**ETHYLENE GLYCOL**

**ETHYLENE GLYCOL**

**ETHYLENE GLYCOL**

**ETHYLENE GLYCOL**

**ETHYLENE GLYCOL**

**ETHYLENE GLYCOL**

**ETHYLENE GLYCOL**

MATERIAL SAFETY DATA SHEET

FISHER SCIENTIFIC

EMERGENCY NUMBER: (201) 796-7100

CHEMICAL DIVISION

CHEMTREC ASSISTANCE: (800) 424-9300

1 REAGENT LANE

FAIR LAWN NJ 07410

(201) 796-7100

THIS INFORMATION IS BELIEVED TO BE ACCURATE AND REPRESENTS THE BEST

INFORMATION CURRENTLY AVAILABLE TO US. HOWEVER, WE MAKE NO WARRANTY OF

MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO

SUCH INFORMATION, AND WE ASSUME NO LIABILITY RESULTING FROM ITS USE.

SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE

INFORMATION FOR THEIR PARTICULAR PURPOSES.

SUBSTANCE IDENTIFICATION

CAS NUMBER 107-21-1

SUBSTANCE: ETHYLENE GLYCOL

TRADE NAMES/SYNONYMS: 1,2-DIHYDROXYETHANE; 1,2-ETHANEDIOL; ETHYLENE ALCOHOL; GLYCOL; GLYCOL ALCOHOL; MONOETHYLENE GLYCOL; GLYCOL ETHER; ETHANE; 1,2-DIOL; LUTROL; MACROCOL 400 BPC; M.E.G.; TESCOL; 2 HYDROXYETHANOL; E-177; E-178. BP230; ACC09400

CHEMICAL FAMILY: GLYCOL

MOLECULAR FORMULA: C2-H6-O2

MOLECULAR WEIGHT: 62.08

CERCLA RATING (SCALE 0-3): HEALTH-3 FIRE-1 REACTIVITY-0 PERSISTENCE-0

NFPA RATINGS (SCALE 0-4): HEALTH-1 FIRE-1 REACTIVITY-0

COMPONENTS AND CONTAMINANTS

COMPONENT: ETHYLENE GLYCOL

PERCENT: 99.9

CAS# 107-21-1

OTHER CONTAMINANTS: MAY CONTAIN 1,4-DIOXANE AT 0.0026%

EXPOSURE LIMITS:

ETHYLENE GLYCOL: 50 PPM (25 MG/M3) OSHA CEILING

50 PPM (25 MG/M3) ACGIH CEILING (VAPOR AND MIST)

SUBJECT TO SARA SECTION 313 ANNUAL TOXIC CHEMICAL RELEASE REPORTING

1,4-DIOXANE: 25 PPM (90 MG/M3) OSHA TWA (SKIN)

25 PPM (90 MG/M3) ACGIH TWA (SKIN)

1 PPM (0.6 MG/M3) IDOSH RECOMMENDED 30 MINUTE CEILING

50 PPM (250 MG/M3) IDOSH MAK TWA (SKIN)

100 PPM (500 MG/M3) DFG MAK TWA (SKIN)

MEASUREMENT METHOD: CHARCOAL TUBE; CARBON DISULFIDE; GAS CHROMATOGRAPHY WITH FLAME IONIZATION DETECTION (IDOSH VOL. III # 1620)

100 POUND CERCLA SECTION 103 REPORTABLE QUANTITY

SUBJECT TO SARA SECTION 313 ANNUAL TOXIC CHEMICAL RELEASE REPORTING

SULFUR DIOXIDE TO CALIFORNIA PROPOSITION 65 CANCER AND/or REPRODUCTIVE TOXICITY AND WARNING REQUIREMENTS - (JANUARY 1, 1988)


PHYSICAL DATA

DESCRIPTION: HYDROSCOPIC, CLEAR, COLORLESS, ODORLESS, SWEET-TASTING, SYRUPY LIQUID. BOILING POINT: 387 F (197 C). MELTING POINT: 9 F (-13 C)

SPECIFIC GRAVITY: 1.1 @ 25 C. VAPOR PRESSURE: 0.01 MMHG @ 20 C

SOLUBILITY IN WATER: SOLUBLE. VAPOR DENSITY: 2.14

SOLVENT SOLUBILITY: ALCOHOL, ACETONE, GLYCEROL, ACETIC ACID, ALDEHYDES, KETONES, PYRIDINE, PRACTICALLY INSOLUBLE IN CHLORINATED HYDROCARBONS, BENZENE, PETROLEUM ETHER, AND OILS

