MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS, Australian WorkSafe, and European Community Standards

PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

TRADE NAME (AS LABELED):	**EJ-CTS Black Ink (UV Absorbing Water-Based Dye)**
CHEMICAL NAME/CLASS:	Glycol Based Ink
SYNONYMS:	Not Applicable
PRODUCT USE:	Printing Operations
U.N. NUMBER:	None Allocated
U.N. DANGEROUS GOODS CLASS/SUBSIDIARY RISK:	None Allocated
HAZCHEM CODE (AUSTRALIA):	None Allocated
POISONS SCHEDULE NUMBER (AUSTRALIA):	None Allocated
SUPPLIER/MANUFACTURER'S NAME:	Multi-Technologies, Inc. (Multi-Tech Ink)
ADDRESS:	5101 Penrose St. St. Louis, MO 63115 USA
INFORMATION PHONE:	314-382-9881
EMERGENCY PHONE:	Chemtrec: 800-424-9300
DATE OF PREPARATION:	July 4, 2012

2. COMPOSITION and INFORMATION ON INGREDIENTS

EU LABELING AND CLASSIFICATION: This product is considered to be dangerous according to current European Community Guidelines. This product meets the definition of EU hazard class Xn (Harmful).

EU CLASSIFICATION: Xn [Harmful]

EU RISK PHRASES: [R: 22]: Harmful if swallowed.

See Section 15 for full EU classification information of product and components.

CHEMICAL NAME	CAS #	EINECS #	% w/v	EU CLASSIFICATION FOR COMPONENTS
1,3-Propanediol	504-63-2	207-997-3	0-39%	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Black Colorant Mixture # 1	Proprietary		0-39%	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Diethylene Glycol	111-46-6	203-872-2	0-28%	HAZARD CLASSIFICATION: Xn [Harmful] RISK PHRASES: R: 22
Blue Colorant Mixture # 1	Proprietary		0-25%	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Black Colorant Mixture # 2	Proprietary		0-13%	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Aliphatic Diamide Compound	57-13-6	200-289-5	3-10%	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Butoxy Triglycol	143-22-6	205-592-6	0-10%	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.

NOTE: ALL Canadian WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR. The MSDS is also prepared to include all European Union required information under EU Directives.

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	EINECS #	% w/v	EU CLASSIFICATION FOR COMPONENTS
Alkanolamine Compound	Proprietary		0-8%	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Aliphatic Triol Compound	Proprietary		1-7%	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Water and other components each present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).			Balance	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.

See Section 15 for full EU classification information of product and components.

NOTE: ALL Canadian WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR. The MSDS is also prepared to include all European Union required information under EU Directives.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a clear liquid that has a mild odor and comes in a variety of colors (black, magenta, cyan, yellow). **Health Hazards:** The primary health hazard associated with this product is the potential for moderate irritation of contaminated tissue. Inhalation of high concentration levels or prolonged inhalation and ingestion may be harmful. Ingestion of this product may be harmful or fatal in large amounts. Ingestion or inhalation may cause central nervous system effects. The ink may stain skin, eyes, other contaminated tissue, and objects. **Flammability Hazards:** This product must be substantially preheated for ignition to become a potential hazard. **Reactivity Hazards:** This product is not reactive. **Environmental Hazards:** This product may have adverse effects when released into the environment. **Emergency Recommendations:** Emergency responders must wear the personal protective equipment suitable for the situation to which they are responding.

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

INHALATION: This product does not normally present a significant inhalation hazard under anticipated circumstances of use. Inhalation of vapors, mists, or sprays of this product may irritate the nose, throat, and other tissues of the respiratory system. Symptoms of severe overexposure, especially as may occur in poorly ventilated areas, may include central nervous system effects (e.g., headaches, dizziness, anesthesia, drowsiness, and unconsciousness), coughing, nausea, abdominal pain and vomiting. Chronic inhalation exposure may cause headache, throat irritation, low backache, and symptoms described under “Other Health Effects”.

CONTACT WITH SKIN or EYES: Due to the colorants, skin contact may discolor contaminated areas. Skin contact may cause redness, pain, or itching in sensitive individuals. Repeated or prolonged skin overexposure may cause dermatitis (dry, red skin). Eye contact with this product can moderately irritate the eyes, causing pain, tearing, and redness. Because the eye tissue may be stained, vision may be temporarily blurred. There are some reports that the Alkanolamine Compound component of this product may cause allergic skin reaction in susceptible individuals. Symptoms may include dryness, redness, itching, rash or welts.

SKIN ABSORPTION: The Alkanolamine Compound component of this product is suspected to be absorbed through the skin, especially if the skin is abraded or affected by dermatitis or eczema.

INGESTION: Though not anticipated to be a significant route of occupational exposure, ingestion of large quantities of this product may cause stomach pains, nausea, vomiting, and discoloration of the mouth, teeth, and tissues of the throat. Ingestion of large quantities can cause central nervous depression, nausea, vomiting, headache, diarrhea and abdominal pain. Chronic ingestion to this product can adversely affect the kidneys and liver.

INJECTION: Accidental injection of this liquid (as may occur by a puncture with a contaminated object) will cause local pain, irritation, and redness.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD	(BLUE)	2
FLAMMABILITY HAZARD	(RED)	0
PHYSICAL HAZARD	(YELLOW)	0

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

3. HAZARD IDENTIFICATION (Continued)

OTHER HEALTH EFFECTS: In acute poisoning from products containing glycols, such as the Diethylene Glycol component of this product, there is often renal injury, albuminuria (abnormal presence of serum albumin in the urine), and hematuria (presence of blood in the urine). Other symptoms of overexposure to products that contain Glycols may include nausea, vomiting, diarrhea, prominent headache, and delayed abdominal and lower back pain, Hydropic degenerative lesions in liver and kidney, pulmonary edema, pericardial hemorrhage and distension of leptomeningeal veins, slight jaundice, progressive coma, subnormal temperature, slow pulse, and moderate leukocytosis, hemorrhages into gastrointestinal tract and lungs and bronchopneumonia, enlargement of kidneys and, pain in the kidney region may also occur. Anuria from tubular degeneration may prove fatal within few days. In general, pathology observed in human victims consists primarily of degeneration of the kidney with lesser lesions in the liver. In fatal cases polyuria, and oliguria and anuria, drowsiness, slight edema are often present. Death in practically all these cases was due to renal insufficiency, colicky pain, convulsions, kidney toxicity (oxalate crystal formation), as well as liver toxicity.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Lay Terms**. In the event of overexposure, the following symptoms may be observed:

ACUTE: The ink may stain hair, skin, and other contaminated tissue. Acute exposure to low concentrations of this product via skin contact, eye contact, and inhalation may irritate contaminated tissue. Inhalation of higher levels may cause significant irritation and adverse effects on the central nervous system. Ingestion of small amounts will cause nausea, vomiting, abdominal pain, and adverse effects on the central nervous system. Ingestion of large amounts may be fatal or cause kidney failure.

CHRONIC: Chronic skin exposure to this product may cause dermatitis or allergic reaction in susceptible individuals. Chronic exposure to this product can adversely affect the kidneys and liver. Refer to Section 11 (Toxicology Information) for additional data.

TARGET ORGANS: ACUTE: Skin, respiratory system, eyes, kidneys. CHRONIC: Skin, liver, kidneys, renal system.

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

Contaminated individuals must be taken for medical attention if any adverse effect occurs. Rescuers should be taken for medical attention if necessary. Take a copy of the label and MSDS to health professional with victim.

SKIN EXPOSURE: If this product contaminates the skin, immediately begin decontamination with running water and soap. The minimum recommended flushing time is 15 minutes. Remove exposed or contaminated clothing, taking care not to contaminate eyes. The contaminated individual must seek medical attention if any adverse effect occurs.

EYE EXPOSURE: If vapors, sprays, or mists of this product enter the eyes, open the contaminated individual's eyes while under gently running water. Use sufficient force to open eyelids. Have the contaminated individual "roll" eyes. Minimum flushing is for 15 minutes. The contaminated individual must seek medical attention if any adverse effect occurs.

