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

TRADE NAME (AS LABELED): **PVC SOLVENT CEMENTS:**

202 E-Z 1 **203 POOL PRO** **222 WET WELD** **224 E-Z BLUE**

Wet R' Dry **5E531** **5E530**

CHEMICAL NAME/CLASS: Polyvinyl Chloride / Solvent Mixture

PRODUCT USE: Solvent Cement for PVC Material

SUPPLIER/MANUFACTURER'S NAME: E-Z Weld, Inc

U.S. BUSINESS PHONE: 1-800-327-8460; 1-561-844-0241

U.S. ADDRESS: 1661 Old Dixie Highway
Riviera Beach, FL 33404

U.S. EMERGENCY PHONE: CHEMTREC:
1-800-424-9300 (U.S. and Canada)
1-703-527-3887 (International)

DATE OF PREPARATION: November 12 2008

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	EINECS #	% w/w	EXPOSURE LIMITS IN AIR					
				ACGIH		OSHA			
				TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	OTHER
Tetrahydrofuran	109-99-9	203-726-8	25-65	50 A3 (confirmed Animal Carcinogen with Unknown Relevance to Humans)	100	200	250 (vacated 1989 PEL)	2000 (based on LEL)	NIOSH REL: TWA = 200 STEL = 250 DFG MAK: 50
Acetone	67-64-1	200-662-2	5-40	500 A4 (Not Classifiable as a Human Carcinogen)	750	1000 750 (vacated 1989 PEL)	NE 1000 (vacated 1989 PEL)	2500 (based on LEL)	NIOSH REL: TWA = 250 DFG MAK: 500 Carcinogen: EPA-D
Methyl Ethyl Ketone	78-93-3	201-159-0	30-35	200	300	200	300 (vacated 1989 PEL)	3000	NIOSH REL: TWA = 200 STEL = 300 DFG MAK: 200 Carcinogen: EPA-D
Polyvinyl Chloride Resin	9002-86-2	206-625-7	< 25	NE	NE	NE	NE	NE	Carcinogen: IARC-3;

NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.
NOTE: All WHMIS and EC required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

2. COMPOSITION and INFORMATION ON INGREDIENTS (Continued)

CHEMICAL NAME	CAS #	EINECS #	% w/w	EXPOSURE LIMITS IN AIR					
				ACGIH		OSHA			
				TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	OTHER
Silicon Dioxide (exposure limits are for silica-amorphous diatomaceous earth)	112945-52-5	Unlisted	Balance	For CAS # 61790-53-2 (uncalcined) 10 mg/m^3 (Inhalable particulate) 3 mg/m^3 (Respirable particulate)	NE	20 mppcf or $\frac{80\ mg/m^3}{\%\ SiO_2}$ 6 mg/m^3 (vacated 1989 PEL)		3000 mg/m^3	NIOSH REL: 6 mg/m^3 DFG MAK: 4 mg/m^3 (CAS # 61790-53-2) Carcinogen: IARC-3 (CAS # 61790-53-2)

NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.
NOTE: All WHMIS and EC required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

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.

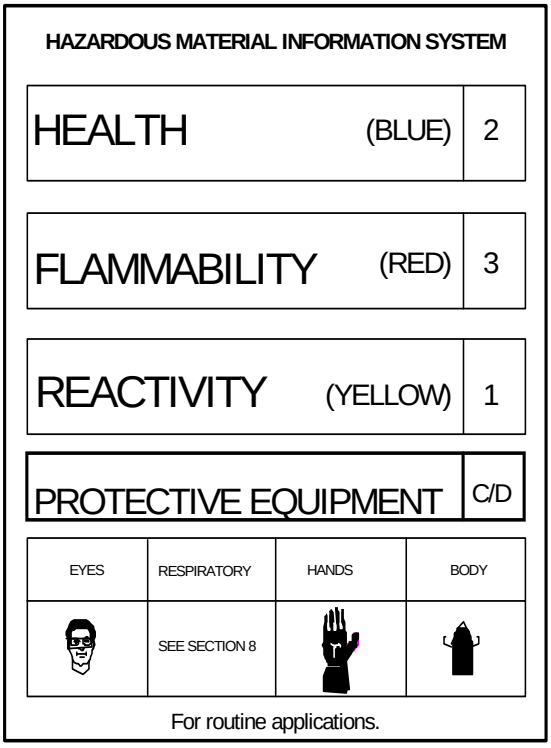
SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The most significant routes of occupational overexposure are inhalation and contact with skin and eyes. The symptoms of overexposure to this product, via route of exposure, are as follows:

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 over-exposure can include drowsiness, dizziness, 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 studies involving test animals, Tetrahydrofuran, a component 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 not reported to be a significant route of exposure for any component of this product.



