

JUN 29 1992

ETHYLENE GLYCOL MONOMETHYL ETHER
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 MATERIAL SAFETY DATA SHEET

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 SUBSTANCE IDENTIFICATION

SUBSTANCE: **ETHYLENE GLYCOL MONOMETHYL ETHER**
 CAS-NUMBER 109-86-4

TRADE NAMES/SYNONYMS:

METHYL CELLOSOLVE; 2-METHOXYETHANOL; METHYL GLYCOL; GLYCOL MONOMETHYL ETHER;
 METHOXYHYDROXYETHANE; DOMANOL EM; POLY-SOLV EM; METHYL OXITOL;
 ETHYLENE GLYCOL METHYL ETHER; EGM; MECS; GLYCOLMETHYL ETHER; EGME; 2-ME;
 STCC 4913162; UN 1188; E-182; 0-3487; C3H8O2;

CHEMICAL FAMILY:
 GLYCOL ETHER

MOLECULAR FORMULA: H-O-C-H2-C-H2-O-C-H3

MOLECULAR WEIGHT: 76.10

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

 COMPONENTS AND CONTAMINANTS

COMPONENT: ETHYLENE GLYCOL MONOMETHYL ETHER PERCENT: 100
 CAS# 109-86-4

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:

ETHYLENE GLYCOL MONOMETHYL ETHER (METHYL CELLOSOLVE):
 25 PPM (80 MG/M3) OSHA TWA (SKIN)
 5 PPM (16 MG/M3) ACGIH TWA (SKIN)
 LOWEST FEASIBLE LIMIT NIOSH RECOMMENDED EXPOSURE CRITERIA
 5 PPM (16 MG/M3) DFG MAK TWA (SKIN);
 10 PPM (32 MG/M3) DFG MAK 30 MINUTE PEAK, AVERAGE VALUE, 4 TIMES/SHIFT

MEASUREMENT METHOD: CHARCOAL TUBE; METHANOL/METHYLENE CHLORIDE; GAS
 CHROMATOGRAPHY WITH FLAME IONIZATION DETECTION; (NIOSH VOL. III # 1403,
 ALCOHOLS IV).

SUBJECT TO SARA SECTION 313 ANNUAL TOXIC CHEMICAL RELEASE REPORTING

SUBJECT TO CALIFORNIA PROPOSITION 65 CANCER AND/OR REPRODUCTIVE TOXICITY
WARNING AND RELEASE REQUIREMENTS- (JANUARY 1, 1989)

PHYSICAL DATA

DESCRIPTION: CLEAR LIQUID WITH A MILD, PLEASANT ODOR.

BOILING POINT: 255 F (124 C) MELTING POINT: -121 F (-85 C)

SPECIFIC GRAVITY: 0.97 VAPOR PRESSURE: 6 MMHG @ 20 C

EVAPORATION RATE: (BU ACETATE=1) 0.5 SOLUBILITY IN WATER: MISCIBLE

ODOR THRESHOLD: 60 PPM VAPOR DENSITY: 2.6

SOLVENT SOLUBILITY: ALCOHOL, BENZENE, ETHER, GLYCERIN, ACETONE, DIMETHYL
FORMAMIDE

FIRE AND EXPLOSION DATA

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

VAPOR-AIR MIXTURES ARE EXPLOSIVE ABOVE FLASH POINT.

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

FLASH POINT: 102 F (39 C) (CC) UPPER EXPLOSIVE LIMIT: 24.5%

LOWER EXPLOSIVE LIMIT: 2.3% AUTOIGNITION TEMP.: 545 F (285 C)

FLAMMABILITY CLASS(OSHA): II

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).

ALCOHOL FOAM
(NFPA 325M, FIRE HAZARD PROPERTIES OF FLAMMABLE LIQUIDS, GASES, AND VOLATILE
SOLIDS, 1991).

FIREFIGHTING:
MOVE CONTAINER FROM FIRE AREA IF YOU CAN DO IT WITHOUT RISK. APPLY COOLING
WATER TO SIDES OF CONTAINERS THAT ARE EXPOSED TO FLAMES UNTIL WELL AFTER FIRE
IS OUT. STAY AWAY FROM ENDS OF TANKS. FOR MASSIVE FIRE IN CARGO AREA, USE
UNMANNED HOSE HOLDER OR MONITOR NOZZLES; IF THIS IS IMPOSSIBLE, WITHDRAW FROM
AREA AND LET FIRE BURN. 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 26).