INHALATION: If vapors, sprays, or mists of this product are inhaled, remove the contaminated individual to fresh air. If necessary, remove or cover gross contamination to avoid exposure to rescuers. Seek medical attention if adverse effect occurs.

INGESTION: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING, unless directed by medical personnel. Have victim rinse mouth with water if conscious. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow. If vomiting occurs, lean patient forward or place on left side (head-down position if possible) to maintain an open airway and prevent aspiration.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Skin, respiratory, liver, or kidney disorders may be aggravated by prolonged overexposures to this product.

RECOMMENDATIONS TO PHYSICIANS: Usual measures for decontamination (ipecac/lavage, activated charcoal, cathartics) are recommended within 2 hours of ingestion. Supportive measures and search for evidence of renal failure should be undertaken simultaneously. Hemodialysis should be considered in severe intoxication.

5. FIRE-FIGHTING MEASURES

FLASH POINT: Not flammable

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): Not applicable.

Upper (UEL): Not applicable.

5. FIRE-FIGHTING MEASURES (Continued)

FIRE EXTINGUISHING MATERIALS:

Water Spray: YES (for cooling) Carbon Dioxide: YES
Foam: YES Dry Chemical: YES
Halon: YES Other: Any "B" Class.

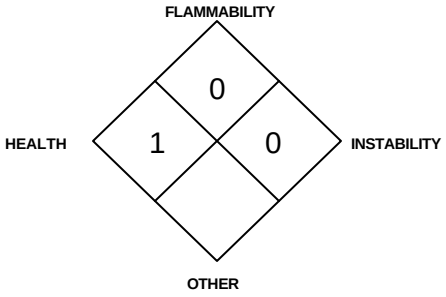
UNUSUAL FIRE AND EXPLOSION HAZARDS: This product is not flammable There are some reports that the Alkanolamine Compound component of this product may cause allergic skin reaction in susceptible individuals. When involved in a fire, this material may decompose and produce irritating vapors and toxic gases (e.g., carbon oxides, nitrogen oxides, copper oxides).

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Due to the presence of colorants, the runoff water from these products can discolor contaminated objects. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas. If necessary, rinse fire-response equipment with soapy water before returning to service.

NFPA RATING



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

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: For incidental spills (e.g., less than 1 L of liquid from a bottle), wear rubber gloves, splash goggles, and appropriate body protection. Trained personnel following pre-planned procedures should handle non-incidental releases (e.g., 10 L of liquid leaking from a crate of several containers). In the event of a non-incidental spill, clear the area and protect people. The minimum personal protective equipment for response to a non-incidental spill is as follows: rubber gloves, rubber boots, face shield, and Tyvek suit. The 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.** Absorb spilled liquid with polypads or other suitable absorbent materials. Rinse area thoroughly with soapy water after liquid has dried. Decontaminate the area thoroughly. If necessary, discard all stained response equipment or rinse with soapy water before returning such equipment to service. Place all spill residue in an appropriate container and seal. Dispose of in accordance with applicable U.S. Federal, State, or local procedures, or appropriate standards of Canada, Australia, or EU Member States (see Section 13, Disposal Considerations).

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing vapors or mists generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Keep away from heat, sparks, and other sources of ignition. Keep container tightly closed when not in use. Use non-sparking tools. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be stored in secondary containers or in a diked area as appropriate. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity).

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 to ensure exposure levels are maintained below the limits provided in Section 2 (Composition and Information on Ingredients). Use local exhaust ventilation. Normal office ventilation conforming to the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Standards is adequate under normal circumstances of use. Persons using this product should consult a qualified Ventilation Engineer and/or Industrial Hygienist if concerns about exposures arise. If necessary, refer to Australian National Code of Practice for the Control of Workplace Hazardous Substances [NOHSC: 2007 (1994)] for further information. As with all products that contain chemicals, ensure proper decontamination equipment (e.g., eyewash/safety shower stations) are available near areas where this product is used as necessary.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

EXPOSURE LIMITS/GUIDELINES:

CHEMICAL NAME	CAS #	Proportion (% v/v)	EXPOSURE LIMITS IN AIR							
			ACGIH-TLV		OSHA-PEL		NIOSH			OTHER
			TWA mg/m^3	STEL mg/m^3	TWA mg/m^3	STEL mg/m^3	TWA mg/m^3	STEL mg/m^3	IDLH mg/m^3	mg/m^3
1,3-Propanediol;	504-63-2	0-34%	NE	NE	NE	NE	NE	NE	NE	NE
Black Colorant Mixture # 1	Proprietary	0-34%	NE	NE	NE	NE	NE	NE	NE	NE
Diethylene Glycol	111-46-6	0-23%	NE	NE	NE	NE	NE	NE	NE	AIHA WEELs: TWA = 10 DFG MAKs: TWA = 44 PEAK = 4•MAK 15 min. average value, 1-hr interval DFG MAK Pregnancy Risk Classification: C
Blue Colorant Mixture #1	Proprietary	0–20%	NE	NE	NE	NE	NE	NE	NE	NE
Yellow Colorant 1	Proprietary	0–20%	NE	NE	NE	NE	NE	NE	NE	NE
Magenta Colorant Mixture # 1	Proprietary	0–17%	NE	NE	NE	NE	NE	NE	NE	NE
Magenta Colorant Mixture # 2	Proprietary	1–10%	NE	NE	NE	NE	NE	NE	NE	NE
Black Colorant Mixture # 2	Proprietary	0–8%	NE	NE	NE	NE	NE	NE	NE	NE
Aliphatic Diamide Compound	Proprietary	6%	NE	NE	NE	NE	NE	NE	NE	AIHA WEELs: TWA = 10
Butoxy Triglycol	143-22-6	5%	NE	NE	NE	NE	NE	NE	NE	NE
Blue Colorant 2	Proprietary	0-3%	NE	NE	NE	NE	NE	NE	NE	NE
Alkanolamine Compound	Proprietary	0–3%	5	NE	NE	NE	NE	NE	NE	DFG MAK: Danger of sensitization of skin. Carcinogen: IARC-3
Aliphatic Triol Compound	Proprietary	2%	10 ppm	NE	15 (Total dust); 5 (Respirable fraction) 10 (Total dust); 5 (Respirable fraction) [vacated 1989 PEL]	NE	NE	NE	NE	NE
Yellow Colorant 2	Proprietary	0–2%	NE	NE	NE	NE	NE	NE	NE	NE
Water and other components each present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).		Balance	None of the other components contribute significant additional hazards at the concentrations present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalent Standards; Canadian Workplace Hazardous Materials Identification System Standards (CPR 4); and the applicable Council Directives of the European Community.							

NE = Not Established. See Section 16 for Definitions of Terms Used. NOTE: All WHMIS, Australian WorkSafe, and European Community required information is included. It is located in appropriate sections based on the ANSI Z400.1-1998 format.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

INTERNATIONAL OCCUPATIONAL EXPOSURE LIMITS: In addition to the exposure limit values cited above, other exposure limits have been established by various countries for this material, as provided below: Note: Refer to current country limits for complete information.

DIETHYLENE GLYCOL:
Denmark: TWA = 2.5 ppm (11 mg/m^3), JAN 1999
Germany: No MAK Established, JAJ 1999
Poland: MAC(TWA) = 10 mg/m^3, JAN 1999
Russia: STEL = 10 mg/m^3, JAN 1993
Sweden: TWA = 10 ppm (45 mg/m^3), STEL = 20 ppm (90 mg/m^3), JAN 1999
United Kingdom: TWA = 23 ppm (101 mg/m^3), SEP 2000

ALIPHATIC TRIOL COMPOUND:
Australia :TWA = 10 mg/m^3, JAN 1993
Belgium: TWA = 10 mg/m^3, JAN 1993

ALIPHATIC TRIOL COMPOUND (continued):
France: VME = 10 mg/m^3, JAN 1999
Finland: TWA = 20 mg/m^3, JAN 1999
The Netherlands: MAC-TGG = 10 mg/m^3, JAN 1999
United Kingdom: TWA = 10 mg/m^3, mist, SEP 2000
In Argentina, Bulgaria, Colombia, Jordan, Korea, New Zealand, Singapore, Vietnam check ACGIH TLV

ALKANOLAMINE COMPOUND:
Denmark: TWA= 0.5 ppm (3.1 mg/m^3), JAN 1999
Sweden: NGV = 5 mg/m3, KTV = 10 mg/m^3 JAN 1999

RESPIRATORY PROTECTION: None needed under normal circumstances of use. If necessary, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, the European Standard EN149, and EU member states, or the Australian Standard 1716-Respiratory Protective Devices and Australian Standard 1715-Selection, Use, and Maintenance of Respiratory Protective Devices. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under U.S. Federal OSHA's Respiratory Protection Standard (1910.134-1998) or the regulations of various U.S. States, Canada, Australia, or EU Member States.

