

# SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI, and Canadian WHMIS Standards

## 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY UNDERTAKING

### IDENTIFICATION of the SUBSTANCE or PREPARATION:

<u>TRADE NAME (AS LABELED):</u>	<b>SRP 5025+ Pinchweld Primer</b>
<u>PRODUCT CODE(S):</u>	
<u>CHEMICAL NAME/CLASS:</u>	Resin Mixture
<u>U.N. NUMBER:</u>	1263
<u>U.N. DANGEROUS GOODS CLASS/SUBSIDIARY RISK:</u>	Not Applicable
<b>RELEVANT USES of the SUBSTANCE:</b>	Automotive Glass Polyurethane Adhesive Primer
<b>USES ADVISED AGAINST:</b>	Other than Relevant Use
<b>COMPANY/UNDERTAKING IDENTIFICATION:</b>	
<u>U.S./DISTRIBUTOR'S NAME:</u>	<b>SHAT-R-PROOF CORP.</b>
<u>ADDRESS:</u>	650 Pelham Boulevard, Suite 100 St Paul, MN 55114
<u>MEDICAL EMERGENCIES:</u>	1-800-420-8036
<u>U.S. EMERGENCY PHONE:</u>	1-800-424-9300 (ChemTrec) 1-703-527-3887 (ChemTrec International)
<u>EMAIL ADDRESS FOR SDS INFORMATION:</u>	msds-info@novusglass.com
<u>DATE OF PREPARATION:</u>	October 3, 2003
<u>DATE OF REVISION:</u>	January 14, 2015

## 2. HAZARD IDENTIFICATION

**OSHA HAZARD COMMUNICATION (GLOBAL HARMONIZATION) LABELING AND CLASSIFICATION:** This product would be classified as follows, per OSHA's Hazard Communication Standard (29CFR §1910.1200). This is a self-classification.

Classification: Skin Sensitizer Category 1, Skin Irritation Category 2, Eye Irritant Category 2A, Flammable Liquid Category 2, Respiratory Sensitizer Category 1, STOT SE 3, Carcinogenic Category 2

Signal Word: Danger

Hazard Statement Codes: H317, H315, H319, H225, H334, H336, H351, H066





Hazard Pictograms:



See Section 15 for full text of Hazard and Precautionary Statements

**EMERGENCY OVERVIEW: Product Description:** This product is a black, highly flammable, harmful liquid with a fruity odor. **Health Hazards:** This product may mildly irritate contaminated tissue, especially upon prolonged exposure. Inhalation of high concentrations of vapors may cause central nervous system depression (e.g., dizziness, headaches, and nausea). This product contains a known human respiratory sensitizer and suspect skin sensitizer. Exposure may cause skin and respiratory sensitization and allergic reaction in susceptible individuals. **Flammability Hazards:** This product is a highly flammable liquid that is readily ignited under almost all conditions and can form explosive mixtures with air. Vapors of the product are heavier than air and can travel to a distant source of ignition and flashback. This product may float and travel on bodies of water to sources of ignition and flashback. In the event of a fire, the components of this product may decompose to release smoke, irritating vapors and toxic gases (e.g., carbon dioxide, carbon monoxide, nitrogen oxides, hydrogen cyanide, amines and alcohols). **Reactivity Hazards:** This product is not normally reactive. **Environmental Hazards:** Releases of this product to the environment, especially in large quantity, may result in environmental damage. **Emergency Recommendations:** Emergency responders must wear personal protective equipment, and appropriate fire equipment suitable for the situation to which they are responding.

### 3. COMPOSITION and INFORMATION ON INGREDIENTS

Chemical Name	CAS #	EINECS or ELINCS #	WT%	OSHA GHS Hazard Symbol	OSHA GHS Classification/Hazard Codes
Carbon Black	1333-86-4	215-609-9	1 - 5%		SELF CLASSIFICATION: Classification: Carcinogenic Cat. 2 Hazard Codes: H351
Triphenyl Phosphite	101-02-0	202-908-4	0 – 5%		Classification: Eye Irritant Cat. 2A, Skin Irritant Cat. 2, Aquatic Toxicity Acute Cat. 1, Aquatic Toxicity Chronic Cat. 1 Hazard Codes: H319, H315, H400, H410
Triphenylmethane Triisocyanate	2422-91-5	219-351-8	7 - 13%		SELF CLASSIFICATION: Classification: Eye Irritant Cat. 2A, Skin Irritant Cat. 2, Respiratory Sensitizer Cat. 1, Skin Sensitizer Cat. 1 Hazard Codes: H319, H315, H334, H332
Ethyl Acetate	141-78-6	205-500-4	60 - 100%		CLASSIFICATION: Flammable Liquid Cat. 2, Eye Irritant Cat. 2A, STOT SE 3 HAZARD CODES: H225, H319, H336, H066

NOTE (1): ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-2004 format. This product has been classified in accordance with the hazard criteria of the CPR and the SDS contains all the information required by the CPR.

### 4. FIRST-AID MEASURES

**DESCRIPTION OF FIRST AID MEASURES:** Contaminated individuals should be taken for medical attention if they feel unwell or if adverse effects occur. Take copy of label and SDS to physician or health professional with contaminated individual.

**SKIN EXPOSURE:** If this material contaminates the skin, begin decontamination with running water. Recommended flushing is for 15 minutes if any sign of skin irritation develops. Contaminated individual should seek immediate medical attention if any adverse exposure symptoms develop.

**EYE EXPOSURE:** If this product enters the eyes, open contaminated individual's eyes while under gently running water. Use sufficient force to open eyelids. Have contaminated individual "roll" eyes. Minimum flushing is for 15 minutes. Do not interrupt flushing. Contaminated individual must seek medical attention if any adverse effect occurs.

**INHALATION:** If this product is inhaled, remove contaminated individual to fresh air. If adverse effect occurs, seek medical attention.

**INGESTION:** If this material is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, do not induce vomiting. Victim 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.

**MOST IMPORTANT SYMPTOMS/EFFECTS:** See Sections 2 (Hazard Identification) and 11 (Toxicological Information) for description of possible health effects from exposure to this product.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Skin disorders and central nervous system conditions may be aggravated by prolonged overexposure to this product.

**INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT IF NEEDED:** Treat symptoms and eliminate overexposure. Consider gastric lavage with activated charcoal in event of ingestion.

### 5. FIRE-FIGHTING MEASURES

**FLASH POINT:** Not determined for product; for main component, Ethyl Acetate: -4.4°C (24°F)

**AUTOIGNITION TEMPERATURE:** Not established for product. The following values are for the main component, Ethyl Acetate: 427°C (800°F).

**FLAMMABLE LIMITS (in air by volume, %):** Not established for product. The following values are for the main component, Ethyl Acetate.

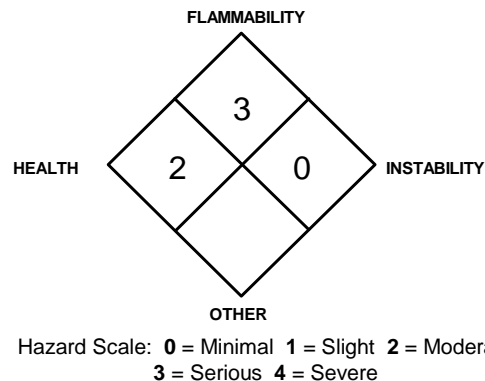
Lower: 2.0%  
Upper: 11.5%

**FIRE EXTINGUISHING MATERIALS:** Use extinguishing material suitable to the surrounding fire.

Water Spray: YES (for cooling of containers)  
Foam: YES  
Halon: YES

Carbon Dioxide: YES  
Dry Chemical: YES  
Other: Any "ABC" Class

#### NFPA RATING



### 5. FIRE-FIGHTING MEASURES, continued

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** This product is a flammable liquid. When involved in a fire, this material may decompose and produce irritating vapors and toxic gases (e.g., carbon dioxide, carbon monoxide, nitrogen oxides, hydrogen cyanide, amines and alcohols). The vapors of this product may travel to a source of ignition, and flashback to a leak or open container.

**Explosion Sensitivity to Mechanical Impact:** Not applicable.

**Explosion Sensitivity to Static Discharge:** This product probably will not accumulate static charge, since the component of greatest percentage, Ethyl Acetate, has a high electrical conductivity (greater than 10(5) pS/m). Vapors from this product in the flammable range for Ethyl Acetate may be ignited by a static discharge of sufficient energy (minimum ignition energy = 0.46 millijoules).

