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MATERIAL SAFETY DATA SHEET

MSDS NO. 402.4 REV. 4 DATE 07-APR-1994

1 1 72474 5

FOAMFLUSH URETHANE REMOVER

SECTION 01 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

DOMESTIC TRADE NAME: FOAMFLUSH URETHANE REMOVER

EXPORT TRADE NAME: FOAMFLUSH URETHANE REMOVER

CAS REGISTRY NO.: MIXTURE - -

CAS REGISTRY NAME: MIXTURE (ALL COMPONENTS ARE LISTED ON TSCA INVENTORY)

SYNONYM: URETHANE REMOVER

SECTION 02 - COMPOSITION/INFORMATION ON HAZARDOUS INGREDIENTS

CAS REGISTRY NUMBER: 00000096-48-0

CAS REGISTRY NAME: 2(3H)-FURANONE, DIHYDRO-

COMMON NAME: GAMMA-BUTYROLACTONE (BLO)

HAZARD%: 40.00 - 70.00

HAZARD REFERENCE:

SEVERE EYE IRRITANT

CAS REGISTRY NUMBER: 00000872-50-4

CAS REGISTRY NAME: 1-METHYL-2-PYRROLIDINONE

COMMON NAME: N-METHYLPYRROLIDONE (NMP)

HAZARD%: 40.00 - 70.00

HAZARD REFERENCE:

ISP RECOMMENDED EXPOSURE LIMIT: 100 PPM

CAS REGISTRY NUMBER: 00000763-69-9

CAS REGISTRY NAME: PROPANOIC ACID, 3-ETHOXY-, ETHYL ESTER

COMMON NAME: ETHYL 3-ETHOXYPROPIONATE

HAZARD%: 1.00 - 5.00

HAZARD REFERENCE:

RECOMMENDED EXPOSURE LIMIT:

8-HR TWA 50 PPM; 15 MIN TWA 100 PPM



SECTION 03 - HAZARDS IDENTIFICATION

***** EMERGENCY OVERVIEW *****

*
 * CLEAR LIQUID WITH SWEET ODOR.
 * COMBUSTIBLE LIQUID IN U.S.A. ONLY.
 * CAUSES EYE IRRITATION.
 * PROLONGED OR REPEATED EXPOSURE CAUSES SEVERE SKIN IRRITATION.
 *

-ACUTE TOXICITY-

ORAL TOXICITY:

TESTING ON ANALOGOUS MATERIAL DEMONSTRATED A RAT LD50 >1500 MG/KG BUT <5000 MG/KG.

NMP - RAT LD50: 4200 MG/KG

BLO - RAT LD50: 1580 MG/KG

DERMAL TOXICITY:

NMP - RABBIT LD50: 8000 MG/KG

BLO - GUINEA PIG LD50 > 5000 MG/KG

INHALATION TOXICITY:

NMP - RAT; AT SUPER SATURATED (110 DEG. C) CONCENTRATIONS, NO EVIDENCE OF TOXIC EFFECTS:

BLO - RAT; SHORT TERM EXPOSURE AT ROOM TEMPERATURE SATURATION; NO EFFECTS.

SKIN IRRITATION:

TESTING ON ANALOGOUS MATERIAL DEMONSTRATED SLIGHT IRRITATION IN THE RABBIT.

NMP - MILD IRRITATION IN THE RABBIT; HOWEVER, HUMAN EXPERIENCE HAS DEMONSTRATED SEVERE DERMATITIS; e.g. BLISTERS, CRACKING, EDEMA, REDNESS UPON PROLONGED OR REPEATED CONTACT.

EYE IRRITATION:

TESTING ON ANALOGOUS MATERIAL DEMONSTRATED SEVERE IRRITATION IN THE RABBIT.

NMP - RABBIT; MODERATE IRRITATION; NO PERMANENT DAMAGE.

BLO - RABBIT; SEVERE IRRITANT.

SENSITIZER:

NMP - HUMAN REPEAT INSULT PATCH TEST; MILD TRANSIENT IRRITATION THROUGH REPEATED PROLONGED CONTACT; MATERIAL WAS FOUND TO BE A FATIGUING AGENT BUT NOT A SENSITIZER.

DOT CORROSIVE:

NO DATA FOUND.



SECTION 03 - HAZARDS IDENTIFICATION (CONT.)