HAND PROTECTION: Wear butyl rubber gloves for routine use to prevent staining. Check gloves for leaks. If necessary, refer to U.S. OSHA 29 CFR 1910.138, Australian Standard 2161-Industrial Safety Gloves and Mittens and appropriate Standards of the EU and Canada for further information.

EYE PROTECTION: None needed under normal circumstances of use. Splash goggles or safety glasses should be worn during operations in which sprays of liquid may occur. If necessary, refer to U.S. OSHA 29 CFR 1910.133, the European Standard EN166, or the Australian Standard 1337-Eye Protection for Industrial Applications and Australian Standard 1336-Recommended Practices for Eye Protection in the Industrial Environment for further information.

BODY PROTECTION: None needed under normal circumstances of use. Use body protection appropriate for task (e.g., rubber apron when cleaning equipment; Tyvek suit and rubber boots during non-incidental spill response). If necessary, refer to Australian Standard 3765-Clothing for Protection Against Hazardous Chemicals for further information. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136.

9. PHYSICAL and CHEMICAL PROPERTIES

VAPOR DENSITY (air = 1): Not established.
EVAPORATION RATE (n-BuAc = 1): Not established.
SPECIFIC GRAVITY (water = 1): Not established.
MELTING/FREEZING POINT: Not established.
SOLUBILITY IN WATER: Insoluble.
BOILING POINT: Not established.
VAPOR PRESSURE, mm Hg @ 20°C: Not established.
pH: Not applicable.
ODOR THRESHOLD: Not established.
COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT): Not established.
APPEARANCE, ODOR AND COLOR: This product is a clear liquid that has a mild odor and comes in a variety of colors (black, magenta, cyan, yellow).
HOW TO DETECT THIS SUBSTANCE (warning properties): The appearance of this product may be a distinguishing characteristic.

10. STABILITY and REACTIVITY

STABILITY: Stable.
DECOMPOSITION PRODUCTS: If exposed to extremely high temperatures, this product can decompose to generate carbon oxides, nitrogen oxides, and copper oxides.
MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong oxidizers, strong bases.
HAZARDOUS POLYMERIZATION: Will not occur.
CONDITIONS TO AVOID: Exposure to or contact with extremely high temperatures, incompatible chemicals.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: Specific toxicology data are available for some components as follows.

BUTOXY TRIGYLCOL:

Open Irritation Test (Skin-Rabbit) 10 mg/24 hours: Mild

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

Standard Draize Test (Eye-Rabbit) 50 mg: Severe

Standard Draize Test (Eye-Rabbit) 20 mg/24 hours: Severe

LD_{50} (Oral-Rat) 5300 mg/kg: Peripheral Nerve and Sensation: flaccid paralysis without anesthesia (usually neuromuscular blockage); Behavioral: altered sleep time (including change in righting reflex)

LD_{50} (Skin-Rat) 3540 µL/kg: Skin and Appendages: primary irritation (after topical exposure)

DIETHYLENE GLYCOL:

Standard Draize Test (Skin-Human) 112 mg/3 days-intermittent: Mild

Standard Draize Test (Skin-Rabbit) 500 mg: Mild

Standard Draize Test (Eye-Rabbit) 50 mg: Mild

LDLo (Oral-Human) 1 gm/kg

LDLo (Oral-Human) 0.75 mg/kg: Brain and Coverings: other degenerative changes; Behavioral: tetany; Lungs, Thorax, or Respiration: dyspnea

TDLo (Oral-Child) 2400 mg/kg: Behavioral: somnolence (general depressed activity); Liver: other changes; Nutritional and Gross Metabolic: metabolic acidosis

LD_{50} (Oral-Rat) 12,565 mg/kg

LD_{50} (Oral-Rat) 12,000 mg/kg: Brain and Coverings: other degenerative changes; Liver: other changes; Kidney, Ureter, Bladder: other changes

LD_{50} (Oral-Mouse) 2300 mg/kg: Brain and Coverings: other degenerative changes; Liver: other changes; Kidney, Ureter, Bladder: other changes

LD_{50} (Oral-Mouse) 23,700 mg/kg: Behavioral: general anesthetic, muscle weakness; Liver: other changes

LD_{50} (Oral-Dog) 9 gm/kg

LD_{50} (Oral-Dog) 9900 mg/kg: Brain and Coverings: other degenerative changes; Liver: other changes; Kidney, Ureter, Bladder: other changes

LD_{50} (Oral-Cat) 3300 mg/kg

LD_{50} (Oral-Cat) 3400 mg/kg: Brain and Coverings: other degenerative changes; Liver: other changes; Kidney, Ureter, Bladder: other changes

LD_{50} (Oral-Rabbit) 4400 mg/kg: Behavioral: coma; Lungs, Thorax, or Respiration: dyspnea; Nutritional and Gross Metabolic: body temperature decrease

LD_{50} (Oral-Guinea Pig) 7800 mg/kg: Behavioral: general anesthetic, muscle weakness; Liver: other changes

LD_{50} (Oral-Guinea Pig) 8000 mg/kg: Brain and Coverings: other degenerative changes; Liver: other changes; Kidney, Ureter, Bladder: other changes

LD_{50} (Intraperitoneal-Rat) 7700 mg/kg

LD_{50} (Intraperitoneal-Mouse) 9719 mg/kg: Lungs, Thorax, or Respiration: chronic pulmonary edema; Kidney, Ureter, Bladder: changes in both tubules and glomeruli; Blood: changes in spleen

DIETHYLENE GLYCOL (continued):

LD_{50} (Subcutaneous-Rat) 18,800 mg/kg

LD_{50} (Intravenous-Rat) 6565 mg/kg

LD_{50} (Skin-Rabbit) 11,890 mg/kg

LD_{50} (Unreported-Rat) 15,650 mg/kg: Behavioral: somnolence (general depressed activity), excitement; Gastrointestinal: nausea or vomiting

LD_{50} (Unreported-Mouse) 13,300 mg/kg: Behavioral: somnolence (general depressed activity), excitement; Gastrointestinal: nausea or vomiting

LD_{50} (Unreported-Rabbit) 2688 mg/kg: Behavioral: somnolence (general depressed activity), excitement; Gastrointestinal: nausea or vomiting

LD_{50} (Unreported-Guinea Pig) 14 gm/kg: Behavioral: somnolence (general depressed activity), excitement; Gastrointestinal: nausea or vomiting

LD_{66} (Oral-Rat) 15 mL/kg: Brain and Coverings: other degenerative changes; Liver: other changes; Kidney, Ureter, Bladder: other changes

LCLo (Inhalation-Mouse) 130 mg/m^3/2 hours: Behavioral: general anesthetic, excitement; Lungs, Thorax, or Respiration: cyanosis

LDLo (Intramuscular-Rat) 7826 mg/kg

LDLo (Intramuscular-Rabbit) 4472 mg/kg

LDLo (Intraperitoneal-Mouse) 5 gm/kg

LDLo (Intravenous-Rabbit) 2236 mg/kg

LDLo (Subcutaneous-Mouse) 5000 mg/kg: Brain and Coverings: other degenerative changes; Liver: other changes; Kidney, Ureter, Bladder: other changes

TDLo (Unreported-Mammal-Species Unspecified) 6 mL/kg: Liver: other changes; Kidney, Ureter, Bladder: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: phosphatases