EXTINGUISH ONLY IF FLOW CAN BE STOPPED; USE FLOODING AMOUNTS OF WATER AS

FOG, SOLID STREAMS MAY NOT BE EFFECTIVE, APPLY FROM AS FAR A DISTANCE AS POSSIBLE. COOL CONTAINERS WITH FLOODING QUANTITIES OF WATER, AVOID BREATHING TOXIC VAPORS, KEEP UPWIND.

TRANSPORTATION DATA

DEPARTMENT OF TRANSPORTATION HAZARD CLASSIFICATION 49 CFR 172.101:
COMBUSTIBLE LIQUID

DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS 49 CFR 172.101 AND
SUBPART E:
NONE

DEPARTMENT OF TRANSPORTATION PACKAGING REQUIREMENTS: NONE
EXCEPTIONS: 49 CFR 173.118A

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, 10/18/91)

U.S. DEPARTMENT OF TRANSPORTATION SHIPPING NAME-ID NUMBER, 49 CFR 172.101:
ETHYLENE GLYCOL MONOMETHYL ETHER-UN 1188

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 III

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

U.S. DEPARTMENT OF TRANSPORTATION PACKAGING AUTHORIZATIONS:
EXCEPTIONS: 49 CFR 173.150
NON-BULK PACKAGING: 49 CFR 173.203
BULK PACKAGING: 49 CFR 173.242

U.S. DEPARTMENT OF TRANSPORTATION QUANTITY LIMITATIONS 49 CFR 172.101:
PASSENGER AIRCRAFT OR RAILCAR: 60 L
CARGO AIRCRAFT ONLY: 220 L

TOXICITY

ETHYLENE GLYCOL MONOMETHYL ETHER (METHYL CELLOSOLVE):
IRRITATION DATA: 483 MG/24 HOURS SKIN-RABBIT MILD; 97 MG EYE-RABBIT;
500 MG/24 HOURS EYE-RABBIT MILD; 10 UG EYE-GUINEA PIG MILD.
TOXICITY DATA: 25 PPM INHALATION-HUMAN TCLD; 1500 PPM/7 HOURS INHALATION-RAT
LC50; 1480 PPM/7 HOURS INHALATION-MOUSE LC50; 1280 MG/KG SKIN-RABBIT LD50;
3380 MG/KG ORAL-HUMAN LDLD; 2370 MG/KG ORAL-RAT LD50; 2560 MG/KG ORAL-MOUSE
LD50; 890 MG/KG ORAL-RABBIT LD50; 950 MG/KG ORAL-GUINEA PIG LD50; 2147 MG/KG

INTRAPERITONEAL-MOUSE LD50; 2500 MG/KG INTRAPERITONEAL-RAT LD50; 2140 MG/KG
INTRAVENOUS-RAT LD50; MUTAGENIC DATA (RTECS); REPRODUCTIVE EFFECTS DATA
(RTECS).

CARCINOGEN STATUS: NONE.

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

TARGET EFFECTS: CENTRAL NERVOUS SYSTEM DEPRESSANT; NEPHROTOXIN. POISONING MAY
ALSO AFFECT THE HEMATOPOIETIC AND NERVOUS SYSTEMS AND THE LIVER.

ADDITIONAL DATA: NIOSH RECOMMENDS THAT ETHYLENE GLYCOL MONOMETHYL ETHER
IN THE WORKPLACE BE REGARDED AS HAVING THE POTENTIAL TO CAUSE ADVERSE
REPRODUCTIVE EFFECTS IN WORKERS, INCLUDING TERATOGENESIS IN THE OFFSPRING
OF EXPOSED PREGNANT FEMALES.

HEALTH EFFECTS AND FIRST AID

INHALATION:

ETHYLENE GLYCOL MONOMETHYL ETHER (METHYL CELLOSOLVE);
NARCOTIC/NEPHROTOXIN/TOXIC.

ACUTE EXPOSURE- VAPORS MAY CAUSE IRRITATION OF THE UPPER RESPIRATORY TRACT
AND EFFECT THE CENTRAL NERVOUS SYSTEM. SYMPTOMS MAY INCLUDE DROWSINESS,
WEAKNESS AND SHAKING. IN ANIMAL STUDIES, DEATH RESULTED FROM LUNG AND
KIDNEY INJURY.