See Section 16 for Definition of Ratings

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.

3. HAZARD IDENTIFICATION (Continued)

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-exposures 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.

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 the main solvents component of this product.

FLASH POINT:

Acetone: -20°C (-4°F)
Methyl Ethyl Ketone: -9°C (16°F)
Tetrahydrofuran: -17°C (1.4°F)

AUTOIGNITION TEMPERATURE:

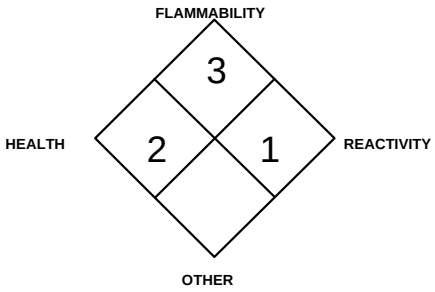
Acetone: 465°C (869°F)
Methyl Ethyl Ketone: 404°C (759°F)
Tetrahydrofuran: 321°C (610°F)

FLAMMABLE LIMITS (in air by volume):

Acetone:	Lower (LEL): 2.6%	Upper (UEL): 12.8%
Methyl Ethyl Ketone:	Lower (LEL): 1.8%	Upper (UEL): 10.0%
Tetrahydrofuran:	Lower (LEL): 1.8%	Upper (UEL): 11.8%

The following information is for the product.

NFPA RATING



See Section 16 for Definition of Ratings

5. FIRE-FIGHTING MEASURES (Continued)

FIRE EXTINGUISHING MATERIALS:

Water Spray: YES (for cooling only)
Foam: YES
Halon: YES
Carbon Dioxide: YES
Dry Chemical: 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.

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. Use in a well-ventilated location. 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 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.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely, if necessary. Collect all rinsates and dispose of according to applicable U.S. Federal, State, or local procedures, the applicable standards of Canada and its Provinces, or the appropriate requirements of European Community member States.

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 immediate 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 as follows.

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

RELATIVE VAPOR DENSITY (air = 1): > 1

EVAPORATION RATE (nBuAc = 1): > 1

SPECIFIC GRAVITY (water = 1): < 1.0

FREEZING/MELTING POINT: Not established.

SOLUBILITY IN WATER @ 25°C: Somewhat soluble.

BOILING POINT: Not established.

VAPOR PRESSURE, mm Hg @ 20°C: Not established.

pH: Not established.

ODOR THRESHOLD: Not established.

COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT): Not established.

ODOR THRESHOLD: 2.48–3.47 ppm (Tetrahydrofuran)

FORM: Liquid.

COLOR: Variable color.

ODOR: Ethereal.

VISCOSITY: Not available.

FLASH POINT:

Acetone: -20°C (-4°F)
Methyl Ethyl Ketone: -9°C (16°F)
Tetrahydrofuran: -17°C (1.4°F)

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.