TDLo (Oral-Rat) 297 gm/kg/99 days-continuous: Kidney, Ureter, Bladder: other changes; Related to Chronic Data: death

TDLo (Oral-Rat) 18,375 mg/kg/7 weeks-continuous: Related to Chronic Data: death

TDLo (Oral-Rat) 50,000 mg/kg/10 days-intermittent: Kidney, Ureter, Bladder: changes in kidney weight

TDLo (Oral-Rat) 890 gm/kg/53 weeks-continuous: Tumorigenic: carcinogenic by RTECS criteria; Kidney, Ureter, Bladder: tumors, changes in both tubules and glomeruli

TDLo (Oral-Rat) 50 gm/kg: female 1-20 day(s) after conception: Reproductive: Specific Developmental Abnormalities: musculoskeletal system

TDLo (Oral-Rat) 76,420 mg/kg: female 6-15 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)

TDLo (Oral-Rat) 38,212 mg/kg: female 6-15 day(s) after conception: Reproductive: Specific Developmental Abnormalities: musculoskeletal system

TDLo (Oral-Mouse) 343 gm/kg: Multigeneration: Reproductive: Maternal Effects: parturition; Effects on Embryo or Fetus: fetal death; Effects on Newborn: sex ratio

DIETHYLENE GLYCOL (continued):

TDLo (Oral-Mouse) 343 gm/kg: Multigeneration: Reproductive: Fertility: female fertility index (e.g. # females pregnant per # sperm positive females; # females pregnant per # females mated); Effects on Newborn: other postnatal measures or effects

TDLo (Oral-Mouse) 50 gm/kg: female 6-15 day(s) after conception: Reproductive: Maternal Effects: other effects

TDLo (Oral-Mouse) 16,000 mg/kg: female 7-14 day(s) after conception: Reproductive: Effects on Newborn: stillbirth, growth statistics (e.g.%, reduced weight gain)

TDLo (Oral-Mouse) 3.1 gm/kg: Multi-generations: Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain)

TDLo (Oral-Mouse) 50 gm/kg: female 6-15 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)

TDLo (Oral-Mouse) 900 gm/kg: female 21 week(s) pre-mating: Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain)

TDLo (Oral-Mouse) 128.6 gm/kg: male 7 day(s) pre-mating; female 7 day(s) pre-mating; female 21 day(s) after conception: Reproductive: Fertility: litter size (e.g. # fetuses per litter; measured before birth); Effects on Newborn: live birth index (measured after birth), growth statistics (e.g.%, reduced weight gain)

TDLo (Oral-Mouse) 16,000 mg/kg/8 days-intermittent: 16,000 mg/kg/8 days-intermittent: Related to Chronic Data: death

TDLo (Oral-Mouse) 20,000 mg/kg/4 days-intermittent: Behavioral: fluid intake

TDLo (Oral-Mouse) 70,000 mg/kg/7 days-intermittent: Behavioral: food intake (animal)

TDLo (Oral-Mouse) 50,000 mg/kg/5 days-intermittent: Kidney, Ureter, Bladder: other changes

TDLo (Oral-Mouse) 50,000 mg/kg/10 days-intermittent: Kidney, Ureter, Bladder: changes in tubules (including acute renal failure, acute tubular necrosis); Kidney, Ureter, Bladder: changes in kidney weight

TDLo (Oral-Mouse) 100,000 mg/kg/10 days-intermittent: Related to Chronic Data: death

TDLo (Oral-Mouse) 900,375 mg/kg/21 weeks-continuous: Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Oral-Mouse) 420 mg/kg/22 weeks-intermittent: Tumorigenic: neoplastic by RTECS criteria; Blood: tumors

TDLo (Oral-Dog) 105 gm/kg/18 days-intermittent: Related to Chronic Data: death

TDLo (Skin-Rabbit) 17,300 µL/kg/30 days-intermittent: Liver: other changes; Kidney, Ureter, Bladder: changes in tubules (including acute renal failure, acute tubular necrosis); Related to Chronic Data: death

TDLo (Skin-Rabbit) 17,300 µL/kg/30 days-intermittent: Liver: other changes; Kidney, Ureter, Bladder: changes in tubules (including acute renal failure, acute tubular necrosis); Related to Chronic Data: death

11. TOXICOLOGICAL INFORMATION (Continued)

TOXICITY DATA (continued):

DIETHYLENE GLYCOL (continued):

TDLo (Subcutaneous-Rat) 2500 mg/kg/82 weeks-intermittent: Tumorigenic: neoplastic by RTECS criteria; Blood: tumors

TDLo (Subcutaneous-Mouse) 1250 mg/kg/66 weeks-intermittent: Tumorigenic: neoplastic by RTECS criteria; Blood: tumors

TCLo (Inhalation-Rat) 20 mg/m^3/2 hours/26 weeks-intermittent: Vascular: BP lowering not characterized in autonomic section; Lungs, Thorax, or Respiration: emphysema; Related to Chronic Data: death

TCLo (Inhalation-Rat) 20 mg/m^3/4 hours/30 days-intermittent: Behavioral: somnolence (general depressed activity); Brain and Coverings: other degenerative changes

TCLo (Inhalation-Rat) 35 mg/m^3/75 days-intermittent: Brain and Coverings: changes in circulation (hemorrhage, thrombosis, etc.); Liver: other changes; Related to Chronic Data: death

TCLo (Inhalation-Mouse) 35 mg/m^3/11 weeks-intermittent: Cardiac: other changes; Liver: fatty liver degeneration; Related to Chronic Data: death

TCLo (Inhalation-Mouse) 35 mg/m^3/75 days-intermittent: Brain and Coverings: changes in circulation (hemorrhage, thrombosis, etc.); Liver: other changes; Related to Chronic Data: death

TCLo (Inhalation-Mouse) 4 mg/m^3/2 hours/30 weeks-intermittent: Tumorigenic: carcinogenic by RTECS criteria; Blood: lymphoma, including Hodgkin's disease; Skin and Appendages: tumors

TD (Oral-Rat) 1752 gm/kg/2 years-continuous: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Kidney, Ureter, Bladder: tumors

TD (Oral-Rat) 584 gm/kg/2 years-continuous: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Kidney, Ureter, Bladder: tumors

TD (Oral-Rat) 840 mg/kg/81 weeks-intermittent: Tumorigenic: neoplastic by RTECS criteria; Blood: tumors

ALIPHATIC TRIOL COMPOUND:

Skin Irritancy (rabbit) = 500 mg/24 hours; mild

Eye Irritancy (rabbit) = 126 mg; mild

Eye Irritancy (rabbit) = 500 mg/24 hours; mild

LD_{50} (oral, rat) = 12600 mg/kg; general anesthetic, muscle weakness, Liver: other changes

LC_{50} (inhalation, rat) > 570 mg/m^3/1 hour

LD_{50} (intraperitoneal, rat) = 4420 mg/kg; toxic psychosis; Cardiac; other changes; Kidney, Urethra, Bladder: other changes

LD_{50} (subcutaneous, rat) = 100 mg/kg

LD_{50} (intravenous, rat) = 5566 mg/kg

LD_{50} (oral, mouse) = 4090 mg/kg

LD_{50} (intraperitoneal, mouse) = 8700 mg/kg

LD_{50} (subcutaneous, mouse) = 91 mg/kg

LD_{50} (intravenous, mouse) = 4250 mg/kg

LD_{50} (oral, rabbit) = 27 g/kg

LD_{50} (skin, rabbit) > 10 g/kg

LD_{50} (intravenous, rabbit) = 53 g/kg

LD_{50} (oral, guinea pig) = 7750 mg/kg

TDLo (oral, rat) = 16800 mg/kg/28 days/continuous; Endocrine: changes in adrenal weight

ALIPHATIC TRIOL COMPOUND (continued):

TDLo (oral, rat) = 96 g/kg/30 days/intermittent; Blood: changes in leukocyte (WBC) count, changes in serum composition (e.g. TP, bilirubin, cholesterol); Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: true cholinesterase