VISCOSITY: 26 CPS @ 15 C

FIRE AND EXPLOSION DATA

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

FLASH POINT: 232 F (111 C). (CC) UPPER EXPLOSION LIMIT: 15.3%

LOWER EXPLOSION LIMIT: 3.2% AUTOIGNITION TEMP: 748 F (398 C)

FLAMMABILITY CLASS: OSHA: IEII

FIREFIGHTING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR FOAM

FOR LARGER FIRES, USE WATER SPRAY, FOAM OR ALCOHOL FOAM

ALCOHOL FOAM (NFPRA 355, FIRE HAZARD PROPERTIES OF FLAMMABLE LIQUIDS, GASES, AND VOLATILE SOLIDS, 1951)

FIREFIGHTING:

MOBILE CONTAINER FROM FIRE AREA IF YOU CAN DO IT WITHOUT RISK. DO NOT SCATTER SPILLED MATERIAL WITH HIGH-PRESSURE WATER STREAMS. DIKE FIRE CONTROL WATER FOR LATER DISPOSAL (1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 9000.5, GUIDE PAGE 21).

USE AGENTS SUITABLE FOR TYPE OF SURROUNDING FIRE. AVOID BREATHING HAZARDOUS VAPORS, KEEP UPWIND.

WATER OR FOAM MAY CAUSE FROTHING (NFPRA 355, FIRE HAZARD PROPERTIES OF FLAMMABLE LIQUIDS, GASES, AND VOLATILE SOLIDS, 1951)

TOXICITY

ETHYLENE GLYCOL

IRRITATION DATA: 950 MG OPEN SKIN-RABBIT MILD; 12 MG/M3/3 DAYS EYE-RAT; 150 MG/M3/4 HOURS EYE-RABBIT MILD; 500 MG/M3/24 HOURS EYE-RABBIT MILD; 12 MG/M3/7 DAYS EYE-RABBIT MILD; 1140 MG/M3 EYES EYE-RABBIT MODERATE.

TOXICITY DATA: 1000 MG/M3 INHALATION- HUMAN, TCD50; 100 MG/M3 INHALATION- RAT LC50 45.8 MG/KG SKIN-RABBIT LD50; 5500 MG/KG ORAL-CHILD TDLO; 788 MG/KG ORAL-HUMAN LDO; 388 MG/KG ORAL-HUMAN LD50; 16 MG/KG ORAL- MAN TDLO; 4700 MG/KG ORAL- RAT LD50; 7500 MG/KG ORAL- MOUSE LD50; 6610 MG/KG ORAL- GUINEA PIG LD50; 2500 MG/KG ORAL- DOG LD50; 1600 MG/KG ORAL- MACA R RAT LD50; 2800 MG/KG SUBCUTANEOUS-RAT LD50; 2700 MG/KG SUBCUTANEOUS MOUSE LD50; 5900 MG/KG SUBCUTANEOUS-GUINEA PIG LD50; 2000 MG/KG SUBCUTANEOUS CAT LD50; 3250 MG/KG INTRAVENOUS-RAT LD50; 3000 MG/KG INTRAVENOUS MOUSE LD50; 5 GM INTRAVENOUS-RABBIT LD50; 5101 MG/KG INTRAPERITONEAL-RAT LD50; 6514 MG/KG INTRAPERITONEAL-MOUSE LD50; 1600 MG/KG INTRAPERITONEAL-RABBIT LD50; 3300 MG/KG INTRAMUSCULAR-RAT LD50; 2500 MG/KG INTRAMUSCULAR-MOUSE LD50; 1637 MG/KG INTRAPERITONEAL-RABBIT LD50; 13 GM/KG INTRAPERITONEAL-RAT LD50; 517 MG/KG INTRAPERITONEAL-RAT LD50; 8500 MG/KG UNREPORTED ROUTE-RABBIT LD50; 1115 MG/KG UNREPORTED ROUTE-GUINEA PIG LD50; MUTAGENIC DATA (RTCS): REPRODUCTIVE EFFECTS DATA (RTCS)

CARRIAGENIN STATUS: NONE

LOCAL EFFECTS: IRITANT- INHALATION, SKIN, EYE

ACUTE TOXICITY LEVEL: MODERATELY TOXIC BY INGESTION, SLIGHTLY TOXIC BY DERMAL

TARGET EFFECTS: CENTRAL NERVOUS SYSTEM DEPRESSANT; NEUROTOKIN; NEUROTOXIN.

