

MATERIAL SAFETY DATA SHEET

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

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

1. PRODUCT IDENTIFICATION

TRADE NAME (AS LABELED): Hot Pink 'em™, Pink Stinker™ brand, Model # 14-2, Formula #1-20-1.
CHEMICAL NAME/CLASS: Alcohol/Glycol Aerosol Propelled by Inert Gas
SYNONYMS: None
PRODUCT USE: Less than Lethal Defense Spray
SUPPLIER/MANUFACTURER'S NAME: Enhanced Defense Sprays, LLC.
ADDRESS: PO Box 38
Beaver Creek, OR 97004
503-632-6572
503-632-6572 [M-F 9:00 A.M. to 5:00 P.M. P.S.T.]
EMERGENCY PHONE:
BUSINESS PHONE:
EMAIL ADDRESS:
FOR INFORMATION ON MSDS/PRODUCT: MSDS@PinkStinker.com
Date of Preparation: June 15, 2009

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

2. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: Product Description: This product is a pink flammable, odorless liquid packaged in a pressurized container and propelled by an inert propellant gas. **Health Hazards:** Inhalation overexposures to the vapors of this product can cause central-nervous system effects (dizziness, drowsiness, nausea, and headaches). Contamination of the eyes can cause irritation and tearing. Skin contact may cause irritation. Ingestion is unlikely. **Flammability Hazards:** The liquid contents of this product are flammable but do not readily ignite. Under fire conditions, the canisters will rupture and release the flammable liquid, which will ignite. Vapors of this product may travel to a source of ignition and flashback to a leak or open container. If involved in a fire, this product will release smoke, acrid vapors and toxic gases (e.g. carbon monoxide, carbon dioxide, sulfur oxides, hydrogen sulfide and nitrogen oxides). **Reactivity Hazards:** This product is not reactive. **Environmental Hazards:** Release of this product to the environment may cause harm to plants and animals. **Emergency Response Considerations:** Emergency responders must wear proper personal protective equipment (and have appropriate fire protection) suitable for the situation to which they are responding.

3. COMPOSITION and INFORMATION ON INGREDIENTS

This product consists of a pressurized container containing 12 mL of a flammable liquid propelled by 2 mL of Nitrogen, an inert gas.

CHEMICAL NAME	CAS #	% w/v
The liquid mixture of this product consists of the following components:		
Proprietary Aliphatic Alcohol		25-35%
Proprietary Alkyl Alcohol		20-30%
Proprietary Glycol		15-20%
Proprietary Pepper Derivative		2-8%
Proprietary Red Pigment Mixture		0.1-1.0%
Deionized Water	7732-18-5	Balance
Nitrogen (propellant gas)	7727-37-9	100%

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

4. FIRST-AID MEASURES

Victims of chemical exposure must be taken for medical attention if any adverse effect occurs. Rescuers should be taken for medical attention, if necessary. Remove or cover gross contamination to avoid exposure to rescuers. Take a copy of label and MSDS to health professional with victim.

SKIN EXPOSURE: If this product contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 20 minutes. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek medical attention if any adverse effect occurs.

EYE EXPOSURE: If vapors or liquid from this product enter the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 20 minutes. Victim must seek medical attention if any adverse effect occurs.

INHALATION: If vapors, mists, or sprays of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Seek medical attention if adverse effect occurs after removal to fresh air.

INGESTION: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING, unless directly by medical personnel. Have victim rinse mouth with water or give several cupfuls of 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.

4. FIRST-AID MEASURES (Continued)

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Acute or chronic respiratory conditions, skin disorder, central nervous system conditions, or disorders involving the "Target Organs" (see Section 11, "Toxicological Information") may be aggravated by overexposure to this product.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate overexposure. Provide oxygen, if necessary. Pulmonary function tests, chest X-rays, and nervous system evaluations may prove useful.

5. FIRE-FIGHTING MEASURES

FLASH POINT (calculated): 28.89°C (82.0°F)

AUTOIGNITION TEMPERATURE: Not determined for product.

Proprietary Aliphatic Alcohol: 363°C (685°F)

Proprietary Alkyl Alcohol: 415°C (780°F) For Proprietary Glycol: 371°C (700°F)

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

The following are limits for the main components:

	Lower (LEL):	Upper (UEL):
Proprietary Aliphatic Alcohol:	3.3-4.3%	19.0%
Proprietary Alkyl Alcohol:	1.7%	10.6%
Proprietary Glycol	2.6%	12.5%

FIRE EXTINGUISHING MATERIALS: Unless incompatibilities exist for surrounding materials, carbon dioxide, water spray, 'ABC' type chemical extinguishers, foam, dry chemical and halon extinguishers can be used to fight fires involving this product.

FIRE EXTINGUISHERS NOT TO BE USED: None known.

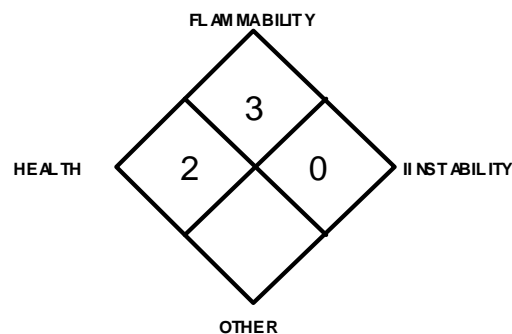
UNUSUAL FIRE AND EXPLOSION HAZARDS: The liquid content of this product are flammable but do not readily ignite. The product has been tested per ASTM D 3065 'Standard Method for Flammability of Aerosol Product' and produced no flame under test conditions. Under fire conditions, the canisters will rupture and release the flammable liquid, which will ignite. If involved in a fire this product will produce irritating vapors and toxic gases (e.g., carbon monoxide, carbon dioxide, sulfur oxides, hydrogen sulfide and nitrogen oxides).

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: May be sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters 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 spray can be used to cool fire-exposed containers. Water fog or spray can also be used by trained firefighters 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



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

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: A release of a single container or several containers presents a minimal hazard. Allow containers to vent and remove container for appropriate disposal. If a large quantity of containers of this product is involved, evacuate immediate area. Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. If a large quantity of product is involved, the minimum Personal Protective Equipment should be **Level B: Self-Contained Breathing Apparatus**. Allow the gas to dissipate. Monitor the surrounding area for the level of Oxygen and level of combustible vapors. The atmosphere must have at least 19.5 percent Oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus. In the event that any liquid material remains after spill, absorb with non-reactive absorbent (e.g. carbon black, etc.) or polypads. Decontaminate area with soap and water. 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.

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. Use ventilation and other engineering controls to minimize potential exposure to the aerosol of this product.

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. 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). 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. Storage areas should be made of fire resistant materials. Post warning and "NO SMOKING" signs in storage and use areas, as appropriate.

7. HANDLING and STORAGE (Continued)

STORAGE AND HANDLING PRACTICES (continued): Have appropriate extinguishing equipment in the storage area (e.g., sprinkler system, portable fire extinguishers).

PRODUCT USE: This product is used as a defensive spray. Follow all industry standards for handling of this product.

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 this section, if applicable. Exhaust directly to the outside, taking necessary precautions for environmental protection. Ensure eyewash/safety shower stations and appropriate fire protection is available near areas where this product is used.