**SPECIAL FIRE-FIGHTING PROCEDURES:** Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Chemical resistant clothing may be necessary. Move containers from fire area if it can be done without risk to personnel. Due to the low flash point of this product, water may be ineffective to extinguish fires involving this product). Water spray can be used to cool fire-exposed containers. Water fog or spray can also be used by trained fire-fighters to disperse this product's vapors and to protect personnel. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas. Rinse contaminated equipment thoroughly with soapy water before returning such equipment to service.

## 6. ACCIDENTAL RELEASE MEASURES

**SPILL AND LEAK RESPONSE:** Proper protective equipment should be used. In the event of a spill, clear the area and protect people. Eliminate all sources of ignition before cleanup begins. Use non-sparking tools. The atmosphere must have levels of components lower than those listed in Section 8, (Exposure Controls and Personal Protective Equipment) if applicable, and have at least 19.5 percent oxygen before personnel can be allowed into the area without Self-Contained Breathing Apparatus (SCBA).

**Small Spills:** Wear rubber gloves, splash goggles, and appropriate body protection. Wipe up spilled paste with polypads or other suitable absorbent materials. Wash contaminated area with soap and water, absorb with paper towels, and rinse with water.

**Large Spills:** Trained personnel following pre-planned procedures should handle non-incident releases. Minimum Personal Protective Equipment should be rubber gloves, rubber boots, face shield, and Tyvek suit. Minimum level of personal protective equipment for releases in which the level of oxygen is less than 19.5% or is unknown must be **Level B: triple-gloves (rubber gloves and nitrile gloves over latex gloves), chemical resistant suit and boots, hard hat, and Self-Contained Breathing Apparatus**. Wipe up spilled paste with polypads or other suitable absorbent materials. Prevent material from entering sewer or confined spaces, waterways, soil or public waters. Monitor area and confirm levels are below exposure limits given in Section 8 (Exposure Controls-Personal Protection), if applicable, before non-response personnel are allowed into the spill area.

Place all spill residue in an appropriate container and seal. Decontaminate the area thoroughly. If necessary, discard all stained response equipment or rinse with soapy water before returning such equipment to service. Do not mix with wastes from other materials. Dispose of in accordance with applicable Federal, State, and local procedures (see Section 13, Disposal Considerations). For spills on water, contain, minimize dispersion and collect. Dispose of recovered material and report spill per regulatory requirements.

## 7. HANDLING AND USE

**PRECAUTIONS FOR SAFE HANDLING:** 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. All employees who handle this material should be trained to handle it safely. Keep away from heat, sparks, and other sources of ignition. Keep container tightly closed when not in use. Use non-sparking tools. Bond and ground containers during transfers of material. If this product is transferred into another container, only use portable containers and dispensing equipment (faucet, pump, drip can) approved for flammable liquids.

**CONDITIONS FOR SAFE STORAGE:** Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). Containers should be separated from oxidizing materials by a minimum distance of 20 ft. or by a barrier of non-combustible material at least 5 ft. high having a fire-resistance rating of at least 0.5 hours. Inspect all incoming containers before storage to ensure containers are properly labeled and not damaged.

**SPECIFIC END USES:** This product is used as a windshield replacement adhesive primer.

**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 and appropriate Canadian standards and those of European Union Member States.

## 8. EXPOSURE CONTROLS – PERSONAL PROTECTION

**VENTILATION AND ENGINEERING CONTROLS:** Use with adequate ventilation. Use a mechanical fan or vent area to outside. Where appropriate, use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Ensure eyewash/safety shower stations are available near areas where this product is used.

## 8. EXPOSURE CONTROLS – PERSONAL PROTECTION, continued

### EXPOSURE LIMITS:

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR							
		ACGIH-TLVS		OSHA-PELS		NIOSH-RELS		NIOSH	OTHER
		TWA ppm	STEL ppm	TWA ppm	STEL ppm	TWA ppm	STEL ppm	IDLH ppm	
Triphenyl Phosphite	101-02-0	NE	NE	NE	NE	NE	NE	NE	NE
Carbon Black	1333-86-4	3.5 mg/m <sup>3</sup>	NE	3.5 mg/m <sup>3</sup>	NE	3.5 mg/m <sup>3</sup> (0.1 in presence of PAHs as PAHs; 10-HR TWA	NE	1750 mg/m <sup>3</sup>	DFG MAK: As inhalable dust Carcinogen: IARC-2B, MAK-3B, NIOSH-Ca, TLV-A4
Ethyl Acetate	141-78-6	400	NE	400	NE	400	NE	2000 (based on LEL)	DFG MAKs: TWA = 400 PEAK = 2•MAK 15 min. average value, 1-hr interval DFG MAK Pregnancy Risk Classification: C
Triphenylmethane Triisocyanate	2422-91-5	NE	NE	NE	NE	NE	NE	NE	NE

NE = Not Established.

**INTERNATIONAL OCCUPATIONAL EXPOSURE LIMITS:** In addition to the exposure limit values cited above, other exposure limits have been established by various countries for the components of this mixture. Individual country regulatory authorities should be checked to ensure no new limits are available.

#### **CARBON BLACK:**

Australia: TWA = 3 mg/m<sup>3</sup>, JAN 1993  
 Belgium: TWA = 3.5 mg/m<sup>3</sup>, JAN 1993  
 Denmark: TWA = 3.5 mg/m<sup>3</sup>, JAN 1999  
 Finland: TWA = 3.5 mg/m<sup>3</sup>, STEL = 7 mg/m<sup>3</sup>, JAN 1999  
 France: VME = 3.5 mg/m<sup>3</sup>, JAN 1999  
 Norway: TWA = 3.5 mg/m<sup>3</sup>, JAN 1999  
 The Philippines: TWA = 3.5 mg/m<sup>3</sup>, JAN 1993  
 The Netherlands: MAC-TGG = 3.5 mg/m<sup>3</sup>, 2003  
 Sweden: NGV = 3 mg/m<sup>3</sup> (dust), JAN 1999  
 United Kingdom: TWA = 3.5 mg/m<sup>3</sup>, STEL = 7 mg/m<sup>3</sup>, SEP 2000  
 In Argentina, Bulgaria, Colombia, Jordan, Korea, New Zealand, Singapore, Vietnam,  
 New Zealand, Singapore, Vietnam check ACGIH TLV

#### **ETHYL ACETATE:**

Australia: TWA = 400 ppm (1400 mg/m<sup>3</sup>), JAN 1993  
 Austria: MAK = 400 ppm (1400 mg/m<sup>3</sup>), JAN 1999  
 Belgium: TWA = TWA 400 ppm (1440 mg/m<sup>3</sup>), JAN 1993

#### **ETHYL ACETATE (continued):**

Denmark: TWA = TWA 150 ppm (540 mg/m<sup>3</sup>), JAN 1999  
 Finland: TWA = 300 ppm (1100 mg/m<sup>3</sup>), STEL = 500 ppm (1800 mg/m<sup>3</sup>), JAN 1993  
 France: VME = 400 ppm (1400 mg/m<sup>3</sup>), JAN 1999  
 Germany: MAK = 400 ppm (1400 mg/m<sup>3</sup>), JAN 1999  
 Hungary: TWA = 400 mg/m<sup>3</sup>, STEL = 1200 mg/m<sup>3</sup>, JAN 1993  
 The Netherlands: MAC-TGG = 550 mg/m<sup>3</sup>, 2003  
 Norway: TWA = 150 ppm (550 mg/m<sup>3</sup>), JAN 1999  
 The Philippines: TWA = 400 ppm (1400 mg/m<sup>3</sup>), JAN 1993  
 Poland: MAC(TWA) = 200 ppm, MAC(STEL) = 600 mg/m<sup>3</sup>, JAN 1999  
 Russia: TWA = 50 mg/m<sup>3</sup>, STEL = 200 mg/m<sup>3</sup>, JUN 2003  
 Sweden: NGV = 150 ppm (500 mg/m<sup>3</sup>), KTV = 300 ppm (1100 mg/m<sup>3</sup>), JAN 1999  
 Switzerland: MAK-W = 400 ppm (1400 mg/m<sup>3</sup>), KZG-W = 800 ppm (2800 mg/m<sup>3</sup>),  
 JAN 1999  
 Turkey: TWA = 400 ppm (1400 mg/m<sup>3</sup>), JAN 1993  
 United Kingdom: TWA = 400 ppm (1460 mg/m<sup>3</sup>), SEP 2000  
 In New Zealand, Singapore, Vietnam check ACGIH TLV

*The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132) or equivalent standard of Canada for relevant details.*

**RESPIRATORY PROTECTION:** Maintain airborne contaminant concentrations below guidelines listed in this section, if applicable. If respiratory protection is needed, use only protection authorized in 29 CFR 1910.134 or applicable State regulations. For operations in which mists or sprays of this product will be generated use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards or Canadian CSA Standard Z94.4-93. The following are NIOSH respiratory protection recommendations are for the Ethyl Acetate component in air.