PRIMARY ROUTE(S) OF ENTRY: ABSORPTION / CONTACT

-SIGNS AND SYMPTOMS OF EXPOSURE-

SYMPTOMS OF INGESTION:

NO EFFECTS OF EXPOSURE EXPECTED.

SYMPTOMS OF INHALATION:

NO EFFECTS OF EXPOSURE EXPECTED. IF MISTED OR AT HIGH CONCENTRATIONS, MAY CAUSE PALLOR, NAUSEA, ANESTHETIC OR NARCOTIC EFFECTS.

SYMPTOMS OF SKIN CONTACT:

PROLONGED OR REPEATED CONTACT CAUSES REDNESS, SWELLING, CRACKING.

SYMPTOMS OF EYE CONTACT:

VAPORS SLIGHTLY UNCOMFORTABLE. SPLASHES IRRITATING. WILL CAUSE PAINFUL BURNING OR STINGING OF EYES AND LIDS, WATERING OF EYES AND INFLAMMATION OF CONJUNCTIVA.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

NO DATA FOUND

-OTHER TOXICITY-

OTHER ACUTE TOXICITY:

NO DATA FOUND

SUB CHRONIC ORAL TOXICITY:

NMP - 90-DAY FEEDING STUDIES IN MICE, RATS AND DOGS, IN CONCENTRATIONS UP TO 1% OF THE DIET, FAILED TO DEMONSTRATE ANY TREATMENT RELATED EFFECTS.
BLO - 90-DAY FEEDING STUDY IN RATS; NO EFFECTS AT HIGHEST DOSE LEVEL (0.8% OF DIET).

SUB CHRONIC INHALATION TOXICITY:

NMP - INHALATION STUDIES; RATS, GUINEA PIGS, RABBITS, CATS; NO GROSS OR HISTOPATHOLOGICAL ABNORMALITIES WHEN EXPOSED TO 50 PPM NMP FOR 8 HOURS/DAY FOR 20 DAYS; EXPOSURES AS HIGH AS 370 PPM FOR 6 HOURS/DAY FOR 10 DAYS SIMILARLY CAUSED NO EFFECTS IN RATS.
4-WEEK; RAT; AEROSOL-VAPOR MIXTURE OF NMP AT 0, 0.1 (25 PPM), 0.5 (123 PPM) AND 1.0 (247 PPM) MG/L FOR 6 HOURS/DAY, 5 DAYS/WEEK; NO EFFECTS AT 0.1 OR 0.5 MG/L; HEMOPOIETIC (BLOOD SYSTEM) EFFECTS OBSERVED AT 1.0 MG/L.

SUB CHRONIC MISCELLANEOUS TOXICITY:

NMP - 20-DAY DERMAL; RABBIT; 0.4, 0.8 AND 1.6 ML/KG/DAY ON ABRADED AND INTACT SKIN; MILD LOCAL IRRITATION; NO SYSTEMIC EFFECTS; 1/4 ANIMALS DIED AT 1.6 ML/KG/DAY.



SECTION 03 - HAZARDS IDENTIFICATION (CONT.)

AQUATIC TOXICITY:

NMP - BLUEGILL (LEPOMIS MACROCHIRUS) LC50 (AT 22 DEG. C): 832 MG/L;
FATHEAD MINNOW (PIMEPHALES PROMELAS) LC50 (AT 22 DEG. C): 1072 MG/L;
TROUT (SALMO GAIRDNERI) LC50 (AT 12 DEG. C): 3048 MG/L.
BLO - MINNOW; 48-HOUR LC50: 100-500 MG/L; AQUATIC TOXICITY
RATING: 96-HOUR TLM > 1000 MG/L.

TUMORIGENICITY:

NMP - 2-YEAR; RAT; VAPOR OF NMP AT 0, 0.04 (10 PPM) AND 0.4 (99 PPM) MG/L
FOR 6 HOURS/DAY, 5 DAYS/WEEK; NO LIFE-SHORTENING TOXIC OR CARCINOGENIC
EFFECTS OBSERVED.
BLO - IARC 11, 231 (1976): NO CARCINOGENIC EFFECTS NOTED IN MICE
(ORAL, SUBCUTANEOUS AND SKIN) OR RATS (ORAL AND SUBCUTANEOUS).

MUTAGENICITY:

NMP - TESTED IN THE AMES ASSAY, CHO/HGPRT FORWARD MUTATION ASSAY, MOUSE
LYMPHOMA ASSAY, RAT PRIMARY HEPATOCYTE UDS ASSAY, DOMINANT LETHAL ASSAY AND
MOUSE MICRONUCLEUS TEST. IN EACH CASE, NMP WAS FOUND TO BE NONMUTAGENIC.

REPRODUCTIVE TOXICITY:

NMP - RAT; DERMAL; DEVELOPMENTAL TOXICITY; 75, 237 AND 750 MG/KG; MATERNAL AND
DEVELOPMENTAL NOAEL (NO OBSERVED ADVERSE EFFECT LEVEL): 237 MG/KG.
RAT; INHALATION; DEVELOPMENTAL TOXICITY; 0.1 (25 PPM) AND 0.36 (89 PPM) MG/L;
MATERNAL AND DEVELOPMENTAL NOAEL: 0.36 (89 PPM) MG/L.
RABBIT; ORAL; DEVELOPMENTAL TOXICITY; 55, 175 AND 540 MG/KG/DAY; MATERNAL
NOAEL: 55 MG/KG/DAY; DEVELOPMENTAL NOAEL: 175 MG/KG/DAY.
RAT; ORAL; MULTI-GENERATION; 50, 160 AND 500 MG/KG/DAY; PARENTAL, REPRODUCTIVE
AND DEVELOPMENTAL NOAEL: 160 MG/KG/DAY.
BLO - RAT TERATOLOGY; GRADED DOSES 10-1000 MG/KG/DAY (DAYS 6-15 OF GESTATION);
MATERNAL AND DEVELOPMENTAL NOAEL: 1000 MG/KG/DAY.

MISCELLANEOUS TOXICITY:

SECTION 04 - FIRST AID MEASURES

FIRST AID FOR INGESTION:

GENERAL PRECAUTIONARY MEASURES SUGGEST INDUCING VOMITING IMMEDIATELY BY
GIVING TWO GLASSES OF WATER AND STICKING FINGER DOWN THROAT. NEVER GIVE
ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. CALL A PHYSICIAN.

FIRST AID FOR INHALATION:

REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION,
PREFERABLY MOUTH-TO-MOUTH. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
CALL A PHYSICIAN.



SECTION 04 - FIRST AID MEASURES (CONT.)

FIRST AID FOR SKIN CONTACT:

WASH SKIN WITH SOAP AND WATER. CALL A PHYSICIAN. WASH CLOTHING BEFORE REUSE.

FIRST AID FOR EYE CONTACT:

IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. CALL A PHYSICIAN.

SECTION 05 - FIREFIGHTING MEASURES

FLASH POINT: 191.00 DEG F (SETAFLASH/CC)

AUTOIGNITION TEMP: NO DATA FOUND

FLAMMABLE LIMITS: NO DATA FOUND

FIRE FIGHTING MEDIA: WATER / ALCOHOL FOAM / DRY CHEMICAL / CARBON DIOXIDE

SPECIAL FIRE FIGHTING PROCEDURES:

FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE, FULL FACE SELF-CONTAINED BREATHING APPARATUS. COOL FIRE-EXPOSED CONTAINERS WITH WATER SPRAY.

CAUTION: AFTER FIRE IS EXTINGUISHED, MATERIAL VAPORS COULD ACCUMULATE, TRAVEL TO A SOURCE OF IGNITION AND FLASH BACK.

FIRE/EXPLOSION HAZARDS:

COMBUSTIBLE LIQUID. FIRE HAZARD WHEN EXPOSED TO HEAT, SPARKS 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.

NFPA HAZARD CODES - HEALTH/FLAMMABILITY/REACTIVITY 2 2 0

HMS HAZARD CODES - HEALTH/FLAMMABILITY/REACTIVITY 2 2 0

SECTION 06 - ACCIDENTAL RELEASE MEASURES

SPILL/LEAK CLEAN-UP PROCEDURES:

ELIMINATE SOURCES OF IGNITION. ABSORB WITH EARTH, SAND OR SIMILAR INERT MATERIAL AND DISPOSE OF WITH SOLID WASTE ACCORDING TO FEDERAL, STATE AND LOCAL REGULATIONS. FLUSH SPILL AREA WITH A WATER SPRAY.

EPA HAZARDOUS SUBSTANCE REPORTABLE QUANTITY: NOT LISTED

SECTION 07 - HANDLING AND STORAGE



SECTION 07 - HANDLING AND STORAGE (CONT.)

PRECAUTIONARY MEASURES:

AVOID CONTACT WITH EYES, SKIN AND CLOTHING. WASH THOROUGHLY AFTER HANDLING. AT HIGH CONCENTRATIONS, USE WITH ADEQUATE VENTILATION. KEEP CONTAINER AND VAPORS FROM THIS CONTAINER AWAY FROM HEAT, SPARKS AND FLAME. KEEP CONTAINER CLOSED.

DISPOSAL METHOD:

DISPOSE OF WITH LIQUID WASTE ACCORDING TO FEDERAL, STATE AND LOCAL REGULATIONS.

RCRA CLASS: NOT REGULATED

SECTION 08 - EXPOSURE CONTROLS/PERSONAL PROTECTION

VENTILATION:

AT HIGH CONCENTRATIONS, USE WITH ADEQUATE VENTILATION.

RESPIRATORY PROTECTION:

NIOSH-APPROVED RESPIRATOR, WHERE TLV OR PEL MAY BE EXCEEDED.

EYE PROTECTION:

CHEMICAL GOGGLES.

SKIN PROTECTION:

IMPERVIOUS GLOVES OF NATURAL LATEX OR NEOPRENE (SPECIFICALLY, NATURAL LATEX GLOVES AR-340 AND STYLE #Y-18 FROM GLOVER LATEX INC. - ANAHEIM, CA; OR A NEOPRENE GLOVE "SCORPIO" #8-352 FROM EDMONT WILSON - COSHOCTON, OH).

PERSONAL HYGIENE:

WASH THOROUGHLY AFTER HANDLING.

PROTECTIVE MEASURES DURING REPAIR/MAINTENANCE OF EQUIPMENT:

WASH EQUIPMENT THOROUGHLY WITH STEAM OR WARM WATER UNTIL CLEAN. CHECK FOR FLAMMABLES WITH AN 'EXPLOSION METER' AND ALSO CHECK THE OXYGEN LEVEL WITH AN OXYGEN METER. IN ALL CASES, FOLLOW GOOD INDUSTRIAL SAFETY PRACTICES BEFORE ENTERING EQUIPMENT.

EXPOSURE LIMITS:

SEE SECTION 02 FOR COMPOSITION/INFORMATION ON HAZARDOUS INGREDIENTS.

SECTION 09 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT: 202-204 DEG. C

VAPOR PRESSURE: 0.29 mm Hg (AT 20 DEG. C)

**SECTION 09 - PHYSICAL AND CHEMICAL PROPERTIES (CONT.)**

VAPOR DENSITY (AIR=1): > 3.0
WATER SOLUBILITY: COMPLETE
MELTING/FREEZING POINT: NONE TO -20 DEG. C
APPEARANCE: CLEAR LIQUID
SPECIFIC GRAV. (WATER=1): 1.06 - 1.08 (AT 25 DEG. C)
PERCENTAGE VOLATILES: ESSENTIALLY 0% AT S.T.P.
EVAPORATION RATE: <1.00 (BUTYL ACETATE = 1)
pH OF SOLUTION: 4.00 - 6.00 (10% SOLUTION)
ODOR: SWEET

SECTION 10 - STABILITY AND REACTIVITY

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID:
HEAT, FIRE, IGNITION SOURCES.

INCOMPATIBLE MATERIALS:
STRONG OXIDIZING OR REDUCING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS:
CARBON MONOXIDE, CARBON DIOXIDE, OXIDES OF NITROGEN, SMOKE.

SECTION 11 - TRANSPORT INFORMATION**-DOMESTIC DATA-**

DOT SHIPPING NAME: COMBUSTIBLE LIQUID, N.O.S. (ONLY IN BULK; > 110 GAL.)
DOT HAZARD CLASS: 3.3 (> 110 GAL.)
HAZARDOUS INGREDIENT(S): (CONTAINS N-METHYL-2-PYRROLIDONE)
NA NUMBER: 1993

-EXPORT DATA-

EXPORT SHIPPING NAME: NOT REGULATED
EXPORT HAZARD CLASS: NOT REGULATED
HAZARDOUS INGREDIENT(S): NONE
UN NUMBER: NONE