOULD BE IN A STANDARD FLAMMABLE LIQUIDS STORAGE ROOM OR CABINET. SEPARATE FROM OXIDIZING MATERIALS (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.

**\*\*DISPOSAL\*\***

DISPOSAL MUST BE IN ACCORDANCE WITH STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE, 40CFR 262. EPA HAZARDOUS WASTE NUMBER U220

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 CONDITIONS TO AVOID

MAY BE IGNITED BY HEAT, SPARKS OR FLAMES. VAPORS MAY TRAVEL TO A SOURCE OF IGNITION AND FLASH BACK. CONTAINER MAY EXPLODE IN HEAT OF FIRE. VAPOR EXPLOSION HAZARD INDOORS, OUTDOORS OR IN SEWERS. RUNOFF TO SEWER MAY CREATE FIRE OR EXPLOSION HAZARD.

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 SPILL AND LEAK PROCEDURES

SOIL SPILL:  
 DIG HOLDING AREA SUCH AS LAGOON, POND OR PIT FOR CONTAINMENT.

DIKE FLOW OF SPILLED MATERIAL USING SOIL OR SANDBAGS OR FOAMED BARRIERS SUCH AS POLYURETHANE OR CONCRETE.

USE CEMENT POWDER OR FLY ASH TO ABSORB LIQUID MASS.

IMMOBILIZE SPILL WITH UNIVERSAL GELLING AGENT.

REDUCE VAPOR AND FIRE HAZARD WITH FLUOROCARBON WATER FOAM.

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

WATER SPILL:  
 LIMIT SPILL MOTION AND DISPERSION WITH NATURAL BARRIERS OR OIL SPILL CONTROL BOOMS.

APPLY DETERGENTS, SOAPS, ALCOHOLS OR ANOTHER SURFACE ACTIVE AGENT.

APPLY UNIVERSAL GELLING AGENT TO IMMOBILIZE TRAPPED SPILL AND INCREASE EFFICIENCY OF REMOVAL.

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

USE SUCTION HOSES TO REMOVE TRAPPED SPILL MATERIAL.

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

OCCUPATIONAL SPILL:  
 SHUT OFF IGNITION SOURCES. 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 RESTRICT ENTRY.

REPORTABLE QUANTITY (RQ): 1000 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).

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PROTECTIVE EQUIPMENT

VENTILATION:  
PROVIDE LOCAL EXHAUST OR GENERAL DILUTION 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 OR NIOSH CRITERIA DOCUMENTS, OR DEPARTMENT OF LABOR, 29CFR1910 SUBPART Z.  
THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAMINATION LEVELS FOUND IN THE WORK PLACE AND BE JOINTLY APPROVED BY THE NATIONAL INSTITUTE OF OCCUPATIONAL SAFETY AND HEALTH AND THE MINE SAFETY AND HEALTH ADMINISTRATION.

TOLUENE:  
1000 PPM- ANY CHEMICAL CARTRIDGE RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE(S).  
ANY SUPPLIED-AIR RESPIRATOR.  
ANY POWERED AIR-PURIFYING RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE(S).  
ANY SELF-CONTAINED BREATHING APPARATUS.

2000 PPM- ANY SUPPLIED-AIR RESPIRATOR OPERATED IN A CONTINUOUS FLOW MODE.  
ANY SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE.  
ANY SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE.  
ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR (GAS MASK) WITH A CHIN-STYLE OR FRONT OR BACK-MOUNTED ORGANIC VAPOR CANISTER.

ESCAPE- ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR (GAS MASK) WITH A CHIN-STYLE OR 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:

SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE.

SUPPLIED-AIR RESPIRATOR WITH FULL FACEPIECE AND OPERATED IN 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 REPEATED OR PROLONGED 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 TO PREVENT EYE CONTACT WITH THIS SUBSTANCE. CONTACT LENSES SHOULD NOT BE WORN.

AUTHORIZED - FISHER SCIENTIFIC GROUP, INC.  
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