ACETONE:
Eye Irritancy (human) = 500 ppm
Skin Irritancy (rabbit) = 395 mg/ open; mild
Skin Irritancy (rabbit) = 500 mg/ 24 hours; mild
Eye Irritancy (rabbit) = 3950 □g; severe
Eye Irritancy (rabbit) = 20 mg/ 24 hours; moderate
Cytogenetic Analysis (*Saccharomyces cerevisiae*) = 200 mmol/tube
Sex Chromosome Loss and Nondisjunction (*Saccharomyces cerevisiae*) = 47,600 ppm
TCLo (inhalation, mammal) = 31,500 □g/m^3/ 24 hours/ 1-13 days pregnant; reproductive effects
TDLo (oral, man) = 2857 mg/kg
TCLo (inhalation, man) = 12,000 ppm/ 4 hours; central nervous system effects
TDLo (inhalation, man) = 440 □g/m^3/ 6 months
TDLo (inhalation, man) = 10 mg/m^3/ 6 hours
TCLo (inhalation, human) = 500 ppm; eye effects
TCLo (inhalation, man) = 12,000 ppm/ 4 hours; gastrointestinal tract effects
LD_{50} (intravenous, rat) = 5500 mg/kg
LD_{50} (oral, rat) = 5800 mg/kg
LC_{50} (inhalation, rat) = 50,100 mg/m^3/ 8 hours
LDLo (intraperitoneal, rat) = 500 mg/kg
LD_{50} (intravenous, rat) = 5500 mg/kg
LD_{50} (oral, mouse) = 3000 mg/kg
LCLo (inhalation, mouse) = 110 g/m^3/ 1 hour
LD_{50} (intraperitoneal, mouse) = 1297 mg/kg
LDLo (intravenous, mouse) = 4 g/kg
LDLo (oral, dog) = 8 g/kg
LD_{50} (oral, rabbit) = 5340 mg/kg
LD_{50} (skin, rabbit) = 20 g/kg
TDLo - Oral - rat: 273 gm/kg: male 13 week(s) pre-mating: Reproductive - Paternal Effects - spermatogenesis
TCLo - Inhalation: Mammal - species unspecified: 31500 ug/m3/24H: female 1-13 day(s) after conception

ACETONE (continued):
Sex chromosome loss and nondisjunction: Yeast - Saccharomyces cerevisiae: 47600 ppm
Cytogenetic analysis: Rodent - hamster Fibroblast: 40 gm/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
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 LD_{50}: 2737 mg/kg
Inhalation-Rat LC_{50}: 23,500 mg/m3/8 hours;
Intraperitoneal-Rat LD50: 607 mg/kg
Oral-Mouse LD_{50}: 4050 mg/kg
Inhalation-Mouse LC_{50}: 40 g/m3/2 hours
Intraperitoneal-Mouse LD_{50}: 616 mg/kg
Skin-Rabbit, adult LD_{50}: 6450 mg/kg
Intraperitoneal-Guinea Pig, adult LDLo: 2 g/kg
Inhalation-Unspecified effects LC_{50}: 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

METHYL ETHYL KETONE (continued):
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: 7 5 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 LD_{50}: 3160 mg/kg
Intraperitoneal-Rat LDLo: 50 mg/kg
Intravenous-Rat LD_{50} :15 mg/kg
Intratracheal-Rat LDLo: 10 mg/kg
Intraperitoneal-Guinea Pig, adult LDLo: 120 mg/kg

TETRAHYDROFURAN:
Mutation in Microorganisms-Escherichia coli 1 □mol/L
Inhalation-Human TCLo: 25,000 ppm: Central nervous system effects
Oral-Rat LD_{50}: 1650 mg/kg.
Inhalation-Rat LC_{50}: 21,000 ppm/3H
Intraperitoneal-Rat LD_{50}: 2900 mg/kg
Inhalation-Mouse LCLo: 24,000 mg/m3/2 hours
Intraperitoneal-Mouse LD_{50}: 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/6 hours: female 6-17 day(s) after conception: Reproductive - Fertility - post-implantation mortality
Mutation in microorganisms: Bacteria - Escherichia coli: 1 umol/L

SUSPECTED CANCER AGENT: Components of this products are listed as follows:

ACETONE:
EPA-D: Not Classifiable as to Human Carcinogenicity.

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.

11. TOXICOLOGICAL INFORMATION (Continued)

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. Animal mutation data are available for Acetone, Methyl Ethyl Ketone, Silicon Dioxide, and Tetrahydrofuran (components of this product); these data were obtained during clinical studies on specific animal tissues or micro-organisms exposed to high doses 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 Acetone, 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:

ACETONE: Log K_{ow} = -0.24. Water Solubility = Miscible. Acetone is quite readily degraded in the environment. BOD = 122%; 5 days. The potential for bioconcentration in fish is negligible. One experimental study of bioconcentration in adult haddock at 7-9°C (static test) resulted in a BCF of 0.69.

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°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 quantity in a body of water. The following aquatic toxicity data are available for the components of this product:

ACETONE:

LC_{50} (Japanese quail) = 40,000 ppm, in diet, age 14 days, (no mortality to 40,000 ppm)

LC_{50} (Ring-necked pheasant) = 40,000 ppm, in diet, age 10 days, (no mortality to 40,000 ppm)

LC_{50}, F (fingerling trout) = 6,100 mg/L/ 24 hours

ACETONE (continued):

LC_{50} (*Salmo gairdeneri*, rainbow trout) = 5,540 mg/L/ 86 hours/ 12°C; (95% confidence limit 4,740-6,330 mg/L) , wt 1.0 g (static bioassay)

LD_{100} (*Asellus aquaticus*) = 3 mL/L/ within 3 days; (within 3 days of exposure) (conditions of bioassay not specified)

12. ECOLOGICAL INFORMATION (Continued)

EFFECT OF CHEMICAL ON AQUATIC LIFE (continued):

ACETONE (continued):

LD_{100} (*Gamarus fossarum*) = 10 mL/L/ within 48 hours; (conditions of bioassay not specified)

LC_{50} (*Pimephaleus promelas*) = 8,120 mg/L/ 96 hours, (conditions of bioassay not specified)

TLm (*Daphnia magna*) = 10 mg/L/ 24 and 48 hours, (conditions of bioassay not specified)

TLm (brine shrimp) = 2100 mg/L 24 and 48 hours, (conditions of bioassay not specified)

TLm (mosquito fish) = 13000 mg/L/ 24, 48, and 96 hours, (conditions of bioassay not specified)

LC_{50} (*Lepomis macrochirus*, bluegill sunfish) = 8300 mg/L 96 hours, (conditions of bioassay not specified)

LD_{50} (goldfish) = 5000 mg/L/ 24 hours, (conditions of bioassay not specified)

LC_{50} (*Poecilia reticulata*, guppy) = 7,032 ppm/ 14 days, (conditions of bioassay not specified)

ACETONE (continued):

LC_{50} (Mexican axolotl) = 20.0 mg/L/ 48 hours/ 3-4 weeks after hatching, (conditions of bioassay not specified)

LC_{50} (clawed toad) = 24.0 mg/L/ 48 hours/ 3-4 weeks after hatching, (conditions of bioassay not specified)

METHYL ETHYL KETONE:

EC_0 (*Scenedesmus quadricauda*, green algae) = 4300 mg/L/ 8 days

EC_0 (*Entosiphon sulcatum*, protozoa) = 190 mg/L/ 72 hours

EC_0 (*Uronema parduczi* Chatton-Lwoff, protozoa) = 2830 mg/L

EC_0 (*Pseudomonas putida*, bacteria) = 1150 mg/L/ 16 hours

LC_{50} (*Pimephales promelas*, fathead minnow) = 3200 mg/L/96 hour

LD_0 (*Pseudomonas*, bacteria) = 2,500 mg/L

LD_0 (*Scenedesmus*, algae) = 12,500 mg/L

LD_0 (*Colpoda*, protozoa) = 5,000 mg/L

LC_{50} (mosquito fish) = 5,600 mg/L/ 24□96 hours

LC_{50} (bluegill) = 5,640□1,690 mg/L/ 24□96 hours

LC_{50} (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

LC_{50} (silver/golden orfe) = 2820–2930 mg/L

LC_{50} (fathead minnow) = 2160 mg/L/ 96 hours

LC_{50} (carp) = 4400 mg/L/ 48 hours

LC_{50} (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, 5°, (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
Methyl Ethyl Ketone	No	Yes	Yes
Tetrahydrofuran	No	Yes	No

U.S. SARA THRESHOLD PLANNING QUANTITY: Not applicable.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Acetone = 5000 lb.; Methyl Ethyl Ketone: 5000 lb.; Tetrahydrofuran = 1000 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: Acetone, Methyl Ethyl Ketone, Tetrahydrofuran**.**

California - Permissible Exposure Limits for Chemical Contaminants: Acetone, Methyl Ethyl Ketone, Tetrahydrofuran**.**

Florida - Substance List: Acetone, Methyl Ethyl Ketone, Tetrahydrofuran**.**

Illinois - Toxic Substance List: Acetone, Methyl Ethyl Ketone, Tetrahydrofuran**.**

Kansas - Section 302/313 List: Acetone, Methyl Ethyl Ketone, Tetrahydrofuran**.**

Massachusetts - Substance List: Acetone, Methyl Ethyl Ketone, Tetrahydrofuran**.**

Michigan - Critical Materials Register: No.

Minnesota - List of Hazardous Substances: Acetone, Methyl Ethyl Ketone, Tetrahydrofuran**.**

Missouri - Employer Information/Toxic Substance List: Acetone, Methyl Ethyl Ketone, Tetrahydrofuran**.**

New Jersey - Right to Know Hazardous Substance List: Acetone, Methyl Ethyl Ketone, Tetrahydrofuran**.**

North Dakota - List of Hazardous Chemicals, Reportable Quantities: Acetone, Methyl Ethyl Ketone, Tetrahydrofuran**.**

Pennsylvania - Hazardous Substance List: Acetone, Methyl Ethyl Ketone, Tetrahydrofuran**.**

Rhode Island - Hazardous Substance List: Acetone, Methyl Ethyl Ketone, Tetrahydrofuran**.**

Texas - Hazardous Substance List: Acetone, Methyl Ethyl Ketone, Tetrahydrofuran**.**

West Virginia - Hazardous Substance List: Acetone, Methyl Ethyl Ketone, Tetrahydrofuran**.**

Wisconsin - Toxic and Hazardous Substances: Acetone, 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°C (70-90°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 CO_2. 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.

15. REGULATORY INFORMATION (Continued)

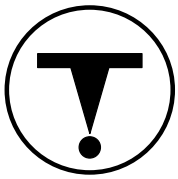
ADDITIONAL CANADIAN REGULATIONS:

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:

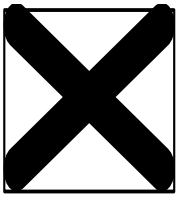
EC LABELING AND CLASSIFICATION: Based on the information on the product's components and an assessment of the physical and health hazards associated with the material, the following assignments have been made (per council directive 67/548/EEC)

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:



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.*

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: CHEMICAL SAFETY ASSOCIATES, Inc.
9163 Chesapeake Drive, San Diego, CA 92123-1002
619/565-0302

EDITED/UPDATED BY: John Brown, E-Z Weld, Inc
DATE OF PRINTING: November 12, 2008

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Cookson assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, Cookson assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching.

EXPOSURE LIMITS IN AIR:
ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.
TLV - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average **(TWA)**, the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level **(C)**. Skin absorption effects must also be considered.
OSHA - U.S. Occupational Safety and Health Administration.
PEL - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.
IDLH - Immediately Dangerous to Life and Health **-** This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. **O**ccupational **S**afety and **H**ealth **A**dministration (**OSHA**). NIOSH issues exposure guidelines called **R**ecommended **E**xposure **L**evels (**REL**s). When no exposure guidelines are established, an entry of **NE** is made for reference.

HAZARD RATINGS:
HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); **3** (Class IB and IC flammable liquids with flash points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]. Reactivity Hazard: **0** (normally stable); 1 (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).
NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:
Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:
Human and Animal Toxicology: Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD_{50}** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC_{50}** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m^3** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **Cancer Information:** The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. **Other Information: BEI** - ACGIH Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. **Ecological Information:** EC is the effect concentration in water. **BCF** = Bioconcentration Factor, which is used to determine if a substance will concentrate in lifeforms which consume contaminated plant or animal matter. Coefficient of Oil/Water Distribution is represented by **log K_{ow}** or **log K_{oc}** and is used to assess a substance's behavior in the environment.

REGULATORY INFORMATION:
U.S. AND CANADA: This section explains the impact of various laws and regulations on the material. **U.S.: EPA** is the U.S. Environmental Protection Agency. **DOT** is the U.S. Department of Transportation. **SARA** is the Superfund Amendments and Reauthorization Act. **TSCA** is the U.S. Toxic Substance Control Act. **CERCLA (or Superfund)** refers to the Comprehensive Environmental Response, Compensation, and Liability Act**)**. Labeling is per the American National Standards Institute (**ANSI Z129.1**). **CANADA: CEPA** is the Canadian Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **TC** is Transport Canada. **DSL/NDSL** are the Canadian Domestic/Non-Domestic Substances Lists.
EUROPEAN and INTERNATIONAL: EC is the European Community (formerly known as the **EEC,** European Economic Community). **EINECS:** This the European Inventory of Now-Existing Chemical Substances. **IMO** is the International Maritime Organization. The **ARD** is the European Agreement Concerning the International Carriage of Dangerous Goods by Road and the **RID** are the International Regulations Concerning the Carriage of Dangerous Goods by Rail.