CHRONIC EXPOSURE- REPEATED OR PROLONGED EXPOSURE MAY CAUSE EFFECTS ON THE
CENTRAL NERVOUS SYSTEM AND TOXIC ENCEPHALOPATHY. SYMPTOMS MAY INCLUDE
HEADACHE, DIZZINESS, DROWSINESS, FATIGUE, LETHARGY, WEAKNESS, ATAXIA,
TREMORS, HYPERREFLEXIA, GASTROINTESTINAL UPSET, ANOREXIA, WEIGHT LOSS,
PERSONALITY CHANGES, DISORIENTATION, AND MENTAL RETARDATION. UNEQUAL
PUPILS, DISTURBANCES IN VISION, HEARING AND SPEECH, ANKLE CLONUS AND
BED WETTING HAVE BEEN REPORTED. BONE MARROW DEPRESSION, LEUKOCYTE
IMMATURITY, DECREASED ERYTHROID ELEMENTS, THROMBOCYTOPENIA, AND
MACROCYTIC ANEMIA MAY OCCUR. SIGNS AND SYMPTOMS USUALLY DISAPPEAR SEVERAL
WEEKS TO MONTHS AFTER EXPOSURE CEASES. EXPOSURE OF RABBITS TO 800-1600 PPM
FOR 4-10 DAYS HAS CAUSED KIDNEY DAMAGE WITH HEMATURIA, ALBUMINURIA,
CALCIFIED CASTS IN THE URINE AND SEVERE GLOMERULITIS. REPRODUCTIVE
EFFECTS HAVE BEEN REPORTED IN ANIMALS INCLUDING TESTICULAR ATROPHY,
TEMPORARY STERILITY IN MALES, ABNORMAL SPERM MORPHOLOGY, FETOTOXICITY AND
MALFORMATIONS, ESPECIALLY SKELETAL AND CARDIOVASCULAR.

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:

ETHYLENE GLYCOL MONOMETHYL ETHER (METHYL CELLOSOLVE);
NARCOTIC/NEPHROTOXIN.

ACUTE EXPOSURE- NO APPRECIABLE IRRITATION HAS BEEN REPORTED FROM ANIMAL
STUDIES. THE SUBSTANCE MAY BE READILY ABSORBED WITH SIGNS OF
INTOXICATION AS DESCRIBED IN ACUTE INHALATION.

CHRONIC EXPOSURE- REPEATED OR PROLONGED CONTACT MAY CAUSE DRYING AND
DEFATTING. ENCEPHALOPATHY, CONFUSION, DISORIENTATION, LETHARGY, ANOREXIA,
TREMORS, AGITATION, WEIGHT LOSS, BLURRED VISION, HEADACHE, FEVER, BED
WETTING, MARKED ANEMIA AND DAMAGE TO THE BONE MARROW HAVE BEEN REPORTED
IN 2 CASES WHERE SKIN CONTACT WAS CONSIDERED THE MAIN ROUTE OF ABSORPTION.
OTHER SYSTEMIC EFFECTS AS DESCRIBED FOR CHRONIC INHALATION MAY ALSO OCCUR.
EFFECTS ON THE MALE REPRODUCTIVE SYSTEM OF GUINEA PIGS HAVE BEEN REPORTED
FROM REPEATED SKIN APPLICATION.

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:

ETHYLENE GLYCOL MONOMETHYL ETHER (METHYL CELLOSOLVE):

ACUTE EXPOSURE- HIGH VAPOR CONCENTRATIONS OR DIRECT CONTACT MAY CAUSE IRRITATION. APPLICATION TO RABBIT EYES CAUSED SLIGHT IRRITATION GRADED 3 ON A SCALE OF 1-10 IN ONE STUDY AND IMMEDIATE PAIN, CONJUNCTIVAL IRRITATION AND SLIGHT, TRANSITORY CLOUDINESS OF THE CORNEA WHICH CLEARED WITHIN 24 HOURS IN ANOTHER STUDY.
CHRONIC EXPOSURE- REPEATED OR PROLONGED EXPOSURE 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:

ETHYLENE GLYCOL MONOMETHYL ETHER (METHYL CELLOSOLVE):

NARCOTIC/NEPHROTOXIN.