TDLo (oral, rat) = 100 mg/kg/male 1 day pre-mating; Reproductive: Fertility: post-implantation mortality

TDLo (intratesticular, rat) = 280 mg/kg/male 2 days pre-mating; Reproductive: Paternal Effects: spermatogenesis, testes, epididymis, sperm duct

TDLo (intratesticular, rat) = 1600 mg/kg/male 1 day pre-mating; Reproductive: Fertility: male fertility index

TDLo (intratesticular, rat) = 862 mg/kg/male 1 day pre-mating; Reproductive: Paternal Effects: spermatogenesis

TDLo (intratesticular, monkey) = 119 mg/kg/male 1 day pre-mating; Reproductive: Paternal Effects: spermatogenesis, testes, epididymis, sperm duct

TDLo (oral, mouse) = 560 g/kg/8 weeks/continuous; Lungs, Thorax, or Respiration: structural or functional change in trachea or bronchi

DNA Inhibition (human, lymphocyte) = 200 mmol/L

Cytogenetic Analysis (oral, rat) = 1 g/kg

1,3- PROPANEDIOL:

Standard Draize Test (Skin-Human) 10%/48 hours

Standard Draize Test (Skin-Human) 100%/48 hours: Moderate

Standard Draize Test (Skin-Human) 100%/7 days: Moderate

LD_{50} (Intraperitoneal-Mouse) 4780 mg/kg

LD_{50} (Unreported-Mouse) 10,930 mg/kg

LDLo (Oral-Rat) 10 gm/kg: Behavioral: somnolence (general depressed activity)

LDLo (Oral-Cat) 3 gm/kg: Behavioral: somnolence (general depressed activity)

LDLo (Intramuscular-Rat) 6 gm/kg: Behavioral: somnolence (general depressed activity)

LDLo (Oral-Rabbit) 3 gm/kg: Behavioral: somnolence (general depressed activity)

LD_{50} (Oral-Mouse) 4500 mg/kg

DNA Damage (Oral-Rat) 2100 mg/kg/10 weeks-continuous

ALKANOLAMINE COMPOUND:

Standard Draize Test (Skin-Human) 15 mg/3 days-intermittent: Mild

Standard Draize Test (Skin-Rabbit) 560 mg/24 hours: Mild

Standard Draize Test (Eye-Rabbit) 20 mg: Severe

Standard Draize Test (Eye-Rabbit) 10 mg: Mild

LD_{50} (Oral-Rat) 4920 µL/kg: Sense Organs and Special Senses (Eye): lacrymation; Gastrointestinal: hypermotility, diarrhea; Skin and Appendages: hair

LD_{50} (Oral-Rabbit) 2200 mg/kg

LD_{50} (Oral-Mouse) 5846 mg/kg: Behavioral:

convulsions or effect on seizure threshold; Gastrointestinal: hypermotility, diarrhea; Kidney, Ureter, Bladder: other changes

LD_{50} (Oral-Guinea Pig) 2200 mg/kg

LD_{50} (Skin-Rat) > 16 mL/kg

LD_{50} (Skin-Rabbit) > 20 mL/kg

LD_{50} (Intraperitoneal-Rat) 1510 mg/kg

ALKANOLAMINE COMPOUND (continued):

LD_{50} (Intraperitoneal-Mouse) 1450 mg/kg

LDLo (Oral-Mammal-species unspecified) 2 gm/kg

TCLo (Inhalation-Rat) 2 gm/m^3/6 hours/3 weeks-intermittent: Liver: changes in liver weight; Kidney, Ureter, Bladder: changes in bladder weight; Endocrine: changes in thymus weight

TCLo (Inhalation-Mouse) 125 mg/m^3/6 hours/3 weeks-intermittent: Cardiac: changes in heart weight; Blood: pigmented or nucleated red blood cells, changes in erythrocyte (RBC) count

TDLo (Oral-Rat) 63,028 mg/kg/28 days-continuous: Liver: changes in liver weight; Kidney, Ureter, Bladder: changes in bladder weight; Related to Chronic Data: changes in testicular weight

TDLo (Oral-Rat) 96 gm/kg/60 days-intermittent: Kidney, Ureter, Bladder: other changes

TDLo (Oral-Rat) 29,700 µg/kg/90 days-continuous: Liver: changes in liver weight; Kidney, Ureter, Bladder: changes in bladder weight

TDLo (Skin-Rat) 65 gm/kg/13 weeks-intermittent: Kidney, Ureter, Bladder: changes in kidney weight; Skin and Appendages: dermatitis, other (after systemic exposure); Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Oral-Mouse) 2296 mL/kg/82 weeks-continuous: Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Oral-Guinea Pig) 192 gm/kg/17 weeks-intermittent: Liver: other changes; Kidney, Ureter, Bladder: other changes

TDLo (Skin-Mouse) 260 gm/kg/13 weeks-intermittent: Liver: changes in liver weight; Kidney, Ureter, Bladder: changes in kidney weight; Skin and Appendages: dermatitis, other (after systemic exposure)

TDLo (Skin-Guinea Pig) 32 gm/kg/4 days-intermittent: Related to Chronic Data: death

TDLo (Skin-Rat) 129 gm/kg/2 years-intermittent: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Kidney, Ureter, Bladder: tumors

Cytogenetic Analysis (Human-Lymphocyte) 100 µmol/L

Sister Chromatid Exchange (Human-Lymphocyte) 1 mmol/L

ALIPHATIC DIAMIDE COMPOUND:

Standard Draize Test (Skin-Human) 22 mg/3 days-intermittent: Mild

TDLo (Intraplacental-Woman) 1600 mg/kg: female 16 week(s) after conception: Reproductive: Fertility: abortion

TDLo (Intraplacental-Human) 1400 mg/kg: female 16 week(s) after conception: Reproductive: Fertility: abortion

LD_{50} (Oral-Rat) 8471 mg/kg

LD_{50} (Oral-Mouse) 11 gm/kg

LD_{50} (Intraperitoneal-Rat) > 5 gm/kg

LD_{50} (Subcutaneous-Rat) 8200 mg/kg: Behavioral: altered sleep time (including change in righting reflex), changes in motor activity (specific assay); Behavioral: antipsychotic

LD_{50} (Subcutaneous-Mouse) 9200 mg/kg: Behavioral: altered sleep time (including change in righting reflex), changes in motor activity (specific assay), Behavioral: antipsychotic

11. TOXICOLOGICAL INFORMATION (Continued)

TOXICITY DATA (continued):

ALIPHATIC DIAMIDE COMPOUND (continued):

LD_{50} (Intravenous-Rat) 5300 mg/kg: Behavioral: altered sleep time (including change in righting reflex), changes in motor activity (specific assay), antipsychotic

LD_{50} (Intravenous-Mouse) 4600 mg/kg: Behavioral: altered sleep time (including change in righting reflex), changes in motor activity (specific assay), antipsychotic LD_{50} (Intratracheal-Rat) 567 mg/kg: Behavioral: convulsions or effect on seizure threshold; Lungs, Thorax, or Respiration: dyspnea; Blood: methemoglobinemia-carboxyhemoglobin

LDLo (Intraperitoneal-Mouse) 6608 mg/kg: Behavioral: convulsions or effect on seizure threshold, coma

LDLo (Subcutaneous-Dog) 3 gm/kg

LDLo (Intravenous-Dog) 3 gm/kg

LDLo (Intravenous-Rabbit) 4800 mg/kg

LDLo (Oral-Rabbit) 10 gm/kg: Brain and Coverings: other degenerative changes; Lungs, Thorax, or Respiration: structural or functional change in trachea or bronchi; Blood: hemorrhage

ALIPHATIC DIAMIDE COMPOUND (continued):

LDLo (Oral- Mammal-Domestic) 511 mg/kg: Behavioral: tetany; Lungs, Thorax, or Respiration: dyspnea; Gastrointestinal: changes in structure or function of salivary glands