POISONING MAY AFFECT THE LUNGS, HEART, LIVER, BRAIN AND KIDNEY

HEALTH EFFECTS AND FIRST AID

INHALATION:

ETHYLENE GLYCOL

IRRITANT

ACUTE EXPOSURE- INHALATION IS UNLIKELY AT ROOM TEMPERATURE, DUE TO THE LOW VAPOR PRESSURE. AEROSOLS AT 140 MG/M3 WERE IRITATING, AND 200 MG/M3 WERE INtolerable.Causing a burning sensation of the throat and coughing. Exposure to High concentrations of mists or aerosols may result in effects on the hematopoietic system and central nervous system with headache, dizziness and DROWSINESS.

CHRONIC EXPOSURE - HUMANS EXPOSED TO AEROSOLS FROM 3-67 MG/M3 CONTINUOUSLY FOR 1 MONTH REPORTED IRITATION OF THE RESPIRATORY TRACT, OCCASIONALLY SOFT HEADACHE, AND LOW BACKACHE, BUT NO OTHER SIGNIFICANT ADVERSE EFFECTS. CONTINUED EXPOSURE TO VAPORS FROM A PROCESS UTILIZING A MIXTURE OF ETHYLENE GLYCOL, BORIC ACID AND AMMONIA HEATED ABOVE 100 C resulted in Nystagmus, Lymphocytosis and Sudden Loss of Consciousness for 5-10 MINUTES. Nystagmus occurred 2-3 TIMES DAILY UNTIL EXPOSURE CEASED. REPEATED EXPOSURE TO SATURATED ETHYLENE GLYCOL VAPORS PRODUCED SLIGHT NARCOSIS AT RATS. EFFECTS ON THE FEET HAVE BEEN REPORTED IN RATS AND MICE FOLLOWING EXPOSURE DURING GESTATION. THERE WAS A LIKELIHOOD THAT AT LEAST SOME EFFECTS RESULTED FROM INGESTION SINCE ANIMALS GROaned CONSTANTLY BEFORE AND AFTER EXPOSURE.

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:
TREATMENT: WASH WITH SOAP AND WATER.

IRRITANT:
ACUTE EXPOSURE: LIQUID MAY DAMAGE THE SKIN. FURTHER JUDGMENTS SHOULD BE MADE IN CONCERT WITH MEDICAL PERSONNEL.

CHRONIC EXPOSURE: A LUNG AND LIVER HERNIA CAUSED BY MECHANICAL PROLONGED EXPOSURE TO LIQUID RESULT IN DERMATITIS. REPEATED OR PROLONGED CONTACT MAY RESULT IN CONTACT DERMATITIS.

FIRST AID:
- REMOVAL CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFED AFRONT WITH SOAP OR MILD DETERGENT AND WATER. APPLY EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT:
ETHYLENE GLYCOL:
IRRITANT.
ACUTE EXPOSURE: VAPORS MAY CAUSE REDNESS, AND CONTACT WITH THE EYES. ETHYLENE GLYCOL CONTAINING A MID-CENTURY, IRIDOCECTOMY BUT NOT RECOMMENDED FOR EYES. CHRONIC EXPOSURE - VAPOR OR SPRAY AT 11 MG/M3/4 WEEKS PRODUCED NO EFFECTS IN Animals. 48-HOUR CONTINUOUSLY, TO 12 MG/M3/4 WEEKS, SOMETIMES SHOWED SEVERE EYE IRRITATION, EDEMA, AND VESICULATION. SOFT TISSUE, AND OPACITY AND APPARENT BLINDNESS, WITHOUT SIGNS OF SYSTEMIC INTOXICATION.