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	
Proprietary Red Pigment Mixture		NE	NE	NE	NE	NE	NE	NE	NE
Proprietary Pepper Derivative		NE	NE	NE	NE	NE	NE	NE	NE
Proprietary Aliphatic Alcohol		1000	NIC = 1000	1000	NE	1000	NE	3300 (Based on 10% of LEL)	DFG MAKs: TWA = 500 PEAK = 2•MAK, 15 min., average value, 1-hr interval, 4 per shift DFG MAK Pregnancy Risk Classification: C DFG MAK Germ Cell Mutagen Category 5 Carcinogenicity: MAK-5, NIC = TLV-A3
Proprietary Alkyl Alcohol		50	NE	100 50 (skin) [vacated 1989 PEL]	NE	50	NE	1600	DFG MAKs: TWA = 0.5 PEAK = 1•MAK, 15 min., average value, 1-hr interval, 4 per shift DFG MAK Pregnancy Risk Classification: C
Proprietary Glycol		NE	NE	NE	NE	NE	NE	NE	AIHA WEEL: TWA = 10 mg/m ³
Water	7732-18-5	NE	NE	NE	NE	NE	NE	NE	NE
Nitrogen	7727-37-9	There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.							

NE = Not Established.

NIC = Notice of Intended Change

See Section 16 for Definitions of Terms Used.

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132) or equivalent 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 exposure limits listed in this section, if applicable. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the Canadian CSA Standard Z94.4-93. 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 OSHA's Respiratory Protection Standard (1910.134-1998). The following are NIOSH respiratory protection equipment guidelines for some components:

PROPRIETARY ALIPHATIC ALCOHOL

RESPIRATORY PROTECTION

Up to 3300 ppm: Any Supplied-Air Respirator (SAR), or any Self-Contained Breathing Apparatus (SCBA) 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 appropriate escape-type, SCBA.

PROPRIETARY ALKYL ALCOHOL

RESPIRATORY PROTECTION

CONCENTRATION

Up to 500 ppm: Any Chemical Cartridge Respirator with organic vapor cartridge(s), or any Supplied-Air Respirator (SAR).
 Up to 1250 ppm: Any SAR operated in a continuous-flow mode, or any Powered, Air-Purifying Respirator (PAPR) with organic vapor cartridge(s).
 Up to 1600 ppm: 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 PAPR, or any Self-Contained Breathing Apparatus (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.

EYE PROTECTION: Splash goggles or safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133 and the Canadian CSA Standard Z94.3-M1982, *Industrial Eye and Face Protectors*.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

HAND PROTECTION: Wear nitrile rubber gloves or solvex gloves for routine industrial use for routine industrial use. Use triple gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this MSDS. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.

BODY PROTECTION: Use body protection appropriate for task (e.g., coveralls or apron). If necessary, refer to the OSHA Technical Manual (Section VII: Personal Protective Equipment) or appropriate Standards of. 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-M1984, *Protective Footwear*.

9. PHYSICAL and CHEMICAL PROPERTIES

RELATIVE VAPOR DENSITY (air = 1): Not determined.

EVAPORATION RATE (n-BuAc = 1): < 1

SPECIFIC GRAVITY (water = 1): Not determined.

MELTING/FREEZING POINT: Not determined.

SOLUBILITY IN WATER: Soluble.

BOILING POINT: Not determined.

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

pH: Not determined.

ODOR THRESHOLD: Not determined.

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

APPEARANCE, ODOR AND COLOR: This product is a pink, odorless liquid packaged in a pressurized container with Nitrogen as a propellant gas.

HOW TO DETECT THIS SUBSTANCE (warning properties): The appearance and odor of this product may be a warning property in event of an accidental release.

10. STABILITY and REACTIVITY

STABILITY: This product is stable.

DECOMPOSITION PRODUCTS: Combustion: Carbon monoxide, carbon dioxide, sulfur oxides, hydrogen sulfide and nitrogen oxides. Hydrolysis: None known.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: This product would be incompatible with strong oxidizers, strong acids. Due to the presence of Propylene Glycol, this product may attack some plastics, such as chlorinated polyvinyl chloride (CPVC), polyvinyl chloride (PVC) and the polyester fiber Dacron.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Avoid exposure or contact to ignition sources, extreme temperatures, and incompatible chemicals.

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

11. TOXICOLOGICAL INFORMATION



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 defined as follows:

INHALATION: Overexposure to this product by inhalation may cause irritation of the respiratory system. Symptoms may include difficulty breathing or cough. In addition, inhalation overexposures to vapors, mists or sprays from this product can cause central-nervous system effects (dizziness, drowsiness, nausea, and headaches).

CONTACT WITH SKIN or EYES: Vapors of this product can irritate the eyes. This product will cause immediate pain, tearing and irritation in contact with the eyes, causing redness and tearing. Brief contact with the skin may be moderately irritating. Prolonged or repeated skin overexposures can cause dermatitis and defatting of the skin, causing dry, red, itchy skin and contact dermatitis, due to the presence of the Proprietary Pepper Derivative.

SKIN ABSORPTION: Components of this product can be absorbed through intact skin. If a large area of the skin is involved, symptoms of skin absorption may include central nervous system depression as described under "Inhalation".

INGESTION: Ingestion is not anticipated to be a significant route of overexposure for this product in an occupational setting and due to aerosol form. If ingestion occurs through poor hygiene or other method, irritation of the mouth, throat, esophagus and other tissues of the digestive system may occur. Symptoms of ingestion may include vomiting, abdominal pain, burning diarrhea and nausea. Ingestion may also lead to symptoms of depression of the central nervous system, as described under "Inhalation". Liver and kidney damage may occur.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM			
HEALTH HAZARD	(BLUE)	2	
FLAMMABILITY HAZARD	(RED)	3	
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

11. TOXICOLOGICAL INFORMATION (Continued)

INJECTION: Injection is not anticipated to be a significant route of overexposure for this product. Injection of this product (via puncture with a contaminated object) can cause pain and irritation in addition to the wound.

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

ACUTE: Overexposures to this product can moderately to severely irritate contaminated eyes, and moderately irritate the skin, respiratory systems and mucous membranes. Inhalation and ingestion overexposure can cause depression of the central nervous system.

CHRONIC: Prolonged or repeated skin exposures can cause dermatitis (dry, red skin).

TARGET ORGANS: ACUTE: Respiratory system, skin and eyes. **CHRONIC:** Skin.

TOXICITY DATA: The following toxicology data are available for components in greater than 1% composition.