LDLo (Subcutaneous-Rabbit) 3 gm/kg

LDLo (Subcutaneous-Pigeon) 14,800 mg/kg

LDLo (Subcutaneous-Frog) 600 mg/kg

TDLo (Oral-Cattle) 200 mg(N)/kg: Behavioral: tremor, muscle weakness; Gastrointestinal: alteration in gastric secretion

TCLo (Inhalation-Rat) 288 mg/m^3/17 weeks-intermittent: Kidney, Ureter, Bladder other changes in urine composition; Blood: other changes; Nutritional and Gross Metabolic: changes in chlorine

TDLo (Oral-Rat) 3024 mg/kg/4 weeks-continuous: Liver: changes in liver weight; Endocrine: changes in thymus weight; Related to Chronic Data: changes in testicular weight

TDLo (Skin-Rat) 37,800 mg/kg/25 weeks-continuous: Brain and Coverings: changes in brain weight; Related to Chronic Data: changes in prostate weight

ALIPHATIC DIAMIDE COMPOUND (continued):

TDLo (Oral-Rat) 821 gm/kg/1 year-continuous: Tumorigenic: neoplastic by RTECS criteria; Blood: tumors; Blood: lymphoma, including Hodgkin's disease

TDLo (Oral-Mouse) 394 gm/kg/1 year-continuous: Tumorigenic: carcinogenic by RTECS criteria; Blood: tumors; Blood: lymphoma, including Hodgkin's disease

TDLo (Intrauterine-Monkey) 6 gm/kg: female 18 week(s) after conception: Reproductive: Fertility: abortion

DNA Inhibition (Human-Lymphocyte) 600 mmol/L

Cytogenetic Analysis (Human-Lymphocyte) 50 mmol/L

Cytogenetic Analysis (Oral-Mouse) 100 gm/kg/5 days-continuous

Cytogenetic Analysis (Hamster-Fibroblast) 16 gm/L/24 hours

Cytogenetic Analysis (Hamster-Lung) 13 gm/L

DNA Damage (Mouse-Lymphocyte) 628 mmol/L

DNA Damage (Hamster-Fibroblast) 8 mol/L

Mutation in Mammalian Somatic Cells (Mouse-Lymphocyte) 265 mmol/L

SUSPECTED CANCER AGENT: The components of this product are listed by agencies tracking carcinogenic potential as follows:

ALKANOLAMINE COMPOUND: IARC-3 (Unclassifiable as to Carcinogenicity in Humans)

The remaining components of this product are not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, and CAL/OSHA and therefore are not considered to be, nor suspected to be, a cancer-causing agent by these agencies.

IRRITANCY OF PRODUCT: Skin contact will be moderately irritating. Contact with the eyes will be irritating and may cause temporary visual impairment.

SENSITIZATION TO THE PRODUCT: The Alkanolamine Compound component of this product is suspected to be a skin sensitizer which may cause allergic skin reaction in susceptible individuals.

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

Mutagenicity: The components of this product are not reported to produce mutagenic effects in humans.

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

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

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

A mutagen is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical that causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical that causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance that interferes in any way with the reproductive process.

BIOLOGICAL EXPOSURE INDICES: Currently, there are no Biological Exposure Indices (BEIs) established for the components of this product.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: This product is relatively stable under ambient environmental conditions. Additional environmental data are available as follows:

ALIPHATIC TRIOL COMPOUND:

Terrestrial Fate: If released to soil, Aliphatic Triol Compound is expected to undergo rapid biodegradation under aerobic conditions. Biodegradation under anaerobic conditions is also expected to occur. Based on an experimental log octanol/water partition coefficient of -1.76 and its water solubility, 1,220,000 mg/l at 5°C, soil adsorption coefficients for Aliphatic Triol Compound can be estimated at 3 and 2, respectively, using regression-derived equations. The magnitude of these values indicate that Aliphatic Triol Compound will display very high mobility in soil. Based on an estimated Henry's Law constant of 1.75X10+11 atm cu-m/mol and vapor pressure, 1.58X10-4 mm Hg at 25°C Aliphatic Triol Compound is not expected to significantly volatilize from wither moist or dry soil to the atmosphere.

Aquatic Fate: If released to water, Aliphatic Triol Compound is expected to rapidly degrade under aerobic conditions. Degradation is also likely in seawater and under anaerobic conditions. Based on an experimental log octanol/water partition coefficient of -1.76 and its water solubility, 1,220,000 mg/L at 5°C, bioconcentration factors for Aliphatic Triol Compound can be estimated at 3 and 0.2, respectively, using regression-derived equations. The magnitude of these values indicate that bioconcentration in fish and aquatic organisms is not likely to occur to a significant extent. Estimated soil adsorption coefficients of 2 and 3 indicated that adsorption to sediment and suspended organic matter will not be important. Based on an estimated Henry's Law constant of 1.75X10+11 atm cu-m/mol, volatilization of Aliphatic Triol Compound from water will be slower then for water itself.

12. ECOLOGICAL INFORMATION (Continued)

ENVIRONMENTAL STABILITY:

ALIPHATIC TRIOL COMPOUND (continued):

Atmospheric Fate: If released to the atmosphere, Aliphatic Triol Compound may undergo a gas-phase oxidation with photochemically produced hydroxyl radicals. An estimated rate constant for this reaction of 1.7X10-11 cu- cm/molec-sec at 25°C translates to an atmospheric half-life of 33 hours using an average atmospheric hydroxyl radical concentration of 5X10+5 molec/cu-cm. The water solubility of Aliphatic Triol Compound, 1,220,000 mg/L at 5°C, indicates that it may also undergo atmospheric removal by wet deposition processes.

Bioconcentration: Based on an experimental log octanol/water partition coefficient of -1.76 and its water solubility, 1,220,000 mg/l at 5°C, bioconcentration factors for Aliphatic Triol Compound can be estimated at 3 and 0.2, respectively, using regression-derived equations. The magnitude of these values indicate that bioconcentration of Aliphatic Triol Compound in fish and aquatic organisms will not be significant.

DIETHYLENE GLYCOL:

Terrestrial Fate: Based on a recommended classification scheme, an estimated Koc value of 1, determined from a structure estimation method, indicates that Diethylene Glycol is expected to have very high mobility in soil. Volatilization of Diethylene Glycol is not expected to be important from moist soil surfaces given an estimated Henry's Law constant of 2X10-9 atm-cu m/mole. Diethylene Glycol will not be susceptible to direct photolysis on soil surfaces based on its absorption of light at wavelengths >290 nm. According to a biodegradation study conducted in a sandy loam, Diethylene Glycol is expected to biodegrade quickly in soil.

Aquatic Fate: Based on a recommended classification scheme, an estimated Koc value of 1, determined from a structure estimation method, indicates that Diethylene Glycol is not expected to adsorb to suspended solids and sediment in the water. Diethylene Glycol will be essentially non-volatile from water surfaces based on an estimated Henry's Law constant of 2X10-9 atm-cu m/mole, developed using a fragment constant estimation method. An estimated BCF value of 0.05, from an estimated log Kow of 1.47, suggests that Diethylene Glycol will not bioconcentrate in aquatic organisms, according to a recommended classification scheme. Although biodegradation test results vary, biodegradation of Diethylene Glycol is expected to be an important fate process in water (22% BOD theoretical in 15 days in river water; little degradation during winter).

Atmospheric Fate: According to a model of gas/particle partitioning of semi-volatile organic compounds in the atmosphere, Diethylene Glycol, which has an experimental vapor pressure of 5.7X10-3 mm Hg at 25 deg C(2), will exist as a vapor in the ambient atmosphere. Vapor-phase Diethylene Glycol is degraded in the atmosphere by reaction with photochemically produced hydroxyl radicals; the half-life for this reaction in air is estimated to be about 13 hours. Particulate-phase Diethylene Glycol may be physically removed from the air by wet deposition.

Bioconcentration: An estimated BCF value of 0.05 was calculated for Diethylene Glycol, using an estimated log Kow of -1.47 and a recommended regression-derived equation. According to a recommended classification scheme, this BCF value suggests that bioconcentration in aquatic organisms is low.

