

SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS, and the Global Harmonization Standard

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

IDENTIFICATION of the SUBSTANCE or PREPARATION:

TRADE NAME (AS LABELED):

SRP 7050 One Step Glass Primer

PRODUCT CODE(S):

1917

CHEMICAL NAME/CLASS:

Resin Mixture

U.N. NUMBER:

1263

U.N. DANGEROUS GOODS CLASS/SUBSIDIARY RISK:

Flammable Liquid

RELEVANT USES of the SUBSTANCE:

Automotive Glass Polyurethane Adhesion Primer

USES ADVISED AGAINST:

Other than Relevant Use

COMPANY/UNDERTAKING IDENTIFICATION:

U.S./DISTRIBUTOR'S NAME:

SHAT-R-PROOF CORP.

ADDRESS:

650 Pelham Boulevard, Suite 100

St Paul, MN 55114

1-800-420-8036

MEDICAL EMERGENCIES:

U.S. EMERGENCY PHONE:

CHEMTREC: 1-800-424-9300 (U.S./Canada/Puerto Rico/Virgin Islands) [24-hours]

CHEMTREC: +1-703-527-3887 (Outside North America) [24-hours]

EMAIL ADDRESS FOR MSDS INFORMATION:

msds-info@novusglass.com

DATE OF REVISION:

February 4, 2015

2. HAZARD IDENTIFICATION

OSHA HAZARD COMMUNICATION (GLOBAL HARMONIZATION) LABELING AND CLASSIFICATION: This product has been classified in accordance with OSHA's Hazard Communication Standard. This is a self-classification.

Classification: Skin Sensitizer Category 1, 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, 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 solvent odor. **Health Hazards:** This product may 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). Ingestion may be harmful. This product contains a possible carcinogen by inhalation. This product contains compounds that may cause respiratory and/or skin sensitization and allergic reaction. **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:** Polymerization may occur if highly heated or in contact with amines. Contact with water can generate carbon dioxide and cause rupture of closed containers. **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
Methyl Ethyl Ketone	78-93-3	201-159-0	30-40%	 	CLASSIFICATION: Flammable Liquid Cat. 2, Eye Irritant Cat. 2, STOT SE 3 HAZARD CODES: H225, H319, H336, H066
Ethyl Acetate	141-78-6	205-500-4	10-30%	 	CLASSIFICATION: Flammable Liquid Cat. 2, Eye Irritant Cat. 2, STOT SE 3 HAZARD CODES: H225, H319, H336, H066
Carbon Black	1333-86-4	215-609-9	5-10%		SELF CLASSIFICATION: CLASSIFICATION: Carcinogenic Cat. 2 HAZARD CODES: H351
Aromatic/Aliphatic Polyisocyanate	63368-95-6	Polymer	10-30%	 	SELF CLASSIFICATION CLASSIFICATION: Respiratory Sensitization Cat. 1, Skin Sensitization Cat. 1 HAZARD CODES: H334, H317
3-Methoxy Butyl Acetate	4435-53-4	224-644-9	5-10%	None	CLASSIFICATION: NONE
3-Trimethoxysilylpropane-1-thiol	4420-74-0	224-588-5	0-2.5%		SELF CLASSIFICATION CLASSIFICATION: Skin Sensitization Cat. 1, Acute Toxicity Cat. 4, Aquatic Toxicity Chronic Cat. 2 HAZARD CODES: H317, H302, H411

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: < 21°C (68.9°F)

AUTOIGNITION TEMPERATURE: Not determined for product; for Ethyl Acetate and Methyl Ethyl Ketone components: Ethyl Acetate: 427°C (800°F); Methyl Ethyl Ketone: 404°C (759°F)

FLAMMABLE LIMITS (in air by volume, %): Not established for product.

	Lower:	Upper:
Ethyl Acetate	2.0%	11.5%
Methyl Ethyl Ketone	1.4%	11.4%

5. FIRE-FIGHTING MEASURES, continued

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

Water Spray: YES (for cooling of containers) **Carbon Dioxide:** YES

Foam: YES **Dry Chemical:** YES

Halon: YES **Other:** Any "ABC" Class

FIRE EXTINGUISHING MATERIALS NOT TO BE USED: Water should be used with caution.

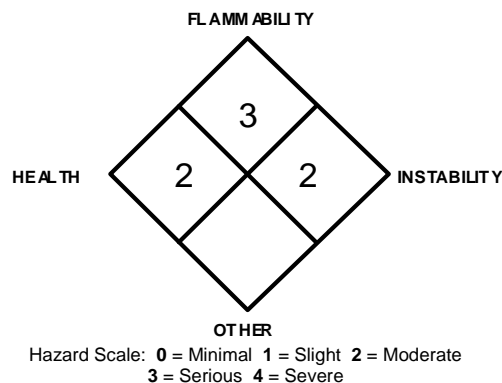
UNUSUAL FIRE AND EXPLOSION HAZARDS: This product is a flammable liquid. When involved in a fire, this material may decompose and produce irritating vapors and toxic gases (e.g., carbon dioxide, carbon monoxide, nitrogen oxides, hydrogen cyanide, amines and alcohols). The vapors of this product may travel 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 a component of high 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. Water should be used with care as reaction may cause generation of carbon dioxide and subsequent rupture of closed containers. 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.

NFPA RATING



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.

7. HANDLING AND USE, continued

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.

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. If necessary, refer to Australian National Code of Practice for the Control of Workplace Hazardous Substances [NOHSC: 2007 (1994)] for further information.

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	
3-Methoxy Butyl Acetate	4435-53-4	NE	NE	NE	NE	NE	NE	NE	NE
Carbon Black	1333-86-4	3.5 mg/m ³ NIC = 3 mg/m ³ (inhalable fraction)	NE	3.5 mg/m ³	NE	3.5 mg/m ³ (0.1 in presence of PAHs as PAHs; 10-HR TWA)	NE	1750 mg/m ³	DFG MAK: As inhalable dust Carcinogen: IARC-2B, MAK-3B, NIOSH-Ca (in presence of PAHs), TLV-A4; NIC = TLV-A3
Ethyl Acetate	141-78-6	400	NE	400	NE	400	NE	2000 (Based on 10% of LEL)	DFG MAKs: TWA = 400 PEAK = 2•MAK 15 min. average value, 1-hr interval, 4 per shift DFG MAK Pregnancy Risk Group Classification: C
Methyl Ethyl Ketone	78-93-3	200	300	200	NE	200	300	NE	DFG MAKs: TWA = 200 (Skin) PEAK = 1•MAK 15 min. average value, 1-hr interval, 4 per shift DFG MAK Pregnancy Risk Classification: C Carcinogen: EPA-I
Aromatic/Aliphatic Polyisocyanate	63368-95-6	NE	NE	NE	NE	NE	NE	NE	Manufacturer recommendations TWA = 0.5 mg/m ³ STEL = 1 mg/m ³
3-Trimethoxysilylpropan e-1-thiol	4420-74-0	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/m³, JUL 2008
 Belgium: TWA = 3.6 mg/m³, MAR 2002
 Denmark: TWA = 3.5 mg/m³, OCT 2002
 Finland: TWA = 3.5 mg/m³, STEL = 7 mg/m³, SEP 2009
 France: VME = 3.5 mg/m³, FEB 2006
 Japan: OEL = 1 mg/m³ (respirable), 4 mg/m³ (total), APR 2007
 Korea: TWA = 3.5 mg/m³, 2006
 Mexico: TWA = 3.5 mg/m³, STEL = 7 mg/m³, 2004
 The Netherlands: MAC-TGG = 3.5 mg/m³, 2003
 New Zealand: TWA = 3 mg/m³, JAN 2002
 Norway: TWA = 3.5 mg/m³, JAN 1999
 The Philippines: TWA = 3.5 mg/m³, JAN 1993
 Russia: STEL = 4 mg/m³, JUN 2003
 Sweden: TWA = 3 mg/m³, JUN 2005
 United Kingdom: TWA = 3.5 mg/m³, STEL = 7 mg/m³, 2005
 In Argentina, Bulgaria, Colombia, Jordan, Singapore, Vietnam check ACGIH TLV

ETHYL ACETATE:

Australia: TWA = 200 ppm (720 mg/m³), STEL = 400 ppm (1440 mg/m³), JUL 2008
 Belgium: TWA = 400 ppm (1461 mg/m³), MAR 2002
 Denmark: TWA = 150 ppm (540 mg/m³), OCT 2002
 Finland: TWA = 300 ppm (1100 mg/m³), STEL = 500 ppm (1800 mg/m³), SEP 2009
 France: VME = 400 ppm (1400 mg/m³), FEB 2006
 Germany: MAK = 1500 mg/m³ (400 mL/m³), 2005
 Hungary: TWA = 1400 mg/m³, STEL = 1400 mg/m³, SEP 2000
 Japan: OEL = 200 ppm (720 mg/m³), APR 2007

ETHYL ACETATE (continued):

Korea: TWA = 400 ppm (1400 mg/m³), 2006

Mexico: TWA = 400 ppm (1400 mg/m³), 2004
 The Netherlands: MAC-TGG = 550 mg/m³, 2003
 New Zealand: TWA = 200 ppm (720 mg/m³), JAN 2002
 Norway: TWA = 150 ppm (550 mg/m³), JAN 1999
 The Philippines: TWA = 400 ppm (1400 mg/m³), JAN 1993
 Poland: MAC(TWA) = 200 ppm, MAC(STEL) = 600 mg/m³, JAN 1999
 Russia: TWA = 50 mg/m³, STEL 200 mg/m³, JUN 2003
 Sweden: TWA = 150 ppm (500 mg/m³); STEL = 300 ppm (1100 mg/m³), JUN 2005
 Switzerland: MAK-W = 400 ppm (1400 mg/m³), KZG-W = 800 ppm (2800 mg/m³), DEC 2006
 Turkey: TWA = 400 ppm (1400 mg/m³), JAN 1993
 United Kingdom: TWA = 200 ppm; STEL = 400 ppm, 2005
 In Singapore, Vietnam check ACGIH TLV

METHYL ETHYL KETONE:

Australia: TWA = 150 ppm (445 mg/m³), STEL = 300 ppm (890 mg/m³), JUL 2008
 Belgium: TWA = 200 ppm(600 mg/m³), STEL = 300 ppm(900 mg/m³), MAR 2002
 Denmark: TWA = 50 ppm (145 mg/m³), OCT 2002
 EC: TWA = 600 mg/m³ (200 ppm); STEL = 900 mg/m³ (300 ppm), FEB 2006
 Finland: STEL = 100 ppm (300 mg/m³), Skin, SEP 2009
 France: VME = 200 ppm (600 mg/m³), VLE = 300 ppm (900 mg/m³), FEB 2006
 Germany: MAK = 600 mg/m³ (200 mL/m³), 2005
 Hungary: TWA 600 mg/m³, STEL = 900 mg/m³, Skin, SEP 2000
 India: TWA = 200 ppm (590 mg/m³), STEL = 300 ppm (885 mg/m³), JAN 1993
 Japan: OEL = 200 ppm (590 mg/m³), APR 2007

METHYL ETHYL KETONE (continued):

Korea: TWA = 200 ppm (590 mg/m³), STEL = 300 ppm (885 mg/m³), 2006
 Mexico: TWA = 200 ppm (590 mg/m³); STEL = 300 ppm (885 mg/m³), 2004
 The Netherlands: MAC-TGG = 590 mg/m³, Skin, 2003

New Zealand: TWA = 150 ppm (445 mg/m³); STEL = 300 ppm (890 mg/m³), JAN 2002
Norway: TWA = 75 ppm (220 mg/m³), JAN 1999
The Philippines: TWA = 200 ppm (590 mg/m³), JAN 1993
Poland: MAC(TWA) = 200 mg/m³, MAC(STEL) = 850 mg/m³, JAN 1999
Russia: TWA = 200 mg/m³, STEL = 400 mg/m³, JUN 2003

Sweden: TWA = 50 ppm (150 mg/m³); STEL = 100 ppm (300 mg/m³), JUN 2005
Switzerland: MAK-W = 200 ppm (590 mg/m³); KZG-W = 200 ppm (590 mg/m³), DEC 2006
Turkey: TWA = 200 ppm (590 mg/m³), JAN 1993
United Kingdom: TWA = 200 ppm (600 mg/m³); STEL = 300 ppm (skin), 2005
In Argentina, Bulgaria, Colombia, Jordan, 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), and equivalent standards of Canada (including CSA Standard Z94.4-02 and CSA Standard Z94.3-07), Please reference applicable regulations and standards 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 U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-02, the European Standard EN 529:2005, and EU member states, or the Australian Standard 1716-Respiratory Protective Devices and Australian Standard 1715-Selection, Use, and Maintenance of Respiratory Protective Devices. The following are NIOSH respiratory protection recommendations are for the Ethyl Acetate and Methyl Ethyl Ketone components in air.

METHYL ETHYL KETONE
CONCENTRATION

Up to 3000 ppm:

RESPIRATORY PROTECTION

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

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 or Canadian CSA Standard Z94.3-07, 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 for further information.

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 the OSHA Technical Manual (Section VII: Personal Protective Equipment) or appropriate Standards of Canada. 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 foot protection, as described in U.S. OSHA 29 CFR 1910.136 and the Canadian CSA Standard Z195-02, *Protective Footwear*.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Viscous Liquid.

COLOR: Black.

MOLECULAR FORMULA: Mixture.

MOLECULAR WEIGHT: Mixture.

ODOR: Fruity.

% VOLATILE: 58%

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): Not established for product.

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

SPECIFIC GRAVITY (water = 1): 1

MELTING/FREEZING POINT: Not established for product.

SOLUBILITY IN WATER: Insoluble.

BOILING POINT: > 35°C (> 95°F)

VAPOR PRESSURE: < 110kPa

pH: 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 under conditions of normal temperature and pressure. Contact with water can evolve carbon dioxide, which can cause an overpressure of closed containers in the event of heating of the container or exposure to high temperatures. Polymerization may occur in contact with amines or high heat.

10. STABILITY AND REACTIVITY, continued

DECOMPOSITION PRODUCTS: *Combustion:* 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).

Hydrolysis: Carbon dioxide.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: This product is incompatible with strong oxidizing agents, hydrogen peroxide or mixtures of hydrogen peroxide and nitric acid, solid potassium t-butoxide, 2-propanol, mixtures of haloforms (e.g. chloroform) and strong bases, strong acids, water, amines, alcohols, acids, bases, metal compounds, amides, phenols, mercaptans, urethanes, ureas, and surface active compounds, potassium tert-butoxide, lithium aluminum hydride. Reactions with alcohols and amines can be exothermic.

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

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. This product contains possible respiratory sensitizers. In susceptible individuals, inhalation may lead to sensitization and allergic reaction. Symptoms may include difficulty breathing, coughing and wheezing. Once sensitized, exposure to very low concentration may cause reaction.

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. 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. This product contains potential skin sensitizers. In susceptible individuals, skin contact may cause sensitization and allergic reaction. Symptoms can include redness, itching, welts and rash. Once sensitized, exposure to very low concentration can cause allergic reaction.

SKIN ABSORPTION: Components of this product may be absorbed via intact skin. If a large area of the skin is involved, some systemic effect may occur.

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). This product contains potential skin and/or respiratory sensitizers which may result in allergic reaction in susceptible individuals.

TARGET ORGANS: **Acute:** Skin, eyes, central nervous system. **Chronic:** Skin, respiratory system, liver, kidneys, central nervous system.



HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD	(BLUE)	2*
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FLAMMABILITY HAZARD	(RED)	3
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PHYSICAL HAZARD	(YELLOW)	2
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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

11. TOXICOLOGICAL INFORMATION, continued

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

3-METHOXY BUTYL ACETATE:

LD₅₀ (Oral-Rat) 4210 mg/kg

CARBON BLACK:

LD₅₀ (Oral-Rat) > 15 400 mg/kg: Behavioral: somnolence (general depressed activity)

LD₅₀ (Skin-Rabbit) > 3 gm/kg

TCLo (Inhalation-Rat) 7 mg/m³: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Rat) 1.66 mg/m³/7 hours: Lungs, Thorax, or Respiration: sputum; Blood: changes in leukocyte (WBC) count; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Rat) 229 mg/m³/6 hours: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Rat) 50 mg/m³: Sense Organs and Special Senses (Olfaction): effect, not otherwise specified; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Rat) 50 mg/m³/6 hours/90 days-intermittent: Lungs, Thorax, or Respiration: other changes

TCLo (Inhalation-Rat) 1 mg/m³/13 weeks-intermittent: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Rat) 1 mg/m³/13 weeks-intermittent: Lungs, Thorax, or Respiration: other changes, changes in lung weight; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Rat) 50 mg/m³/13 weeks-intermittent: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): other, Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Rat) 7 mg/m³/6 hours/13 weeks-intermittent: Sense Organs and Special Senses (Olfaction): effect, not otherwise specified; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Rat) 50 mg/m³/13 weeks-intermittent: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): other

TCLo (Inhalation-Rat) 11,600 µg/m³/18 hours/2 years-intermittent: Tumorigenic: carcinogenic by RTECS criteria; Lungs, Thorax, or Respiration: tumors

TCLo (Inhalation-Mouse) 50 mg/m³/6 hours: Sense Organs and Special Senses (Olfaction): effect, not otherwise specified

TCLo (Inhalation-Mouse) 1 mg/m³/13 weeks-intermittent: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Mouse) 1 mg/m³/13 weeks-intermittent: Lungs, Thorax, or Respiration: other changes, changes in lung weight; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Mouse) 7 mg/m³/6 hours/13 weeks-intermittent: Sense Organs and Special Senses (Olfaction): effect, not otherwise specified; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Hamster) 7 mg/m³/13 weeks-intermittent: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Hamster) 50 mg/m³/6 hours/13 weeks-intermittent: Sense Organs and Special Senses (Olfaction): effect, not otherwise specified

TDLo (Oral-Mouse) 20,000 µg/kg/4 weeks-intermittent: Brain and Coverings: other degenerative changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TDLo (Skin-Rat) 11 gm/kg/4 weeks-intermittent: 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: Liver: changes in liver weight; Blood: changes in spleen

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.)

CARBON BLACK (continued):

TDLo (Intratracheal-Rat) 16 mg/kg: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TDLo (Intratracheal-Rat) 15 mg/kg: Lungs, Thorax, or Respiration: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: cytochrome oxidases (including oxidative phosphorylation)

TDLo (Intratracheal-Rat) 10 mg/kg: Lungs, Thorax, or Respiration: sputum; Biochemical: Metabolism (Intermediary): other proteins; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TDLo (Intratracheal-Mouse) 1000 µg/kg: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TDLo (Intratracheal-Mouse) 20 mg/kg/4 days-intermittent: Lungs, Thorax, or Respiration: sputum; Immunological Including Allergic: increase in cellular immune response; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TDLo (Intratracheal-Mouse) 4000 µg/kg/4 weeks-intermittent: Lungs, Thorax, or Respiration: other changes; Immunological Including Allergic: increase in cellular immune response; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TDLo (Parenteral-Mouse) 36 µg/kg/3 days-intermittent: Immunological Including Allergic: increase in humoral immune response

Mutation in Microorganisms (Bacteria-Salmonella typhimurium) 1 mg/plate

DNA Adduct (Inhalation-Mouse) 6200 µg/m³/16 hours/12 weeks-intermittent

DNA Damage (Human Lymphocyte) 16 µg/L/48 hours

DNA Damage (Inhalation-Rat) 50 µg/L/13 weeks-intermittent

DNA Damage (Inhalation-Rat) 50 gm/L/13 weeks

Mutation in Microorganisms (Bacteria-Salmonella typhimurium) 1 mg/plate

DNA Adduct (Inhalation-Mouse) 6200 µg/m³/16 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; Sense Organs and Special Senses (Eye): conjunctive irritation; Lungs, Thorax, or Respiration: other changes

LD₅₀ (Oral-Rat) 5620 mg/kg

LD₅₀ (Oral-Mouse) 4.1 gm/kg

LD₅₀ (Oral-Mouse) 4100 mg/kg: Behavioral: somnolence (general depressed activity), changes in motor activity (specific assay), coma, somnolence (general depressed activity), changes in motor activity (specific assay), coma

LD₅₀ (Oral-Rabbit) 4935 mg/kg

LD₅₀ (Oral-Guinea Pig) 5.5 gm/kg

LD₅₀ (Oral-Guinea Pig) 5500 mg/kg: Behavioral: somnolence (general depressed activity), changes in motor activity (specific assay), coma

LD₅₀ (Skin-Rabbit) > 20 mL/kg

LD₅₀ (Intraperitoneal-Mouse) 709 mg/kg

LD₅₀ (Subcutaneous-Cat) 3 gm/kg: Behavioral: somnolence (general depressed activity); Gastrointestinal: nausea or vomiting; Blood: other changes

LD₅₀ (Subcutaneous-Guinea Pig) 3 gm/kg: Behavioral: somnolence (general depressed activity)

LC₅₀ (Inhalation-Rat) > 6000 ppm/6 hours

LC₅₀ (Inhalation-Rat) 1600 ppm/8 hours

LC₅₀ (Inhalation-Rat) 200 gm/m³: Behavioral: somnolence (general depressed activity); Lungs, Thorax, or Respiration: acute pulmonary edema; Gastrointestinal: changes in structure or function of salivary glands

LC₅₀ (Inhalation-Mouse) 45 gm/m³/2 hours

LCLo (Inhalation-Cat) 61 gm/m³

TCLo (Inhalation-Rat) 1500 ppm/90 days-intermittent: Sense Organs and Special Senses (Olfaction): change in sensation of smell, effect, not otherwise specified

ETHYL ACETATE (continued):

TCLo (Inhalation-Dog) 22 gm/m³/40 minutes/4 weeks-intermittent: Behavioral: ataxia; Lungs, Thorax, or Respiration: respiratory stimulation; Nutritional and Gross Metabolic: body temperature decrease

TCLo (Inhalation-Mouse) 200 ppm/6 minutes: Lungs, Thorax, or Respiration: respiratory depression

LDLo (Subcutaneous-Rat) 5 gm/kg

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 Non-Disjunction (Yeast-Saccharomyces cerevisiae) 24,400 ppm

Cytogenetic Analysis (Hamster Fibroblast) 9 gm/L

METHYL ETHYL KETONE:

Standard Draize Test (Eye-Human) 350 ppm

TCLo (Inhalation-Human) 100 ppm/5 minutes: Sense Organs and Special Senses (Olfaction): effect, not otherwise specified; Sense Organs and Special Senses (Eye): conjunctive irritation; Lungs, Thorax, or Respiration: other changes

TCLo (Inhalation-Human) 1000 mg/m³: Sense Organs and Special Senses (Eye): conjunctive irritation Lungs, Thorax, or Respiration: cough

TCLo (Inhalation-Human) 10 ppm/4 hours: Cardiac: pulse rate; Lungs, Thorax, or Respiration: other changes

TCLo (Inhalation-Woman) 61 mg/m³/169 weeks-intermittent: Peripheral Nerve and Sensation: sensory change involving peripheral nerve; Peripheral Nerve and Sensation: recording from peripheral motor nerve

LDLo (Oral-Human) 714.3 mg/kg...

Standard Draize Test (Skin-Rabbit) 500 mg/24 hours: Moderate

Standard Draize Test (Skin-Rabbit) 402 mg/24 hours: Mild

Standard Draize Test (Eye-Rabbit) 80 mg

Open Irritation Test (Skin-Rabbit) 14 mg/24 hours: Mild

LC₅₀ (Inhalation-Rat) 23,500 mg/m³/8 hours

LC₅₀ (Inhalation-Rat) 23,500 mg/m³

LC₅₀ (Inhalation-Mouse) 32 gm/m³/4 hours

LC₅₀ (Inhalation-Mouse) 32 gm/m³

LD₅₀ (Oral-Rat) 2737 mg/kg

LD₅₀ (Oral-Mouse) 3000 mg/kg

LD₅₀ (Skin-Rabbit) 6480 mg/kg

LD₅₀ (Intraperitoneal-Rat) 607 mg/kg

LD₅₀ (Intraperitoneal-Mouse) 616 mg/kg

LD₅₀ (Intraperitoneal-Guinea Pig) 2 gm/kg

TCLo (Inhalation-Rat) 5000 ppm/6 hours/90 days-intermittent: Liver: changes in liver weight; Kidney/Ureter/Bladder: urine volume increased; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: transaminases

TCLo (Inhalation-Rat) 750 ppm/7 hours/7 days-intermittent: Liver: liver function tests impaired

TCLo (Inhalation-Rat) 4000 ppm/8 days-intermittent: Nutritional and Gross Metabolic: weight loss or decreased weight gain

TCLo (Inhalation-Rat) 3000 ppm/15 days-intermittent: Nutritional and Gross Metabolic: weight loss or decreased weight gain

TCLo (Inhalation-Rat) 3000 ppm/15 days-intermittent: Liver: changes in liver weight

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); Specific Developmental Abnormalities: musculoskeletal system

TCLo (Inhalation-Rat) 2900 mg/m³: female 6-10 day(s) after conception: Reproductive: Specific Developmental Abnormalities: craniofacial (including nose and tongue), musculoskeletal system, gastrointestinal system

TCLo (Inhalation-Rat) 2000 ppm: female 6-20 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)

TCLo (Inhalation-Mouse) 25,000 mg/m³/2 hours: Behavioral: general anesthetic; Lungs, Thorax, or Respiration: emphysema; Liver: other changes

TCLo (Inhalation-Mouse) 4000 ppm/6 minutes: Lungs, Thorax, or Respiration: respiratory depression

11. TOXICOLOGICAL INFORMATION, continued

TOXICITY DATA (continued):

METHYL ETHYL KETONE (continued):

TCLo (Inhalation-Mouse) 3000 ppm/7 hours: female 6-15 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)

TCLo (Inhalation-Mouse) 3000 ppm: female 6-15 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus); Specific Developmental Abnormalities: craniofacial (including nose and tongue), musculoskeletal system

TCLo (Inhalation-Guinea Pig) 30,000 mg/m³/2 minutes: Sense Organs and Special Senses (Eye): conjunctive irritation; Lungs, Thorax, or Respiration: cough

TCLo (Inhalation-Guinea Pig) 30,000 mg/m³/4 hours: Behavioral: general anesthetic; Lungs, Thorax, or Respiration: emphysema; Liver: other changes

METHYL ETHYL KETONE (continued):

TCLo (Inhalation-Guinea Pig) 97,300 mg/m³/30 minutes: Behavioral: ataxia

TCLo (Inhalation-Cat) 25,000 mg/m³: Gastrointestinal: changes in structure or function of salivary glands

TCLo (Inhalation-Cat) 50,000 mg/m³: Sense Organs and Special Senses (Eye): conjunctive irritation

TCLo (Inhalation-Rabbit) 1250 mg/m³: Peripheral Nerve and Sensation: recording from peripheral motor nerve

TCLo (Inhalation-Mammal-Species Unspecified) 588 mg/m³/12 hours/24 weeks-intermittent: Peripheral Nerve and Sensation: recording from peripheral motor nerve

LCLo (Inhalation-Mouse) 40,000 mg/m³: Lungs, Thorax, or Respiration: emphysema; Liver: other changes; Kidney/Ureter/Bladder: other changes

METHYL ETHYL KETONE (continued):

LCLo (Inhalation-Mouse) 97,300 mg/m³/1 hour: Lungs, Thorax, or Respiration: emphysema; Liver: other changes; Kidney/Ureter/Bladder: other changes

TDLo (Oral-Mouse) 3000 ppm/10 days-intermittent: Liver: changes in liver weight

TDLo (Subcutaneous-Cat) 55,500 mg/kg/37 55500 mg/kg/37 weeks-intermittent: Related to Chronic Data: death

LDLo (Intraperitoneal-Guinea Pig) 2 gm/kg: Liver: other changes; Immunological Including: Allergic: other immediate (humoral): urticaria, allergic rhinitis, serum sickness; Biochemical: Metabolism (Intermediary): lipids including transport

Sex Chromosome Loss and Non-Disjunction (Yeast-*Saccharomyces cerevisiae*) 33800 ppm

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); NIC = ACGIH TLV-A3 (Confirmed Animal Carcinogen with Unknown Relevance to Humans)

METHYL ETHYL KETONE: EPA-D (Not Classifiable as to Human Carcinogenicity); EPA-I (Data are Inadequate for an Assessment of Human Carcinogenicity)

The remaining components are not found on the following lists: U.S. EPA, U.S. NTP, U.S. OSHA, U.S. NIOSH, GERMAN MAK, IARC, and ACGIH, and therefore are not considered to be, nor suspected to be cancer-causing agents by these agencies.

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: Several components of this product are known human skin or respiratory sensitizers. In susceptible individuals, contact with this product via inhalation or skin contact may cause sensitization and allergic reaction.

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. The Methyl Ethyl Ketone component gave positive result in studies with *Saccharomyces cerevisiae* yeast.

Embryotoxicity: The components of this product are not reported to produce embryotoxic effects in humans. The Methyl Ethyl Ketone component has caused fetotoxic effects (minor skeletal variations, delayed bone formation, reduced fetal weight) in rats and mice in the presence of mild maternal toxicity.

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

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

ACGIH BIOLOGICAL EXPOSURE INDICES: Currently, there are ACGIH Biological Exposure Indices (BEIs) determined for the components of this product, as follows:

CHEMICAL: DETERMINANT	SAMPLING TIME	BEI
Methyl Ethyl Ketone • MEK in Urine	• End of Shift	• 2 mg/L

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

MOBILITY: This product has not been tested for mobility in soil. The following information is available for some components.

ETHYL ACETATE:

The Koc of Ethyl Acetate is estimated as 59, using a log Kow of 0.73 and a regression-derived equation. According to a classification scheme, this estimated Koc value suggests that Ethyl Acetate is expected to have high mobility in soil.

METHYL ETHYL KETONE:

Measured Koc values of 29 and 34 were obtained for Methyl Ethyl Ketone in silt loams. Based on a recommended classification scheme, Methyl Ethyl Ketone is expected to have very high mobility in soil.

PERSISTENCE AND BIODEGRADABILITY: This product has not been tested for persistence or biodegradability. The following information is available for some components.

ETHYL ACETATE:

If released to air, a vapor pressure of 93 mm Hg at 25°C indicates Ethyl Acetate will exist solely as a vapor in the ambient atmosphere. Vapor-phase Ethyl Acetate will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 9.4 days. Volatilization from moist soil surfaces is expected to occur based upon a Henry's Law constant of 1.34X10⁻⁴ atm-cu m/mole. Ethyl Acetate's vapor pressure indicates the potential for volatilization from dry soil surfaces exists. Biodegradation is expected to be an important process in both soil and water, based upon Ethyl Acetate's biodegradation in aqueous screening studies. 93% biodegradation was observed in a complete mix continuous-flow activated sludge system. 26.6 and 57.1% of Ethyl Acetate's theoretical BOD was reached in 5 days using the standard dilution method and seawater dilution method, respectively. If released into water, Ethyl Acetate is not expected to adsorb to suspended solids and sediment in water based on the estimated Koc. Volatilization from water surfaces is expected to be an important fate process based on Ethyl Acetate's Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 8.9 hours and 5.6 days, respectively. An estimated BCF of 3.2 suggests the potential for bioconcentration in aquatic organisms is low. Ethyl Acetate's hydrolysis half-life at 25 deg C and pH 7 is 2.0 years.

12. ECOLOGICAL INFORMATION, continued

METHYL ETHYL KETONE:

Based on an experimental vapor pressure of 91 mm Hg at 25°C, Methyl Ethyl Ketone is expected to exist solely as a vapor in the ambient atmosphere. Vapor-phase Methyl Ethyl Ketone is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals with an estimated atmospheric half-life of about 14 days. This compound is also expected to undergo photolysis in the atmosphere by natural sunlight. Photochemical degradation of Methyl Ethyl Ketone by natural sunlight is expected to occur at approximately 1/5 the rate of degradation by photochemically produced hydroxy radicals. Methyl Ethyl Ketone is expected to have very high mobility in soils based upon measured Koc values of 29 and 34 obtained in silt loams. Volatilization from dry soil surfaces is expected based upon the vapor pressure of this compound. Volatilization from moist soil surfaces is also expected based upon the measured Henry's Law constant of 4.7×10^{-5} atm-cu m/mol. The volatilization half-life of Methyl Ethyl Ketone from silt and sandy loams was measured as 4.9 days. This compound is expected to biodegrade under aerobic and anaerobic conditions. In water, Methyl Ethyl Ketone is not expected to adsorb to suspended solids or sediment based upon its measured Koc values. Volatilization from water surfaces is expected to be an important environmental fate process given its Henry's Law constant. Estimated half-lives for a model river and model lake are 19 and 197 hours, respectively.

BIO-ACCUMULATION POTENTIAL: This product has not been tested for bio-accumulation potential. The following information is available for some components.

ETHYL ACETATE:

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.

METHYL ETHYL KETONE:

An estimated BCF value of 1 was calculated for Methyl Ethyl Ketone, using an experimental log Kow of 0.29 and a recommended regression-derived equation. According to a classification scheme, this BCF value suggests that bioconcentration in aquatic organisms is low.

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 Butyl Acetate and Ethyl Acetate components of this product:

ETHYL ACETATE:

BCF (*Chlorella fusca* algae) (wet wt): 13,500
EC₀ (*Pseudomonas putida* bacteria): 16 hours = 650 mg/L
EC₀ (*Microcystis aeruginosa* algae): 8 days = 550 mg/L
EC₀ (*Scenedesmus quadricauda* green algae) 7 days = 15 mg/L
EC₀ (*Entosiphon sulcatum* protozoa) 72 hours = 202 mg/L
EC₀ (*Uronema parduczi* Chatton-Lwoff protozoa) = 1,620 mg/L
LC₅₀ (Mexican axolotl) [3-4 w after hatching] 48 hours = 150 mg/L
LC₅₀ (clawed toad) [3-4 w after hatching] 48 hours = 180 mg/L

METHYL ETHYL KETONE:

EC₀ (*Pseudomonas putida* bacteria) 16 hours = 1,150 mg/L
EC₀ (*Microcystis aeruginosa* algae) 7 days = 110 mg/L

METHYL ETHYL KETONE (continued):

EC₀ (*Scenedesmus quadricauda* green algae) 8 days = 4,300 mg/L
EC₀ (*Entosiphon sulcatum* protozoa) 72 hours = 190 mg/L
EC₀ (*Uronema parduczi* Chatton-Lwoff) 2,830 mg/L
LD₀ (*Pseudomonas* bacteria) 2,500 mg/L
LD₀ (*Scenedesmus* algae) 12,500 mg/L
LD₀ (*Colpoda* protozoa) 5,000 mg/L
LC₅₀ (mosquito fish) 24-96 hours = 5,600 mg/L
LC₅₀ (bluegill) 24-96 hours = 5,640-1,690 mg/L
LC₅₀ (goldfish) 24 hours = 5,000 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 see if they meet waste criteria for D001, Characteristic-Ignitability.

14. TRANSPORTATION INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION: This product is classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.

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 (2008): 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

14. TRANSPORTATION INFORMATION, continued

TDG Regulations, continued:

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
LIMITED QUANTITIES: LQ: 5 L; EQ: E2
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
Methyl Ethyl Ketone	No	No	Yes

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); Methyl Ethyl Ketone = 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:

ETHYL ACETATE:

CERCLA: Persons in charge of vessels or facilities are required to notify the National Response Center (NRC) immediately, when there is a release of this designated hazardous substance, in an amount equal to or greater than its reportable quantity of 5000 lb or 2270 kg. The toll free number of the NRC is (800) 424-8802. The rule for determining when notification is required is stated in 40 CFR 302.4 (section IV. D.3.b).

METHYL ETHYL KETONE:

CLEAN AIR ACT: Listed as a Hazardous Air Pollutant (HAP) generally known or suspected to cause serious health problems. The Clean Air Act, as amended in 1990, directs EPA to set standards requiring major sources to sharply reduce routine emissions of toxic pollutants. EPA is required to establish and phase in specific performance based standards for all air emission sources that emit one or more of the listed pollutants. Methyl Ethyl Ketone is included on this list.

CERCLA: Persons in charge of vessels or facilities are required to notify the National Response Center (NRC) immediately, when there is a release of this designated hazardous substance, in an amount equal to or greater than its reportable quantity of 5000 lb or 2270 kg. The toll free number of the NRC is (800) 424-8802. The rule for determining when notification is required is stated in 40 CFR 302.4 (section IV. D.3.b).

15. REGULATORY INFORMATION, continued

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): The Carbon Black component is on the Proposition 65 lists, but only when in airborne particles of respirable size.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDL INVENTORY: The components of this are listed on the DSL Inventory.

CANADIAN WHMIS IDL DISCLOSURE STATUS: The Carbon Black, Ethyl Acetate, and Methyl Ethyl Ketone 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 D1A: Poisonous and Infectious Material, Other effects - acute lethality, aerosol exposure.

Class D2A: Poisonous and Infectious Material, Other effects - respiratory sensitization, chronic inhalation effects, contains IARC-2B (Carbon Black) carcinogens.

Class D2B: Poisonous and Infectious Material, Other effects - central nervous system depression, skin sensitization, lung effects.



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

Classification: Skin Sensitizer Category 1, 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. 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. P363: Wash contaminated clothing 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. P321: Specific treatment (remove from exposure and treat symptoms). P333 + P313: If skin irritation or rash occurs: Get medical advice/attention. P304 + P340 + P341: IF INHALED: If inhaled or if breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. P342 + P311: If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician. P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. P337 + P313: If eye irritation persists: get medical advice/attention. P370 + P378: In case of fire: Use materials appropriate for surrounding fire for extinction.

Storage Precautionary Statements: P403 + P233 + P 235 + 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



16. OTHER INFORMATION

U.S. ANSI STANDARD LABELING (Z129.1): DANGER! FLAMMABLE LIQUID. HARMFUL IF INHALED OR INGESTED. 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. MAY CAUSE SKIN AND/OR RESPIRATORY SENSITIZATION AND ALLERGIC REACTION. CONTAINS CRYSTALLINE SILICA, WHICH IS A KNOWN HUMAN CARCINOGEN BY INHALATION. REPEATED INHALATION OF CRYSTALLINE SILICA CAN CAUSE SILICOSIS AND PRESENTS A CANCER HAZARD. MAY POLYMERIZE IN CONTACT WITH AMINES OR HIGH HEAT. CONTACT WITH WATER PRODUCES CARBON DIOXIDE; CLOSED CONTAINERS CAN RUPTURE. 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 20 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, CO₂, 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.

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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 LD₅₀ Rat:* < 5000 mg/kg. *Dermal Toxicity LD₅₀Rat or Rabbit:* < 2000 mg/kg. *Inhalation Toxicity 4-hrs LC₅₀ 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 LD₅₀ Rat:* > 500-5000 mg/kg. *Dermal Toxicity LD₅₀Rat or Rabbit:* > 1000-2000 mg/kg. *Inhalation Toxicity LC₅₀ 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 LD₅₀ Rat:* > 50-500 mg/kg. *Dermal Toxicity LD₅₀Rat or Rabbit:* > 200-1000 mg/kg. *Inhalation Toxicity LC₅₀ 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 LD₅₀ Rat:* > 1-50 mg/kg. *Dermal Toxicity LD₅₀Rat or Rabbit:* > 20-200 mg/kg. *Inhalation Toxicity LC₅₀ 4-hrs Rat:* > 0.05-0.5 mg/L; 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 LD₅₀ Rat:* ≤ 1 mg/kg. *Dermal Toxicity LD₅₀Rat or Rabbit:* ≤ 20 mg/kg. *Inhalation Toxicity LC₅₀ 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:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

FLAMMABILITY HAZARD (continued): 3 (continued):

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:* Packing 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. *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 ≥ 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 LC₅₀ for acute inhalation toxicity is greater than 10,000 ppm. Dusts and mists whose LC₅₀ for acute inhalation toxicity is greater than 200 mg/L. Materials whose LD₅₀ for acute dermal toxicity is greater than 2000 mg/kg. Materials whose LD₅₀ 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 LC₅₀ for acute inhalation toxicity is greater than 5,000 ppm but less than or equal to 10,000 ppm. Dusts and mists whose LC₅₀ for acute inhalation toxicity is greater than 10 mg/L but less than or equal to 200 mg/L. Materials whose LD₅₀ for acute dermal toxicity is greater than 1000 mg/kg but less than or equal to 2000 mg/kg. Materials whose LD₅₀ 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.

DEFINITIONS OF TERMS (Continued)

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

HEALTH HAZARD (continued): 2 (materials that, under emergency conditions, can cause temporary incapacitation or residual injury): Gases and vapors whose LC₅₀ for acute inhalation toxicity is greater than 3,000 ppm but less than or equal to 5,000 ppm. Dusts and mists whose LC₅₀ for acute inhalation toxicity is greater than 2 mg/L but less than or equal to 10 mg/L. Materials whose LD₅₀ for acute dermal toxicity is greater than 200 mg/kg but less than or equal to 1000 mg/kg. Materials whose LD₅₀ 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 LC₅₀ for acute inhalation toxicity, if its LC₅₀ 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 LC₅₀ for acute inhalation toxicity is greater than 1,000 ppm but less than or equal to 3,000 ppm. Dusts and mists whose LC₅₀ for acute inhalation toxicity is greater than 0.5 mg/L but less than or equal to 2 mg/L. Materials whose LD₅₀ for acute dermal toxicity is greater than 40 mg/kg but less than or equal to 200 mg/kg. Materials whose LD₅₀ 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 LC₅₀ for acute inhalation toxicity, if its LC₅₀ 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 LC₅₀ for acute inhalation toxicity less than or equal to 1,000 ppm. Dusts and mists whose LC₅₀ for acute inhalation toxicity is less than or equal to 0.5 mg/L. Materials whose LD₅₀ for acute dermal toxicity is less than or equal to 40 mg/kg. Materials whose LD₅₀ 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 LC₅₀ for acute inhalation toxicity, if its LC₅₀ 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 cup 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.

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

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. **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: **LD₅₀** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC₅₀** - 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/m³** 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_m** = median threshold limit; 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:

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.