PROPRIETARY PEPPER COMPOUND:

Standard Draize Test (Skin-Human) 1%/30 minutes: Mild
TDLo (Oral-Human) 5.7 µg/kg: Endocrine: hyperglycemia;
Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Biochemical: Metabolism (Intermediary): other carbohydrates
Standard Draize Test (Eye-Guinea Pig) 1 mg: Mild
Standard Draize Test (Eye-Guinea Pig) 0.09 mg/8 days-intermittent
LD₅₀ (Skin-Mouse) > 512 mg/kg
LD₅₀ (Oral-Mouse) 47,200 µg/kg
LD₅₀ (Intraperitoneal-Rat) 9500 µg/kg: Behavioral: convulsions or effect on seizure threshold, excitement, muscle contraction or spasticity
LD₅₀ (Intraperitoneal-Rat) 10.4 mg/kg
LD₅₀ (Intraperitoneal-Mouse) 6.5 mg/kg
LD₅₀ (Intraperitoneal-Mouse) 6500 µg/kg: Behavioral: convulsions or effect on seizure threshold, excitement muscle contraction or spasticity
LD₅₀ (Intraperitoneal-Hamster) > 120 mg/kg
LD₅₀ (Intraperitoneal-Guinea Pig) 1100 µg/kg: Behavioral: convulsions or effect on seizure threshold, excitement, muscle contraction or spasticity
LD₅₀ (Intraperitoneal-Guinea Pig) 1.1 mg/kg
LD₅₀ (Intraperitoneal-Rabbit) > 50 mg/kg
LD₅₀ (Subcutaneous-Mouse) 9000 µg/kg: Behavioral: convulsions or effect on seizure threshold, excitement, muscle contraction or spasticity
LD₅₀ (Intravenous-Mouse) 400 µg/kg
LD₅₀ (Intramuscular-Mouse) 7800 µg/kg: Behavioral: convulsions or effect on seizure threshold, excitement, muscle contraction or spasticity
LD₅₀ (Intratracheal-Mouse) 1600 µg/kg: Behavioral: convulsions or effect on seizure threshold, excitement, muscle contraction or spasticity
LD₅₀ (Intratracheal-Mouse) 1.6 mg/kg
LD₅₀ (Rectal-Mouse) > 218 mg/kg
TDLo (Oral-Rat) 5 mg/kg: Gastrointestinal: other changes, Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
TDLo (Oral-Mouse) 800 mg/kg/2 days-intermittent: Related to Chronic Data: death
TDLo (Oral-Mouse) 3318 mg/kg/5 weeks-continuous: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Gastrointestinal: tumors
TDLo (Skin-Mouse) 10.87 mg/kg/30 minutes: Sense Organs and Special Senses (Ear): effect, not otherwise specified; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
TDLo (Skin-Mouse) 0.1 pph: Behavioral: changes in psychophysiological tests; Immunological Including Allergic: decreased immune response
TDLo (Skin-Mouse) 4 mg/kg: Skin and Appendages: dermatitis, irritative (after systemic exposure); Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
TDLo (Skin-Mouse) 5 mg/kg: Behavioral: analgesia
TDLo (Skin-Monkey) 1222 gm/m³: Behavioral: convulsions or effect on seizure threshold
TDLo (Subcutaneous-Rat) 6.4 µg/kg: Peripheral Nerve and Sensation: sensory change involving peripheral nerve; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
TDLo (Subcutaneous-Rat) 120 µg/kg: Behavioral: changes in psychophysiological tests; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
TDLo (Subcutaneous-Rat) 1 mg/kg: Vascular: BP lowering not characterized in autonomic section; Vascular: measurement of regional blood flow; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol)
TDLo (Subcutaneous-Rat) 125 mg/kg/3 days-intermittent: Vascular: measurement of regional blood flow; Gastrointestinal: other changes; Biochemical: Metabolism (Intermediary): other
TDLo (Subcutaneous-Rat) 2400 mg/kg/2 weeks-intermittent: Behavioral: food intake (animal); Nutritional and Gross Metabolic: weight loss or decreased weight gain

PROPRIETARY PEPPER COMPOUND (continued):

TDLo (Subcutaneous-Rat) 1222 ng/kg: Peripheral Nerve and Sensation: sensory change involving segmental distribution
TDLo (Subcutaneous-Rat) 100 mg/kg/2 days-intermittent: Cardiac: changes in heart weight; Vascular: BP elevation not characterized in autonomic section, structural changes in vessels
TDLo (Subcutaneous-Rat) 100 mg/kg/2 days-intermittent: Kidney/Ureter/Bladder: changes in blood vessels or in circulation of kidney
TDLo (Subcutaneous-Rat) 100 mg/kg/3 days-intermittent: Lungs, Thorax, or Respiration: other changes, Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
TDLo (Subcutaneous-Mouse) 12.2 µg/kg: Peripheral Nerve and Sensation: sensory change involving segmental distribution
TDLo (Subcutaneous-Mouse) 16 µg/kg: Behavioral: changes in psychophysiological tests
TDLo (Subcutaneous-Guinea Pig) 1222 ng/kg: Peripheral Nerve and Sensation: sensory change involving segmental distribution
TDLo (Subcutaneous-Monkey) 0.02 mg/kg: Peripheral Nerve and Sensation: sensory change involving peripheral nerve
TDLo (Intraperitoneal-Rat) 240 mg/kg/2 days-intermittent: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): other proteins, Metabolism (Intermediary): effect on inflammation or mediation of inflammation
TDLo (Intraperitoneal-Rat) 50 mg/kg: Cardiac: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: other Enzymes; Biochemical: Metabolism (Intermediary): other proteins
TDLo (Intravenous-Rat) 5 µg/kg: Lungs, Thorax, or Respiration: respiratory depression
TDLo (Intravenous-Mouse) 306 µg/kg: Behavioral: alteration of operant conditioning; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
TDLo (Intravenous-Guinea Pig) 306 ng/kg: Lungs, Thorax, or Respiration: bronchiolar constriction
TDLo (Intravenous-Guinea Pig) 3 mg/kg/10 minutes: Endocrine: other changes
TDLo (Intracerebral-Rat) 304 µg/kg: Gastrointestinal: alteration in gastric secretion
TDLo (Intracerebral-Mammal-Species Unspecified) 15.2 µg/kg: Gastrointestinal: nausea or vomiting
TDLo (Ocular-Rat) 12 µg/kg: Sense Organs and Special Senses (Eye): effect, not otherwise specified
TDLo (Intraarterial-Dog) 1.71 µg/kg: Vascular: measurement of regional blood flow
LDLo (Intravenous-Cat) 1600 µg/kg
TCLo (Inhalation-Mouse) 4.3 mg/m³/10 minutes: Lungs, Thorax, or Respiration: sputum, other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
TCLo (Inhalation-Guinea Pig) 9.17 gm/m³/6 minutes: Lungs, Thorax, or Respiration: cough
Sister Chromatid Exchange (Human Cells-Not Otherwise Specified) 30 µmol/L/3 hours
Sister Chromatid Exchange (Human Cells-Not Otherwise Specified) 50 µmol/L/3 hours
Mutation in Microorganisms (Bacteria-*Salmonella typhimurium*) 10 µg/plate
Mutation in Microorganisms (Hamster-Lung) 5 mg/L
Micronucleus Test (Intraperitoneal-Mouse) 7500 µg/kg
Micronucleus Test (Human Cells-Not Otherwise Specified) 50 µmol/L/3 hours
DNA Inhibition (Intraperitoneal-Mouse) 1800 µg/kg
Sister Chromatid Exchange (Intraperitoneal-Mouse) 93,120 µg/kg/32 days-intermittent
Mutation in Mammalian Somatic Cells (Oral-Rat) 42 mg/kg/5 weeks
Specific Locus Test (Mouse Cells-Not Otherwise Specified) 18 mg/L/4 hours
Specific Locus Test (Mouse Cells-Not Otherwise Specified) 65 mg/L/4 hours
PROPRIETARY ALIPHATIC ALCOHOL:
Standard Draize Test (Skin-rabbit) 400 mg: Mild
Standard Draize Test (Skin-rabbit) 20 mg/24 hours: Moderate

PROPRIETARY ALIPHATIC ALCOHOL (continued):