ACUTE EXPOSURE- IN HUMANS, A NON-FATAL DOSE HAS CAUSED MUSCULAR WEAKNESS, NAUSEA, VOMITING, CONFUSION, METABOLIC ACIDOSIS, OXALURIA, AND PARTIAL KIDNEY FAILURE FOLLOWED BY RECOVERY. A DOSE OF ABOUT 3 GM/KG CAUSED COMA AND DEATH WITHIN 5 HOURS; AUTOPSY REVEALED MARKED DEGENERATION OF KIDNEY TUBULES, ACUTE HEMORRHAGIC GASTRITIS, FATTY DEGENERATION OF THE LIVER, EARLY NECROSIS OF THE PANCREAS, AND BRAIN EDEMA. EFFECTS ON THE REPRODUCTIVE SYSTEM OF MALE RATS HAVE BEEN REPORTED FROM A SINGLE EXPOSURE.

CHRONIC EXPOSURE- 7 DAILY DOSES OF 0.1 ML/KG IN RABBITS PRODUCED HEMATURIA. LARGER DOSES ALSO CAUSED TREMORS, EXHAUSTION, AND ALBUMINURIA. DEATH WAS DELAYED AND DUE TO SEVERE KIDNEY DAMAGE AND FAILURE. REPRODUCTIVE EFFECTS, INCLUDING TESTICULAR ATROPHY, 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 (DREISBACH, HANDBOOK OF POISONING, 12TH ED.). ADMINISTRATION OF GASTRIC LAVAGE OR OXYGEN SHOULD BE PERFORMED BY QUALIFIED MEDICAL PERSONNEL.

ANTIDOTE:

NO SPECIFIC ANTIDOTE. TREAT SYMPTOMATICALLY AND SUPPORTIVELY.

REACTIVITY

REACTIVITY:

ETHYLENE GLYCOL MONOMETHYL ETHER (METHYL CELLOSOLVE):

STABLE UNDER NORMAL TEMPERATURES AND PRESSURES. MAY FORM EXPLOSIVE PEROXIDES ON PROLONGED EXPOSURE TO AIR.

INCOMPATIBILITIES:

ETHYLENE GLYCOL MONOMETHYL ETHER (METHYL CELLOSOLVE):

CAUSTICS: INCOMPATIBLE.

OXIDIZERS (STRONG): FIRE AND EXPLOSION HAZARD.

PLASTICS, RUBBER AND COATINGS: ATTACKS.

DECOMPOSITION:
THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE TOXIC OXIDES OF 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. FOR ASSISTANCE, CONTACT THE DISTRICT DIRECTOR OF THE ENVIRONMENTAL PROTECTION AGENCY.

STORAGE

STORE IN ACCORDANCE WITH 29 CFR 1910.106.

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.

ON PROLONGED STORAGE IN CONTACT WITH OXYGEN OR AIR, ETHERS MAY FORM DANGEROUSLY EXPLOSIVE PEROXIDES. STORE IN A TIGHTLY CLOSED CONTAINERS, PROTECTED FROM HEAT AND LIGHT. CHECK FOR PEROXIDE CONTENT OFTEN; NEVER DISTILL TO DRYNESS.

STORE AWAY FROM INCOMPATIBLE SUBSTANCES.

DISPOSAL

DISPOSAL MUST BE IN ACCORDANCE WITH STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE, 40 CFR 262, EPA HAZARDOUS WASTE NUMBER D001.
100 POUND CERCLA SECTION 103 REPORTABLE QUANTITY.

CONDITIONS TO AVOID

AVOID CONTACT WITH HEAT, SPARKS, FLAMES, OR OTHER SOURCES OF IGNITION. VAPORS MAY BE EXPLOSIVE AND POISONOUS; DO NOT ALLOW UNNECESSARY PERSONNEL IN AREA. DO NOT OVERHEAT CONTAINERS; CONTAINERS MAY VIOLENTLY RUPTURE AND TRAVEL A CONSIDERABLE DISTANCE IN HEAT OF FIRE.

SPILL AND LEAK PROCEDURES

WATER SPILL:
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. 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.

PROTECTIVE EQUIPMENT

VENTILATION:

PROVIDE LOCAL EXHAUST OR PROCESS ENCLOSURE VENTILATION TO MEET THE 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).

ETHYLENE GLYCOL MONOMETHYL ETHER (METHYL CELLOSOLVE):

AT ANY DETECTABLE CONCENTRATION:

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.

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 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.

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

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