



**Common Name:** LOW VOC PVC SOLVENT CEMENTS: REGULAR CLEAR PVC CEMENT, GRAY PVC CEMENT, BLUE PVC

**Manufacturer:** COOKSON ELECTRONICS

**MSDS Revision Date:** 1/30/2004

**Grainger Item Number(s):** 5E525, 5E526, 5E527, 5E528, 5E529, 5E530, 5E531

**Manufacturer Model Number(s):** WW60504, WW90502, WW90503, WW90602, WW90603, WW92202, WW92203

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MATERIAL SAFETY DATA SHEET

PREPARED TO U.S. OSHA, CMA, ANSI AND CANADIAN WHMIS, AND EUROPEAN COMMUNITY STANDARDS

PART I WHAT IS THE MATERIAL AND WHAT DO I NEED TO KNOW IN AN EMERGENCY?

**1. PRODUCT IDENTIFICATION**



GRAINGER 5E525, 5E526, 5E527, 5E529, 5E530, 5E531, 5E528

TRADE NAME (AS LABELED):  
LOW VOC PVC SOLVENT CEMENTS:  
REGULAR CLEAR PVC CEMENT  
GRAY PVC CEMENT  
BLUE PVC CEMENT

CHEMICAL NAME/CLASS: POLYVINYL CHLORIDE / SOLVENT MIXTURE

PRODUCT USE: SOLVENT CEMENT FOR PVC-BASED MATERIAL

SUPPLIER/MANUFACTURER'S NAME: COOKSON ELECTRONICS

U.S. ADDRESS:  
1661 OLD DIXIE HIGHWAY  
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1-800-327-8460  
1-561-844-0241

U.S. EMERGENCY PHONE:  
CHEMTREC:  
1-800-424-9300 (U.S. AND CANADA)  
1-703-527-3887 (INTERNATIONAL)

DATE OF PREPARATION: JAN. 30, 2004

2. COMPOSITION AND INFORMATION ON INGREDIENTS



CHEMICAL NAME	CAS #	EINECS #	% W/W
TETRAHYDROFURAN	109-99-9	203-726-8	40-60
METHYL ETHYL KETONE	78-93-3	201-159-0	1-12
POLYVINYL CHLORIDE RESIN	9002-86-2	206-625-7	<25
CYCLOHEXANONE	108-94-1	203-631-1	8-18
ACETONE	67-64-1	200-662-2	5-20
SILICON DIOXIDE	112945-52-5	UNLISTED	BALANCE

CHEMICAL NAME	ACGIH	EXPOSURE LIMITS IN AIR				OTHER
		TLV PPM	STEL PPM	PEL PPM	OSHA STEL PPM	IDLH PPM
TETRAHYDROFURAN	200	250	200	250 (VACATED 1989 PEL)	2000 (BASED ON LEL)	NIOSH REL: TWA: 200 STEL: 250 DFG MAK: 50
METHYL ETHYL KETONE	200	300	200	300 (VACATED 1989 PEL)	3000	NIOSH REL: TWA: 200 STEL: 300 DFG MAK: 200 CARCINOGEN: EPA: D
POLYVINYL CHLORIDE RESIN	NE	NE	NE	NE	NE	CARCINOGEN: IARC: 3
CYCLOHEXANONE	25, SKIN, A3 (CONFIRMED ANIMAL CARCINOGEN WITH UNKNOWN RELEVANCE TO HUMANS)	NE	50 25 (VACATED 1989 PEL)	NE	700	NIOSH REL: TWA: 25, SKIN DFG MAK: DANGER OF CUTANEOUS ABSORPTION CARCINOGEN: IARC: 3 MAK: B
ACETONE	500 A4 (NOT CLASSIFIABLE AS A HUMAN CARCINOGEN)	750	1000 750	NE 1000	2500	NIOSH REL: TWA: 250 DFG MAK: 500 CARCINOGEN: EPA: D
SILICON DIOXIDE (EXPOSURE LIMITS ARE FOR SILICA-AMORPHOUS DIATOMACEOUS EARTH)	FOR CAS # 61790-53-2 (UNCALCINED) 10 MG/M3 (INHALABLE PARTICULATE) 3 MG/M3 (RESPIRABLE PARTICULATE)	NE	20 MPPCF OR 80 MG/M3/ % SiO2 6 MG/M3 (VACATED 1989 PEL)		3000 MG/M3	NIOSH REL: 6 MG/M3 DFG MAK: 4 MG/M3 (CAS # 61790-53-2) CARCINOGEN: IARC: 3 (CAS # 61790-53-2)

NE = NOT ESTABLISHED  
C = CEILING LIMIT.

SEE ORIGINAL MSDS FOR DEFINITIONS OF TERMS USED.

3. HAZARD IDENTIFICATION



EMERGENCY OVERVIEW:  
THIS IS AN EXTREMELY FLAMMABLE LIQUID WITH AN ETHER-LIKE ODOR. THIS PRODUCT COMES IN A VARIETY OF COLORS. INHALATION OVEREXPOSURES TO THE VAPORS OF THIS PRODUCT CAN CAUSE CENTRAL-NERVOUS SYSTEM EFFECTS (E.G., DIZZINESS, DROWSINESS, NAUSEA, AND HEADACHES). THIS PRODUCT CAN BE MILDLY TO SEVERELY IRRITATING TO THE EYES, SKIN, AND OTHER CONTAMINATED TISSUE. VAPORS OF THIS PRODUCT ARE HEAVIER THAN AIR AND MAY TRAVEL TO A SOURCE OF IGNITION AND FLASHBACK TO A LEAK OR OPEN CONTAINER. TETRAHYDROFURAN, A COMPONENT OF THIS PRODUCT, IS KNOWN TO FORM EXPLOSIVE PEROXIDES UNDER CERTAIN CIRCUMSTANCES. EMERGENCY RESPONDERS MUST WEAR THE PROPER PERSONAL PROTECTIVE EQUIPMENT (AND HAVE APPROPRIATE FIRE PROTECTION) SUITABLE FOR THE SITUATION TO WHICH THEY ARE RESPONDING.

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE:  
THE MOST SIGNIFICANT ROUTES OF OCCUPATIONAL OVEREXPOSURE ARE INHALATION AND CONTACT WITH SKIN AND EYES. THE SYMPTOMS OF OVEREXPOSURE TO THIS PRODUCT, VIA ROUTE OF EXPOSURE, ARE AS FOLLOWS:

INHALATION:  
INHALATION OF VAPORS, MISTS, OR SPRAYS OF THIS PRODUCT CAN BE IRRITATING TO THE NOSE, THROAT, MUCOUS MEMBRANES, AND OTHER TISSUES OF THE RESPIRATORY SYSTEM. SYMPTOMS OF OVEREXPOSURE CAN INCLUDE COUGHING, SNEEZING, AND SHORTNESS OF BREATH. ADDITIONALLY, THE COMPONENTS OF THIS PRODUCT ARE CENTRAL NERVOUS SYSTEM DEPRESSANTS. SYMPTOMS OF OVEREXPOSURE CAN INCLUDE DROWSINESS, DIZZINESS, FATIGUE, HEADACHE, NAUSEA, AND GENERAL ANESTHETIC EFFECTS. INHALATION OF HIGH CONCENTRATIONS OF THIS PRODUCT (AS MAY OCCUR IN A POORLY-VENTILATED AREA) MAY BE FATAL. BASED ON CLINICAL STUDIES INVOLVING TEST ANIMALS, CYCLOHEXANONE AND TETRAHYDROFURAN, COMPONENTS OF THIS PRODUCT, MAY CAUSE LIVER AND KIDNEY DAMAGE AFTER LONG-TERM INHALATION OVEREXPOSURES.

THIS PRODUCT MUST BE USED WITH ADEQUATE VENTILATION. MECHANICAL EXHAUST MAY BE NEEDED. ENSURE EXPOSURE TO VAPORS IS MINIMIZED BY USE OF APPROPRIATE ENGINEERING CONTROLS, WORK PRACTICES, AND PERSONAL PROTECTIVE EQUIPMENT, AS DESCRIBED IN THE REMAINDER OF THIS DOCUMENT.

CONTACT WITH SKIN OR EYES:  
CONTACT WITH THIS PRODUCT CAN BE IRRITATING TO CONTAMINATED SKIN AND EYES. VAPORS OF THIS PRODUCT CAN REDDEN AND IRRITATE THE EYES. IF THE EYES ARE CONTAMINATED WITH SPLASHES, SPRAYS OR MISTS OF THIS PRODUCT, REDDENING, TEARING, AND CORNEAL OPACITY CAN OCCUR. THE LIQUID CAN BE MILDLY TO SEVERELY IRRITATING TO CONTAMINATED SKIN (DEPENDING ON DURATION OF EXPOSURE). PROLONGED OR REPEATED SKIN OVER-EXPOSURES CAN LEAD TO DERMATITIS.