Standard Draize Test (Eye-rabbit) 500 mg: Severe
Standard Draize Test (Eye-rabbit) 500 mg/24 hours: Mild
Standard Draize Test (Eye-rabbit) 100 mg/4 seconds: Moderate
LC₅₀ (Inhalation-Rat) 20000 ppm/10 hours
LC₅₀ (Inhalation-Mouse) 39 gm/m³/4 hours
LD₅₀ (Oral-Rat) 7060 mg/kg
LD₅₀ (Oral-Mouse) 3450 mg/kg
LD₅₀ (Oral-Rabbit) 6300 mg/kg
LD₅₀ (Oral-Guinea Pig) 5560 mg/kg
LD₅₀ (Intraperitoneal-Rat) 3600 µg/kg
LD₅₀ (Intraperitoneal-Hamster) 5068 mg/kg
LD₅₀ (Intraperitoneal-Rabbit) 963 mg/kg
LD₅₀ (Intraperitoneal-Guinea Pig) 3414 mg/kg
LD₅₀ (Intraperitoneal-Species Unspecified) 4300 mg/kg
LD₅₀ (Intravenous-Rat) 1440 mg/kg
LD₅₀ (Intravenous-Mouse) 1973 mg/kg
LD₅₀ (Intraarterial-Rat) 11 mg/kg
LD₅₀ (Subcutaneous-Mouse) LD₅₀: 8285 mg/kg
TDLo (Oral-Man) 3371 µL/kg: altered sleep time, excitement, coma
TDLo (Oral-Man) 700 mg/kg
TDLo (Oral-Man) 50 mg/kg: Gastrointestinal: alteration in gastric secretion, other changes
TDLo (Oral-Man) 1430 µg/kg: Behavioral: changes in motor, ataxia, antipsychotic
TDLo (Oral-woman) 256 gm/kg/12 weeks: Behavioral: hallucinations, distorted perceptions; Endocrine: effect on menstrual cycle
TDLo (Oral-Child) 14400 mg/kg/30 minutes-intermittent: coma, dyspnea, nausea or vomiting
TDLo (Oral-Woman) 41 gm/kg: female 41 week(s) after conception: Effects on Newborn: Apgar score (human only), other neonatal measures or effects, drug dependence
TDLo (Oral-Woman) 250 mg/kg: female 37 week(s) after conception: Effects on Embryo or Fetus: other effects to embryo
TDLo (Intravenous-Woman) 8 gm/kg female 32 week(s) after conception: Effects on Newborn: Apgar score (human only), other neonatal measures or effects
TDLo (Oral-Rat) 1825 gm/kg/1 years-continuous: Liver: fatty liver degeneration, changes in liver weight, weight loss or decreased weight gain
TDLo (Oral-mouse) 320 mg/kg/50 weeks-intermittent: Tumorigenic: equivocal tumorigenic agent
TDLo (Rectal-Mouse) 120 gm/kg/18 weeks-intermittent: Tumorigenic: equivocal tumorigenic agent
LDLo (Oral-Child) 2 gm/kg
LDLo (Oral-Human) 1400 mg/kg
LDLo (Subcutaneous-Human) 19440 mg/kg: Behavioral: convulsions or effect on seizure threshold, coma; body temperature decrease
LDLo (Oral-Dog) 5500 mg/kg
LDLo (Oral-Cat) 6 mg/kg
LDLo (Intraperitoneal-Dog) 3 gm/kg
LDLo (Subcutaneous-Rabbit) 20 gm/kg
LDLo (Subcutaneous-Dog) 6 gm/kg
LDLo (Subcutaneous-Pigeon) 5 gm/kg
LDLo (Subcutaneous-Chicken) 5 gm/kg
LDLo (Subcutaneous-Frog) 7100 mg/kg
LDLo (Intravenous-Dog) 1600 mg/kg
LDLo (Intravenous-Cat) 3945 mg/kg
LDLo (Skin-Rabbit) 20 mg/kg
LCLo (Inhalation-Guinea Pig) 21900 ppm
LDLo (Intravenous-Chicken) 8216 mg/kg: Vascular: other changes
LDLo (Parenteral-Frog) 36 gm/kg
Mutation in Microorganisms (Salmonella typhimurium) 11 pph
Mutation in Microorganisms (Escherichia) 140 gm/L
Mutation in Microorganisms (Aspergillus nidulans) 20 pph
Mutation in Microorganisms (Saccharomyces cerevisiae) 24 pph
DNA Repair (Escherichia coli) 5 mg/well
Sex Chromosome Loss and Non-disjunction (Oral-Drosophila melanogaster) 10 pph
Cytogenetic Analysis (Human-Lymphocyte) 1160 gm/L
Cytogenetic Analysis (Human-Fibroblast) 12000 ppm
Cytogenetic Analysis (Human-Leukocyte) 1 pph/72 hours-continuous

11. TOXICOLOGICAL INFORMATION (Continued)

TOXICITY DATA (continued):

PROPRIETARY ALIPHATIC ALCOHOL (continued):

Cytogenetic Analysis (Parenteral-Grasshopper) 500 mmol/L
DNA Inhibition (Human-Lymphocyte) 220 mmol/L
Sister Chromatid Exchange (Human-Lymphocyte) 500 ppm/72 hours-continuous
Mutation Test Systems (Intraperitoneal-Rat) 250 mg/kg/16 days-continuous

PROPRIETARY ALKYL ALCOHOL:

LDLo (Oral-Human) 428 mg/kg
TDLo (Eye-Human) 72.5 mg/m³: Sense Organs and Special Senses (Eye): conjunctive irritation
LC₅₀ (Inhalation-Rat) 19,200 mg/m³/4 hours
LC₅₀ (Inhalation-Mouse) 15,500 mg/m³/2 hours
LC₅₀ (Inhalation-Rabbit) 2630 mg/m³/4 hours
LC₅₀ (Inhalation-Guinea Pig) 19,900 mg/m³/4 hours
LD₅₀ (Oral-Rat) 2460 mg/kg
LD₅₀ (Oral-Mouse) 3500 mg/kg
LD₅₀ (Oral-Rabbit) 74.1 mg/kg
LD₅₀ (Skin-Rabbit) 3400 mg/kg
LD₅₀ (Intraperitoneal-Rat) 720 mg/kg
LD₅₀ (Intraperitoneal-Mouse) 544 mg/kg: Liver: other changes
LD₅₀ (Intraperitoneal-Mouse) 544 mg/kg
LD₅₀ (Intraperitoneal-Rabbit) 323 mg/kg
LD₅₀ (Intraperitoneal-Guinea Pig) 1201 mg/kg
LD₅₀ (Intraperitoneal-Hamster) 1401 mg/kg
LD₅₀ (Intravenous-Rat) 340 mg/kg
LD₅₀ (Intravenous-Mouse) 417 mg/kg
LDLo (Oral-Rabbit) 3750 mg/kg: Behavioral: general anesthetic
LDLo (Oral-Rabbit) 3750 mg/kg
LDLo (Intravenous-Cat) 180 mg/kg
TDLo (Oral-Rat) 29 mg/kg/71 weeks-intermittent: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Skin and Appendages: tumors; Blood: leukemia

PROPRIETARY ALKYL ALCOHOL (continued):

TDLo (Oral-Rat) 93 mg/kg/13 weeks-intermittent: Behavioral: somnolence (general depressed activity); Nutritional and Gross Metabolic: changes in potassium; Related to Chronic Data: death
TDLo (Oral-Rat) 9 mg/kg/78 weeks-intermittent: Tumorigenic: carcinogenic by RTECS criteria; Gastrointestinal: tumors; Liver: tumors
LCLo (Inhalation-Rat) 8000 ppm/4 hours
TCLo (Inhalation-Rat) 0.5 mg/m³/122 days-continuous: Lungs, Thorax, or Respiration: other changes; Liver: other changes; Nutritional and Gross Metabolic: weight loss or decreased weight gain
TCLo (Inhalation-Rat) 1500 ppm/6 hours/2 weeks-intermittent: Brain and Coverings: other degenerative changes; Lungs, Thorax, or Respiration: dyspnea
TCLo (Inhalation-Mammal-Species Unspecified) 15.7 mg/m³/4 hours: Brain and Coverings: other degenerative changes; Liver: multiple effects; Endocrine: evidence of thyroid hyperfunction
Mutation in Microorganisms 25,000 ppm
PROPRIETARY GLYCOL:
Skin Irritancy (human) = 500 mg/7 days; mild
Skin Irritancy (human) = 104 mg/3 days/intermittent; moderate
Skin Irritancy (man) = 10%/2 days
TDLo (oral, child) = 79 g/kg/56 weeks/intermittent; Central nervous system effects, BRN
TDLo (parenteral, infant) = 10 g/kg/3 days/continuous; Systemic effects
LD₅₀ (oral, rat) = 20 g/kg
LD₅₀ (intraperitoneal, rat) = 6660 mg/kg
LD₅₀ (subcutaneous, rat) = 22,500 mg/kg

PROPRIETARY GLYCOL (continued):

LD₅₀ (intramuscular, rat) = 14 g/kg
LD₅₀ (oral, mouse) = 22 g/kg
LD₅₀ (intraperitoneal, mouse) = 9718 mg/kg
LD₅₀ (subcutaneous, mouse) = 17,370 mg/kg
LD₅₀ (intravenous, mouse) = 6630 mg/kg
LD₅₀ (oral, rabbit) 18500 mg/kg
LD₅₀ (skin, rabbit) = 20800 mg/kg
LD₅₀ (intravenous, rabbit) = 6500 mg/kg
LDLo (intramuscular, rabbit) = 6300 mg/kg: Behavioral: somnolence (general depressed activity); Behavioral: coma; Lungs, Thorax, or Respiration: respiratory stimulation
LD₅₀ (oral, dog) = 22 g/kg
LD₅₀ (intravenous, dog) = 26 g/kg
LD₅₀ (oral, guinea pig) = 18350 mg/kg
LDLo (subcutaneous, guinea pig) = 15500 mg/kg
LD₅₀ (oral, quail) > 2080 mg/kg
LDLo (intravenous, chicken) = 27 g/kg; Vascular: other changes
TCLo (inhalation, rat) = 2180 mg/m³/6 hours/90 days/intermittent; Behavioral: food intake (animal); Endocrine: changes in spleen weight; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: dehydrogenases
TDLo (intraperitoneal, mouse) = 100 mg/kg/15 days preg; Teratogenic effects
TDLo (intraperitoneal, mouse) = 100 mg/kg/11 days preg; Reproductive effects
Eye Irritancy (rabbit) = 100 mg; mild
Eye Irritancy (rabbit) = 500 mg/24 hours; mild
DNA Inhibition (subcutaneous, mouse) = 8000 mg/kg
Cytogenetic Analysis (subcutaneous, mouse) = 8000 mg/kg
Cytogenetic Analysis (fibroblast, hamster) = 32 g/L

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

PROPRIETARY ALIPHATIC ALCOHOL: ACGIH TLV-A4 (Not Suspected as a Human Carcinogen); Notice of Intended Change: ACGIH TLV-A3 (Confirmed Animal Carcinogen with Unknown Relevance to Humans); MAK-5 (Substances with Carcinogenic and Genotoxic Potential, the potency of which is considered to be so low that, provided the MAK value is observed, no significant contribution to human cancer risk is to be expected).

The remaining components of this product are not found on the following lists: U.S. EPA, U.S. NTP, U.S. OSHA, U.S. NIOSH, GERMAN MAK, IARC, or ACGIH and therefore are neither considered to be nor suspected to be cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: The liquid or vapors of this product are moderately to severely irritating to the eyes and moderately irritating to skin and respiratory system.

SENSITIZATION TO THE PRODUCT: No component of this product is known to cause human skin or respiratory sensitization.

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. Mutagenic data in microorganisms exist for the Proprietary Aliphatic Alcohol component of this product. Animal mutation data are available for the Proprietary Aliphatic Alcohol component of this product. These data were obtained from studies specific animal tissues exposed to high concentrations of this compound.

Embryotoxicity: The Proprietary Aliphatic Alcohol component of this product is reported to have embryotoxic effects in humans. These data are considered to be related to alcohol consumption.

Teratogenicity: The Proprietary Aliphatic Alcohol component of this product is reported to have teratogenic effects in humans. These data are considered to be related to alcohol consumption.

Reproductive Toxicity: The Proprietary Aliphatic Alcohol component of this product has other reported reproductive toxicity data in humans. These data are considered to be related to alcohol consumption.

*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.*

ACGIH BIOLOGICAL EXPOSURE INDICES: Currently, no information is available as to whether there are ACGIH Biological Exposure Indices (BEIs) determined for the components of this product.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

MOBILITY: This product has not been tested for mobility in soil. Due to high level of solvents and water, it is expected to be highly mobile in soil. The following information is available for the main components of this product.

PROPRIETARY ALIPHATIC ALCOHOL:

Using a structure estimation method based on molecular connectivity indices, the Koc for this compound can be estimated to be 1. According to a classification scheme, this estimated Koc value suggests that this material is expected to have very high mobility in soil.

PROPRIETARY ALKYL ALCOHOL:

The Koc of this compound is estimated as 62, using a log Kow of 0.76 and a regression-derived equation. According to a classification scheme, this estimated Koc value suggests that this material is expected to have high mobility in soil

PROPRIETARY PEPPER COMPOUND:

The Koc of this compound is estimated as 1,100, using a log Kow of 3.04 and a regression-derived equation. According to a classification scheme, this estimated Koc value suggests that this material is expected to have low mobility in soil.

PROPRIETARY GLYCOL:

The Koc of this compound is estimated as 8, using a log Kow of -0.92 and a regression-derived equation. According to a classification scheme, this estimated Koc value suggests that Proprietary Glycol is expected to have very high mobility in soil.

12. ECOLOGICAL INFORMATION (Continued)

PERSISTENCE AND BIODEGRADABILITY: This product has not been tested for persistence or biodegradability. It is expected that some biodegradation will occur to this product; however, no specific information is known. The following information is available for the main components of this product.

PROPRIETARY ALIPHATIC ALCOHOL:

If released to the atmosphere, an extrapolated vapor pressure of 59.3 mm Hg at 25°C indicates that this compound will exist solely in the vapor phase. Vapor phase material is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 5 days. If released to soil, this compound is expected to have very high mobility based upon an estimated Koc of 1. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 5X10⁻⁶ atm-cu m/mole. This compound may also volatilize from dry soils based upon its vapor pressure. Biodegradation is expected to occur rapidly in the environment based on numerous screening tests using different types of inocula and incubation periods. This compound was degraded with half-lives on the order of a few days using microcosms constructed with a low organic sandy soil and groundwater, indicating it is unlikely to be persistent in the environment. If released into water, this material is not expected to adsorb to suspended solids and sediment based upon the estimated Koc. Volatilization from water surfaces is expected to be an important fate process based upon this compound's Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 3 and 39 days, respectively. An estimated BCF of 3 suggests the potential for bioconcentration in aquatic organisms is low. Hydrolysis and photolysis in sunlight surface waters are not expected since this compound lacks functional groups that are susceptible to hydrolysis or photolysis under environmental conditions.

PROPRIETARY ALKYL ALCOHOL:

If released to air a vapor pressure of 10.4 mm Hg at 25°C indicates this compound will exist solely as a vapor in the ambient atmosphere. Vapor-phase material 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 56 hours. If released to soil, this compound is expected to have high mobility based upon an estimated Koc of 62. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 9.78X10⁻⁶ atm-cu m/mole. This compound may volatilize from dry soil surfaces based upon its vapor pressure. The biodegradation half-life of this material was 2.4 days in a basic soil and 11.3 days in an acidic soil. If released into water, this compound is not expected to adsorb to suspended solids and sediment in water based upon the estimated Koc. Volatilization from water surfaces is expected to be an important environmental fate process based upon this compound's Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 2 and 27 days, respectively. In a river die-away test, this compound achieved 58% of its theoretical BOD in 5 days, suggesting biodegradation will be an important fate process in water. Hydrolysis is not expected to be an important environmental fate process since this compound lacks functional groups that hydrolyze under environmental conditions.

PROPRIETARY PEPPER COMPOUND:

If released to air, an estimated vapor pressure of 1.3X10⁻⁸ mm Hg at 25°C indicates this compound will exist solely in the particulate phase in the atmosphere. Particulate-phase material will be removed from the atmosphere by wet and dry deposition. This material does not contain chromophores that absorb at wavelengths > 290 nm and therefore is not expected to be susceptible to direct photolysis by sunlight. If released to soil, this compound is expected to have low mobility based upon an estimated Koc of 1,100. Volatilization from moist soil and water surfaces is not expected to be an important fate process based upon an estimated Henry's Law constant of 1.0X10⁻¹³ atm-cu m/mole. This compound is not expected to volatilize from dry soil surfaces based upon its vapor pressure. Biodegradation data were not available. If released into water, this material is expected to adsorb to suspended solids and sediment based upon the estimated Koc. Hydrolysis is not expected to be an important environmental fate process since this compound lacks functional groups that hydrolyze under environmental conditions.

PROPRIETARY GLYCOL:

Based on a classification scheme, an estimated Koc value of 8, determined from a log Kow of -0.92 and a regression-derived equation, indicates that this compound is expected to have very high mobility in soil. Volatilization of this material from moist soil surfaces is not expected to be an important fate process given an estimated Henry's Law constant of 1.3X10⁻⁸ atm-cu m/mole, derived from its vapor pressure, 0.13 mmHg, and water solubility, 1X10⁺⁶ mg/liter. This compound is not expected to volatilize from dry soil surfaces based upon its vapor pressure. Laboratory experiments using agricultural soils from South Carolina conducted at 22°C and a fortification of 1,000 ppm this material, yielded 73-78% mineralization during a 51 day incubation period, suggesting that biodegradation will be an important fate process in soils. Based on a classification scheme, an estimated Koc value of 8, determined from a log Kow of -0.92 and a regression-derived equation, indicates that this compound is not expected to adsorb to suspended solids and sediment. Volatilization from water surfaces is not expected based upon an estimated Henry's Law constant of 1.3X10⁻⁸ atm-cu m/mole, derived from its vapor pressure, 0.13 mmHg, and water solubility, 1X10⁺⁶ mg/L. Numerous screening studies using wastewater or sewage inoculum as seed, suggests that this material will be degraded readily under aqueous environments. According to a model of gas/particle partitioning of semi-volatile organic compounds in the atmosphere, Proprietary Glycol, which has a vapor pressure of 0.13 mmHg at 25°C, is expected to exist solely as a vapor in the ambient atmosphere. Vapor-phase material is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 32 hours, calculated from its rate constant of 1.2X10⁻¹¹ cu cm/molecule-sec at 25°C

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

PROPRIETARY ALIPHATIC ALCOHOL:

An estimated BCF of 3 was calculated for this compound, using a log Kow of -0.31 and a regression-derived equation. According to a classification scheme, this BCF suggests the potential for bioconcentration in aquatic organisms is low.

PROPRIETARY ALKYL ALCOHOL:

An estimated BCF of 3 was calculated for this compound, using a log Kow of 0.76 and a regression-derived equation. According to a classification scheme, this BCF suggests the potential for bioconcentration in aquatic organisms is low.

PROPRIETARY PEPPER COMPOUND:

An estimated BCF of 43 was calculated for this material, using a log Kow of 3.04 and a regression-derived equation. According to a classification scheme, this BCF suggests the potential for bioconcentration in aquatic organisms is high, provided the compound is not metabolized by the organism.

PROPRIETARY GLYCOL:

An estimated BCF of 3 was calculated for this compound, using a log Kow of -0.92 and a regression-derived equation. According to a classification scheme, this BCF suggests the potential for bioconcentration in aquatic organisms is low.

EFFECT OF MATERIAL ON PLANTS OR ANIMALS: This product may be harmful or fatal to contaminated plant and animal-life (especially if large quantities are released).

EFFECT OF CHEMICAL ON AQUATIC LIFE: This product has not been tested for aquatic toxicity. This product may be harmful or fatal to contaminated aquatic plant and animal life. The following aquatic toxicity data are available for the main components:

PROPRIETARY ALIPHATIC ALCOHOL:

LC₅₀ (*Palaemonetes pugio*, grass shrimp) = 250 µg/L/ 96 hours
LC₅₀ (*Salmo gairdneri*, rainbow trout) = 13,000 mg/L/ 96 hours
LC₅₀ (*Pimephales promelas*, fathead minnow) = 15.3 mg/L/ 96 hours
EC₅₀ (*Pimephales promelas*, fathead minnow) = 12.9 mg/L/ 96 hours
LC₅₀ (*Pimephales promelas*, fathead minnow) = 14.2 mg/L/ 96 hours
IC₁₀ (*Scenedesmus subspicatus*, algae) = 18,400 mg/L; inhibition of fluorescence
IC₁₀ (*Scenedesmus subspicatus*, algae) = 400 mg/L; growth inhibition
IC₁₀ (Ribulose-P2-carboxylase in protoplasts) = 11,500 mg/L; inhibition of enzyme activity
EC₅₀ (*Photobacterium*) = 32,000 mg/L/ 5 minutes
LC₅₀ (*Artemia salina*) = 24,000 mg/L/ 24 hours
LC₅₀ (*Streptocephalus proboscideus*) = 19,000 mg/L/ 24 hours
LC₅₀ (*Daphnia magna*) = 11,000 mg/L/ 24 hours
LC₅₀ (*Brachionus calyciflorus*) = 30,000 mg/L/ 24 hours

PROPRIETARY ALIPHATIC ALCOHOL (continued):

LD₅₀ (creek chub) = 7,000 mg/L/ 24 hours
LD₁₀₀ (creek chub) = 9,000 mg/L/ 24 hours
LC₅₀ (fingerling trout) = 11,200 mg/L/ 24 hours
LC₅₀ (*Semotilus atromaculatus*, creek chub) > 7,000 mg/L/ 24 hours
LC₅₀ (*Poecilia reticulata*, guppy) = 11,050 ppm/ 7 days
LC₅₀ (*Alburnus alburnus*, bleak) = 11,000 mg/L/ 96 hours
LC₅₀ (*Nitocra spinipes*) = 7,750 mg/L/ 96 hours
EC₅₀ (*Pseudomonas putida*, bacteria) = 6,500 mg/L/ 16 hours
EC₅₀ (*Microcystis aeruginosa*, algae) = 1,450 mg/L/ 8 days
EC₅₀ (*Scenedesmus quadricauda*, green algae) = 5,000 mg/L/ 7 days
EC₅₀ (*Entosiphon sulcatum*, protozoa) = 65 mg/L/ 72 hours
EC₅₀ (*Uronema parduczi* Chatton-Lwoff, protozoa) = 6,120 mg/L
PROPRIETARY ALKYL ALCOHOL:
LC₅₀ (goldfish) 96 hours = 2030 mg/L
LC₅₀ (water flea) 24 hours = 1220 mg/L
LC₅₀ (water flea) 48 hours = 1190 mg/L
LC₅₀ (*Daphnia magna*) 48 hours = 1439 mg/L
LC₅₀ (water flea (*Ceriodaphnia reticulata*)) 48 hours = 1200 mg/L
LC₅₀ (mosquito fish) 96 hours = 1800 mg/L
LC₅₀ (channel catfish) 96 hours = 1460 mg/L

PROPRIETARY ALKYL ALCOHOL (continued):

LC₅₀ (bluegill) 96 hours = 1600 mg/L
LC₅₀ (rainbow trout) 96 hours = 1330 mg/L
LC₅₀ (*Pimephales promelas* fathead minnow) 96 hours = 96 hours = 1510 mg/L
LC₅₀ (*Pimephales promelas* fathead minnows) 96 hours = 1430 g/L (95% confidence limits 1370-1490 g/L); age 30 days old, water hardness 47.8 mg/L (CaCO₃), temp 25.7°C, pH 7.58, dissolved oxygen 6.2 mg/L, alkalinity 40.9 mg/L (CaCO₃)
LC₅₀ (*Orconectes immunis* crayfish) 96 hours = 949 mg/L
LC₅₀ (*Rana catesbeiana* bullfrog) 96 hours = 3010 mg/L
LC₅₀ (*Xenopus laevis* clawed toad) 48 hours = 18.3 mg/L
LC₅₀ (midge) 48 hours = 2090 mg/L
Toxicity Threshold (Cell Multiplication Inhibition Test) (*Entosiphon sulcatum* protozoa) 295 mg/L
Toxicity Threshold (Cell Multiplication Inhibition Test) (*Scenedesmus quadricauda* green algae) 350 mg/L
Toxicity Threshold (Cell Multiplication Inhibition Test) (*Microcystis aeruginosa* algae) 290 mg/L
Toxicity Threshold (Cell Multiplication Inhibition Test) (*Uronema parduczi* Chatton-Lwoff protozoa) 169 mg/L

ENVIRONMENTAL EXPOSURE CONTROLS: Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

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.

PRECAUTIONS TO BE FOLLOWED DURING WASTE HANDLING: Wear proper protective equipment when handling waste materials. Dispose of in accordance with applicable Federal, State, and local procedures and standards.

U.S. EPA WASTE NUMBER: Wastes of this product should be tested to see if it meets criteria for waste characteristic ignitability (D001).

14. TRANSPORTATION INFORMATION

This product has been tested per ASTM D 3065 'Standard Method for Flammability of Aerosol Product' and produced no flame under test conditions.

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

PROPER SHIPPING NAME:	Consumer commodity
HAZARD CLASS NUMBER and DESCRIPTION:	ORM-D
UN IDENTIFICATION NUMBER:	Not Applicable
PACKING GROUP:	Not Applicable
DOT LABEL(S) REQUIRED:	Not Applicable
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2008):	171
MARINE POLLUTANT:	The components of this product are not designated by the Department of Transportation to be Marine Pollutants (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 (see Section 9.1 of the TDG for all requirements).

PROPER SHIPPING NAME:	Consumer commodity (nitrogen)
HAZARD CLASS NUMBER and DESCRIPTION:	Class 2.2 (Non-Flammable Gas)
UN IDENTIFICATION NUMBER:	UN 1956
PACKING GROUP:	Not Applicable
HAZARD LABEL(S) REQUIRED:	Class 2.2 (Non-Flammable Gas)
MARINE POLLUTANT:	Not Applicable
SPECIAL PROVISIONS:	None
EXPLOSIVE LIMIT & LIMITED QUANTITY INDEX:	0.125 (SOR/2002-306)
ERAP INDEX:	None
PASSENGER CARRYING SHIP INDEX:	None
PASSENGER CARRYING ROAD OR RAIL VEHICLE INDEX:	75

NOTE: When the gross mass of an accumulation of limited quantities offered for transport by one consignor to one destination is greater than 500 kg, the consignor must give to the carrier a document that includes the words "Limited Quantity" or "quantité limitée", the abbreviation "Ltd. Qty." or "quant. Itée" or the words "Consumer Commodity" or "bien de consommation". **SOR/2003-273.**

For Shipment by air within Canada, mark the words "Air Transport, 12.8, Consumer commodity" or "Transport aérien, 12.8, produit de consommation" in letters at least 25 mm high and in a colour that contrasts with the background colour of the means of containment; and **SOR/2003-273**

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA): This product is classified as dangerous goods under the rules of IATA.

UN IDENTIFICATION NUMBER:	UN 8000
PROPER SHIPPING NAME:	Consumer commodity
HAZARD CLASS NUMBER and DESCRIPTION:	9 (Miscellaneous Hazardous Material)
PACKING GROUP:	Not Applicable
HAZARD LABEL(S) REQUIRED:	Class 9 (Miscellaneous)
PASSENGER & CARGO AIRCRAFT PACKING INSTRUCTION:	910
PASSENGER & CARGO AIRCRAFT MAXIMUM NET QUANTITY/PKG:	25 kg
CARGO AIRCRAFT ONLY PACKING INSTRUCTION:	910
CARGO AIRCRAFT ONLY MAXIMUM NET QUANTITY/PKG:	25 kg
SPECIAL PROVISIONS:	A112
ERG CODE:	9L

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: The components of this product are not subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.

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.

15. REGULATORY INFORMATION (Continued)

ADDITIONAL U.S. REGULATIONS (continued):

U.S. CERCLA REPORTABLE QUANTITY (RQ): Proprietary Alkyl Alcohol = 5000 lb (2270 kg)

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

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): The Proprietary Aliphatic Alcohol is on the California Proposition 65 lists when consumed as an alcoholic beverage, but not as an industrial chemical. The components of this product are not listed on the California Proposition 65 lists.

ANSI LABELING (Z129.1): **DANGER! FLAMMABLE LIQUID UNDER PRESSURE. KEEP AWAY FROM CHILDREN. IF RELEASED IN LARGE QUANTITY, REDUCES OXYGEN AVAILABLE FOR BREATHING. CAUSES SKIN AND EYE IRRITATION. HARMFUL IF INHALED, BY SKIN ABSORPTION OR INGESTION. MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS. ASPIRATION HAZARD - INGESTION CAN CAUSE LIFE-THREATENING LUNG DAMAGE. MAY CAUSE HARMFUL EFFECT OR DAMAGE TO LIVER, BASED ON ANIMAL DATA FOR COMPONENTS.** Keep away from heat, sparks and flame. Avoid breathing gas, vapor, or mists. Avoid contact with skin or clothing. Use only with adequate ventilation. Keep container closed. Wash thoroughly after handling. Wear gloves and goggles. **FIRST-AID:** In case of contact, immediately flush skin or eyes for at least 20 minutes with large amounts of water. If inhaled, move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If ingested, do not induce vomiting. Get medical attention immediately. **IN CASE OF FIRE:** Use fog, foam, dry chemical or carbon dioxide. Liquid will float and may re-ignite on the surface of water. **IN CASE OF SPILL:** Absorb spill with inert material and place in suitable container. Refer to Material Safety Data Sheet for additional information on this product.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are listed on the DSL Inventory.

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 A:** Compressed Gas **Class B6:** Flammable Aerosol

Class D2A/B: Materials Causing Other Toxic Effects- Acute and Chronic Toxic Effects



16. OTHER INFORMATION

PREPARED BY:

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

DEFINITIONS OF TERMS

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

CAS #: This is the Chemical Abstract Service Number that uniquely identifies each constituent.

EXPOSURE LIMITS IN AIR:

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

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

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

IDLH-Immediately Dangerous to Life and Health: This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury.

LOQ: Limit of Quantitation.

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.

EXPOSURE LIMITS IN AIR (continued):

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 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;

DEFINITIONS OF TERMS (Continued)

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

HEALTH HAZARD (continued): 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 coarse dusts that may burn rapidly but that generally do not form explosive atmospheres; Solid materials in a fibrous or shredded form that may burn rapidly and create flash fire hazards (e.g. cotton, sisal, hemp; Solids and semisolids that readily give off flammable vapors.); **3** (Serious Hazard-Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures, or, unaffected by ambient temperature, are readily ignited under almost all conditions, including: Liquids having a flash point below 22.8°C [73°F] and having a boiling point at or above 38°C [100°F] and below 37.8°C [100°F] [e.g. OSHA Class IB and IC]; Materials that on account of their physical form or environmental conditions can form explosive mixtures with air and are readily dispersed in air [e.g., dusts of combustible solids, mists or droplets of flammable liquids]; Materials that burn extremely rapidly, usually by reason of self-contained oxygen [e.g. dry nitrocellulose and many organic peroxides]); **4** (Severe Hazard-Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air, and which will burn readily, including: Flammable gases; Flammable cryogenic materials; Any liquid or gaseous material that is liquid while under pressure and has a flash point below 22.8°C [73°F] and a boiling point below 37.8°C [100°F] [e.g. OSHA Class IA; Material that ignite spontaneously when exposed to air at a temperature of 54.4°C [130°F] or below [e.g. pyrophoric].

PHYSICAL HAZARD: 0 (Water Reactivity: Materials that do not react with water. *Organic Peroxides:* Materials that are normally stable, even under fire conditions and will not react with water. *Explosives:* Substances that are Non-Explosive. *Unstable Compressed Gases:* No Rating. *Pyrophorics:* No Rating. *Oxidizers:* No "0" rating allowed. *Unstable Reactives:* Substances that will not polymerize, decompose, condense or self-react.); **1** (Water Reactivity: Materials that change or decompose upon exposure to moisture. *Organic Peroxides:* Materials that are normally stable, but can become unstable at high temperatures and pressures. These materials may react with water, but will not release energy. *Explosives:* Division 1.5 & 1.6 substances that are very insensitive explosives or that do not have a mass explosion hazard. *Compressed Gases:* Pressure below OSHA definition. *Pyrophorics:* No Rating. *Oxidizers:* Packaging Group III; *Solids:* any material that in either concentration tested, exhibits a mean burning time less than or equal to the mean burning time of a 3:7 potassium bromate/cellulose mixture and the criteria for Packing Group I and II are not met. *Liquids:* any material that exhibits a mean pressure rise time less than or equal to the pressure rise time of a 1:1 nitric acid (65%)/cellulose mixture and the criteria for Packing Group I and II are not met. *Unstable Reactives:* Substances that may decompose, condense or self-react, but only under conditions of high temperature and/or pressure and have little or no potential to cause significant heat generation or explosive hazard. Substances that readily undergo hazardous polymerization in the absence of inhibitors.); **2** (Water Reactivity: Materials that may react violently with water. *Organic Peroxides:* Materials that, in themselves, are normally unstable and will readily undergo violent chemical change, but will not detonate. These materials may also react violently with water. *Explosives:* Division 1.4 – Explosive substances where the explosive effect are largely confined to the package and no projection of fragments of appreciable size or range are expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package. *Compressed Gases:* Pressurized and meet OSHA definition but < 514.7 psi absolute at 21.1°C (70°F) [500 psig]. *Pyrophorics:* No Rating. *Oxidizers:* Packaging Group II *Solids:* any material that, in either 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:* Packaging 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. *Oxidizers:* *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. **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 up flash point of the solvent. Most ordinary combustible materials. **2** Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not under normal conditions form hazardous atmospheres with air, but under high ambient temperatures or under moderate heating could release vapor in sufficient quantities to produce hazardous atmospheres with air: Liquids having a flash point at or above 37.8°C (100°F) and below 93.4°C (200°F) (i.e. Class II and Class IIIA liquids.) Solid materials in the form of powders or coarse dusts of representative diameter between 420 microns (40 mesh) and 2 mm (10 mesh) that burn rapidly but that generally do not form explosive mixtures in air. Solid materials in fibrous or shredded form that burn rapidly and create flash fire hazards, such as cotton, sisal and hemp. Solids and semisolids that readily give off flammable vapors. Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **3** Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions: Liquids having a flash point below 22.8°C (73°F) and having a boiling point at or above 37.8°C (100°F) and those liquids having a flash point at or above 22.8°C (73°F) and below 37.8°C (73°F) and below 37.8°C (100°F) (i.e. Class IB and IC liquids). Materials that, on account of their physical form or environmental conditions, can form explosive mixtures with air and are readily dispersed in air. Flammable or combustible dusts with a representative diameter less than 420 microns (40 mesh). Materials that burn with extreme rapidity, usually by reason of self-contained oxygen (e.g. dry nitrocellulose and many organic peroxides). Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **4** Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and will burn readily: Flammable gases. Flammable cryogenic materials. Any liquid or gaseous materials that is liquid while under pressure and has a flash point below 22.8°C (73°F) and a boiling point below 37.8°C (100°F) (i.e. Class IA liquids). Materials that ignite when exposed to air. Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent.

DEFINITIONS OF TERMS (Continued)

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 **TDL_o**, the lowest dose to cause a symptom and **TCL_o** 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. **ERAP:** Emergency Response Assistance Plan under Transport Canada regulations. ERAP or ERP) are required by the TDG Regulations for certain very harmful dangerous goods that necessitate special expertise and response equipment. The plans are intended to assist local emergency responders by providing them with technical experts and specialized equipment at an accident site. **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/NDSL**); 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.