#### **ETHYL ACETATE CONCENTRATION**

Up to 2000 ppm:

#### **RESPIRATORY PROTECTION**

Any Supplied-Air Respirator (SAR) operated in a continuous-flow mode, or any Powered, Air-Purifying Respirator (PAPR) with organic vapor cartridge(s), or any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s), or any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister, or any Self-Contained Breathing Apparatus (SCBA) with a full facepiece, or any Supplied-Air Respirator (SAR) with a full facepiece.

Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Any SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any SAR that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in pressure-demand or other positive-pressure mode.

Escape: Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister, or any appropriate escape-type, SCBA.

**EYE PROTECTION:** If necessary, refer to U.S. OSHA 29 CFR 1910.133, the Canadian CSA Standard Z94.3-M1982, *Industrial Eye and Face Protectors*, or the European Standard EN166 and the CR 13464:1999 for further information.

**HAND PROTECTION:** Polyvinyl alcohol, polyethylene/ethylene vinyl alcohol, 4H™, Barricade™, or Responder™ gloves. Natural rubber, butyl rubber, neoprene, polyvinyl chloride, and nitrile gloves are not recommended. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.

## 8. EXPOSURE CONTROLS – PERSONAL PROTECTION, continued

**BODY PROTECTION:** None normally needed under typical circumstances of use. If necessary, use body protection appropriate for task (e.g., Tyvek suit, rubber apron). If necessary, refer to appropriate Standards of Canada for further information. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use protection as described in U.S. OSHA 29 CFR 1910.136 or Canadian CSA Standard Z195-M1984, *Protective Footwear*.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**PHYSICAL STATE:** Viscous Liquid.

**COLOR:** Black.

**MOLECULAR FORMULA:** Mixture.

**MOLECULAR WEIGHT:** Mixture.

**ODOR:** Fruity.

**ODOR THRESHOLD:** Not established for product. Range of values reported for Ethyl Acetate: 6.4-50 ppm (detection); 13.3-75 (recognition).

**RELATIVE VAPOR DENSITY (air = 1):** >1

**VAPOR PRESSURE:** < 110kPa

**EVAPORATION RATE (nBuAc = 1):** Not established for product.

**SPECIFIC GRAVITY (water = 1):** Not established for product.

**MELTING/FREEZING POINT:** Not established for product.

**BOILING POINT:** Not established for product.

**SOLUBILITY IN WATER:** Soluble.

**pH:** Not established for product.

**% VOLATILE:** Not established for product.

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

**HOW TO DETECT THIS SUBSTANCE (warning properties):** The odor of this product may act as a warning of this product.

## 10. STABILITY AND REACTIVITY

**STABILITY:** Stable.

**DECOMPOSITION PRODUCTS:** The products of thermal decomposition of this material include irritating vapors and toxic gases (e.g., carbon dioxide, carbon monoxide, nitrogen oxides, hydrogen cyanide, amines and alcohols).

**MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:** This product is incompatible with strong oxidizing agents, potassium tert-butoxide, lithium aluminum hydride, chlorosulfonic acid, alcohols, acids, bases, amines, amides, phenols, mercaptans, urethanes, ureas and surface active materials, metal compounds (e.g. organotin catalysts).

**HAZARDOUS POLYMERIZATION:** May occur if highly heated or in contact with amines.

**CONDITIONS TO AVOID:** Contact with incompatible chemicals, exposure to elevated temperatures.

## 11. TOXICOLOGICAL INFORMATION

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

**INHALATION:** If high concentrations of vapors of this product are inhaled (as may occur if this material is used in a poorly ventilated area), symptoms of central nervous system depression may occur (e.g., headaches, dizziness, nausea, incoordination, light-headedness, and drowsiness). Inhalation of high concentration of vapors may be fatal from central nervous system. Additionally, irritation may cause irritation of the nose, throat and respiratory system, especially if inhalation exposure is prolonged. Symptoms may include coughing, sneezing and difficulty breathing. Congestion of the upper respiratory tract, spleen and kidney and hemorrhaging in lung tissue may occur. Isocyanate compound vapors or aerosols may cause respiratory tract irritation, possible severe enough to produce bronchospasm and pulmonary edema. Pulmonary sensitization and asthmatic reactions, ranging in severity from minor difficulty breathing to an acute attack, may also occur. Once sensitized, susceptible individuals may experience allergic reaction after exposure to very low levels of the product. Possible neurological symptoms from isocyanate exposure may include headache, insomnia, euphoria, ataxia, anxiety neurosis, depression, and paranoia. Gastrointestinal disturbances may include nausea, vomiting, abdominal pain. Chronic exposure to this product via inhalation may aggravate existing symptoms of bronchitis and emphysema.

**CONTACT WITH SKIN or EYES:** Skin contact may cause reddening, discomfort, and irritation. Repeated or prolonged contact may result in defatting, redness, itching, inflammation, cracking and possible secondary infection. The Triphenylmethane Triisocyanate compound is a potential skin sensitizer. Susceptible individuals may experience allergic reaction after exposure to this product, including itching, eczema, welts and other reaction. Direct contact with the eyes can be moderately to severely irritating and will result in immediate pain, tearing. Redness, itching, burning sensation and visual disturbances may indicate excessive eye contact. Vapors of the product may cause watering and irritation of the eyes.

**SKIN ABSORPTION:** No component of this product is known to be absorbed via intact skin.

## 11. TOXICOLOGICAL INFORMATION, continued

**INGESTION:** Ingestion is not anticipated to be a likely route of exposure to this product. If this material is swallowed, it may cause nausea, diarrhea, and vomiting and symptoms of central nervous system depression, such as described under "Inhalation". A danger of aspiration into the lungs exists after ingestion and can cause damage to the tissues of the lungs, resulting in chemical pneumonia and edema (accumulation of fluid in the lungs). Ingestion of large quantities of this product may be fatal.

**INJECTION:** Though not anticipated to be a likely route of occupational exposure, injection of this material (via puncture or laceration by a contaminated object) may cause local reddening, tissue swelling, and discomfort in addition to the wound.

**HEALTH EFFECTS OR RISKS FROM EXPOSURE:** An Explanation in Lay Terms.

**ACUTE:** This material may irritate the eyes, skin, and mucous membranes. Inhalation of high concentrations of this product's vapors may cause dizziness, headaches, and nausea and in very high concentrations, may cause death.

**CHRONIC:** Prolonged or repeated skin contact may cause dermatitis (inflammation of the skin, resulting in redness and dryness). Due to the presence of the Triphenylmethane Triisocyanate compound, a risk of respiratory and skin sensitization exists for susceptible individuals.

**TARGET ORGANS:** **Acute:** Skin, eyes, central nervous system.

**Chronic:** Skin, respiratory, liver, kidneys, neurological system, central nervous system.



### HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

<b>HEALTH HAZARD</b>	(BLUE)	2*
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<b>FLAMMABILITY HAZARD</b>	(RED)	3
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<b>PHYSICAL HAZARD</b>	(YELLOW)	0
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### PROTECTIVE EQUIPMENT

EYES	RESPIRATORY	HANDS	BODY
	SEE SECTION 8		SEE SECTION 8

For Routine Industrial Use and Handling Applications

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate  
3 = Serious 4 = Severe \* = Chronic hazard

**TOXICITY DATA:** The specific toxicology data available for the components of this product present in greater than 1 percent concentration are presented below:

**CARBON BLACK:**

LD<sub>50</sub> (Oral-Rat) > 15400 mg/kg: Behavioral: somnolence (general depressed activity)  
 LD<sub>50</sub> (Skin-Rabbit) > 3 gm/kg  
 TDLo (Intravenous-Rat) 10 mg/kg/2 minutes: Liver: changes in liver weight; Blood: changes in spleen  
 TDLo (Skin-Rat) 11 gm/kg/4: Blood: pigmented or nucleated red blood cells; Liver: changes in liver weight; Nutritional and Gross Metabolic: weight loss or decreased weight gain  
 TDLo (Intravenous-Rat) 10 mg/kg/2 minutes: Biochemical: Enzyme inhibition, induction, or change in blood or tissue Levels: hepatic microsomal mixed oxidase (dealkylation, hydroxylation, etc.)  
 TCLo (Inhalation-Rat) 50 mg/m<sup>3</sup>/6 hours/90 days-intermittent: Lungs, Thorax, or Respiration: other changes  
 TCLo (Inhalation-Rat) 11,600 µg/m<sup>3</sup>/18 hours/2 years-intermittent: Tumorigenic: carcinogenic by RTECS criteria; Lungs, Thorax, or Respiration: tumors  
 Mutation in Microorganisms (Bacteria-Salmonella typhimurium) 1 mg/plate  
 DNA Adduct (Inhalation-Mouse) 6200 µg/m<sup>3</sup>/16 hours/12 weeks-intermittent  
 DNA Damage (Human-Lymphocyte) 16 µg/L/48 hours

**ETHYL ACETATE:**

Standard Draize Test (Eye-Human) 400 ppm  
 TCLo (Inhalation-Human) 400 ppm: Sense Organs and Special Senses (Olfaction): effect, not otherwise specified, (Eye): conjunctive irritation; Lungs, Thorax, or Respiration: other changes  
 LD<sub>50</sub> (Oral-Rat) 5620 mg/kg  
 LD<sub>50</sub> (Oral-Mouse) 4100 mg/kg: Behavioral: somnolence (general depressed activity), changes in motor activity (specific assay), coma  
 LD<sub>50</sub> (Oral-Rabbit) 4935 mg/kg  
 LD<sub>50</sub> (Oral-Guinea Pig) 5500 mg/kg: Behavioral: somnolence (general depressed activity), changes in motor activity (specific assay), coma  
 LD<sub>50</sub> (Skin-Rabbit) > 20 mL/kg  
 LD<sub>50</sub> (Intraperitoneal-Mouse) 709 mg/kg  
 LD<sub>50</sub> (Subcutaneous-Cat) 3 gm/kg: Behavioral: somnolence (general depressed activity); Gastrointestinal: nausea or vomiting; Blood: other changes  
 LD<sub>50</sub> (Subcutaneous-Guinea Pig) 3 gm/kg: Behavioral: somnolence (general depressed activity)  
 LC<sub>50</sub> (Inhalation-Rat) 45 gm/m<sup>3</sup>/2 hours  
 LC<sub>50</sub> (Inhalation-Rat) 200 gm/m<sup>3</sup>: Behavioral: somnolence (general depressed activity); Lungs, Thorax, or Respiration: acute pulmonary edema; Gastrointestinal: changes in structure or function of salivary glands

**ETHYL ACETATE (continued):**

LDLo (Subcutaneous-Rat) 5 gm/kg  
 LCLo (Inhalation-Cat) 61 gm/m<sup>3</sup>  
 TCLo (Inhalation-Mouse) 200 ppm/6 minutes: Lungs, Thorax, or Respiration: respiratory depression  
 TCLo (Inhalation-Rat) 1500 ppm/90 days-intermittent: Sense Organs and Special Senses (Olfaction): change in sensation of smell, effect, not otherwise specified  
 TCLo (Inhalation-Dog) 22 gm/m<sup>3</sup>/40 minutes/4 weeks-intermittent: Behavioral: ataxia; Lungs, Thorax, or Respiration: respiratory stimulation; Nutritional and Gross Metabolic: body temperature decrease  
 TDLo (Intraperitoneal-Rat) 8 mL/kg/8 days-intermittent: Liver: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: phosphatases, Metabolism (Intermediary): other carbohydrates  
 Sex Chromosome Loss and Nondisjunction (*Saccharomyces cerevisiae*) 24,400 ppm  
 Cytogenetic Analysis (Hamster-Fibroblast) 9 gm/L  
**TRIPHENYLMETHANE TRIISOCYANATE:**  
 Currently, there are no data for this compound.

**CARCINOGENIC POTENTIAL OF COMPONENTS:** Components of this product are listed by agencies tracking the carcinogenic potential of chemical compounds, as follows:

**CARBON BLACK:** ACGIH-TLV-A4 (Not Classifiable as a Human Carcinogen); IARC-2B (Possibly Carcinogenic to Humans); MAK-3B (Substances for Which in-vitro Tests or Animal Studies Have Yielded Evidence of Carcinogenic Effects is Not Sufficient for Classification of the Substance in One of the Other Categories); NIOSH-Ca (Carcinogen Defined with no Further Categorization)

The remaining components of this product 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.

## 11. TOXICOLOGICAL INFORMATION, continued

**IRRITANCY OF PRODUCT:** This product may be mildly irritating to contaminated, skin, and moderately to severely irritating to the eyes and mucous membranes.

**SENSITIZATION TO THE PRODUCT:** Due to the presence of the Triphenylmethane Triisocyanate compound, a risk of respiratory and skin sensitization exists for susceptible individuals.

**REPRODUCTIVE TOXICITY INFORMATION:** Listed below is information concerning the effects of this product and its components on the human reproductive system.

**Mutagenicity:** The components of this product are not reported to produce mutagenic effects in humans. Positive results (chromosomal aberrations) have been obtained in tests involving Chinese hamster cells in vitro exposed to high levels of Ethyl Acetate.

**Embryotoxicity:** The components of this product are not reported to produce embryotoxic effects in humans.

**Teratogenicity:** The components of this product are not reported to cause teratogenic effects in humans.

**Reproductive Toxicity:** The components of this product are not reported to cause reproductive effects in humans.

**BIOLOGICAL EXPOSURES INDICES (BEIs):** Currently, there are no Biological Exposure Indices (BEIs) determined for any component of this product.

## 12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

**ENVIRONMENTAL STABILITY:** The components of this product are relatively stable under ambient environmental conditions. The following are environmental data for the main component, Ethyl Acetate.

### ETHYL ACETATE:

**Terrestrial Fate:** Based on a classification scheme, an estimated Koc value of 59, determined from a log Kow of 0.73 and a regression-derived equation, indicates that ethyl acetate is expected to have high mobility in soil. Volatilization of Ethyl Acetate from moist soil surfaces is expected to be important given a Henry's Law constant of  $1.34 \times 10^{-4}$  atm-cu m/mole. The potential for volatilization of Ethyl Acetate from dry soil surfaces may exist based on a vapor pressure of 93 mm Hg. Ethyl acetate may biodegrade in soil, based upon its biodegradation in aqueous screening studies

**Aquatic Fate:** Based on a classification scheme, an estimated Koc value of 59, determined from a log Kow of 0.73 and a regression-derived equation, indicates that Ethyl Acetate is not expected to adsorb to suspended solids and sediment in water. Ethyl Acetate is expected to volatilize from water surfaces based on a Henry's Law constant of  $1.34 \times 10^{-4}$  atm-cu m/mole. Estimated volatilization half-lives for a model river and model lake are 8.9 hours and 5.6 days, respectively. According to a classification scheme, an estimated BCF of 3.2, from the log Kow, suggests the potential for bioconcentration in aquatic organisms is low. Simple esters are resistant to hydrolysis; ethyl acetate's hydrolysis half-life at 25 deg C and pH 7 is 2.0 years. Biodegradation is expected to be an important process in aquatic systems, based upon aqueous screening studies. Ethyl Acetate reached 26.6 and 57.1% of its theoretical BOD in 5 days using the standard dilution method and seawater dilution method, respectively. 99.9% removal of ethyl acetate was observed in a complete mix continuous-flow activated sludge system; 93% of this removal was attributed to biodegradation(8). 94% of theoretical methane production was observed after incubation in sediment and groundwater collected from the methanogenic portion of an anoxic aquifer polluted by municipal landfill leachate.

**Atmospheric Fate:** According to a model of gas/particle partitioning of semi-volatile organic compounds in the atmosphere, ethyl acetate, which has a vapor pressure of 93 mm Hg at 25°C, is expected to exist solely as a vapor in the ambient atmosphere. Vapor-phase ethyl acetate is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 10 days.

**Bioconcentration:** An estimated BCF of 3.2 was calculated for Ethyl Acetate, using a log Kow of 0.73 and a regression-derived equation. According to a classification scheme, this BCF suggests the potential for bioconcentration in aquatic organisms is low.

**MOBILITY:** This product has not been tested for mobility in soil.

**PERSISTENCE AND BIODEGRADABILITY:** This product has not been tested for persistence or biodegradability.

**BIO-ACCUMULATION POTENTIAL:** This product has not been tested for bio-accumulation potential.

**EFFECT OF MATERIAL ON PLANTS or ANIMALS:** This product may cause adverse effects on terrestrial plants and animals.

**EFFECT OF CHEMICAL ON AQUATIC LIFE:** This product is not anticipated to have significant, adverse effects on aquatic plants and animals. The following aquatic toxicity data are available for the main component of this product:

### ETHYL ACETATE:

BCF (*Chlorella fusca* algae) (wet wt): 13,500

EC<sub>0</sub> (*Pseudomonas putida* bacteria): 16 hours = 650 mg/L

EC<sub>0</sub> (*Microcystis aeruginosa* algae): 8 days = 550 mg/L

EC<sub>0</sub> (*Scenedesmus quadricauda* green algae) 7 days = 15 mg/L

### ETHYL ACETATE (continued):

EC<sub>0</sub> (*Entosiphon sulcatum* protozoa) 72 hours = 202 mg/L

EC<sub>0</sub> (*Uronema parduczi* Chatton-Lwoff protozoa) = 1,620 mg/L

LC<sub>50</sub> (Mexican axolotl) [3-4 w after hatching] 48 hours = 150 mg/L

LC<sub>50</sub> (clawed toad) [3-4 w after hatching] 48 hours = 180 mg/L

## 13. DISPOSAL CONSIDERATIONS

**DISPOSAL METHODS:** It is the responsibility of the generator to determine at the time of disposal whether the product meets the criteria of a hazardous waste per regulations of the area in which the waste is generated and/or disposed of. Waste disposal must be in accordance with appropriate Federal, State, and local regulations. 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. Shipment of wastes must be done with appropriately permitted and registered transporters.

**DISPOSAL CONTAINERS:** Waste materials must be placed in and shipped in appropriate 5-gallon or 55-gallon poly or metal waste pails or drums. Permeable cardboard containers are not appropriate and should not be used. Ensure that any required marking or labeling of the containers be done to all applicable regulations.

**PRECAUTIONS TO BE FOLLOWED DURING WASTE HANDLING:** Wear proper protective equipment when handling waste materials.

**EPA WASTE NUMBER:** Wastes of this product should be tested to determine if they meet the criteria of D001, Characteristic-Ignitability.



## 14. TRANSPORTATION INFORMATION

THIS PRODUCT IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Paint related material  
HAZARD CLASS NUMBER and DESCRIPTION: 3 (Flammable)  
UN IDENTIFICATION NUMBER: UN 1263  
DOT LABEL(S) REQUIRED: Class 3 (Flammable)  
PACKAGING GROUP: II  
NORTH AMERICAN RESPONSE GUIDEBOOK NUMBER (2004): 128  
MARINE POLLUTANT: The components of this product are not listed as a marine pollutant as per D.O.T. (49 CFR 172.101, Appendix B).

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This product is classified as Dangerous Goods, per regulations of Transport Canada. The use of the above U.S. DOT information from the U.S. 49 CFR regulations is allowed for shipments that originate in the U.S. For shipments via ground vehicle or rail that originate in Canada, the following information is applicable.

PROPER SHIPPING NAME: Paint related material  
HAZARD CLASS NUMBER and DESCRIPTION: 3 (Flammable)  
UN IDENTIFICATION NUMBER: UN 1263  
PACKING GROUP: II  
HAZARD LABEL(S) REQUIRED: Class 3 (Flammable)  
SPECIAL PROVISIONS: 59  
EXPLOSIVE LIMIT & LIMITED QUANTITY INDEX: 5  
ERAP INDEX: None  
PASSENGER CARRYING SHIP INDEX: None  
PASSENGER CARRYING ROAD OR RAIL VEHICLE INDEX: 5  
MARINE POLLUTANT: Not applicable.

INTERNATIONAL AIR TRANSPORT ASSOCIATION DESIGNATION: This product is classified as dangerous goods, per rules of IATA.

UN IDENTIFICATION NUMBER: UN 1263  
PROPER SHIPPING NAME: Paint related material  
HAZARD CLASS NUMBER and DESCRIPTION: 3 (Flammable)  
PACKING GROUP: II  
HAZARD LABEL(S) REQUIRED: Class 3 (Flammable)  
PASSENGER and CARGO AIRCRAFT PACKING INSTRUCTION: 353  
PASSENGER and CARGO AIRCRAFT MAXIMUM NET QUANTITY PER PKG: 5 L  
PASSENGER and CARGO AIRCRAFT LIMITED QUANTITY PACKING INSTRUCTION: Y341  
PASSENGER and CARGO AIRCRAFT LIMITED QUANTITY MAXIMUM NET QUANTITY PER PKG: 1 L  
CARGO AIRCRAFT ONLY PACKING INSTRUCTION: 364  
CARGO AIRCRAFT ONLY MAXIMUM NET QUANTITY PER PKG: 60 L  
SPECIAL PROVISIONS: A3, A72  
ERG CODE: 3L

INTERNATIONAL MARITIME ORGANIZATION (IMO): This product is classified as dangerous goods, per rules of the IMO, as follows:

PROPER SHIPPING NAME: Paint related material  
HAZARD CLASS NUMBER and DESCRIPTION: 3 (Flammable)  
UN IDENTIFICATION NUMBER: UN 1263  
PACKING GROUP: II  
HAZARD LABEL(S) REQUIRED: Class 3 (Flammable)  
SPECIAL PROVISIONS: 163, 944  
LIMITED QUANTITIES: 5 L  
PACKING INSTRUCTIONS: P001  
PROVISIONS: PP1  
IBC INSTRUCTIONS: IBC02  
IBC PROVISIONS: None  
EmS: F-E, S-E  
STOWAGE CATEGORY: Category B

MARINE POLLUTANT: The components of this product are not designated by the IMO to be a Marine Pollutant.

## 15. REGULATORY INFORMATION

### U.S. STATE AND FEDERAL REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: The components of this product is subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.

CHEMICAL NAME	SARA 302 (40 CFR 355, Appendix A)	SARA 304 (40 CFR Table 302.4)	SARA 313 (40 CFR 372.65)
Ethyl Acetate	No	No	Yes



## 15. REGULATORY INFORMATION, continued

**U.S. SARA THRESHOLD PLANNING QUANTITY:** There are no specific Threshold Planning Quantities for this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

**U.S. CERCLA REPORTABLE QUANTITY (RQ):** Ethyl Acetate = 5000 lb (2270 kg)

**U.S. TSCA INVENTORY STATUS:** The components of this product are listed on the TSCA Inventory.

**OTHER U.S. FEDERAL REGULATIONS:** Not applicable.

**CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):** No component is on the California Proposition 65 lists.

**OSHA HAZARD COMMUNICATION AND GLOBAL HARMONIZATION LABELING AND CLASSIFICATION:** Classified in accordance with OSHA's Hazard Communication Standard. It is important to note this substance has not been fully tested.

**Classification:** Skin Sensitizer Category 1, Skin Irritation Category 2, Eye Irritant Category 2A, Flammable Liquid Category 2, Respiratory Sensitizer Category 1, STOT SE 3, Carcinogenic Category 2

**Signal Words:** Danger

**Hazard Statements:** H317: May cause an allergic skin reaction. H315: Causes skin irritation. H319: Causes serious eye irritation. H225: Highly flammable liquid and vapor. H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled. H336: May cause drowsiness or dizziness. H351: Suspected of causing cancer by inhalation.

**Supplemental Hazard Statements:** H066: Repeated exposure may cause skin dryness or cracking.

**Prevention Precautionary Statements:** P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P210: Keep away from heat/sparks/open flames/hot surfaces — No smoking. P233: Keep container tightly closed. P240: Ground/bond container and receiving equipment. P241: Use explosion-proof electrical/ventilating/lighting/equipment. P242: Use only non-sparking tools. P243: Take precautionary measures against static discharge. P261: Avoid breathing fume/vapor. P264: Wash thoroughly after handling. P271: Use only outdoors or in a well-ventilated area. P272: Contaminated work clothing should not be allowed out of the workplace. P280: Wear protective gloves/protective clothing/eye protection/face protection. P285: In case of inadequate ventilation wear respiratory protection.

**Response Precautionary Statements:** P312: Call a POISON CENTER or doctor/physician if you feel unwell. P321: Specific treatment (remove from exposure and treat symptoms). P362+P363: Take off immediately all contaminated clothing and wash before reuse. P302 + P352: IF ON SKIN: wash with plenty of soap and water. P303 + P361 + P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. P333 + P313: If skin irritation or rash occurs: Get medical advice/attention. P304 + P341: IF INHALED: if breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. P337 + P313: If eye irritation persists: get medical advice/attention. P308 + P313: If you are exposed or concerned: get medical advice/attention. P342 + P311: If experiencing respiratory symptoms, call a Poison Center or doctor/physician. P370 + P378: IN CASE OF FIRE: Use materials appropriate for surrounding fire for extinction.

**Storage Precautionary Statements:** P403 + P233 + P235 + P405: Store locked up in a well-ventilated place. Keep container tightly closed and cool.

**Disposal Precautionary Statements:** P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

**Hazard Symbols:** GHS02, GHS07, GHS08

### ADDITIONAL CANADIAN REGULATIONS:

**CANADIAN DSL/NDL INVENTORY:** The components of this product listed by CAS # are listed on the DSL Inventory.

**CANADIAN WHMIS IDL DISCLOSURE STATUS:** The Carbon Black and Ethyl Acetate components of this product have a disclosure requirement level of 1.0%.

**OTHER CANADIAN REGULATIONS:** Not applicable.

**CANADIAN ENVIRONMENTAL PROTECTION AGENCY (CEPA) PRIORITY SUBSTANCES LISTS:** The components of this product are not on the Priority Substances Lists.

**CANADIAN WHMIS CLASSIFICATION AND SYMBOLS:** **Class B2:** Flammable Liquid

**Class D2A:** Poisonous and Infectious Material, Other effects - central nervous system depression, sensitization.



## 16. OTHER INFORMATION

**U.S. ANSI STANDARD LABELING (Z129.1):** **DANGER!** HIGHLY FLAMMABLE LIQUID. HARMFUL IF INHALED OR INGESTED. CONTAINS KNOWN RESPIRATORY SENSITIZER AND SUSPECT SKIN SENSITIZER. CAN CAUSE ADVERSE EFFECTS ON THE CENTRAL NERVOUS SYSTEM. CAUSES SKIN, RESPIRATORY SYSTEM AND EYE IRRITATION. ASPIRATION HAZARD – INGESTION CAN CAUSE LIFE-THREATENING LUNG DAMAGE. PROLONGED EXPOSURE CAN CAUSE ADVERSE EFFECTS ON LIVER, KIDNEYS AND NEUROLOGICAL SYSTEMS. Keep away from heat, spark or flame. Do not taste or swallow. Do not get on skin or in eyes. Avoid breathing vapors or mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves, goggles, respiratory protection and eye protection, as appropriate. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. If inhaled, remove to fresh air. If ingested, do not induce vomiting and get medical attention. Get medical attention if any adverse reaction occurs. **IN CASE OF FIRE:** Use water fog (for cooling of containers), dry chemical, CO<sub>2</sub>, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with inert material. Replace residue in suitable container. Consult Material Safety Data Sheet for additional information.

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. Shat-R-Proof 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, Shat-R-Proof 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 that uniquely identifies each constituent.

### EXPOSURE LIMITS IN AIR:

**CEILING LEVEL:** The concentration that shall not be exceeded during any part of the working exposure.

**DFG MAK Germ Cell Mutagen Categories:** **1:** Germ cell mutagens which have been shown to increase the mutant frequency in the progeny of exposed humans. **2:** Germ cell mutagens which have been shown to increase the mutant frequency in the progeny of exposed mammals. **3A:** Substances which have been shown to induce genetic damage in germ cells of human of animals, or which produce mutagenic effects in somatic cells of mammals *in vivo* and have been shown to reach the germ cells in an active form. **3B:** Substances which are suspected of being germ cell mutagens because of their genotoxic effects in mammalian somatic cell *in vivo*; in exceptional cases, substances for which there are no *in vivo* data, but which are clearly mutagenic *in vitro* and structurally related to known *in vivo* mutagens. **4:** Not applicable (Category 4 carcinogenic substances are those with non-genotoxic mechanisms of action. By definition, germ cell mutagens are genotoxic. Therefore, a Category 4 for germ cell mutagens cannot apply. At some time in the future, it is conceivable that a Category 4 could be established for genotoxic substances with primary targets other than DNA [e.g. purely aneugenic substances] if research results make this seem sensible.) **5:** Germ cell mutagens, the potency of which is considered to be so low that, provided the MAK value is observed, their contribution to genetic risk for humans is expected not to be significant.

**DFG MAK Pregnancy Risk Group Classification: Group A:** A risk of damage to the developing embryo or fetus has been unequivocally demonstrated. Exposure of pregnant women can lead to damage of the developing organism, even when MAK and BAT (Biological Tolerance Value for Working Materials) values are observed. **Group B:** Currently available information indicates a risk of damage to the developing embryo or fetus must be considered to be probable. Damage to the developing organism cannot be excluded when pregnant women are exposed, even when MAK and BAT values are observed. **Group C:** There is no reason to fear a risk of damage to the developing embryo or fetus when MAK and BAT values are observed. **Group D:** Classification in one of the groups A-C is not yet possible because, although the data available may indicate a trend, they are not sufficient for final evaluation.

**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.

**LOQ:** Limit of Quantitation.

**SKIN:** Used when there is a danger of cutaneous absorption.

**STEL-Short Term Exposure Limit:** Short Term Exposure Limit, usually a 15-minute time-weighted average (TWA) exposure that should not be exceeded at any time during a workday, even if the 8-hr TWA is within the TLV-TWA, PEL-TWA or REL-TWA.

**TLV-Threshold Limit Value:** An airborne concentration of a substance that 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.

**TWA-Time Weighted Average:** Time Weighted Average exposure concentration for a conventional 8-hr (TLV, PEL) or up to a 10-hr (REL) workday and a 40-hr workweek.

### HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS:

This rating system was developed by the National Paint and Coating Association and has been adopted by industry to identify the degree of chemical hazards.

#### HEALTH HAZARD:

**0 (Minimal Hazard):** No significant health risk, irritation of skin or eyes not anticipated. *Skin Irritation:* Essentially non-irritating. PII or Draize = "0". *Eye Irritation:* Essentially non-irritating, or minimal effects which clear in < 24 hours [e.g. mechanical irritation]. Draize = "0". *Oral Toxicity LD<sub>50</sub> Rat:* < 5000 mg/kg. *Dermal Toxicity LD<sub>50</sub> Rat or Rabbit:* < 2000 mg/kg. *Inhalation Toxicity 4-hrs LC<sub>50</sub> Rat:* < 20 mg/L.; **1 (Slight Hazard):** Minor reversible injury may occur; slightly or mildly irritating. *Skin Irritation:* Slightly or mildly irritating. *Eye Irritation:* Slightly or mildly irritating. *Oral Toxicity LD<sub>50</sub> Rat:* > 500-1000 mg/kg. *Dermal Toxicity LD<sub>50</sub> Rat or Rabbit:* > 1000-2000 mg/kg. *Inhalation Toxicity LC<sub>50</sub> 4-hrs Rat:* > 2-20 mg/L.; **2 (Moderate Hazard):** Temporary or transitory injury may occur. *Skin Irritation:* Moderately irritating; primary irritant; sensitizer. PII or Draize > 0, < 5. *Eye Irritation:* Moderately to severely irritating and/or corrosive; reversible corneal opacity; corneal involvement or irritation clearing in 8-21 days. Draize > 0, ≤ 25. *Oral Toxicity LD<sub>50</sub> Rat:* > 50-500 mg/kg. *Dermal Toxicity LD<sub>50</sub> Rat or Rabbit:* > 200-1000 mg/kg. *Inhalation Toxicity LC<sub>50</sub> 4-hrs Rat:* > 0.5-2 mg/L.; **3 (Serious Hazard):** Major injury likely unless prompt action is taken and medical treatment is given; high level of toxicity; corrosive. *Skin Irritation:* Severely irritating and/or corrosive; may destroy dermal tissue, cause skin burns, dermal necrosis. PII or Draize > 5-8 with destruction of tissue. *Eye Irritation:* Corrosive, irreversible destruction of ocular tissue; corneal involvement or irritation persisting for more than 21 days. Draize > 80 with effects irreversible in 21 days. *Oral Toxicity LD<sub>50</sub> Rat:* > 1-50 mg/kg. *Dermal Toxicity LD<sub>50</sub> Rat or Rabbit:* > 20-200 mg/kg. *Inhalation Toxicity LC<sub>50</sub> 4-hrs Rat:* > 0.05-0.5 mg/L.;

### HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

**4 (Severe Hazard):** Life-threatening; major or permanent damage may result from single or repeated exposure. *Skin Irritation:* Not appropriate. Do not rate as a "4", based on skin irritation alone. *Eye Irritation:* Not appropriate. Do not rate as a "4", based on eye irritation alone. *Oral Toxicity LD<sub>50</sub> Rat:* ≤ 1 mg/kg. *Dermal Toxicity LD<sub>50</sub> Rat or Rabbit:* ≤ 20 mg/kg. *Inhalation Toxicity LC<sub>50</sub> 4-hrs Rat:* ≤ 0.05 mg/L.

#### FLAMMABILITY HAZARD:

**0 (Minimal Hazard-Materials that will not burn in air when exposure to a temperature of 815.5°C [1500°F] for a period of 5 minutes.); 1 (Slight Hazard-Materials that must be pre-heated before ignition can occur. Material require considerable pre-heating, under all ambient temperature conditions before ignition and combustion can occur, Including: Materials that will burn in air when exposed to a temperature of 815.5°C (1500°F) for a period of 5 minutes or less; Liquids, solids and semisolids having a flash point at or above 93.3°C [200°F] (e.g. OSHA Class IIIB, or: Most ordinary combustible materials [e.g. wood, paper, etc.]; 2 (Moderate Hazard-Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not, under normal conditions, form hazardous atmospheres in air, but under high ambient temperatures or moderate heating may release vapor in sufficient quantities to produce hazardous atmospheres in air, Including: Liquids having a flash-point at or above 37.8°C [100°F] Solid materials in the form of course dusts that may burn rapidly but that generally do not form explosive atmospheres; Solid materials in a fibrous or shredded form that may burn rapidly and create flash fire hazards (e.g. cotton, sisal, hemp; Solids and semisolids that readily give off flammable vapors.); 3 (Serious Hazard- Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures, or, unaffected by ambient temperature, are readily ignited under almost all conditions, including: Liquids having a flash point below 22.8°C [73°F] and having a boiling point at or above 38°C [100°F] and below 37.8°C [100°F] [e.g. OSHA Class IB and IC]; Materials that on account of their physical form or environmental conditions can form explosive mixtures with air and are readily dispersed in air [e.g., dusts of combustible solids, mists or droplets of flammable liquids]; Materials that burn extremely rapidly, usually by reason of self-contained oxygen [e.g. dry nitrocellulose and many organic peroxides]); 4 (Severe Hazard-Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air, and which will burn readily, including: Flammable gases; Flammable cryogenic materials; Any liquid or gaseous material that is liquid while under pressure and has a flash point below 22.8°C [73°F] and a boiling point below 37.8°C [100°F] [e.g. OSHA Class IA; Material that ignite spontaneously when exposed to air at a temperature of 54.4°C [130°F] or below [e.g. pyrophoric].**

#### PHYSICAL HAZARD:

**0 (Water Reactivity: Materials that do not react with water. Organic Peroxides: Materials that are normally stable, even under fire conditions and will not react with water. Explosives: Substances that are Non-Explosive. Unstable Compressed Gases: No Rating. Pyrophorics: No Rating. Oxidizers: No "0" rating allowed. Unstable Reactives: Substances that will not polymerize, decompose, condense or self-react.); 1 (Water Reactivity: Materials that change or decompose upon exposure to moisture. Organic Peroxides: Materials that are normally stable, but can become unstable at high temperatures and pressures. These materials may react with water, but will not release energy. Explosives: Division 1.5 & 1.6 substances that are very insensitive explosives or that do not have a mass explosion hazard. Compressed Gases: Pressure below OSHA definition. Pyrophorics: No Rating. Oxidizers: Packaging Group III; Solids: any material that in either concentration tested, exhibits a mean burning time less than or equal to the mean burning time of a 3:7 potassium bromate/cellulose mixture and the criteria for Packing Group I and II are not met. Liquids: any material that exhibits a mean pressure rise time less than or equal to the pressure rise time of a 1:1 nitric acid (65%)/cellulose mixture and the criteria for Packing Group I and II are not met. Unstable Reactives: Substances that may decompose, condense or self-react, but only under conditions of high temperature and/or pressure and have little or no potential to cause significant heat generation or explosive hazard. Substances that readily undergo hazardous polymerization in the absence of inhibitors.); 2 (Water Reactivity: Materials that may react violently with water. Organic Peroxides: Materials that, in themselves, are normally unstable and will readily undergo violent chemical change, but will not detonate. These materials may also react violently with water. Explosives: Division 1.4 – Explosive substances where the explosive effect are largely confined to the package and no projection of fragments of appreciable size or range are expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package. Compressed Gases: Pressurized and meet OSHA definition but < 514.7 psi absolute at 21.1°C (70°F) [500 psig]. Pyrophorics: No Rating. Oxidizers: Packaging Group II Solids: any material that, either in concentration tested, exhibits a mean burning time of less than or equal to the mean burning time of a 2:3 potassium bromate/cellulose mixture and the criteria for Packing Group I are not met.**

## DEFINITIONS OF TERMS (Continued)

### HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

#### FLAMMABILITY HAZARD (continued):

**2 (continued):** Liquids: any material that exhibits a mean pressure rise time less than or equal to the pressure rise of a 1:1 aqueous sodium chlorate solution (40%/cellulose mixture and the criteria for Packing Group I are not met. *Unstable Reactives:* Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure, but have a low potential for significant heat generation or explosion. Substances that readily form peroxides upon exposure to air or oxygen at room temperature); **3 (Water Reactivity):** Materials that may form explosive reactions with water. *Organic Peroxides:* Materials that are capable of detonation or explosive reaction, but require a strong initiating source, or must be heated under confinement before initiation; or materials that react explosively with water. *Explosives:* Division 1.2 – Explosive substances that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but do not have a mass explosion hazard. *Compressed Gases:* Pressure  $\geq$  514.7 psi absolute at 21.1°C (70°F) [500 psig]. *Pyrophorics:* No Rating. *Oxidizers:* Packing Group I Solids: any material that, in either concentration tested, exhibits a mean burning time less than the mean burning time of a 3:2 potassium bromate/cellulose mixture. Liquids: Any material that spontaneously ignites when mixed with cellulose in a 1:1 ratio, or which exhibits a mean pressure rise time less than the pressure rise time of a 1:1 perchloric acid (50%/cellulose mixture. *Unstable Reactives:* Substances that may polymerize, decompose, condense or self-react at ambient temperature and/or pressure and have a moderate potential to cause significant heat generation or explosion.); **4 (Water Reactivity):** Materials that react explosively with water without requiring heat or confinement. *Organic Peroxides:* Materials that are readily capable of detonation or explosive decomposition at normal temperature and pressures. *Explosives:* Division 1.1 & 1.2-explosive substances that have a mass explosion hazard or have a projection hazard. A mass explosion is one that affects almost the entire load instantaneously. *Compressed Gases:* No Rating. *Pyrophorics:* Add to the definition of Flammability "4". *Oxidizers:* No "4" rating. *Unstable Reactives:* Substances that may polymerize, decompose, condense or self-react at ambient temperature and/or pressure and have a high potential to cause significant heat generation or explosion.)

### NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS:

HEALTH HAZARD: **0** (materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials): Gases and vapors whose LC<sub>50</sub> for acute inhalation toxicity is greater than 10,000 ppm. Dusts and mists whose LC<sub>50</sub> for acute inhalation toxicity is greater than 200 mg/L. Materials whose LD<sub>50</sub> for acute dermal toxicity is greater than 2000 mg/kg. Materials whose LD<sub>50</sub> for acute oral toxicity is greater than 2000 mg/kg. Materials that are essentially non-irritating to the respiratory tract, eyes and skin. **1** (materials that, under emergency conditions, can cause significant irritation): Gases and vapors whose LC<sub>50</sub> for acute inhalation toxicity is greater than 5,000 ppm but less than or equal to 10,000 ppm. Dusts and mists whose LC<sub>50</sub> for acute inhalation toxicity is greater than 10 mg/L but less than or equal to 200 mg/L. Materials whose LD<sub>50</sub> for acute dermal toxicity is greater than 1000 mg/kg but less than or equal to 2000 mg/kg. Materials whose LD<sub>50</sub> for acute oral toxicity is greater than 500 mg/kg but less than or equal to 2000 mg/kg. Materials that cause slight to moderate irritation to the respiratory tract, eyes and skin. **2** (materials that, under emergency conditions, can cause temporary incapacitation or residual injury): Gases and vapors whose LC<sub>50</sub> for acute inhalation toxicity is greater than 3,000 ppm but less than or equal to 5,000 ppm. Dusts and mists whose LC<sub>50</sub> for acute inhalation toxicity is greater than 2 mg/L but less than or equal to 10 mg/L. Materials whose LD<sub>50</sub> for acute dermal toxicity is greater than 200 mg/kg but less than or equal to 1000 mg/kg. Materials whose LD<sub>50</sub> for acute oral toxicity is greater than 50 mg/kg but less than or equal to 500 mg/kg. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC<sub>50</sub> for acute inhalation toxicity, if its LC<sub>50</sub> is less than or equal to 5000 ppm and that does not meet the criteria for either degree of hazard 3 or degree of hazard 4. Compressed liquefied gases with boiling points between -30°C (-22°F) and -55°C (-66.5°F) that cause severe tissue damage, depending on duration of exposure. Materials that are respiratory irritants. Materials that cause severe, but reversible irritation to the eyes or are lachrymators. Materials that are primary skin irritants or sensitizers. **3** (materials that, under emergency conditions, can cause serious or permanent injury): Gases and vapors whose LC<sub>50</sub> for acute inhalation toxicity is greater than 1,000 ppm but less than or equal to 3,000 ppm. Dusts and mists whose LC<sub>50</sub> for acute inhalation toxicity is greater than 0.5 mg/L but less than or equal to 2 mg/L. Materials whose LD<sub>50</sub> for acute dermal toxicity is greater than 40 mg/kg but less than or equal to 200 mg/kg. Materials whose LD<sub>50</sub> for acute oral toxicity is greater than 5 mg/kg but less than or equal to 50 mg/kg. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC<sub>50</sub> for acute inhalation toxicity, if its LC<sub>50</sub> is less than or equal to 3000 ppm and that does not meet the criteria for degree of hazard 4. Compressed liquefied gases with boiling points between -30°C (-22°F) and -55°C (-66.5°F) that cause frostbite and irreversible tissue damage. Materials that are respiratory irritants. Cryogenic gases that cause frostbite and irreversible tissue damage. Materials that are corrosive to the respiratory tract. Materials that are corrosive to the eyes or cause irreversible corneal opacity. Materials that are corrosive to the skin. **4** (materials that, under emergency conditions, can be lethal): Gases and vapors whose LC<sub>50</sub> for acute inhalation toxicity less than or equal to 1,000 ppm. Dusts and mists whose LC<sub>50</sub> for acute inhalation toxicity is less than or equal to 0.5 mg/L.

### NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

HEALTH HAZARD (continued): **4 (continued):** Materials whose LD<sub>50</sub> for acute dermal toxicity is less than or equal to 40 mg/kg. Materials whose LD<sub>50</sub> for acute oral toxicity is less than or equal to 5 mg/kg. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC<sub>50</sub> for acute inhalation toxicity, if its LC<sub>50</sub> is less than or equal to 1000 ppm.

FLAMMABILITY HAZARD: **0** Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand: Materials that will not burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in accordance with Annex D. **1** Materials that must be preheated before ignition can occur. Materials in this degree require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur: Materials that will burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in accordance with Annex D. Liquids, solids and semisolids having a flash point at or above 93.4°C (200°F) (i.e. Class IIIB liquids). Liquids with a flash point greater than 35°C (95°F) that do not sustain combustion when tested using the Method of Testing for Sustained Combustibility, per 49 CFR 173, Appendix H or the UN Recommendation on the Transport of Dangerous Goods, Model Regulations (current edition) and the related Manual of Tests and Criteria (current edition). Liquids with a flash point greater than 35°C (95°F) in a water-miscible solution or dispersion with a water non-combustible liquid/solid content of more than 85 percent by weight.

Liquids that have no fire point when tested by ASTM D 92 Standard Test Method for Flash and Fire Points by Cleveland Open Cup, up to a boiling point of the liquid or up to a temperature at which the sample being tested shows an obvious physical change. Combustible pellets with a representative diameter of greater than 2 mm (10 mesh). Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed up flash point of the solvent. Most ordinary combustible materials. **2** Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not under normal conditions form hazardous atmospheres with air, but under high ambient temperatures or under moderate heating could release vapor in sufficient quantities to produce hazardous atmospheres with air: Liquids having a flash point at or above 37.8°C (100°F) and below 93.4°C (200°F) (i.e. Class II and Class IIIA liquids.) Solid materials in the form of powders or coarse dusts of representative diameter between 420 microns (40 mesh) and 2 mm (10 mesh) that burn rapidly but that generally do not form explosive mixtures in air. Solid materials in fibrous or shredded form that burn rapidly and create flash fire hazards, such as cotton, sisal and hemp. Solids and semisolids that readily give off flammable vapors. Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **3** Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions: Liquids having a flash point below 22.8°C (73°F) and having a boiling point at or above 37.8°C (100°F) and those liquids having a flash point at or above 22.8°C (73°F) and below 37.8°C (73°F) and below 37.8°C (100°F) (i.e. Class IB and IC liquids). Materials that, on account of their physical form or environmental conditions, can form explosive mixtures with air and are readily dispersed in air. Flammable or combustible dusts with a representative diameter less than 420 microns (40 mesh). Materials that burn with extreme rapidity, usually by reason of self-contained oxygen (e.g. dry nitrocellulose and many organic peroxides). Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **4** Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and will burn readily: Flammable gases. Flammable cryogenic materials. Any liquid or gaseous materials that is liquid while under pressure and has a flash point below 22.8°C (73°F) and a boiling point below 37.8°C (100°F) (i.e. Class IA liquids). Materials that ignite when exposed to air. Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent.

INSTABILITY HAZARD: **0** Materials that in themselves are normally stable, even under fire conditions: Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) below 0.01 W/mL. Materials that do not exhibit an exotherm at temperatures less than or equal to 500°C (932°F) when tested by differential scanning calorimetry. **1** Materials that in themselves are normally stable, but that can become unstable at elevated temperatures and pressures: Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 0.01 W/mL and below 10 W/mL. **2** Materials that readily undergo violent chemical change at elevated temperatures and pressures: Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 10 W/mL and below 100W/mL. **3** Materials that in themselves are capable of detonation or explosive decomposition or explosive reaction, but that require a strong initiating source or that must be heated under confinement before initiation: Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 100 W/mL and below 1000 W/mL. Materials that are sensitive to thermal or mechanical shock at elevated temperatures and pressures.

## DEFINITIONS OF TERMS (Continued)

### NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

**INSTABILITY HAZARD (continued):** 4 Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures: Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) of 1000 W/mL or greater. Materials that are sensitive to localized thermal or mechanical shock at normal temperatures and pressures.

### 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<sub>50</sub>** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC<sub>50</sub>** - 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<sup>3</sup>** 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. **TL<sub>m</sub>** = median threshold limit; Coefficient of Oil/Water Distribution is represented by **log K<sub>ow</sub>** or **log K<sub>oc</sub>** and is used to assess a substance's behavior in the environment.

### REGULATORY INFORMATION:

#### U.S. and CANADA:

**ACGIH:** American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (**OSHA**). **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act (**SARA**); the Canadian Domestic/Non-Domestic Substances List (**DSL/NDL**); the U.S. Toxic Substance Control Act (**TSCA**); Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act (**CERCLA** or **Superfund**); and various state regulations. This section also includes information on the precautionary warnings which appear on the material's package label. **OSHA** - U.S. Occupational Safety and Health Administration. **EC**, European Economic Community).

#### EUROPEAN and INTERNATIONAL:

**The DFG:** This is the Federal Republic of Germany's Occupation Health Agency, similar to the U.S. OSHA. **EC** is the European Community (formerly known as the **EEC**, European Economic Community). **EINECS:** This is the European Inventory of Now-Existing Chemical Substances. 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. **AICS** is the Australian Inventory of Chemical Substances.