ALKANOLAMINE COMPOUND:

Terrestrial Fate: If released to soil, Alkanolamine Compound is expected to biodegrade fairly rapidly following acclimation (half-life on the order of days to weeks). Residual Alkanolamine Compound may leach. Volatilization from soil is not expected to be an important fate process.

Aquatic Fate: If released to water, Alkanolamine Compound should biodegrade. The half-life of this compound is expected to range from a few days to a few weeks depending, in large part, on the degree of acclimation of the system. Bioconcentration in aquatic organisms, adsorption to suspended solids and sediments, and volatilization are not expected to be important fate processes in water.

Atmospheric Fate: Based on a vapor of 3.59X10-6 mm Hg at 25°C, Alkanolamine Compound is expected to exist partly in the vapor phase and partly adsorbed to particulates in the atmosphere. Alkanolamine Compound vapor is expected to react with photochemically generated hydroxyl radicals in the atmosphere (estimated half-life 4 hours). The complete miscibility of Alkanolamine Compound in water suggests that this compound may also be removed from the atmosphere in precipitation. Dry deposition may be an important removal process for Alkanolamine Compound adsorbed on particles.

Bioconcentration: A bioconcentration factor (BCF) of < 1 was estimated for Alkanolamine Compound based on a log Kow of -1.59. An experimentally determined BCF was < 3.9. These BCF values and Alkanolamine Compound's complete solubility in water suggest that this compound does not bioconcentrate in aquatic organisms.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: This product may be harmful to plant or animal life, especially if large volumes of this product are released. Plants may be discolored and damaged (depending on the severity of the contamination).

EFFECT OF CHEMICAL ON AQUATIC LIFE: This product may be harmful to aquatic plant or animal life, especially if large volumes of this product are released into a body of water. Additional aquatic toxicity data are available as follows:

DIETHYLENE GLYCOL:

NOEL (*Selenastrum capricornutum* algae) = 1-100 mg/L
EC_0 (*Pseudomonas putida* bacteria) 16 Hours = 8,000 mg/L
EC_0 (*Microcystis aeruginosa* algae) 8 days = 1,700 mg/L
EC_0 (*Scenedesmus quadricauda* green algae) 7 days = 2,700 mg/L
EC_0 (*Entosiphon sulcatu* protozoa) 72 hours = 10,745 mg/L
EC_0 (*Uronema parduczi* Chatton-Lwoff protozoa) = > 8,000 mg/L
LD_{50} (gold fish) 24 hours = > 5,000 mg/L
LC_{50} (*Daphnia magna*) = between 0.3 and 1 mg/L
LC_{50} (mosquito fish) 24 hours = > 32,000 mg/L
LC_{50} (*Pimephales promelas*) = > 100 mg/L
LC_{50} (Poecilia reticulata guppy) 7 days = 61,072 ppm

ALIPHATIC TRIOL COMPOUND:

EC_0 (*Pseudomonas putida* bacteria) 16 hours = > 10,000 mg/L
EC_0 (*Microcystis aeruginosa* algae) 8 days = 2,900 mg/L
EC_0 (*Scenedesmus quadricauda* green algae) 7 days = > 10,000 mg/L
EC_0 (*Entosiphon sulcatum* protozoa) 72 hours = 3,200 mg/L
EC_0 (*Uronema parduczi* Chatton-Lwoff protozoa) = >10,000 mg/L
LC_{50} (goldfish) 24 hours = > 5,000 mg/L

ALKANOLAMINE COMPOUND:

LC_0 (*Scenedesmus*) = 100 mg/L
LC_0 (Colpoda) = 160 mg/L
LC_0 (*Daphnia*) = 2,500 mg/L
LC_{50} (*Pimephales promelas* fathead minnow) 96 hours = 11.8 mg/L (95% confidence limit 10.6 - 13.0 mg/L), flow-through bioassay with measured concentrations, 25.7 deg C, dissolved oxygen 7.3 mg/l, and pH 7.8

ALKANOLAMINE COMPOUND (continued):

LC_{50} (*Artemia salina*) 24 hours = 5,600 mg/L
LC_{50} (*Carassius auratus*) 24 hours = > 5,000 mg/L
LC_{50} (Leuciscus idus) 48 hours = > 10,000 mg/L
LC_{100} (*Pseudomonas putida*) 72 hours = 5,000 mg/L
EC_0 (Photobacterium) 30 minutes = 140 mg/L(not neutralized)
EC_0 (*Pseudomonas putida*) 17 hours = > 10,000 mg/L
EC_0 (*Microcystis aeruginosa*) 8 days = 47 mg/L
EC_0 (*Microcystis aeruginosa*) 8 days = 19 mg/L
EC_0 (*Scenedesmus quadricauda*) 8 days = 1.8 mg/L
EC_0 (*Scenedesmus quadricauda*) 8 days = 715 mg/L
EC_0 (*Entosiphon sulcatum*) 72 hours = 56 mg/L
EC_0 (*Uronema parduczi* Chatton-Lwoff) = > 10,000 mg/L
EC_0 (*Daphnia magna Straus*) 24 hours = 875; 1,386; 1,530 mg/L
EC_{10} (phosphoreum) 30 minutes = 3,154 mg/L (neutralized)
EC_{10} (*Scenedesmus subspicatus*) 72 hours = 7.9; 26 mg/L
EC_{10} (*Scenedesmus subspicatus*) 48 hours = 62; 110 mg/L
EC_{50} (phosphoreum) 30 minutes = 525 mg/L (not neutralized)
EC_{50} (phosphoreum) 30 minutes = 38,400 mg/L (neutralized)
EC_{50} (*Scenedesmus subspicatus*) 72 hours = 216; 512 mg/L
EC_{50} (*Scenedesmus subspicatus*) 48 hours = 470; 750 mg/L
EC_{50} (*Daphnia magna Straus*) 24 hours = 1,360; 1,850; 2,038 mg/L
EC_{75} (*Pseudomonas putida*) 7 days = 1,000 mg/L
NOEC (*Daphnia magna Straus*) 21 days =16 mg/L

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with regulations of Canada, Australia, or EU Member States. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.
EPA WASTE NUMBER: Not applicable to wastes consisting only of this product

14. TRANSPORTATION INFORMATION

THIS PRODUCT IS **NOT** HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Not Regulated
HAZARD CLASS NUMBER and DESCRIPTION: Not Applicable
UN IDENTIFICATION NUMBER: Not Applicable
PACKING GROUP: Not Applicable
DOT LABEL(S) REQUIRED: Not Applicable
EMERGENCY RESPONSE GUIDEBOOK NUMBER, 2004: Not Applicable
MARINE POLLUTANT: No component of this product is designated by the DOT to be a Marine Pollutant (per Appendix B to 49 CFR 172.101).

TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This product is not considered as dangerous goods, per regulations of Transport Canada.

INTERNATIONAL AIR TRANSPORT ASSOCIATION SHIPPING INFORMATION (IATA): This product is not considered as dangerous goods.

INTERNATIONAL MARITIME ORGANIZATION SHIPPING INFORMATION (IMO): This product is not considered as dangerous goods.

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR): This product is not considered by the United Nations Economic Commission for Europe to be dangerous goods.

AUSTRALIAN FEDERAL OFFICE OF ROAD SAFETY CODE FOR THE TRANSPORTATION OF DANGEROUS GOODS BY ROAD OR RAIL: This product is not considered as dangerous goods, per regulations of the Australian Federal Office of Road Safety.

15. REGULATORY INFORMATION

ADDITIONAL UNITED STATES REGULATIONS:

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

CHEMICAL NAME	SARA 302 (40 CFR 355, Appendix A)	SARA 304 (40 CFR Table 302.4)	SARA 313 (40 CFR 372.65)
Diethylene Glycol (in generic Glycol Ether category)	No	Yes	N230

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of 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): 2-Butoxyethyl Acetate = Under the generic Glycol Ether category, this compound does not have a RQ assigned, but is considered a CERCLA Hazardous Waste.

U.S. TSCA INVENTORY STATUS: The components of this product listed by CAS # in Section 2 are listed on the TSCA Inventory or are excepted from listing.