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

INGESTION:
ETHYLENE GLYCOL:
NARCOTIC/NEPHTHROXIN/NEUROTICXIN.
ACUTE EXPOSURE: THE ESTIMATED LETHAL DOSE FOR ADULTS IS 100 MILLILITERS. THERE ARE THREE STAGES OF INTOXICATION FOLLOWING INGESTION OF ETHYLENE GLYCOL. CENTRAL NERVOUS SYSTEM DEPRESSED. T AND RENAL FAILURE. ACUTE CENTRAL NERVOUS SYSTEM EXAMINATION MIGHT FOLLOW SHORTLY AFTER INGESTION AND LAST SEVERAL HOURS WITH SYMPTOMS OF NAUSEA, VOMITING, ABDOMINAL PAIN, DEHYDRATION, VISION DIZZINESS, INABILITY TO SLEEP, PERSONALITY CHANGES, HALLUCINATIONS, COMA, MENINGES, MYOCARDIAL, FIXED PILLS, LOSS OF VISION, LIVER AND LUNG DEGENERATION, PARAPLEIA, DIAPHRAGM, NYSTAGMUS, AND AVERAGE. LIFE THREATENING COMPLICATIONS WHICH MAY OCCUR IN THIS PERIOD INCLUDE CEREBRAL DEPRESSION, CARDIOVASCULAR COLLAPSE, LUNEBURG FRIABLE, SEVERE METABOLIC ACIDOSIS. DEATH MAY OCCUR IN 8-24 HOURS. NO DEATHS HAVE OCCURRED. LUMBAR PAIN, ALBUMINURIA, HEMATURIA, HEPATOPATIA, PROGRESSING TO ANuria ARE PROBABLE. ACUTE RENAL FAILURE IS POSSIBLE. IMMEDIATE ACTUAL RESULTS IN PRECIPITATION OF CALCIUM OXALATE CRYSTALS IN SOFT TISSUES. CAPILLARY DAMAGES TO EYES, LUNEBURG MELT, SUGGESTIVE TO THE BRAIN, PERICARDIUM AND LUNG MELT. INTOXICATION MAY RESULT IN INTRODUCTION FOLLOWED BY AN ASYMPTOMATIC PERIOD OF SEVERAL DAYS BEFORE THE ONSET OF RENAL FAILURE. Oliguria MAY BE PERIODICALLY ANTICIPATED IN SURVIVING PATIENTS. CEREBRAL DAMAGE MAY OCCUR IN SURVIVORS OF PROLONGED COMA OR CONVULSIONS. CHRONIC EXPOSURE: INCREASED DAILY INGESTION OF 15-30 ML MAY CAUSE Oliguria WITHIN 24-72 HOURS, WHICH MAY PROGRESS RAPIDLY TO ANuria AND Uremia. REPEATED ADMINISTRATION TO ANIMALS RESULTED IN SHORT-TERM Oliguria WITHIN 48-72 HOURS. CALCIUM OXALATE BLADDER STONES, SEVERE RENAL INJURY, AND ABDOMINAL PAIN MAY OCCUR. CALCIUM OXALATE DEPOSITION IN THE LIVER, IN A TWELVE-YEAR STUDY. ADMINISTRATION RESULTED IN HEPATOCYTOPLASM HYALINE DEGENERATION AND INCREASED INCIDENCE OF MEDIAL HYPERPLASIA OF SMALL RENAL PAPILLARY ARTERIES AND ARTERIOLES. MATERNAL EFFECTS, EFFECTS ON FERTILITY. Fetal DEATH, STILLBIRTH, ABNORMALITIES OF ORGANS. AND EFFECTS ON THE EMBRYO, FETUS HAS BEEN REPORTED FROM REPEATED ADMINISTRATION TO RATS AND MICE DURING GESTATION, RESULTING IN REACTING MICE PRODUCED DELAYED EMBRYO DEATHS TO THE NEWBORN.

FIRST AID:
- REMOVE INGESTED MATERIAL BY GASTRIC LAVAGE OR EMESIS. GIVE ARTIFICIAL RESPIRATION WITH OXYGEN IF RESPIRATION IS DEPRESSED (DRESBACH ZONE OF RESUSCITATION, 117TH ED). GET MEDICAL ATTENTION IMMEDIATELY. ADMINISTRATION OF GASTRIC LAVAGE SHOULD BE PERFORMED BY QUALIFIED MEDICAL PERSONNEL.

ANTIDOTE:
THE FOLLOWING ANTIDOTE(S) HAVE BEEN RECOMMENDED, HOWEVER, THE DECISION AS TO WHICH ANTIDOTE TO USE DEPENDS UPON THE INGESTION. ANY ANTIDOTE AND ACTUAL DOSE REQUIRED SHOULD BE MADE BY QUALIFIED MEDICAL PERSONNEL.

ETHYLENE GLYCOL POISONING:
GIVE ETHANOL (30-100 PROPO) 1.5 ML/KG ORALLY INITIAL DILUTED TO NOT MORE THAN 5% SOLUTION. FOLLOWED BY 0.5-1.0 ML/KG EVERY 2 HOURS ORALLY FOR 4 DAYS TO PREVENT INGESTION OF METABOLIZE OF INGESTED ETHYLENE GLYCOL.
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.

AUTHORIZED - FISHER SCIENTIFIC, INC
CREATION DATE: 06/24/85
REVISION DATE: 07/14/93

ADDITIONAL INFORMATION
THIS INFORMATION IS BELIEVED TO BE ACCURATE AND REPRESENTS THE BEST
INFORMATION CURRENTLY AVAILABLE TO US. HOWEVER, WE MAKE NO WARRANTY OF
MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO
SUCH INFORMATION, AND WE ASSUME NO LIABILITY RESULTING FROM ITS USE. USERS
SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE
INFORMATION FOR THEIR PARTICULAR PURPOSES.