SKIN ABSORPTION:  
SKIN ABSORPTION IS A POTENTIAL ROUTE OF OVEREXPOSURE FOR CYCLOHEXANONE (A COMPONENT OF THIS PRODUCT). SYMPTOMS OF SUCH EXPOSURE CAN INCLUDE THOSE DESCRIBED UNDER "INHALATION" AND "CONTACT WITH SKIN AND EYES".

INGESTION:  
INGESTION IS NOT ANTICIPATED TO BE A SIGNIFICANT ROUTE OF OCCUPATIONAL OVEREXPOSURE FOR THIS PRODUCT. IF INGESTION OCCURS, REFER TO SECTION 4 (FIRST-AID MEASURES) AND GET MEDICAL HELP IMMEDIATELY. IF INGESTION OF THIS PRODUCT DOES OCCUR, SYMPTOMS OF SUCH OVER-EXPOSURE CAN INCLUDE NAUSEA, VOMITING, AND OTHER SYMPTOMS DESCRIBED FOR "INHALATION". INGESTION CAN ALSO LEAD TO LIVER AND KIDNEY DAMAGE. INGESTION OF THIS PRODUCT MAY BE FATAL.

INJECTION:  
INJECTION IS NOT ANTICIPATED TO BE A SIGNIFICANT ROUTE OF OVER-EXPOSURE FOR THIS PRODUCT. IF INJECTION DOES OCCUR (I.E. THROUGH A PUNCTURE BY AN OBJECT CONTAMINATED WITH THE PRODUCT), LOCAL IRRITATION AND SWELLING CAN OCCUR. ADDITIONAL SYMPTOMS MAY INCLUDE THOSE DESCRIBED FOR "INHALATION".

HEALTH EFFECTS OR RISKS FROM EXPOSURE: AN EXPLANATION IN LAY TERMS.

ACUTE:  
OVER-EXPOSURE TO THIS PRODUCT CAN BE IRRITATING TO THE EYES, SKIN, AND MUCOUS MEMBRANES, AND CAN ALSO CAUSE CENTRAL-NERVOUS SYSTEM EFFECTS

(DIZZINESS, DROWSINESS, NAUSEA AND HEADACHES). INGESTION OF THIS PRODUCT, OR INHALATION OF HIGH CONCENTRATIONS OF THIS PRODUCT'S VAPORS, MAY BE FATAL.

CHRONIC:  
PROLONGED OR REPEATED SKIN EXPOSURES CAN LEAD TO DERMATITIS (DRYNESS, REDDENING AND IRRITATION OF THE SKIN). TETRAHYDROFURAN, A COMPONENT OF THIS PRODUCT, MAY CAUSE LIVER AND KIDNEY DAMAGE AFTER LONG-TERM INHALATION OVEREXPOSURES. THERE IS LIMITED EVIDENCE FROM ANIMAL STUDIES THAT METHYL ETHYL KETONE, A COMPONENT OF THIS PRODUCT, IS A REPRODUCTIVE TOXIN. REFER TO SECTION 11 (TOXICOLOGICAL INFORMATION) FOR ADDITIONAL INFORMATION. A REPORT FROM THE NATIONAL TOXICOLOGY PROGRAM (NTP) HAS SUGGESTED THAT EXPOSURE OF MICE AND RATS TO TETRAHYDROFURAN (THF) VAPOR LEVELS UP TO 1800 PPM 6 HR/DAY, 5 DAYS/WEEK FOR THEIR LIFETIMES CAUSED AN INCREASED INCIDENCE OF KIDNEY TUMORS IN MALE RATS AND LIVER TUMORS IN FEMALE MICE. NO EVIDENCE OF TUMORS WAS SEEN IN FEMALE RATS OR MALE MICE. THE SIGNIFICANCE OF THESE FINDINGS FOR HUMAN HEALTH IS UNCLEAR AT THIS TIME, AND MAY BE RELATED TO "SPECIES SPECIFIC" EFFECTS. ELEVATED INCIDENCES OF TUMORS IN HUMANS HAVE NOT BEEN REPORTED FOR THF. THE NTP, IARC, OR OSHA DOES NOT LIST THF AS A CARCINOGEN. ONE THF VENDOR (DUPONT) HAS RECOMMENDED A REDUCTION IN THE "ACCEPTABLE EXPOSURE LIMIT" FROM 200 PPM TO 25 PPM, 8 AND 12 HOUR TIME WEIGHTED AVERAGE AND A STEL OF 75 PPM.

TARGET ORGANS:  
ACUTE: SKIN, EYES, RESPIRATORY SYSTEM, CENTRAL NERVOUS SYSTEM.  
CHRONIC: LIVER, KIDNEYS.

HAZARDOUS MATERIAL INFORMATION SYSTEM:  
HEALTH (BLUE) 2  
FLAMMABILITY (RED) 3  
REACTIVITY (YELLOW) 1  
PROTECTIVE EQUIPMENT C/D

EYES: SPLASH GOGGLES  
RESPIRATORY: SEE SECTION 8  
HANDS: GLOVES  
BODY: APRON

FOR ROUTINE APPLICATIONS.

SEE ORIGINAL MSDS FOR DEFINITION OF RATINGS

PART II WHAT SHOULD I DO IF A HAZARDOUS SITUATION OCCURS?

4. FIRST-AID MEASURES



SKIN EXPOSURE:  
IF THIS PRODUCT CONTAMINATES THE SKIN, IMMEDIATELY BEGIN DECONTAMINATION WITH RUNNING WATER. MINIMUM FLUSHING IS FOR 15 MINUTES. REMOVE EXPOSED OR CONTAMINATED CLOTHING, TAKING CARE NOT TO CONTAMINATE EYES. THE CONTAMINATED INDIVIDUAL MUST SEEK MEDICAL ATTENTION IF ANY ADVERSE EFFECT OCCURS.

EYE EXPOSURE:  
IF THIS PRODUCT'S LIQUID OR VAPORS ENTER THE EYES, OPEN VICTIM'S EYES WHILE UNDER GENTLY RUNNING WATER. USE SUFFICIENT FORCE TO OPEN EYELIDS. HAVE VICTIM "ROLL" EYES. MINIMUM FLUSHING IS FOR 15 MINUTES. THE CONTAMINATED INDIVIDUAL MUST SEEK IMMEDIATE MEDICAL ATTENTION.

INHALATION:  
IF VAPORS, MISTS, OR SPRAYS OF THIS PRODUCT ARE INHALED, REMOVE VICTIM TO FRESH AIR. IF NECESSARY, USE ARTIFICIAL RESPIRATION TO SUPPORT VITAL FUNCTIONS. REMOVE OR COVER GROSS CONTAMINATION TO AVOID EXPOSURE TO RESCUERS.

INGESTION:  
IF THIS PRODUCT IS SWALLOWED, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. IF PROFESSIONAL ADVICE IS NOT AVAILABLE, DO NOT INDUCE VOMITING. THE CONTAMINATED INDIVIDUAL SHOULD DRINK MILK, EGG WHITES, OR LARGE QUANTITIES OF WATER. NEVER INDUCE VOMITING OR GIVE DILUENTS (MILK OR WATER) TO SOMEONE WHO IS UNCONSCIOUS, HAVING CONVULSIONS, OR UNABLE TO SWALLOW.

THE CONTAMINATED INDIVIDUAL MUST BE TAKEN FOR MEDICAL ATTENTION, ESPECIALLY IF ANY ADVERSE EFFECT OCCURS. RESCUERS SHOULD BE TAKEN FOR MEDICAL ATTENTION, IF NECESSARY. TAKE A COPY OF LABEL AND MSDS TO HEALTH PROFESSIONAL WITH VICTIM.



5. FIRE-FIGHTING MEASURES

THE FOLLOWING INFORMATION IS VARIABLE, DEPENDING ON THE BLEND. THE FOLLOWING INFORMATION IS FOR TETRAHYDROFURAN, THE MAIN SOLVENT COMPONENT OF THIS PRODUCT.

FLASH POINT: -17 DEG. C (4.1 DEG. F)

AUTOIGNITION TEMPERATURE: 321 DEG. C (610 DEG. F)

FLAMMABLE LIMITS (IN AIR BY VOLUME):  
LOWER (LEL): 1.8%  
UPPER (UEL): 11.8%

THE FOLLOWING INFORMATION IS FOR THE PRODUCT.

FIRE EXTINGUISHING MATERIALS:  
WATER SPRAY: YES (FOR COOLING ONLY)  
CARBON DIOXIDE: YES  
FOAM: YES  
DRY CHEMICAL: YES  
HALON: YES  
OTHER: ANY "B" CLASS.

UNUSUAL FIRE AND EXPLOSION HAZARDS:  
THIS IS A CLASS I-B FLAMMABLE LIQUID. WHEN INVOLVED IN A FIRE, THIS MATERIAL MAY IGNITE AND PRODUCE IRRITATING VAPORS AND TOXIC GASES (E.G., CARBON MONOXIDE, CARBON DIOXIDE). THIS MATERIAL WILL READILY IGNITE AT ROOM TEMPERATURE. THE VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL TO A SOURCE OF IGNITION, AND FLASH BACK TO A LEAK OR OPEN CONTAINER. TETRAHYDROFURAN CAN FORM POTENTIALLY EXPLOSIVE PEROXIDES; CLOSED CONTAINERS CONTAMINATED WITH PEROXIDES CAN RUPTURE VIOLENTLY IN THE HEAT OF A FIRE.

EXPLOSION SENSITIVITY TO MECHANICAL IMPACT: NOT SENSITIVE.

EXPLOSION SENSITIVITY TO STATIC DISCHARGE:  
THE VAPORS OF THIS PRODUCT CAN BE IGNITED BY STATIC ELECTRICAL ENERGY.

SPECIAL FIRE-FIGHTING PROCEDURES:  
INCIPIENT FIRE RESPONDERS SHOULD WEAR EYE PROTECTION. STRUCTURAL FIREFIGHTERS MUST WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE EQUIPMENT. IF IT IS SAFE TO DO SO, ALLOW SMALL FIRES INVOLVING THIS PRODUCT TO BURN-OUT, WHILE PROTECTING EXPOSURES. IF POSSIBLE, PREVENT RUNOFF WATER FROM ENTERING STORM DRAINS, BODIES OF WATER, OR OTHER ENVIRONMENTALLY SENSITIVE AREAS. IF NECESSARY, RINSE CONTAMINATED EQUIPMENT THOROUGHLY BEFORE RETURNING SUCH EQUIPMENT TO SERVICE.

NFPA RATING:  
HEALTH 2  
FLAMMABILITY 3  
REACTIVITY 1  
OTHER

SEE ORIGINAL MSDS FOR DEFINITION OF RATINGS

6. ACCIDENTAL RELEASE MEASURES



RELEASE RESPONSE:  
IN CASE OF A SPILL, CLEAR THE AFFECTED AREA AND PROTECT PEOPLE. UNCONTROLLED RELEASES SHOULD BE RESPONDED TO BY TRAINED PERSONNEL USING PRE-PLANNED PROCEDURES. PROPER PROTECTIVE EQUIPMENT SHOULD BE USED.

SMALL RELEASES (E.G., 1-PINT) MUST BE CLEANED-UP BY PERSONNEL WEARING GLOVES, GOGGLES, AND APPROPRIATE EYE PROTECTION. FACE SHIELDS MUST BE WORN IF SPLASHES OR SPRAYS OF THIS PRODUCT MAY BE GENERATED. IN THE EVENT OF A NON-INCIDENTAL RELEASE (E.G., FIVE, 1-GALLON CONTAINERS LEAKING SIMULTANEOUSLY IN A POORLY-VENTILATED AREA), THE MINIMUM PERSONAL PROTECTIVE EQUIPMENT SHOULD BE LEVEL B: TRIPLE-GLOVES (RUBBER GLOVES AND NITRILE GLOVES, OVER LATEX GLOVES), CHEMICALLY RESISTANT SUIT AND BOOTS, HARD-HAT, AND SELF-CONTAINED BREATHING APPARATUS. LEVEL B SHOULD ALWAYS BE USED DURING RESPONSES IN WHICH THE OXYGEN LEVEL IS BELOW 19.5% OR UNKNOWN.

ELIMINATE ALL SOURCES OF IGNITION BEFORE SPILL CLEAN-UP BEGINS. USE

NON-SPARKING TOOLS. ABSORB SPILLED LIQUID WITH ACTIVATED CARBON, POLYPADS OR OTHER SUITABLE ABSORBENT MATERIALS. MONITOR THE AREA FOR COMBUSTIBLE VAPORS AND THE LEVEL OF OXYGEN. MONITORING MUST INDICATE LESS THAN 10% OF THE LEL (SEE SECTION 5, FIRE-FIGHTING MEASURES) AND GREATER THAN 19.5% OXYGEN IS IN THE ATMOSPHERE BEFORE PERSONNEL ARE PERMITTED IN THE AREA WITHOUT LEVEL B PROTECTION. PLACE ALL SPILL RESIDUE IN AN APPROPRIATE CONTAINER AND SEAL. DISPOSE OF IN ACCORDANCE WITH U.S. FEDERAL, STATE, OR LOCAL PROCEDURES, THE APPLICABLE STANDARDS OF CANADA AND ITS PROVINCES, OR THE APPROPRIATE REQUIREMENTS OF EUROPEAN COMMUNITY MEMBER STATES (SEE SECTION 13, DISPOSAL CONSIDERATIONS).

PART III HOW CAN I PREVENT HAZARDOUS SITUATIONS FROM OCCURRING?

7. HANDLING AND STORAGE



WORK PRACTICES AND HYGIENE PRACTICES:  
AS WITH ALL CHEMICALS, AVOID GETTING THIS PRODUCT ON YOU OR IN YOU. WASH THOROUGHLY AFTER HANDLING THIS PRODUCT. DO NOT EAT, DRINK, SMOKE, OR APPLY COSMETICS WHILE HANDLING THIS PRODUCT. AVOID BREATHING VAPORS OR MISTS GENERATED BY THIS PRODUCT. REMOVE CONTAMINATED CLOTHING IMMEDIATELY.

STORAGE AND HANDLING PRACTICES:  
ALL EMPLOYEES WHO HANDLE THIS MATERIAL SHOULD BE TRAINED TO HANDLE IT SAFELY. CONTAINERS OF THIS PRODUCT MUST BE PROPERLY LABELED. IF THIS MIXTURE IS USED IN OTHER TYPES OF CONTAINERS, ONLY USE PORTABLE CONTAINERS APPROVED FOR FLAMMABLE LIQUIDS. POST "NO SMOKING" SIGNS, WHERE APPROPRIATE IN STORAGE AND USE AREAS. USE NON-SPARKING TOOLS. BOND AND GROUND DURING TRANSFER OF MATERIAL. STORE CONTAINERS OF THE PRODUCT IN A COOL, DRY LOCATION, AWAY FROM DIRECT SUNLIGHT, SOURCES OF INTENSE HEAT, OR WHERE FREEZING IS POSSIBLE. MATERIAL SHOULD BE STORED IN SECONDARY CONTAINERS, OR IN A DIKED AREA, AS APPROPRIATE. STORE CONTAINERS AWAY FROM INCOMPATIBLE CHEMICALS. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. STORAGE AREAS SHOULD BE MADE OF FIRE-RESISTANT MATERIALS. INSPECT ALL INCOMING CONTAINERS BEFORE STORAGE, TO ENSURE CONTAINERS ARE PROPERLY LABELED AND NOT DAMAGED. REFER TO NFPA 30, FLAMMABLE AND COMBUSTIBLE LIQUIDS CODE FOR ADDITIONAL INFORMATION ON STORAGE. EMPTY CONTAINERS MAY CONTAIN RESIDUAL FLAMMABLE LIQUID OR VAPORS. THEREFORE, EMPTY CONTAINERS SHOULD BE HANDLED WITH CARE. DO NOT EXPOSE "EMPTY" CONTAINERS TO WELDING TOUCHES, OR ANY OTHER SOURCE OF IGNITION.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION



VENTILATION AND ENGINEERING CONTROLS:  
USE WITH ADEQUATE VENTILATION. MECHANICAL EXHAUST MAY BE NEEDED.

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

RESPIRATORY PROTECTION:  
RESPIRATORY PROTECTION IS NOT GENERALLY NEEDED WHEN USING THIS PRODUCT. MAINTAIN AIRBORNE CONTAMINANT CONCENTRATIONS BELOW GUIDELINES LISTED IN SECTION 2 (COMPOSITION, INFORMATION ON INGREDIENTS). IF RESPIRATORY PROTECTION IS NEEDED, USE ONLY PROTECTION AUTHORIZED IN 29 CFR 1910.134 OR APPLICABLE STATE REGULATIONS. USE SUPPLIED AIR RESPIRATION PROTECTION IF OXYGEN LEVELS ARE BELOW 19.5% OR ARE UNKNOWN. RESPIRATORY PROTECTION GUIDELINES FOR TETRAHYDROFURAN (A COMPONENT OF THIS PRODUCT) ARE PROVIDED ON THE FOLLOWING.

NIOSH/OSHA RECOMMENDATIONS FOR TETRAHYDROFURAN CONCENTRATIONS IN AIR:

UP TO 2000 PPM:  
SUPPLIED AIR RESPIRATOR (SAR) OPERATED IN A CONTINUOUS-FLOW MODE, FULL-FACEPIECE CHEMICAL CARTRIDGE RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE(S), GAS MASK WITH ORGANIC VAPOR CANISTER, POWERED AIR-PURIFYING RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE(S), FULL-FACEPIECE SELF-CONTAINED BREATHING APPARATUS (SCBA), OR FULL-FACEPIECE SAR.

EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS:  
POSITIVE PRESSURE, FULL-FACEPIECE SCBA OR POSITIVE PRESSURE, FULL-FACEPIECE SAR WITH AN AUXILIARY POSITIVE PRESSURE SCBA.

ESCAPE: GAS MASK WITH ORGANIC VAPOR CANISTER OR ESCAPE-TYPE SCBA.

NOTE:  
THE IDLH CONCENTRATION FOR TETRAHYDROFURAN IS 2000 PPM. THIS VALUE IS BASED ON THE LOWER EXPLOSIVE LIMIT (LEL). RESPIRATORY PROTECTION EQUIPMENT MAY NOT BE ADEQUATE FOR FIRE SITUATIONS.

EYE PROTECTION:  
SPLASH GOGGLES OR SAFETY GLASSES. FACE SHIELD SHOULD BE WORN WHEN WORKING IN SITUATIONS IN WHICH SPLASHES OR SPRAYS CAN BE GENERATED.

HAND PROTECTION:  
WEAR GLOVES FOR ROUTINE INDUSTRIAL USE TO PROTECT HANDS FROM CONTACT. FOR LONG EXPOSURES, OR UNUSUAL CONTACT, SUCH AS SPILL CLEANUP, CHEMICAL RESISTANT GLOVES MAY BE REQUIRED. SEE SECTION 6.

BODY PROTECTION:  
USE BODY PROTECTION APPROPRIATE FOR TASK (E.G., APRON OR TYVEK SUIT).

9. PHYSICAL AND CHEMICAL PROPERTIES



FOR TETRAHYDROFURAN (THE MAIN SOLVENT COMPONENT OF THIS PRODUCT):

RELATIVE VAPOR DENSITY (AIR = 1): 2.5

EVAPORATION RATE (nBuAc = 1): 8-14.5

SPECIFIC GRAVITY (WATER = 1): APPROXIMATELY 0.91

FREEZING/MELTING POINT: -1.85 DEG. C (-16 DEG. F)

SOLUBILITY IN WATER @ 25 DEG. C: 30%

BOILING POINT: 66 DEG. C (151 DEG. F)

VAPOR PRESSURE, MMHg @ 20 DEG. C: 129

pH: NOT ESTABLISHED.

ODOR THRESHOLD: 2.48-3.47 PPM

COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT): 0.46

FOR THIS PRODUCT:

ODOR THRESHOLD: NOT APPLICABLE.

FORM: LIQUID.

COLOR: VARIABLE COLOR.

ODOR: ETHEREAL.

VISCOSITY: NOT AVAILABLE.

FLASH POINT: -17 DEG. C (4.1 DEG. F) (TETRAHYDROFURAN)

HOW TO DETECT THIS SUBSTANCE (WARNING PROPERTIES):  
THE COLOR AND ODOR OF THE PRODUCT MAY BE DISTINCTIVE PROPERTIES OF THIS PRODUCT.

10. STABILITY AND REACTIVITY



STABILITY: STABLE.

NOTE:  
TETRAHYDROFURAN, A COMPONENT OF THIS PRODUCT, CAN FORM POTENTIALLY EXPLOSIVE PEROXIDE COMPOUNDS WHEN EXPOSED TO LIGHT OR AIR. THOUGH THIS PRODUCT CONTAINS INHIBITORS TO PREVENT PEROXIDE FORMATION, CARE SHOULD BE USED WHEN STORING THIS PRODUCT, OR HANDLING OLD CONTAINERS OF THIS MATERIAL.

DECOMPOSITION PRODUCTS:  
CARBON MONOXIDE, CARBON DIOXIDE, SILICON AND CHLORIDE COMPOUNDS.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:  
THIS PRODUCT WILL NOT BE COMPATIBLE WITH STRONG OXIDIZERS, LITHIUM ALUMINUM HYDRIDE, AND ALKALINE EARTH HYDROXIDES.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

CONDITIONS TO AVOID:  
AVOID EXPOSURE OR CONTACT TO EXTREME TEMPERATURES, SOURCES OF IGNITION, INCOMPATIBLE CHEMICALS.

PART IV IS THERE ANY OTHER USEFUL INFORMATION ABOUT THIS MATERIAL?

11. TOXICOLOGICAL INFORMATION



TOXICITY DATA:  
THE SPECIFIC TOXICOLOGY DATA AVAILABLE FOR COMPONENTS GREATER THAN 1% IN CONCENTRATION ARE AS FOLLOWS.

CYCLOHEXANONE:

EYE EFFECTS-HUMAN: 75 PPM

SKIN: RABBIT, ADULT: 500 MG OPEN MILD IRRITATION EFFECTS

ORAL-RAT LD50: 1535 MG/KG

ORAL-MOUSE LD50: 1400 MG/KG

SUBCUTANEOUS-RAT LD50: 2170 MG/KG

INTRAPERITONEAL-MOUSE LD50: 1350 MG/KG

SUBCUTANEOUS-MOUSE LDLO: 1300 MG/KG

INTRAVENOUS-DOG, ADULT LDLO: 630 MG/KG

ORAL-RABBIT, ADULT LDLO: 1600 MG/KG

SKIN-RABBIT, ADULT LD50: 948 MG/KG

TCLO - INHALATION - RAT:  
105 MG/M3/4 HOURS:  
FEMALE 1-20 DAY(S) AFTER CONCEPTION:  
REPRODUCTIVE - FERTILITY - PRE-IMPLANTATION MORTALITY

TDLO - ORAL - MOUSE:  
11 GM/KG:  
FEMALE 8-12 DAY(S) AFTER CONCEPTION:  
REPRODUCTIVE - EFFECTS ON NEWBORN - GROWTH STATISTICS (E.G. %, REDUCED WEIGHT GAIN)

MUTATION IN MICROORGANISMS:  
BACTERIA - SALMONELLA TYPHIMURIUM: 20 (MICRO)L/

MUTATION IN MICROORGANISMS:  
BACTERIA - BACILLUS SUBTILIS: 200 (MICRO)L/L

CYTOGENETIC ANALYSIS:  
HUMAN LEUKOCYTE: 100 (MICRO)MOL/L

CYTOGENETIC ANALYSIS:  
HUMAN LYMPHOCYTE: 5 (MICRO)G/L

SISTER CHROMATID EXCHANGE:  
RODENT - HAMSTER OVARY: 7500 (MICRO)L/L

MUTATION IN MAMMALIAN SOMATIC:  
RODENT - HAMSTER OVARY: 7500 (MICRO)L/L

METHYL ETHYL KETONE:

EYE EFFECTS-HUMAN: 350 PPM

SKIN-RABBIT, ADULT: 500 MG/24 HOURS; MODERATE IRRITATION EFFECTS

SKIN-RABBIT, ADULT: 402 MG/24 HOURS; MILD IRRITATION EFFECTS



SKIN-RABBIT, ADULT: 13,780 MG/24H OPEN MILD IRRITATION EFFECTS

EYE EFFECTS-RABBIT, ADULT: 80 MG

INTRAPERITONEAL-MOUSE LD50: 616 MG/KG

SKIN-RABBIT, ADULT LD50: 6450 MG/KG

SEX CHROMOSOME LOSS AND NONDISJUNCTION:  
SACCHAROMYCES CEREVISIAE: 33,800 PPM

INHALATION-RAT TCLO:  
1000 PPM/(6-15D PREG): TERATOGENIC EFFECTS

INHALATION-HUMAN TCLO:  
100 PPM/5 MINUTES: IRRITANT EFFECTS

ORAL-RAT LD50: 2737 MG/KG

INHALATION-RAT LC50: 23,500 MG/M3/8 HOURS

INTRAPERITONEAL-RAT LD50: 607 MG/KG

ORAL-MOUSE LD50: 4050 MG/KG

INHALATION-MOUSE LC50: 40 G/M3/2 HOURS

INTRAPERITONEAL-GUINEA PIG, ADULT LDLO: 2 G/KG

INHALATION-UNSPECIFIED EFFECTS LC50: 38 G/M3

INHALATION-RAT TCLO: 5000 PPM/6H/90 DAYS - INTERMITTENT

TDLO - SUBCUTANEOUS - CAT:  
55500 MG/KG/37 WEEKS - INTERMITTENT:  
REPRODUCTIVE - TUMORIGENIC EFFECTS - OTHER REPRODUCTIVE SYSTEM TUMORS

TCLO - INHALATION - RAT:  
3000 PPM/7 HOURS:  
FEMALE 6-15 DAY(S) AFTER CONCEPTION:  
REPRODUCTIVE - SPECIFIC DEVELOPMENTAL ABNORMALITIES - CRANIOFACIAL  
(INCLUDING NOSE AND TONGUE), UROGENITAL SYSTEM, HOMEOSTASIS

TCLO - INHALATION - RAT:  
1000 PPM/7 HOURS:  
FEMALE 6-15 DAY(S) AFTER CONCEPTION:  
REPRODUCTIVE - EFFECTS ON EMBRYO OR FETUS - FETOTOXICITY (EXCEPT DEATH,  
E.G., STUNTED FETUS) REPRODUCTIVE - SPECIFIC DEVELOPMENTAL ABNORMALITIES -  
MUSCULOSKELETAL SYSTEM

TCLO - INHALATION - MOUSE:  
3000 PPM/7H:  
FEMALE 6-15 DAY(S) AFTER CONCEPTION:  
REPRODUCTIVE - EFFECTS ON EMBRYO OR FETUS - FETOTOXICITY

POLYVINYL CHLORIDE RESIN:

ORAL-RAT TDLO:  
210 G/KG/30 WEEKS - CONTINUOUS: EQUIVOCAL TUMORIGENIC AGENT

IMPLANT-RAT TDLO:  
75 MG/KG: EQUIVOCAL TUMORIGENIC AGENT

SILICON DIOXIDE:

UNSCHEDULED DNA SYNTHESIS-RAT-INTRATRACHEAL: 120 MG/KG

BODY FLUID ASSAY-RAT:  
LUNG: 120 MG/KG

INHALATION-RAT TCLO: 50 MG/M3/6 HOURS/2 YEARS - INTERMITTENT

ORAL-RAT LD50: 3160 MG/KG

INTRAPERITONEAL-RAT LDLO: 50 MG/KG

INTRAVENOUS-RAT LD50: 15 MG/KG

INTRATRACHEAL-RAT LDLO: 10 MG/KG

INTRAPERITONEAL-GUINEA PIG, ADULT LDLO: 120 MG/KG

TETRAHYDROFURAN:

MUTATION IN MICROORGANISMS-ESCHERICHIA COLI: 1 (MICRO)MOL/L

INHALATION-HUMAN TCLO:  
25,000 PPM: CENTRAL NERVOUS SYSTEM EFFECTS

ORAL-RAT LD50: 1650 MG/KG.

INHALATION-RAT LC50: 21,000 PPM/3H

INTRAPERITONEAL-RAT LD50: 2900 MG/KG

INHALATION-MOUSE LCLO: 24,000 MG/M3/2 HOURS

INTRAPERITONEAL-MOUSE LD50: 1900 MG/KG

INTRAPERITONEAL-GUINEA PIG, ADULT LDLO: 500 MG/KG

INHALATION-RAT TCLO: 5000 PPM/6 HOURS/91 DAYS - INTERMITTENT

TCLO - INHALATION - RAT:  
5000 PPM/6H:  
FEMALE 6-19 DAY(S) AFTER CONCEPTION:  
REPRODUCTIVE - EFFECTS ON EMBRYO OR FETUS - FETOTOXICITY

TCLO - INHALATION - MOUSE:  
1800 PPM/6H:  
FEMALE 6-17 DAY(S) AFTER CONCEPTION:  
REPRODUCTIVE - FERTILITY - POST-IMPLANTATION MORTALITY

MUTATION IN MICROORGANISMS:  
BACTERIA - ESCHERICHIA COLI: 1 (MICRO)MOL/L

SUSPECTED CANCER AGENT:  
COMPONENTS OF THIS PRODUCTS ARE LISTED AS FOLLOWS:

CYCLOHEXANONE:  
IARC-3: NOT CLASSIFIABLE AS A HUMAN CARCINOGEN.  
MAK-B: JUSTIFIABLY SUSPECTED OF HAVING CARCINOGENIC POTENTIAL.

METHYL ETHYL KETONE:  
EPA-D: NOT CLASSIFIABLE AS TO HUMAN CARCINOGENICITY.

POLYVINYL CHLORIDE RESIN:  
IARC-3: NOT CLASSIFIABLE AS A HUMAN CARCINOGEN.

SILICON DIOXIDE:  
IARC-3: NOT CLASSIFIABLE AS A HUMAN CARCINOGEN.

THIS PRODUCT'S COMPONENTS ARE NOT FOUND ON THE FOLLOWING LISTS:  
FEDERAL OSHA Z LIST, NTP, IARC, AND CAL/OSHA AND THEREFORE ARE NEITHER  
CONSIDERED TO BE NOR SUSPECTED TO BE CANCER-CAUSING AGENTS BY THESE  
AGENCIES.

IRRITANCY OF PRODUCT:  
THIS PRODUCT IS EXPECTED TO MILDLY TO SEVERELY IRRITATE THE SKIN AND EYES.

SENSITIZATION TO THE PRODUCT:  
NO COMPONENT OF THIS PRODUCT IS KNOWN TO BE A SENSITIZER WITH PROLONGED OR  
REPEATED USE.

REPRODUCTIVE TOXICITY INFORMATION:  
LISTED BELOW IS INFORMATION CONCERNING THE EFFECTS OF THIS PRODUCT AND ITS  
COMPONENTS ON THE HUMAN REPRODUCTIVE SYSTEM.

MUTAGENICITY:  
THIS PRODUCT IS NOT REPORTED TO PRODUCE MUTAGENIC EFFECTS IN HUMANS. HUMAN  
MUTATION DATA ARE AVAILABLE FOR CYCLOHEXANONE (A COMPONENT OF THIS  
PRODUCT);  
THESE DATA WERE OBTAINED ON SPECIFIC HUMAN TISSUES EXPOSED TO RELATIVELY  
HIGH DOSES. ANIMAL MUTATION DATA ARE AVAILABLE FOR METHYL ETHYL KETONE,  
SILICON DIOXIDE, AND TETRAHYDROFURAN (COMPONENTS OF THIS PRODUCT); THESE  
DATA WERE OBTAINED DURING CLINICAL STUDIES ON SPECIFIC ANIMAL TISSUES OR  
MICROORGANISMS EXPOSED TO HIGH CLOSES OF THESE COMPOUNDS.

EMBRYOTOXICITY:  
THIS PRODUCT IS NOT REPORTED TO PRODUCE EMBRYOTOXIC EFFECTS IN HUMANS.

TERATOGENICITY:

THIS PRODUCT IS NOT REPORTED TO CAUSE TERATOGENIC EFFECTS IN HUMANS. THREE ANIMAL STUDIES INVOLVING METHYL ETHYL KETONE (A COMPONENT OF THIS PRODUCT) HAVE SHOWN FETOTOXICITY (SKELETAL ANOMALIES) AT DOSES WHICH DID NOT PRODUCE SIGNIFICANT MATERNAL TOXICITY.

REPRODUCTIVE TOXICITY:  
THIS PRODUCT IS NOT REPORTED TO CAUSE REPRODUCTIVE EFFECTS IN HUMANS. REPRODUCTIVE TOXICITY DATA ARE AVAILABLE FOR METHYL ETHYL KETONE AND TETRAHYDROFURAN (A COMPONENT OF THIS PRODUCT); THESE DATA WERE OBTAINED FROM CLINICAL STUDIES ON TEST ANIMALS EXPOSED TO RELATIVELY HIGH DOSES.

A MUTAGEN IS A CHEMICAL WHICH CAUSES PERMANENT CHANGES TO GENETIC MATERIAL (DNA) SUCH THAT THE CHANGES WILL PROPAGATE THROUGH GENERATIONAL LINES. AN EMBRYOTOXIN IS A CHEMICAL WHICH CAUSES DAMAGE TO A DEVELOPING EMBRYO (I.E. WITHIN THE FIRST EIGHT WEEKS OF PREGNANCY IN HUMANS), BUT THE DAMAGE DOES NOT PROPAGATE ACROSS GENERATIONAL LINES. A TERATOGEN IS A CHEMICAL WHICH CAUSES DAMAGE TO A DEVELOPING FETUS, BUT THE DAMAGE DOES NOT PROPAGATE ACROSS GENERATIONAL LINES. A REPRODUCTIVE TOXIN IS ANY SUBSTANCE WHICH INTERFERES IN ANY WAY WITH THE REPRODUCTIVE PROCESS.

ACGIH BIOLOGICAL EXPOSURE INDICES:  
CURRENTLY, THERE ARE ACGIH BIOLOGICAL EXPOSURE INDICES (BEIS) ASSOCIATED WITH COMPONENTS OF THIS PRODUCT, AS FOLLOWS:

CHEMICAL DETERMINANT	SAMPLING TIME	BEI
ACETONE:		
ACETONE IN URINE	END OF SHIFT	100 MG/L
METHYL ETHYL KETONE (MEK):		
MEK IN URINE	END OF SHIFT	2 MG/L
TETRAHYDROFURAN (INTENDED):		
TETRAHYDROFURAN IN URINE	END OF SHIFT	8 MG/L

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:  
PREEXISTING RESPIRATORY PROBLEMS, DERMATITIS, AND OTHER SKIN DISORDERS, AS WELL AS CONDITIONS INVOLVING THE "TARGET ORGANS" (SEE SECTION 3, HAZARD IDENTIFICATION) CAN BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT.

RECOMMENDATIONS TO PHYSICIANS:  
TREAT SYMPTOMS AND ELIMINATE OVEREXPOSURE. IF NECESSARY, REVIEW FOR BRAIN AND CENTRAL NERVOUS SYSTEM EFFECTS AND CONDUCT PULMONARY FUNCTION TEST. OTHER TESTS FOR LUNG, KIDNEY, AND LIVER EFFECTS MAY ALSO PROVE USEFUL.

12. ECOLOGICAL INFORMATION



ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY:  
THE COMPONENTS OF THIS PRODUCT WILL BIODEGRADE INTO OTHER ORGANIC COMPOUNDS. ENVIRONMENTAL DATA ARE AVAILABLE FOR COMPONENTS OF THIS PRODUCT, AS FOLLOWS:

CYCLOHEXANONE:  
KOC: 0.81.  
WATER SOLUBILITY: 23,000 MG/L.  
CYCLOHEXANONE IS NOT RAPIDLY VOLATILIZED FROM WATER, EXCEPT FOR FAST MOVING STREAMS OR VERY SHALLOW PONDS. SIGNIFICANT SOIL TEACHING OCCURS, CONTRIBUTING TO GROUND WATER CONTAMINATION. BIODEGRADATION AND PHOTOLYSIS OCCUR IN WATER. RAPID ATMOSPHERIC DEGRADATION OCCURS VIA PHOTOLYSIS, WITH A HALF-LIFE OF ABOUT 1 TO 5 DAYS.

METHYL ETHYL KETONE:  
LOG KOW: 0.29.  
WATER SOLUBILITY: 239,000 MG/L.  
METHYL ETHYL KETONE IS RAPIDLY VOLATILIZED FROM WATER AND UNDERGOES SLOW BIODEGRADATION. IT UNDERGOES MODERATE ATMOSPHERIC PHOTODEGRADATION.

TETRAHYDROFURAN:  
WATER SOLUBILITY: 30% (25 DEG. C).  
TETRAHYDROFURAN IS SIGNIFICANTLY BIODEGRADED IN STANDARD TESTS. THIS COMPOUND IS NOT EXPECTED TO BIOCONCENTRATE IN FISH SIGNIFICANTLY.

EFFECT OF MATERIAL ON PLANTS OR ANIMALS:  
THIS PRODUCT CAN BE HARMFUL OR FATAL TO CONTAMINATED PLANT OR ANIMAL LIFE, ESPECIALLY IF RELEASED IN LARGE QUANTITIES INTO THE ENVIRONMENT. REFER TO SECTION 11 (TOXICOLOGICAL INFORMATION) FOR INFORMATION REGARDING THE EFFECT OF THIS PRODUCT'S COMPONENTS ON TEST ANIMALS.

EFFECT OF CHEMICAL ON AQUATIC LIFE:  
THIS PRODUCT CAN BE HARMFUL OR FATAL TO CONTAMINATED AQUATIC PLANT OR ANIMAL LIFE, ESPECIALLY IF RELEASED IN LARGE QUANTITIES IN A BODY OF WATER. THE FOLLOWING AQUATIC TOXICITY DATA ARE AVAILABLE FOR THE COMPONENTS OF THIS PRODUCT:

CYCLOHEXANONE:  
LC50 (PIMEPHALES PROMELAS FATHEAD MINNOW): 527 MG/L 96 HOURS  
EC0 (BACTERIA PSEUDOMONAS PUTIDA) 16 HOURS: 180 MG/L  
EC0 (ALGAE MICROCYSTIS AERUGLNOSA) 8 DAYS: 52 MG/L  
EC0 (GREEN ALGAE SCENEDESMUS QUADRICAUDA) 7 DAYS: 370 MG/L  
EC0 (PROTOZOA ENTOSIPHON SULCATUM) 72 HOURS: 545 MG/L  
EC0 (PROTOZOA URONEMA PARDUCZI CHATTON-LWOFF): 280 MG/L  
EC0 (BACTERIA PSEUDOMONAS FLUORESCENS) 16 HOURS: 180 MG/L (pH = 7)  
EC0 (CHLLOMONAS PARAMECIUM EHRENBURG) 48 HOURS: 573 MG/L  
EC0 (DAPHNIA MAGNA STRAUS) 24 HOURS: 526 MG/L  
EC50 (DAPHNIA MAGNA STRAUS) 24 HOURS: 820 MG/L  
EC100 (DAPHNIA MAGNA STRAUS) 24 HOURS: 1,240 MG/L  
EC0 (DAPHNIA MAGNA) 24 HOURS: 540 MG/L  
EC50 (DAPHNIA MAGNA) 24 HOURS: 800 MG/L  
EC100 (DAPHNIA MAGNA) 24 HOURS: 1,540 MG/L  
LC50 (FATHEAD MINNOW) 96 HOURS: 526; 618; 630 MG/L  
LC50 (LEUCISCUS IDUS) 24 HOURS: 538 MG/L  
LC50 (LEUCISCUS IDUS) 96 HOURS: 536; 539; 752 MG/L

METHYL ETHYL KETONE:  
EC0 (SCENEDESMUS QUADRICAUDA, GREEN ALGAE): 4300 MG/L/8 DAYS  
EC0 (ENTOSIPHON SULCATUM, PROTOZOA): 190 MG/L/72 HOURS  
EC0 (URONEMA PARDUCZI CHATTON-LWOLL, PROTOZOA): 2830 MG/L  
EC0 (PSEUDOMONAS PUTIDA, BACTERIA): 1150 MG/L/16 HOURS  
LC50 (PIMEPHALES PROMELAS, FATHEAD MINNOW): 3200 MG/L/96 HOUR  
LD0 (PSEUDOMONAS, BACTERIA): 2,500 MG/L  
LD0 (SCENEDESMUS, ALGAE): 12,500 MG/L  
LD0 (COLPODA, PROTOZOA): 5,000 MG/L  
LC50 (MOSQUITO FISH): 5,600 MG/L/24-96 HOURS  
LC50 (BLUEGILL): 5,640-1,690 MG/L/24-96 HOURS  
LC50 (GOLDFISH): 5,000 MG/L/24 HOURS

TETRAHYDROFURAN:  
  
GROWTH INHIBITION (MICROCYSTIS, BLUE ALGEA): 225 MG/L

TOXICITY THRESHOLD (CELL MULTIPLICATION INHIBIT SYSTEM TEST):  
(URONEMA PARDUCZI CHATTON-LWOFF, PROTOZOA): 858 MG/L  
(PSEUDOMONAS PUTIDA, BACTERIA): 580 MG/L  
(MICROCYTIS AERUGINOSA, ALGEA): 225 MG/L

LC50 (SILVER/GOLDEN ORFE): 2820-2930 MG/L  
  
LC50 (FATHEAD MINNOW): 2160 MG/L/96 HOURS  
  
LC50 (CARP): 4400 MG/L/48 HOURS  
  
LC50 (GOLDFISH): 2400 MG/L/48 HOURS

13. DISPOSAL CONSIDERATIONS



PREPARING WASTES FOR DISPOSAL:  
WASTE DISPOSAL MUST BE IN ACCORDANCE WITH APPROPRIATE U.S. FEDERAL, STATE, AND LOCAL REGULATIONS, THOSE OF CANADA AND ITS PROVINCES, AS WELL AS THOSE APPLICABLE TO THE EC MEMBER STATES. THIS PRODUCT, IF UNALTERED BY USE, MAY BE DISPOSED OF BY TREATMENT AT A PERMITTED FACILITY OR AS ADVISED BY YOUR LOCAL HAZARDOUS WASTE REGULATORY AUTHORITY.

U.S. EPA WASTE NUMBER: D001 (CHARACTERISTIC/IGNITABILITY)

14. TRANSPORTATION INFORMATION



THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME:  
FLAMMABLE LIQUID, NOS (ACETONE, TETRAHYDROFURAN, METHYL ETHYL KETONE, CYCLOHEXANONE)

HAZARD CLASS NUMBER AND DESCRIPTION: 3 (FLAMMABLE LIQUID)

UN IDENTIFICATION NUMBER: UN 1993

PACKING GROUP: II

DOT LABEL(S) REQUIRED: FLAMMABLE LIQUID

NOTE:  
SHIPMENTS OF CONTAINERS HOLDING 1-LITER OR LESS IN VOLUME QUALIFY FOR A "LIMITED QUANTITY" EXCEPTION. REFER TO 49 CFR 173.150 FOR ADDITIONAL INFORMATION.

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER, 1996: 128

MARINE POLLUTANT:  
NO COMPONENT OF THIS PRODUCT IS DESIGNATED AS A MARINE POLLUTANT BY THE DOT (PER 49 CFR 172.101, APPENDIX B).

TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:  
THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. USE THE ABOVE INFORMATION FOR THE PREPARATION OF CANADIAN SHIPMENTS.

IMO DESIGNATION:  
THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS BY THE INTERNATIONAL MARITIME ORGANIZATION

PROPER SHIPPING NAME:  
FLAMMABLE LIQUID, NOS (ACETONE, TETRAHYDROFURAN, METHYL ETHYL KETONE, CYCLOHEXANONE)

HAZARD CLASS NUMBER AND DESCRIPTION:  
3.2 (FLAMMABLE LIQUID; INTERMEDIATE FLASH POINT)

UN IDENTIFICATION NUMBER: UN 1993

PACKING GROUP: II

LABEL(S) REQUIRED: FLAMMABLE LIQUID

IMDG CODE: 3230

MARINE POLLUTANT:  
THIS PRODUCT IS NOT DESIGNATED BY THE IMO TO BE A MARINE POLLUTANT.

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR):  
THIS MATERIAL IS NOT CONSIDERED BY THE UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE TO BE DANGEROUS GOODS. ADDITIONAL INFORMATION IS AS FOLLOWS:

SUBSTANCE IDENTIFICATION NO.: 1993

NAME OF SUBSTANCE:  
FLAMMABLE LIQUID, NOS (ACETONE, TETRAHYDROFURAN, METHYL ETHYL KETONE, CYCLOHEXANONE)

HAZARD IDENTIFICATION NO. (DESCRIPTION): 33

LABEL: FLAMMABLE LIQUID

CLASS AND ITEM NUMBER: 3, 50, (C)

15. REGULATORY INFORMATION



ADDITIONAL UNITED STATES REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS:  
THE COMPONENTS OF THIS PRODUCT ARE SUBJECT TO THE REPORTING REQUIREMENTS OF SECTIONS 302, 304, AND 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT, AND ARE LISTED AS FOLLOWS:

CHEMICAL NAME	SARA 302 (40 CFR 355, APPENDIX A)	SARA 304 (40 CFR TABLE 302.4)	SARA 313 (40 CFR 372.65)
ACETONE	NO	YES	NO
CYCLOHEXANONE	NO	YES	YES
METHYL ETHYL KETONE	NO	YES	YES
TETRAHYDROFURAN	NO	YES	NO

U.S. SARA THRESHOLD PLANNING QUANTITY: NOT APPLICABLE.

U.S. CERCLA REPORTABLE QUANTITY (RQ):  
CYCLOHEXANONE: 5000 LB.  
METHYL ETHYL KETONE: 5000 LB.  
TETRAHYDROFURAN: 1000 LB.  
ACETONE: 5000 LB

U.S. TSCA INVENTORY STATUS:  
THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE TSCA INVENTORY.

OTHER U.S. FEDERAL REGULATIONS: NOT APPLICABLE.

U.S. STATE REGULATORY INFORMATION:  
COMPONENTS OF THIS PRODUCT ARE COVERED UNDER SPECIFIC STATE REGULATIONS, AS  
DENOTED BELOW:

ALASKA - DESIGNATED TOXIC AND HAZARDOUS SUBSTANCES:  
CYCLOHEXANONE, METHYL ETHYL KETONE, TETRAHYDROFURAN.

CALIFORNIA - PERMISSIBLE EXPOSURE LIMITS FOR CHEMICAL CONTAMINANTS:  
CYCLOHEXANONE, METHYL ETHYL KETONE, TETRAHYDROFURAN.

FLORIDA - SUBSTANCE LIST:  
CYCLOHEXANONE, METHYL ETHYL KETONE, TETRAHYDROFURAN.

ILLINOIS - TOXIC SUBSTANCE LIST:  
CYCLOHEXANONE, METHYL ETHYL KETONE, TETRAHYDROFURAN.

KANSAS - SECTION 302/313 LIST:  
CYCLOHEXANONE, METHYL ETHYL KETONE, TETRAHYDROFURAN.

MASSACHUSETTS - SUBSTANCE LIST:  
CYCLOHEXANONE, METHYL ETHYL KETONE, TETRAHYDROFURAN.

MICHIGAN - CRITICAL MATERIALS REGISTER: NO.

MINNESOTA - LIST OF HAZARDOUS SUBSTANCES:  
CYCLOHEXANONE, METHYL ETHYL KETONE, TETRAHYDROFURAN.

MISSOURI - EMPLOYER INFORMATION/TOXIC SUBSTANCE LIST:  
CYCLOHEXANONE, METHYL ETHYL KETONE, TETRAHYDROFURAN.

NEW JERSEY - RIGHT TO KNOW HAZARDOUS SUBSTANCE LIST:  
CYCLOHEXANONE, METHYL ETHYL KETONE, TETRAHYDROFURAN.

NORTH DAKOTA - LIST OF HAZARDOUS CHEMICALS, REPORTABLE QUANTITIES:  
CYCLOHEXANONE, METHYL ETHYL KETONE, TETRAHYDROFURAN.

PENNSYLVANIA - HAZARDOUS SUBSTANCE LIST:  
CYCLOHEXANONE, METHYL ETHYL KETONE, TETRAHYDROFURAN.

RHODE ISLAND - HAZARDOUS SUBSTANCE LIST:  
CYCLOHEXANONE, METHYL ETHYL KETONE, TETRAHYDROFURAN.

TEXAS - HAZARDOUS SUBSTANCE LIST:  
CYCLOHEXANONE, METHYL ETHYL KETONE, TETRAHYDROFURAN.

WEST VIRGINIA - HAZARDOUS SUBSTANCE LIST:  
CYCLOHEXANONE, METHYL ETHYL KETONE, TETRAHYDROFURAN.

WISCONSIN - TOXIC AND HAZARDOUS SUBSTANCES:  
CYCLOHEXANONE, METHYL ETHYL KETONE, TETRAHYDROFURAN.

CALIFORNIA, SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):  
THIS PRODUCT MAY CONTAIN TRACE CONSTITUENTS, SUCH AS VINYL CHLORIDE,  
PRESENT IN ONE OF THE PRODUCT'S COMPONENTS. UNDER COMMON USAGE, EXPOSURES  
TO THESE TRACE CONSTITUENTS AT LEVELS EXCEEDING THE "NO SIGNIFICANT RISK

LEVEL" (NSRL) WOULD NOT OCCUR. USERS ARE EXPECTED TO FOLLOW NORMAL PPE AND VENTILATION GUIDELINES SUCH AS THOSE IN SECTION 8 AND OTHER PORTIONS OF THIS MSDS.

VOC INFORMATION:

THIS PRODUCT EMITS VOLATILE ORGANIC COMPOUNDS (VOC'S) DURING USE AND CURE. USERS SHOULD DETERMINE IF LOCAL REGULATIONS REGARDING USE OF VOC CONTAINING PRODUCTS EXIST IN THEIR AREA AND IF THIS PRODUCT COMPLIES.

ANSI STANDARD LABELING (Z129.1):

DANGER!

EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. MAY BE HARMFUL IF INHALED. MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS. MAY CAUSE SKIN AND EYE IRRITATION. ASPIRATION HAZARD - CAN CAUSE LIFE-THREATENING LUNG DAMAGE IF SWALLOWED. MAY CAUSE REPRODUCTIVE EFFECTS, BASED ON ANIMAL TESTS. KEEP AWAY FROM HEAT, SPARKS, AND FLAME. AVOID BREATHING VAPOR OR MISTS. AVOID CONTACT WITH SKIN OR CLOTHING. USE ONLY WITH ADEQUATE VENTILATION. KEEP CONTAINER CLOSED. WASH THOROUGHLY AFTER HANDLING. THE RECOMMENDED STORAGE TEMPERATURE IS 21-32 DEG. C (70-90 DEG. F). RECOMMENDED MAXIMUM SHELF-LIFE FOR UNOPENED CONTAINERS IS 2 YEARS.

FIRST AID:

IN CASE OF CONTACT, IMMEDIATELY FLUSH SKIN OR EYES FOR AT LEAST 15 MINUTES. IF INHALED, MOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.

IN CASE OF FIRE:

USE FOG, FOAM, DRY CHEMICAL OR CO2. LIQUID WILL FLOAT AND MAY RE-IGNITE ON THE SURFACE OF WATER.

IN CASE OF SPILL:

ABSORB SPILL WITH INERT MATERIAL (E.G. ACTIVATED CARBON) THEN PLACE IN SUITABLE CONTAINER. REFER TO MATERIAL SAFETY DATA SHEET FOR ADDITIONAL INFORMATION ON THIS PRODUCT.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS:

THE COMPONENTS OF THIS PRODUCT ARE ON THE DSL INVENTORY.

OTHER CANADIAN REGULATIONS: NOT APPLICABLE.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LIST: THE COMPONENTS OF THIS PRODUCT ARE NOT ON THE CEPA PRIORITIES SUBSTANCES LIST.

CANADIAN WHMIS SYMBOLS:

CLASS B2: FLAMMABLE LIQUID

CLASS D2A/B: MATERIALS CAUSING OTHER TOXIC EFFECTS

EUROPEAN COMMUNITY INFORMATION:

EUROPEAN COMMUNITY INFORMATION FOR PRODUCT:

EC LABELING AND CLASSIFICATION:

BASED ON THE INFORMATION ON THE PRODUCT'S COMPONENTS AND AN ASSESSMENT OF THE PHYSICAL AND HEALTH HAZARDS ASSOCIATED WITH THE MATERIAL, THE FOLLOWING ASSIGNMENTS HAVE BEEN MADE (PER COUNCIL DIRECTIVE 67/548/EEC)

EC CLASSIFICATION: HIGHLY FLAMMABLE. IRRITANT. (F; Xi)

EC RISK PHRASES:

HIGHLY FLAMMABLE. MAY FORM EXPLOSIVE PEROXIDES. IRRITATING TO EYES AND RESPIRATORY SYSTEM. (R: 11-19-36/37)

EC SAFETY PHRASES:

KEEP OUT OF REACH OF CHILDREN. \* KEEP AWAY FROM SOURCES OF IGNITION - NO SMOKING. DO NOT EMPTY INTO DRAINS. DO NOT BREATHE VAPORS. AVOID CONTACT WITH THE EYES. TAKE PRECAUTIONARY MEASURES AGAINST STATIC DISCHARGES. (S: (2) \* 16-23-25-29-33) \* THIS SAFETY PHRASE CAN BE OMITTED FROM THE LABEL WHEN THE SUBSTANCE OR PREPARATION IS SOLD FOR INDUSTRIAL USE ONLY.

EUROPEAN COMMUNITY ANNEX II HAZARD SYMBOLS:

(SYMBOL)

(SYMBOL)

EUROPEAN COMMUNITY INFORMATION FOR CONSTITUENTS:

THE FOLLOWING INFORMATION IS AVAILABLE FOR PRIMARY CONSTITUENTS IN THE COMPONENTS OF THIS PRODUCT.

ACETONE:

EC CLASSIFICATION: HIGHLY FLAMMABLE. (F)

EC RISK PHRASES: HIGHLY FLAMMABLE. (R: 11)

EC SAFETY PHRASES:  
KEEP OUT OF REACH OF CHILDREN.\* KEEP CONTAINER IN A WELL-VENTILATED PLACE.  
KEEP AWAY FROM SOURCES OF IGNITION. NO SMOKING. DO NOT BREATHE VAPORS.  
(S: (2-)\*9-16-23-33).

EC COMMENTS:  
\*THIS SAFETY PHRASE CAN BE OMITTED FROM THE LABEL WHEN THE SUBSTANCE OR PREPARATION IS SOLD FOR INDUSTRIAL USE ONLY.

CYCLOHEXANONE:

EC CLASSIFICATION: FLAMMABLE. HARMFUL. (F; Xn)

EC RISK PHRASES: FLAMMABLE. HARMFUL BY INHALATION. (R: 10-20).

EC SAFETY PHRASES:  
KEEP OUT OF REACH OF CHILDREN.\* AVOID CONTACT WITH THE EYES. (S: (2-)\*25).  
\*THIS SAFETY PHRASE CAN BE OMITTED FROM THE LABEL WHEN THE SUBSTANCE OR PREPARATION IS SOLD FOR INDUSTRIAL USE ONLY.

EC COMMENTS:  
CONCENTRATION GREATER THAN OR EQUAL TO 25%:  
HARMFUL. HARMFUL BY INHALATION. (Xn; R20). THIS PRODUCT CONTAINS LESS THAN THIS CONCENTRATION; THEREFORE, THIS RISK HAS BEEN OMITTED.

METHYL ETHYL KETONE:

EC CLASSIFICATION: HIGHLY FLAMMABLE. IRRITANT. (F; Xi)

EC RISK PHRASES:  
HIGHLY FLAMMABLE. IRRITATING TO THE EYES AND RESPIRATORY SYSTEM.  
(R: 11-36/37).

EC SAFETY PHRASES:  
KEEP OUT OF REACH OF CHILDREN.\* KEEP CONTAINER IN A WELL-VENTILATED PLACE.  
KEEP AWAY FROM SOURCES OF IGNITION. NO SMOKING. AVOID CONTACT WITH THE EYES. TAKE PRECAUTIONARY MEASURES AGAINST STATIC DISCHARGES.  
(S: (2-)\*9-16-25-33).

EC COMMENTS:  
\*THIS SAFETY PHRASE CAN BE OMITTED FROM THE LABEL WHEN THE SUBSTANCE OR PREPARATION IS SOLD FOR INDUSTRIAL USE ONLY.

POLYVINYL CHLORIDE:  
AN OFFICIAL CLASSIFICATION FOR THIS SUBSTANCE HAS NOT BEEN PUBLISHED IN COMMISSION DIRECTIVES 93/72/EEC, 94/69/EC, AND 96/54/EC.

SILICON DIOXIDE:  
AN OFFICIAL CLASSIFICATION FOR THIS SUBSTANCE HAS NOT BEEN PUBLISHED IN COMMISSION DIRECTIVES 93/72/EEC, 94/69/EC, AND 96/54/EC.

TETRAHYDROFURAN:

EC CLASSIFICATION: HIGHLY FLAMMABLE. IRRITANT. (F; Xi)

EC RISK PHRASES:  
HIGHLY FLAMMABLE. MAY FORM EXPLOSIVE PEROXIDES. IRRITATING TO EYES AND RESPIRATORY SYSTEM. (R: 11-19-36/37)

EC SAFETY PHRASES:  
KEEP OUT OF REACH OF CHILDREN.\* KEEP AWAY FROM SOURCES OF IGNITION - NO SMOKING. DO NOT EMPTY INTO DRAINS. TAKE PRECAUTIONARY MEASURES AGAINST STATIC DISCHARGES. (S: (2-)\*16-29-33) \*THIS SAFETY PHRASE CAN BE OMITTED FROM THE LABEL WHEN THE SUBSTANCE OR PREPARATION IS SOLD FOR INDUSTRIAL USE ONLY.

EC COMMENTS:  
CONCENTRATIONS GREATER THAN OR EQUAL TO 25 PERCENT:  
IRRITANT. IRRITATING TO EYES AND RESPIRATORY SYSTEM. (Xi; R36/37)

16. OTHER INFORMATION





PREPARED BY:  
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