U.S. HAZARDOUS AIR POLLUTANT (HAP): The Diethylene Glycol component of the product is listed by the EPA under section 112(b) of the Clean Air Act as a HAP. This component is listed in 40 CFR 68.130 as being subject to EPA's accidental release provisions [112(r)] of 40 CFR Part 68 and has a Threshold Quantity assigned under this regulation.
OTHER U.S. FEDERAL REGULATIONS: None.

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

15. REGULATORY INFORMATION (Continued)

ADDITIONAL UNITED STATES REGULATIONS (continued):

ANSI LABELING (Z129.1): **CAUTION!** MAY CAUSE SKIN AND EYE IRRITATION. INHALATION AND INGESTION MAY BE HARMFUL. MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS. MAY CAUSE ALLERGIC SKIN REACTION IN SUSCEPTIBLE INDIVIDUALS. MAY DISCOLOR CONTAMINATED SKIN, EYES, HAIR, AND CLOTHES. FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN. Use with adequate ventilation. Keep away from heat, sparks, or open flame. Avoid contact of liquid with skin, eyes, and clothing. Avoid exposure to vapors, mists, or sprays. Wash thoroughly after handling. Wear appropriate hand and eye protection. **FIRST-AID:** In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. If inhaled, remove to fresh air. If swallowed, do not induce vomiting. Get medical attention if irritation develops or persists or if any other adverse effect occurs. **IN CASE OF FIRE:** Use water fog, dry chemical, or CO_2, or alcohol foam. **IN CASE OF SPILL:** Absorb spill with inert materials (e.g., polypads, dry sand). Rinse area with soapy water. Consult Material Safety Data Sheet for additional information.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product listed by CAS # in Section 2 are listed on the DSL Inventory or are excepted.

OTHER CANADIAN REGULATIONS: Not applicable.

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

CANADIAN WHMIS CLASSIFICATION and SYMBOLS:

Class D2B: Materials Causing Other Toxic Effects-Acute Toxic Effects

EUROPEAN COMMUNITY INFORMATION:

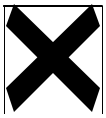
EU LABELING/CLASSIFICATION: This product is considered to be dangerous according to current European Community Guidelines. This product meets the definition of EU hazard class Xn (Harmful), Xi (Irritant).

EU CLASSIFICATION: Xn [Harmful]

EU RISK PHRASES: [R: 22]: Harmful if swallowed.

EU SAFETY PHRASES: [S: 1/2]: Keep out of reach of children. *(This safety phrase can be omitted from the label when the substance or preparation is sold for industrial use only).* [S: 46]: If swallowed, seek medical advice immediately and show this container or label.

EUROPEAN COMMUNITY ANNEX II HAZARD SYMBOL: Xn



AUSTRALIAN INFORMATION FOR PRODUCT:

AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES (AICS) STATUS: The components of this product are listed by CAS # in Section 2 are listed on the AICS.

LIST OF DESIGNATED SUBSTANCES: Not applicable.

STANDARD FOR THE UNIFORM SCHEDULING OF DRUGS AND POISONS: Schedule 6

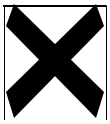
LABELING AND CLASSIFICATION: The following hazard classification data have been selected, based a review of the regulation [NOHSC: 10005 (1994)]:

CLASSIFICATION: Harmful. [Xn]

RISK PHRASES: [R: 22]: Harmful if swallowed.

SAFETY PHRASES: [S: 1/2]: Keep out of reach of children. *(This safety phrase can be omitted from the label when the substance or preparation is sold for industrial use only).* [S: 46]: If swallowed, seek medical advice immediately and show this container or label.

HAZARD SYMBOL:



15. REGULATORY INFORMATION (Continued)

JAPANESE INFORMATION FOR PRODUCT:

JAPANESE MINISTER OF INTERNATIONAL TRADE AND INDUSTRY (MITI) STATUS: The components of this product are not listed as Class I Specified Chemical Substances, Class II Specified Chemical Substances, or Designated Chemical Substances by the Japanese MITI.

16. OTHER INFORMATION

PREPARED BY: PRISM INKS, Inc.
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DATE OF PRINTING: July 15, 2013

The data in this Material Safety Data Sheet is true and accurate to the best of Prism Inks, Inc. knowledge. However, since data, safety standards, and government regulations are subject to change conditions of handling, use, or misuse are beyond Prism Inks, Inc. control, Prism Inks, Inc. MAKES NO WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR RELIANCE THEREON. The user is required to comply with all laws and regulations relating to the purchase, use, storage, and disposal of the product. User must be familiar with and follow generally accepted safe handling procedures of chemicals, and is solely responsible for any effects caused by its misuse or mixing of this chemical with any other substance.

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 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 cause 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.

LOQ: Limit of Quantitation.

MAK: Federal Republic of Germany Maximum Concentration Values in the workplace.

NE: Not Established. When no exposure guidelines are established, an entry of NE is made for reference.

NIC: Notice of Intended Change.

NIOSH CEILING: The exposure that shall not be exceeded during any part of the workday. If instantaneous monitoring is not feasible, the ceiling shall be assumed as a 15-minute TWA exposure (unless otherwise specified) that shall not be exceeded at any time during a workday.

NIOSH RELs: NIOSH's Recommended Exposure Limits.

PEL-Permissible Exposure Limit: OSHA's Permissible Exposure Limits. This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL that was vacated by Court Order.

SKIN: Used when a 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.

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.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS: This rating system was developed by the National Paint and Coating Association and has been adopted by industry to identify the degree of chemical hazards.

HEALTH HAZARD:

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

DEFINITIONS OF TERMS (Continued)

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

FLAMMABILITY HAZARD (continued):

1 (continued): Materials in this degree would not, under normal conditions, form hazardous atmospheres in air, but under high ambient temperatures or moderate heating may release vapor in sufficient quantities to produce hazardous atmospheres in air, Including: Liquids having a flash-point at or above 37.8°C [100°F]; Solid materials in the form of course dusts that may burn rapidly but that generally do not form explosive atmospheres; Solid materials in a fibrous or shredded form that may burn rapidly and create flash fire hazards (e.g. cotton, sisal, hemp; Solids and semisolids that readily give off flammable vapors.);

3 (Serious Hazard- Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures, or, unaffected by ambient temperature, are readily ignited under almost all conditions, including: Liquids having a flash point below 22.8°C [73°F] and having a boiling point at or above 38°C [100°F] and below 37.8°C [100°F] [e.g. OSHA Class IB and IC]; Materials that on account of their physical form or environmental conditions can form explosive mixtures with air and are readily dispersed in air [e.g., dusts of combustible solids, mists or droplets of flammable liquids]; Materials that burn extremely rapidly, usually by reason of self-contained oxygen [e.g. dry nitrocellulose and many organic peroxides]); **4** (Severe Hazard-Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air, and which will burn readily, including: Flammable gases; Flammable cryogenic materials; Any liquid or gaseous material that is liquid while under pressure and has a flash point below 22.8°C [73°F] and a boiling point below 37.8°C [100°F] [e.g. OSHA Class IA; Material that ignite spontaneously when exposed to air at a temperature of 54.4°C [130°F] or below [e.g. pyrophoric]).

PHYSICAL HAZARD:

0 (*Water Reactivity*: Materials that do not react with water. *Organic Peroxides*: Materials that are normally stable, even under fire conditions and will not react with water. *Explosives*: Substances that are Non-Explosive. Unstable *Compressed Gases*: No Rating. *Pyrophorics*: No Rating. *Oxidizers*: No "0" rating allowed. *Unstable Reactives*: Substances that will not polymerize, decompose, condense or self-react.);

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

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

PHYSICAL HAZARD (continued):

2 (continued): *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** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury);**3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury).

FLAMMABILITY HAZARD: **0** Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand. **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 **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. **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. **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.

INSTABILITY HAZARD: **0** Materials that in themselves are normally stable, even under fire conditions. **1** Materials that in themselves are normally stable, but that can become unstable at elevated temperatures and pressures. **2** Materials that readily undergo violent chemical change at elevated temperatures and pressures. **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. **4** Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures.