

# 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): **FLIP-OUT®**  
CHEMICAL NAME/CLASS: Inorganic Salt Mixture  
SYNONYMS: None Allocated  
U.N. NUMBER: Not Applicable  
U.N. DANGEROUS GOODS CLASS/SUBSIDIARY RISK: None Allocated  
HAZCHEM CODE (AUSTRALIA): None Allocated  
POISONS SCHEDULE NUMBER (AUSTRALIA): None Allocated  
PRODUCT USE: Water Purification  
SUPPLIER/MANUFACTURER'S NAME: APi  
U.S. ADDRESS: 880 Jupiter Park Dr. Suite 14  
Jupiter, FL 33458  
U.S. BUSINESS PHONE: 561-743-0449  
U.S. EMERGENCY PHONE: CHEMTEL: 1-800-255-3924 (Domestic)  
1-813-248-0585 (International)  
DATE OF PREPARATION: February 20, 2000  
DATE OF REVISION: February 27, 2007

### 2. COMPOSITION and INFORMATION ON INGREDIENTS

#### EU LABELING/CLASSIFICATION:

EU CLASSIFICATION: Xn: Harmful. Xi: Irritant.

EU RISK PHRASES: R: 22; R: 36/37/38; R: 41; R: 42/43 (See Section 15 for details on classification)

CHEMICAL NAME	CAS #	EINECS #	% w/v	EU CLASSIFICATION FOR COMPONENTS
Proprietary Compound #1	Proprietary		30-60%	HAZARD CLASSIFICATION: O (Oxidizing); Xn (Harmful); Xi (Irritant) RISK PHRASES: R: 8; R: 22; R: 36/37/38; R: 42/43
Proprietary Compound #2	Proprietary		10-40%	HAZARD CLASSIFICATION: Xi (Irritant) RISK PHRASES: R: 41
Proprietary Compound #3	Proprietary		5-15%	HAZARD CLASSIFICATION: Xn (Harmful); Xi (Irritant) RISK PHRASES: R: 22; R: 36
Proprietary Compound #4	Proprietary		5-15%	HAZARD CLASSIFICATION: Xi (Irritant) RISK PHRASES: R: 36
Proprietary Compound #5	Proprietary		5-15%	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Proprietary Compound #6	Proprietary		1-10%	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Proprietary Compound #7	Proprietary		1-10%	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Proprietary Compound #7	Proprietary		1-5%	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Other components which are 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 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, EU Directives, Australian Worksafe.

### 3. HAZARD IDENTIFICATION

**EMERGENCY OVERVIEW:** This is a white, crystalline, odorless solid. **Health Hazards:** The product may be mildly to moderately irritating upon prolonged contact. This product contains a respiratory and skin sensitizer and can cause allergic reaction in susceptible individuals. **Flammability Hazards:** This material is not flammable. This product contains an oxidizer (the Potassium Persulfate); care should be taken to avoid exposing this substance to combustible materials. **Reactivity Hazards:** Heat may be generated when this product is added to water. Opening sealed containers of wetted product may result in inhalation of significant amounts of toxic gases. Pressurized containers of wetted product also have the potential to rupture. **Environmental Hazards:** This product is may be harmful or fatal to terrestrial animals, contaminated plants, and aquatic lifeforms. **Emergency Response:** Emergency responders must wear proper personal protective equipment for the incident to which they are responding.

### 3. HAZARD IDENTIFICATION (Continued)

#### 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:** If dusts or particulates of this product are inhaled, symptoms of exposure may include breathing difficulty, irritation of the mucus membranes, coughing, nasal congestion, and a sore throat. Damage to the tissues of the respiratory system may occur, especially after prolonged exposures to high dust concentrations of this product.

**CONTACT WITH SKIN or EYES:** Contact with the eyes will cause moderate to severe irritation, pain, reddening, watering. Prolonged eye contact with high concentrations of this product may result in tissue damage and blindness. Depending on the duration of skin contact, skin overexposures may cause reddening, discomfort, and moderate irritation. The Proprietary Compound #1 component is a skin sensitizer; prolonged or repeated contact with this product may result in the development of dermatitis, rashes, and other allergic skin reactions.

**SKIN ABSORPTION:** Skin absorption is not a significant route of over-exposure for any component of this product.

**INGESTION:** Ingestion is not anticipated to be a likely route of occupational exposure to this product. If ingestion does occur, moderate to severe irritation of the mouth, throat, esophagus, and other tissues of the digestive system may occur. Symptoms of such over-exposure can include nausea, vomiting, diarrhea. If swallowed, this product may produce quantities of carbon dioxide and other gases which can cause severe damage by physical pressure. Ingestion of large volumes of this product may be fatal.



**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 severe irritation, in addition to the wound.

#### HEALTH EFFECTS OR RISKS FROM EXPOSURE (An explanation in lay terms).

**ACUTE:** Depending on the duration of contact, over-exposures can mildly to moderately irritate the eyes, skin, mucous membranes, and any other exposed tissue. Severe, prolonged eye contact may result in blindness. If inhaled, irritation of the respiratory system may occur, with coughing and breathing difficulty. Severe ingestion over-exposures may be fatal.

**CHRONIC:** The Proprietary Compound #1 component is a skin sensitizer; prolonged or repeated contact with this product may result in the development of dermatitis, rashes, and other allergic skin reactions. Refer to Section 11 (Toxicology Information) for additional information on this product's components.

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

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM			
HEALTH HAZARD	(BLUE)	2*	
FLAMMABILITY HAZARD	(RED)	0	
PHYSICAL HAZARD	(YELLOW)	1	
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

## 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 develops. Rescuers should be taken for medical attention, if necessary. Take a copy of label and MSDS to health professional with victim.

**SKIN EXPOSURE:** If this product contaminates the skin and irritation develops, begin decontamination with running water. The minimum flushing time is 15 minutes for situations in which irritation occurs. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Contaminated individuals must seek medical attention if any adverse effect continues after flushing.

**EYE EXPOSURE:** If dusts or particulates of 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 15 minutes. Contaminated individuals must seek medical attention if any adverse effect continues after flushing.

**INHALATION:** If dusts or particulates of this product are inhaled, remove victim to fresh air. Have the contaminated individual blow nose.

**INGESTION:** If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, do not induce vomiting. Victim should drink milk, egg whites, or large quantities of water. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Acute or chronic skin conditions or disorders involving the "Target Organs" (see Section 3, "Hazard Identification") may be aggravated by overexposure to dusts of this product.

**RECOMMENDATIONS TO PHYSICIANS:** Treat symptoms and eliminate overexposure.

## 5. FIRE-FIGHTING MEASURES

**FLASH POINT:** Not available.

**AUTOIGNITION TEMPERATURE:** Not flammable.

**FLAMMABLE LIMITS (in air by volume, %):**

**Lower (LEL):** Not applicable.

**Upper (UEL):** Not applicable.

**FIRE EXTINGUISHING MATERIALS:**

**Water Spray:** YES

**Foam:** YES

**Halon:** YES

**Carbon Dioxide:** YES

**Dry Chemical:** YES

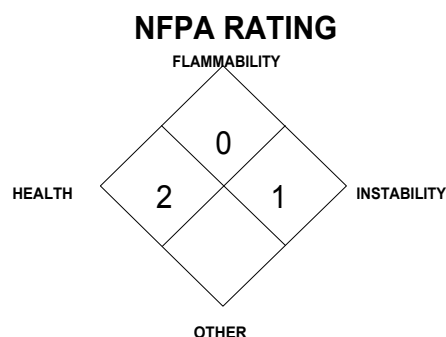
**Other:** Any "ABC" Class.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** This product is a potential irritant and may present a contact hazard to firefighters. When involved in a fire, this material may decompose and produce irritating vapors and toxic gases (e.g., sulfur oxides). This product contains an oxidizer (the Potassium Sulfate); care should be taken to avoid exposing this substance to combustible materials.

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

**Explosion Sensitivity to Static Discharge:** Not sensitive.

**SPECIAL FIRE-FIGHTING PROCEDURES:** Prevent the spread of any released product to combustible objects. Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move containers from fire area if it can be done without risk to 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.



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

## 6. ACCIDENTAL RELEASE MEASURES

**RELEASE RESPONSE:** Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area and protect people. For small releases (e.g., 2 pound release), clean-up spilled solid wearing gloves, goggles, and suitable body protection. The minimum Personal Protective Equipment recommended for response to non-incident releases (e.g., 300 pound release) should be Level C: triple-gloves (rubber gloves, nitrile gloves over latex gloves), chemical resistant suit and boots, hard-hat, and an air-purifying respirator (with high efficiency particulate filter). Level B, which includes a Self-Contained Breathing Apparatus, must be worn when oxygen levels are below 19.5% or unknown. Sweep-up or vacuum spilled solid. Triple-rinse area with water. Place all spill residue in a suitable container. Dispose of in accordance with applicable U.S. Federal, State, or local procedures, or the appropriate standards of Canada, Australia, and 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 using this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing dusts generated by this product. Use in a well-ventilated location. Wipe-down area routinely to avoid the accumulation of dusts of this product. Remove contaminated clothing immediately.

**STORAGE AND HANDLING PRACTICES:** All employees who handle this material should be trained to handle it safely. Keep container tightly closed when not in use. Store containers in a cool, dry location, away from direct sunlight, or sources of intense heat. Material should be stored in secondary containers. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). Store containers away from wood, cardboard boxes, and other combustible materials. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Do not seal a container into which wetted product has been placed. The wetted product will generate toxic gases (e.g., sulfur compounds). If this reaction occurs in a sealed container, there will be a build-up of pressure, which can result in an inhalation exposure to a significant level of toxic substances upon opening the container. Additionally, there is the potential for the pressurized container to rupture. Empty containers may contain residual particulates; therefore, empty containers should be handled with care. Never store food, feed, or drinking water in containers which held 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, or the appropriate standards of Canada, Australia, and EU Member States.

## 8. EXPOSURE CONTROLS - PERSONAL PROTECTION

**VENTILATION AND ENGINEERING CONTROLS:** Use with adequate ventilation to ensure exposure levels are maintained below the limits provided below, if applicable. Ensure eyewash/safety shower stations are 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 mg/m <sup>3</sup>	STEL mg/m <sup>3</sup>	TWA mg/m <sup>3</sup>	STEL mg/m <sup>3</sup>	TWA mg/m <sup>3</sup>	STEL mg/m <sup>3</sup>	IDLH mg/m <sup>3</sup>	
Proprietary Compound #6	10043-01-3	NE	NE	NE	NE	NE	NE	NE	NE
Proprietary Compound #3, fume	12125-02-9	10	20	10 (vacated 1989 PEL)	20 (vacated 1989 PEL)	10	25	NE	NE
Proprietary Compound #4	10043-52-4	NE	NE	NE	NE	NE	NE	NE	NE
Proprietary Compound #7	64-02-8	NE	NE	NE	NE	NE	NE	NE	NE
Proprietary Compound #1	7727-21-1	0.1	NE	NE	NE	NE	NE	NE	NE
Proprietary Compound #5	144-55-8	NE	NE	NE	NE	NE	NE	NE	NE
Proprietary Compound #2	7681-38-1	NE	NE	NE	NE	NE	NE	NE	NE
Proprietary Compound #7 Exposure limits are for borate compounds, inorganic	12179-04-3	2 (inhal. fract.)	6 (inhal. fract.)	10 (vacated 1989 PEL)	NE	NE	NE	NE	Carcinogen: TLV-A4
Other components which are each present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).		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 and Canadian Workplace Hazardous Materials Identification System Standards, European Council Directives, and Australian WorkSafe Regulations.							

NE = Not Established. See Section 16 for Definitions of Terms Used.

**INTERNATIONAL OCCUPATIONAL EXPOSURE LIMITS:** Currently the following international exposure limits are in place for The components of this product. Values given may not be the most current; individual country lists should be consulted to determine most current values available.

#### PROPRIETARY COMPOUND #6:

Australia: TWA = 2 mg(Al)/m<sup>3</sup>, JAN 1993  
 Belgium: TWA = 2 mg(Al)/m<sup>3</sup>, JAN 1993  
 France: VME = 2 mg(Al)/m<sup>3</sup>, JAN 1993  
 Norway: TWA = 2 mg(Al)/m<sup>3</sup>, JAN 1999  
 Russia: TWA = 0.5 mg(Al)/m<sup>3</sup>, STEL = 2 mg(Al)/m<sup>3</sup>, JUN 2003  
 Sweden: NGV = 2 mg(Al)/m<sup>3</sup>, JAN 1999  
 Switzerland: MAK-W = 2 mg(Al)/m<sup>3</sup>, JAN 1999  
 In Argentina, Bulgaria, Colombia, Jordan, Korea, New Zealand, Singapore, Vietnam check ACGIH TLV

#### PROPRIETARY COMPOUND #3:

Australia: TWA = 10 mg/m<sup>3</sup>, STEL = 20 mg/m<sup>3</sup> (fume), JAN 1993  
 Belgium: TWA = 10 mg/m<sup>3</sup>, STEL = 20 mg/m<sup>3</sup> (fume), JAN 1993

#### PROPRIETARY COMPOUND #3 (continued):

Denmark: TWA = 10 mg/m<sup>3</sup> (fume), OCT 2002  
 France: VME = 10 mg/m<sup>3</sup> (fume), JAN 1999  
 Mexico: TWA = 10 mg/m<sup>3</sup>, STEL = 20 mg/m<sup>3</sup> (fume), 2004  
 The Netherlands: MAC-TGG = 10 mg/m<sup>3</sup>, 2003  
 Poland: TWA = 10 mg/m<sup>3</sup>, STEL = 20 mg/m<sup>3</sup> (vapors and fumes), JAN 1999  
 Russia: STEL = 10 mg/m<sup>3</sup>, JUN 2003  
 United Kingdom: TWA = 10 mg/m<sup>3</sup>, STEL = 20 mg/m<sup>3</sup> (fume), 2005  
 In New Zealand, Singapore, Vietnam check ACGIH TLV

#### PROPRIETARY COMPOUND #4:

Russia: STEL = 2 mg/m<sup>3</sup>, Skin, JUN 2003

#### PROPRIETARY COMPOUND #1:

Denmark: TWA = 2 mg(S2O8)/m<sup>3</sup>, OCT 2002  
 The Netherlands: MAC-TGG = 1 mg/m<sup>3</sup>, 2003

#### PROPRIETARY COMPOUND #5:

Russia: STEL = 5 mg/m<sup>3</sup>, JUN 2003

#### PROPRIETARY COMPOUND #7:

Australia: TWA = 1 mg/m<sup>3</sup>, JAN 1993  
 Belgium: TWA = 1 mg/m<sup>3</sup>, JAN 1993  
 Denmark: TWA = 1 mg/m<sup>3</sup>, OCT 2002  
 France: VME = 1 mg/m<sup>3</sup>, JAN 1999  
 Mexico: TWA = 1 mg/m<sup>3</sup>, 2004  
 Norway: TWA = 1 mg/m<sup>3</sup>, JAN 1999  
 The Netherlands: MAC-TGG = 1 mg/m<sup>3</sup>, 2003  
 United Kingdom: TWA = 1 mg/m<sup>3</sup>, 2005  
 In Argentina, Bulgaria, Colombia, Jordan, Korea, New Zealand, Singapore, Vietnam check ACGIH TLV

**RESPIRATORY PROTECTION:** Maintain airborne contaminant concentrations below exposure limits listed in Section 2 (Composition and Information on Ingredients), if applicable. Dust masks should be worn if operations will generate excessive dusts or particulates. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, the European Standard EN 529:2005, and EU member states, or the Australian Standard 1716-Respiratory Protective Devices, the 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 OSHA's Respiratory Protection Standard (1910.134-1998).

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

**HAND PROTECTION:** Use rubber or neoprene gloves. 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 appropriate Standards of Canada, the European Standard CEN/TR 15419:2006 or the Australian Standard 2161-Industrial Safety Gloves and Mittens for further information.

## 8. EXPOSURE CONTROLS - PERSONAL PROTECTION

**BODY PROTECTION:** Use body protection appropriate for task. An apron, Tyvek suit, or other impermeable body protection is suggested if operations will generate excessive dusts. Full-body chemical protective clothing is recommended for emergency response procedures. If necessary, refer to the OSHA Technical Manual (Section VII: Personal Protective Equipment) or appropriate Standards of Canada, the European Standard CEN/TR 15419:2006 the 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

**RELATIVE VAPOR DENSITY (air = 1):** Not applicable.

**SPECIFIC GRAVITY (water = 1):** 2.48

**SOLUBILITY IN WATER:** Soluble.

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

**ODOR THRESHOLD:** Not applicable.

**COLOR:** White.

**VISCOSITY:** Not applicable.

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

**HOW TO DETECT THIS SUBSTANCE (warning properties):** The appearance may act as a distinguishing characteristic.

**EVAPORATION RATE (n-BuAc = 1):** Not applicable.

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

**BOILING POINT:** Not applicable.

**pH (solutions):** 5.7

**FORM:** Crystalline solid.

**ODOR:** Odorless.

**FLASH POINT:** Not applicable.

## 10. STABILITY and REACTIVITY

**STABILITY:** Stable.

**DECOMPOSITION PRODUCTS:** Products of thermal decomposition include ammonia, carbon oxides, sulfur oxides, and a variety of inorganic compounds containing potassium, sodium, calcium, and aluminum.

**MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:** Organic substances, strong acids, strong bases, powdered metal. This product contains an oxidizer (the Proprietary Compound #1 component); care should be taken to avoid exposing this substance to combustible materials.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS TO AVOID:** Avoid exposure or contact to incompatible chemicals and combustible materials.

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

## 11. TOXICOLOGICAL INFORMATION

**TOXICITY DATA:** Currently, the following toxicological data are available for the components of this product.

### ALUMINUM CHLORIDE:

Standard Draize Test (Eye-Rabbit) 10 mg/24 hours: Severe

LD<sub>50</sub> (Oral-Mouse) 6207 mg/kg

LD<sub>50</sub> (Intraperitoneal-Mouse) 274 mg/kg

LD<sub>50</sub> (Unreported-Rat) 410 mg/kg

LD<sub>50</sub> (Unreported-Mouse) 520 mg/kg

LD<sub>50</sub> (Unreported-Guinea Pig) 490 mg/kg

TDLo (Oral-Rat) 10,138 mg/kg/8 days-continuous: Kidney/Ureter/Bladder: other changes in urine composition; Nutritional and Gross Metabolic: changes in phosphorus

TDLo (Oral-Rat) 186 gm/kg/60 days-continuous: Liver: other changes; Biochemical: Metabolism (Intermediary): other proteins

TDLo (Oral-Rat) 564.2 gm/kg/0.5 years-continuous: Kidney/Ureter/Bladder: other changes; Biochemical: Metabolism (Intermediary): other proteins

TDLo (Oral-Rat) 29538 mg/kg/72 weeks-intermittent: Blood: normocytic anemia, changes in serum composition (e.g. TP, bilirubin, cholesterol); Nutritional and Gross Metabolic: changes in iron

TDLo (Oral-Mouse) 300 gm/kg/60 days-continuous: Liver: other changes; Biochemical: Metabolism (Intermediary): other proteins

TDLo (Oral-Mouse) 910 gm/kg/0.5 years-continuous: Kidney/Ureter/Bladder: other changes; Biochemical: Metabolism (Intermediary): other proteins

TDLo (Intraperitoneal-Rat) 1.1 gm/kg/13 weeks-intermittent: Blood: normocytic anemia, changes in serum composition (e.g. TP, bilirubin, cholesterol)

TDLo (Intraperitoneal-Mouse) 800 mg/kg: female 10-13 day(s) after conception: Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain), behavioral

TDLo (Intratesticular-Rat) 27,371 µg/kg: male 1 day(s) pre-mating: Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count), testes, epididymis, sperm duct

### ALUMINUM CHLORIDE (continued):

TDLo (Subcutaneous-Mouse) 27,371 µg/kg: male 30 day(s) pre-mating: Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count), testes, epididymis, sperm duct

Cytogenetic Analysis (Human-Lymphocyte) 20 mg/L

Cytogenetic Analysis (Oral-Rat) 762 mg/kg/7 days-continuous

Micronucleus Test (Human-Lymphocyte) 20 mg/L

Mutation Test Systems-Not Otherwise Specified (Human-Lymphocyte) 20 mg/L

Mutation Test Systems-Not Otherwise Specified (Oral-Rat) 762 mg/kg/7 days-continuous

Sister Chromatid Exchange (Human-Lymphocyte) 20 mg/L

### PROPRIETARY COMPOUND #3:

LDLo (Oral-Infant) 2 gm/kg: Cardiac: other changes

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

Standard Draize Test (Eye-Rabbit) 100 mg: Severe

LD<sub>50</sub> (Oral-Rat) 1650 mg/kg

LD<sub>50</sub> (Oral-Mouse) 1300 mg/kg

LD<sub>50</sub> (Intramuscular-Rat) 30 mg/kg

LD<sub>50</sub> (Unreported-Rat) 550 mg/kg

LD<sub>50</sub> (Intraperitoneal-Mouse) 485 mg/kg

LD<sub>50</sub> (Intravenous-Mouse) 358 mg/kg: Behavioral: convulsions or effect on seizure threshold, coma; Lungs, Thorax, or Respiration: respiratory stimulation

LDLo (Oral-Mammal-Domestic) 1500 mg/kg: Sense Organs and Special Senses (Eye): mydriasis (pupillary dilation); Behavioral: tremor; Lungs, Thorax, or Respiration: respiratory stimulation

LDLo (Oral-Rabbit) 0.005 gm/kg

LDLo (Oral-Dog) 0.02 gm/kg

LDLo (Subcutaneous-Mouse) 500 mg/kg

LDLo (Subcutaneous-Rabbit) 200 mg/kg

LDLo (Subcutaneous-Guinea Pig) 72 mg/kg

### PROPRIETARY COMPOUND #3 (continued):

LDLo (Intravenous-Rabbit) 78 mg/kg

LDLo (Intravenous-Guinea Pig) 220 mg/kg

LDLo (Intraperitoneal-Mouse) 250 mg/kg

LDLo (Intraperitoneal-Rat) 140 mg/kg

TDLo (Oral-Rat) 51,600 mg/kg/10 weeks-continuous:

Kidney/Ureter/Bladder: other changes in urine composition; Nutritional and Gross Metabolic: changes in calcium

TDLo (Oral-Rat) 56,100 mg/kg/170 days-intermittent: Endocrine: changes in spleen weight, changes in thyroid weight

TDLo (Oral-Rat) 35.3 gm/kg/4 weeks-continuous: Kidney/Ureter/Bladder: changes in kidney weight

TDLo (Oral-Rat) 52.9 gm/kg/6 weeks-continuous: Kidney/Ureter/Bladder: urine volume increased, other changes in urine composition; Nutritional and Gross Metabolic: changes in calcium

TDLo (Oral-Rat) 3500 mg/kg/1 week-continuous: Nutritional and Gross Metabolic: metabolic acidosis

TDLo (Oral-Rat) 29.4 gm/kg/4 weeks-continuous: Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Oral-Rat) 455 gm/kg/130 weeks-continuous: Endocrine: adrenal cortex hyperplasia

TDLo (Oral-Rat) 44.1 gm/kg/6 weeks-continuous: Kidney/Ureter/Bladder: other changes in urine composition; Nutritional and Gross Metabolic: changes in calcium, changes in phosphorus

TDLo (Oral-Rat) 556 gm/kg/78 weeks-continuous: Kidney/Ureter/Bladder: changes in tubules (including acute renal failure, acute tubular necrosis)

Cytogenetic Analysis (Hamster-Fibroblast) 400 mg/L

**PROPRIETARY COMPOUND #4:**

TDLo (Intravenous-Woman) 20 mg/kg/1 hour-continuous: Skin and Appendages: dermatitis, other (after systemic exposure); Nutritional and Gross Metabolic: changes in calcium

LD<sub>50</sub> (Oral-Rat) 1 gm/kg

## 11. TOXICOLOGICAL INFORMATION (Continued)

### TOXICITY DATA (continued):

#### PROPRIETARY COMPOUND #4 (continued):

LD<sub>50</sub> (Intraperitoneal-Rat) 264 mg/kg  
LD<sub>50</sub> (Intraperitoneal-Mouse) 600 mg/kg  
LD<sub>50</sub> (Intraperitoneal-Mouse) 210 mg/kg: Behavioral: somnolence (general depressed activity), convulsions or effect on seizure threshold, changes in motor activity (specific assay)  
LD<sub>50</sub> (Subcutaneous-Rat) 2630 mg/kg  
LD<sub>50</sub> (Subcutaneous-Mouse) 823 mg/kg  
LD<sub>50</sub> (Intramuscular-Rat) 25 mg/kg  
LD<sub>50</sub> (Oral-Mouse) 1940 mg/kg  
LD<sub>50</sub> (Oral-Rabbit) 1384 mg/kg  
LD<sub>50</sub> (Intravenous-Mouse) 42 mg/kg  
LD (Intraperitoneal-Mouse) 399.5 mg/kg  
LDLo (Oral-Rabbit) 1384 mg/kg  
LDLo (Intravenous-Rat) 161 mg/kg  
LDLo (Intravenous-Dog) 274 mg/kg  
LDLo (Intravenous-Cat) 249 mg/kg  
LDLo (Intravenous-Rabbit) 274 mg/kg  
LDLo (Intravenous-Guinea Pig) 150 mg/kg  
LDLo (Subcutaneous-Dog) 274 mg/kg  
LDLo (Subcutaneous-Cat) 249 mg/kg  
LDLo (Subcutaneous-Rabbit) 472 mg/kg  
LDLo (Subcutaneous-Frog) 666 mg/kg  
LDLo (Intraarterial-Guinea Pig) 300 mg/kg  
TCLo (Inhalation-Mammal-Species Unspecified) 43 mg/m<sup>3</sup>/4 hours/17 weeks-intermittent: Blood: change in clotting factors, changes in serum composition (e.g. TP, bilirubin, cholesterol); Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: catalyses  
TDLo (Oral-Rat) 2016 mg/kg/30 days-intermittent: Brain and Coverings: recordings from specific areas of CNS; Cardiac: pulse rate; Blood: changes in leukocyte (WBC) count  
TDLo (Oral-Rat) 112 gm/kg/20 weeks-continuous: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Endocrine: thyroid tumors  
TDLo (Intraduodenal-Dog) 555 mg/kg/1 hour: Gastrointestinal: alteration in gastric secretion  
TDLo (Intravenous-Dog) 39.95 mg/kg/15 minutes: Gastrointestinal: alteration in gastric secretion

#### PROPRIETARY COMPOUND #4 (continued):

TDLo (Intravenous-Rat) 300 mg/kg: Cardiac: arrhythmias (including changes in conduction)  
TDLo (Parenteral-Rat) 200 µg/kg: Cardiac: arrhythmias (including changes in conduction)  
Sex Chromosome Loss and Nondisjunction (Yeast-*Saccharomyces cerevisiae*) 200 mmol/L  
Unscheduled DNA Synthesis (Intraperitoneal-Rat) 2500 µmol/kg  
Cytogenetic Analysis (Rat-Ascites tumor) 3500 mg/kg  
**PROPRIETARY COMPOUND #7:**  
Standard Draize Test (Skin-Rabbit) 500 mg/24 hours: Moderate  
Standard Draize Test (Eye-Rabbit) 1900 µg  
Standard Draize Test (Eye-Rabbit) 100 mg/24 hours: Moderate  
LD<sub>50</sub> (Intraperitoneal-Mouse) 330 mg/kg: Kidney, Ureter, Bladder: changes in tubules (including acute renal failure, acute tubular necrosis)  
**PROPRIETARY COMPOUND #1:**  
LD<sub>50</sub> (Oral-Rat) 802 mg/kg  
**PROPRIETARY COMPOUND #2:**  
Mutation in Microorganisms (Microorganism-Not Otherwise Specified) 1000 ppm  
**PROPRIETARY COMPOUND #5:**  
Standard Draize Test (Skin-Human) 30 mg/3 days-intermittent: Mild  
TDLo (Oral-Infant) 1260 mg/kg: Lungs, Thorax, or Respiration: other changes; Kidney/Ureter/Bladder: urine volume increased; Nutritional and Gross Metabolic: changes in sodium  
TDLo (Oral-Man) 20 mg/kg/5 days-intermittent: Gastrointestinal: nausea or vomiting; Nutritional and Gross Metabolic: changes in potassium, metabolic acidosis  
Standard Draize Test (Eye-Rabbit) 100 mg/30 seconds: Mild  
LD<sub>50</sub> (Oral-Rat) 4220 mg/kg  
LD<sub>50</sub> (Oral-Mouse) 3360 mg/kg  
LC (Inhalation-Rat) > 900 mg/m<sup>3</sup>  
TDLo (Oral-Bird-Domestic) 350000 mg/kg/35 days-continuous: Gastrointestinal: other changes

#### PROPRIETARY COMPOUND #5 (continued):

TDLo (Oral-Bird-Domestic) 17,500 mg/kg/35 days-continuous: Blood: changes in erythrocyte (RBC) count; Nutritional and Gross Metabolic: changes in chlorine, changes in potassium  
TDLo (Oral-Bird-Domestic) 65,625 mg/kg/35 days-continuous: Kidney/Ureter/Bladder: other changes; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Related to Chronic Data: death  
TDLo (Oral-Bird-Domestic) 175,000 mg/kg/35 days-continuous: Behavioral: somnolence (general depressed activity), food intake (animal), fluid intake  
TDLo (Oral-Bird-Domestic) 175000 mg/kg/35 days-continuous: Cardiac: cardiomyopathy including infarction, other changes; Lungs, Thorax, or Respiration: other changes  
TDLo (Oral-Bird-Domestic) 175,000 mg/kg/35 days-continuous: Liver: other changes; Kidney/Ureter/Bladder: changes in blood vessels or in circulation of kidney, changes in both tubules and glomeruli  
TDLo (Oral-Bird-Domestic) 175000 mg/kg/35 days-continuous: Musculoskeletal: joints, other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation  
TDLo (Oral-Bird-Domestic) 350,000 mg/kg/35 days-continuous: Kidney/Ureter/Bladder: structural or functional changes in ureter, changes in kidney weight; Blood: changes in spleen  
TDLo (Intraperitoneal-Mouse) 40 mg/kg: female 7 day(s) after conception: Reproductive: Specific Developmental Abnormalities: other developmental abnormalities  
TCLo (Inhalation-Rat) 77,200 µg/kg/17 weeks: Cardiac: other changes; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Nutritional and Gross Metabolic: changes in sodium  
Unscheduled DNA Synthesis (Oral-Rat) 50,400 mg/kg/4 weeks-continuous  
**PROPRIETARY COMPOUND #7:**  
Standard Draize Test (Eye-Rabbit) 100 mg: Severe

**SUSPECTED CANCER AGENT:** The following components of this product are listed by agencies tracking the carcinogenic potential of chemical compounds, as follows:

**PROPRIETARY COMPOUND #7:** TLV-A4 (Not Classifiable as a Human Carcinogen)

The remaining components are not listed by agencies tracking the carcinogenic potential for chemical compounds 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, cancer-causing agents by these agencies.

**IRRITANCY OF PRODUCT:** This product can moderately to severely irritate to contaminated tissue.

**SENSITIZATION TO THE PRODUCT:** The Proprietary Compound #1 component is a skin and respiratory sensitizer; contact with this product may cause allergic skin and respiratory 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 which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An **embryotoxin** is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A **teratogen** is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A **reproductive toxin** is any substance which interferes in any way with the reproductive process.*

**ACGIH BIOLOGICAL EXPOSURE INDICES:** Currently, there are no ACGIH Biological Exposure Indices (BEIs) determined for this material.

## 12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

**ENVIRONMENTAL STABILITY:** Currently, there is no information on the stability of this product in the environment. Environmental data are available of the components of this product, as follows:

**PROPRIETARY COMPOUND #3:** Water solubility: 28.3% g/100 mL (0°C), 37.840 lb/100lb (70°F). The Proprietary Compound #3 can destroy food chain organisms and gamefish in natural waters. Threshold concentrations for fish = 0.5 ppm.

**PROPRIETARY COMPOUND #6:** Biological Half-Life: The mean plasma half-life of aluminum after iv administration in dogs is approximately 4.5 hr. Bioconcentration: A study was undertaken to assess the possibility of aluminum bioaccumulation (in rainbow trout). Trout tissues, plankton, and water were analyzed for total aluminum concentration.

**PROPRIETARY COMPOUND #4:** Water solubility = 74.5 g/100 cc at 20°C, 159g/ 100 cc at 100°C. Proprietary Compound #4 does not biodegrade or bioaccumulate.

## 12. ECOLOGICAL INFORMATION (Continued)

### ENVIRONMENTAL STABILITY (continued):

**PROPRIETARY COMPOUND #7:** Water solubility □ 103 g/mL; Water solubility □ 1000g/L (20°C), Biological Oxygen Demand = 20 mg O<sup>2</sup>/g product, Chemical Oxygen Demand = 575 mg O<sup>2</sup>/g product.

**PROPRIETARY COMPOUND #1:** Water Solubility = 4.7 g/100 cc water.

**EFFECT OF MATERIAL ON PLANTS or ANIMALS:** No specific data is available on the effect to plants and animals this product. If accidentally released, the product could harm plants and animals.

**EFFECT OF CHEMICAL ON AQUATIC LIFE:** No specific data is available on the effect of this product in an aquatic environment. If accidentally released to an aquatic environment, it could harm or kill aquatic life. The following aquatic toxicity data are available for some components of this product, as follows:

#### **PROPRIETARY COMPOUND #3:**

LC<sub>50</sub> (*Daphnia magna*) 24 hours = 202 mg/L  
LC<sub>50</sub> (*Daphnia magna*) 48 hours = 161 mg/L  
LC<sub>50</sub> (*Daphnia magna*) 72 hours = 67 mg/L  
LC<sub>50</sub> (*Daphnia magna*) 96 hours = 50 mg/L  
LC<sub>50</sub> (*Daphnia magna*) 100 hours = 139 mg/L  
LC<sub>50</sub> (*Lymnaea* sp. Snail egg) 24 hours = 241 mg/L  
LC<sub>50</sub> (*Lymnaea* sp. Snail egg) 48 hours = 173 mg/L  
LC<sub>50</sub> (*Lymnaea* sp. Snail egg) 72 hours = 73 mg/L  
LC<sub>50</sub> (*Lymnaea* sp. Snail egg) 96 hours = 70 mg/L  
LC<sub>50</sub> (*Lepomis macrochirus*) 24-96 hours = 725 mg/L  
LC<sub>50</sub> (*Carassius carassius*) 24 hours = 640 mg/L

#### **PROPRIETARY COMPOUND #6:**

LC<sub>50</sub> (*Salmo gairdneri*, Rainbow trout) = 0.05-0.5 mg/L; 24 hours  
LC<sub>60</sub> (water fleas) = 6 mg/L; 24 hours  
LC (Brook trout; fry) = 0.5 - 0.2 mg/L; 13 -15 days  
LC (Brook trout; larva) = 0.029 - 0.35 mg/L; 60 days  
NOEL (Brook trout; juvenile) = 0.088 - 0.168 mg/L; 30 days  
LC (Lake Whitefish; fry) = 0.1 mg/L; 12 days  
LC<sub>60</sub> (Walleyes) = 0.5 mg/L; 4 days

#### **PROPRIETARY COMPOUND #7:**

LC<sub>50</sub> (*Leuciscus Idus*) > 500 mg/L/ 96 hours  
LC<sub>50</sub> (Algae) = 10-100 mg/L/ 72 hours  
LC<sub>50</sub> (*Daphnae*) > 100 mg/L/ 24 hours

### SPECIFIC GERMAN ENVIRONMENTAL LISTINGS:

**Aquatic Hazard Class (WGK):** The components of this product have specific Hazard Classes, as denoted Below:

**PROPRIETARY COMPOUND #6:** WGK Class 1

**PROPRIETARY COMPOUND #3:** WGK Class 1

**PROPRIETARY COMPOUND #5:** WGK Class 0

**PROPRIETARY COMPOUND #4:** WGK Class 1

**PROPRIETARY COMPOUND #7:** WGK Class 2

**PROPRIETARY COMPOUND #1:** WGK Class 1

**PROPRIETARY COMPOUND #2:** WGK Class 1

**PROPRIETARY COMPOUND #7:** WGK: Class 4

## 13. DISPOSAL CONSIDERATIONS

**PREPARING WASTES FOR DISPOSAL:** Waste should be diluted with a great quantity of water treated with sodium carbonate and sodium sulfite and then can be poured to the sewer. Follow local regulations. Waste only contains a mixture of salts and cyanuric acid which is biodegradable. Disposal of dry product is by incineration mixing product with solvents. The incinerator should be provided with a washing system for chlorine combustion gases. Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations, those of Canada and its Provinces, as well as those applicable to the EU Member States or Australia. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.

**U.S. EPA WASTE NUMBER:** Not applicable.

**EUROPEAN EWC WASTE CODE:** Off-Specification Batches and Unused Product: 16 03 03: Inorganic Wastes Containing Dangerous Substances

## 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

**NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER, 2004:** Not applicable.

**MARINE POLLUTANT:** No component of this product is a marine pollutant, as designated by the US DOT, per Appendix B to 49 CFR 172.101.

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

**INTERNATIONAL MARITIME ORGANIZATION (IMO):** This product is not regulated as Dangerous Goods by the IMO.

**EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD**

(ADR): This product is not classified 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 classified as dangerous goods under Australian transportation standards.



## 15. REGULATORY INFORMATION

### ADDITIONAL U.S. REGULATIONS:

**U.S. SARA REPORTING REQUIREMENTS:** 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)
Proprietary Compound #6	No	No	Yes
Proprietary Compound #3	No	No	Yes

**U.S. SARA THRESHOLD PLANNING QUANTITY:** There are no specific Threshold Planning Quantities for 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):** Proprietary Compound #3 = 5000 lb (2270 kg); Proprietary Compound #6 = 5000 lb (2270 kg).

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

**OTHER U.S. FEDERAL REGULATIONS:** The regulations of the Federal Insecticide, Fungicide, and Rodenticide Act are applicable to this product.

**CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):** The components of this product not on the California Proposition 65 lists.

**ANSI LABELING (Z129.1):** **WARNING!** MAY BE HARMFUL OR FATAL IF SWALLOWED. CAUSES SKIN AND EYE IRRITATION. HARMFUL IF INHALED. MAY CAUSE SENSITIZATION AND ALLERGIC RESPIRATORY AND SKIN REACTIONS. CONTAINS OXIDIZING SUBSTANCES; PROLONGED CONTACT WITH COMBUSTIBLE MATERIALS MAY CAUSE FIRE. OPENING SEALED CONTAINERS OF WET PRODUCT MAY RESULT IN INHALATION EXPOSURES TO TOXIC GASES. SEALED CONTAINERS OF WET PRODUCT MAY RUPTURE. Do not taste or swallow. Do not get on skin or in eyes. Avoid breathing dusts or particulates. Keep container closed. Do not seal containers in which wet product has been placed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves, goggles, suitable body protection, and NIOSH-approved respiratory protection, as appropriate. Keep from contact with clothing and other combustible materials. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention, if necessary. **IN CASE OF FIRE:** Use water fog, dry chemical, CO<sub>2</sub>, or "alcohol" foam. **IN CASE OF SPILL:** Sweep-up or vacuum spilled material. Place residue in suitable container. Consult Material Safety Data Sheet for additional information.

### ADDITIONAL CANADIAN REGULATIONS:

**CANADIAN DSL/NDL INVENTORY STATUS:** Components of this product are listed on the DSL Inventory.

**OTHER CANADIAN REGULATIONS:** The labeling and use requirements of the Pest Control Products Act.

**CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS:** Components of this product are not on the CEPA Priorities Substances Lists.

**CANADIAN WHMIS CLASSIFICATION and SYMBOLS:** **Class D2B: Other Toxic Effects (Skin sensitization)**



### EUROPEAN UNION INFORMATION:

**EUROPEAN UNION INFORMATION FOR PRODUCT:** This product meets the definition of a dangerous substance, as defined by the European Community Council Directive 67/548/EEC. The information presented below is pertinent to the product. Caution: this preparation has not been fully tested.

#### EU LABELING AND CLASSIFICATION:

EU CLASSIFICATION: Harmful. Irritant. [Xn; Xi]

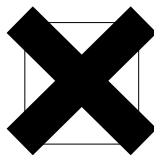
EU RISK PHRASES: [R: 22]: Harmful if swallowed. [R: 36/37/38]: Irritating to eyes, respiratory system and skin. [R: 41]: Risk of serious damage to the eyes. [R: 42/43]: May cause sensitization by inhalation and skin contact.

EU SAFETY PHRASES: [S: 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: 7]: Keep container tightly closed. [S: 8]: Keep container dry. [S: 20]: When using, do not eat or drink. [S: 22]: Do not breathe dust. [S:24/25]: Avoid contact with skin and eyes. [S: 26]: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. [S: 27]: Take off immediately all contaminated clothing. [S: 28]: After contact with skin, wash immediately with plenty of water. [S: 37/39]: Wear suitable gloves and eye/face protection. [S: 45]: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). [S: 62]: If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

## 15. REGULATORY INFORMATION (Continued)

### EUROPEAN UNION INFORMATION (continued):

#### EUROPEAN UNION ANNEX II HAZARD SYMBOL:



**EUROPEAN COMMUNITY INFORMATION FOR CONSTITUENTS:** The following information is available for primary constituents in the components of this product.

#### PROPRIETARY COMPOUND #3:

EU CLASSIFICATION: Harmful. Irritant. [Xn; Xi]

EU RISK PHRASES: [S: 22]: Harmful if swallowed. [S: 36]: Irritating to the eyes.

EU SAFETY PHRASES: [S: (2)-]: Keep out of reach of children.\* [S: 22]: Do not breathe dust.

#### PROPRIETARY COMPOUND #6:

EU CLASSIFICATION: An official classification for this substance has not been published in Commission Directives.

#### PROPRIETARY COMPOUND #4:

EU CLASSIFICATION: Irritant. [Xi]

EU RISK PHRASES: [R: 36]: Irritating to the eyes.

EU SAFETY PHRASES : [S: (2)-]: Keep out of reach of children.\* [S: 22]: Do not breathe dust. [S: 24]: Avoid contact with skin.

#### PROPRIETARY COMPOUND #7:

EU CLASSIFICATION: An official classification for this substance has not been published in Commission Directives.

#### PROPRIETARY COMPOUND #1:

EU CLASSIFICATION: [Xn]: Harmful. [O]: Oxidizer. [Xi]: Irritant.

EU RISK PHRASES: [R: 8]: Contact with combustible material may cause fire. [R: 22]: Harmful if swallowed. [R: 36/37/38]: Irritating to eyes, respiratory system and skin. [R: 42/43]: May cause sensitization by inhalation and skin contact.

EU SAFETY PHRASES : [S: (2)-]: Keep out of reach of children.\* [S: 22]: Do not breathe dust. [S: 24]: Avoid contact with skin. [S: 26]: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. [S: 37]: Wear suitable gloves.

#### PROPRIETARY COMPOUND #5:

EU CLASSIFICATION: An official classification for this substance has not been published in Commission Directives.

#### PROPRIETARY COMPOUND #2:

EU CLASSIFICATION: Irritant. [Xi]

EU RISK PHRASES: [R: 41]: Risk of serious damage to eyes.

EU SAFETY PHRASES : [S: (2)-]: Keep out of reach of children.\* [S: 24]: Avoid contact with skin. [S: 26]: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

#### PROPRIETARY COMPOUND #7:

EU CLASSIFICATION: An official classification for this substance has not been published in Commission Directives.

*\*This safety phrase can be omitted from the label when the substance or preparation is sold for industrial use only.*

### AUSTRALIAN INFORMATION FOR PRODUCT:

**AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES (AICS) STATUS:** Components of this product are listed on the AICS.

**LIST OF DESIGNATED SUBSTANCES:** The following hazard classification data have been selected for this product, based a review of the regulation [NOHSC: 10005 (1994)]:

CLASSIFICATION: Harmful. Irritant. [Xn; Xi]

RISK PHRASES: [R: 22]: Harmful if swallowed. [R: 36/37/38]: Irritating to eyes, respiratory system and skin. [R: 41]: Risk of serious damage to the eyes. [R: 42/43]: May cause sensitization by inhalation and skin contact.

SAFETY PHRASES: [S: 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: 7]: Keep container tightly closed. [S: 8]: Keep container dry. [S: 20]: When using, do not eat or drink. [S: 22]: Do not breathe dust. [S:24/25]: Avoid contact with skin and eyes. [S: 26]: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. [S: 27]: Take off immediately all contaminated clothing. [S: 28]: After contact with skin, wash immediately with plenty of water. [S: 37/39]: Wear suitable gloves and eye/face protection. [S: 45]: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). [S: 62]: If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

---

## 16. OTHER INFORMATION

#### PREPARED BY:

CHEMICAL SAFETY ASSOCIATES, Inc.  
PO Box 3519, La Mesa, CA 91944-3519  
800/441-3365

#### DATE OF PRINTING:

March 9, 2010

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. API 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, API 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:

**ACGIH** - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. **TLV** - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (**TWA**), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level (**C**). Skin absorption effects must also be considered.

**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.

**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 LD<sub>50</sub> Rat:* < 5000 mg/kg. *Dermal Toxicity LD<sub>50</sub>Rat or Rabbit:* < 2000 mg/kg. *Inhalation Toxicity 4-hrs LC<sub>50</sub> Rat:* < 20 mg/L;.

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

### HEALTH HAZARD (continued):

**1 (Slight Hazard:** Minor reversible injury may occur; slightly or mildly irritating. *Skin Irritation:* Slightly or mildly irritating. *Eye Irritation:* Slightly or mildly irritating. *Oral Toxicity LD<sub>50</sub> Rat:* > 500-5000 mg/kg. *Dermal Toxicity LD<sub>50</sub>Rat or Rabbit:* > 1000-2000 mg/kg. *Inhalation Toxicity LC<sub>50</sub> 4-hrs Rat:* > 2-20 mg/L); **2 (Moderate Hazard:** Temporary or transitory injury may occur. *Skin Irritation:* Moderately irritating; primary irritant; sensitizer. PII or Draize > 0, < 5. *Eye Irritation:* Moderately to severely irritating and/or corrosive; reversible corneal opacity; corneal involvement or irritation clearing in 8-21 days. Draize > 0, ≤ 25. *Oral Toxicity LD<sub>50</sub> Rat:* > 50-500 mg/kg. *Dermal Toxicity LD<sub>50</sub>Rat or Rabbit:* > 200-1000 mg/kg. *Inhalation Toxicity LC<sub>50</sub> 4-hrs Rat:* > 0.5-2 mg/L.); **3 (Serious Hazard:** Major injury likely unless prompt action is taken and medical treatment is given; high level of toxicity; corrosive. *Skin Irritation:* Severely irritating and/or corrosive; may destroy dermal tissue, cause skin burns, dermal necrosis. PII or Draize > 5-8 with destruction of tissue. *Eye Irritation:* Corrosive, irreversible destruction of ocular tissue; corneal involvement or irritation persisting for more than 21 days. Draize > 80 with effects irreversible in 21 days. *Oral Toxicity LD<sub>50</sub> Rat:* > 1-50 mg/kg. *Dermal Toxicity LD<sub>50</sub>Rat or Rabbit:* > 20-200 mg/kg. *Inhalation Toxicity LC<sub>50</sub> 4-hrs Rat:* > 0.05-0.5 mg/L.); **4 (Severe Hazard:** Life-threatening; major or permanent damage may result from single or repeated exposure. *Skin Irritation:* Not appropriate. Do not rate as a "4", based on skin irritation alone. *Eye Irritation:* Not appropriate. Do not rate as a "4", based on eye irritation alone. *Oral Toxicity LD<sub>50</sub> Rat:* ≤ 1 mg/kg. *Dermal Toxicity LD<sub>50</sub>Rat or Rabbit:* ≤ 20 mg/kg. *Inhalation Toxicity LC<sub>50</sub> 4-hrs Rat:* ≤ 0.05 mg/L).

### FLAMMABILITY HAZARD:

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

### PHYSICAL HAZARD:

**0 (Water Reactivity:** Materials that do not react with water. *Organic Peroxides:* Materials that are normally stable, even under fire conditions and will not react with water. *Explosives:* Substances that are Non-Explosive. *Unstable Compressed Gases:* No Rating. *Pyrophorics:* No Rating. *Oxidizers:* No "0" rating allowed. *Unstable Reactives:* Substances that will not polymerize, decompose, condense or self-react.); **1 (Water Reactivity:** Materials that change or decompose upon exposure to moisture. *Organic Peroxides:* Materials that are normally stable, but can become unstable at high temperatures and pressures. These materials may react with water, but will not release energy. *Explosives:* Division 1.5 & 1.6 substances that are very insensitive explosives or that do not have a mass explosion hazard. *Compressed Gases:* Pressure below OSHA definition. *Pyrophorics:* No Rating. *Oxidizers:* Packaging Group III; *Solids:* any material that in either concentration tested, exhibits a mean burning time less than or equal to the mean burning time of a 3:7 potassium bromate/cellulose mixture and the criteria for Packing Group I and II are not met. *Liquids:* any material that exhibits a mean pressure rise time less than or equal to the pressure rise time of a 1:1 nitric acid (65%)/cellulose mixture and the criteria for Packing Group I and II are not met. *Unstable Reactives:* Substances that may decompose, condense or self-react, but only under conditions of high temperature and/or pressure and have little or no potential to cause significant heat generation or explosive hazard. Substances that readily undergo hazardous polymerization in the absence of inhibitors.);

## DEFINITIONS OF TERMS (Continued)

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

#### PHYSICAL HAZARD (continued):

**2 (Water Reactivity):** Materials that may react violently with water. *Organic Peroxides:* Materials that, in themselves, are normally unstable and will readily undergo violent chemical change, but will not detonate. These materials may also react violently with water. *Explosives:* Division 1.4 – Explosive substances where the explosive effect are largely confined to the package and no projection of fragments of appreciable size or range are expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package. *Compressed Gases:* Pressurized and meet OSHA definition but < 514.7 psi absolute at 21.1°C (70°F) [500 psig]. *Pyrophorics:* No Rating. *Oxidizers:* Packing Group II *Solids:* any material that, either in concentration tested, exhibits a mean burning time of less than or equal to the mean burning time of a 2:3 potassium bromate/cellulose mixture and the criteria for Packing Group I are not met. *Liquids:* any material that exhibits a mean pressure rise time less than or equal to the pressure rise of a 1:1 aqueous sodium chlorate solution (40%/cellulose mixture and the criteria for Packing Group I are not met. *Unstable Reactives:* Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure, but have a low potential for significant heat generation or explosion. Substances that readily form peroxides upon exposure to air or oxygen at room temperature); **3 (Water Reactivity):** Materials that may form explosive reactions with water. *Organic Peroxides:* Materials that are capable of detonation or explosive reaction, but require a strong initiating source, or must be heated under confinement before initiation; or materials that react explosively with water. *Explosives:* Division 1.2 – Explosive substances that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but do not have a mass explosion hazard. *Compressed Gases:* Pressure  $\geq$  514.7 psi absolute at 21.1°C (70°F) [500 psig]. *Pyrophorics:* No Rating. *Oxidizers:* Packing Group I *Solids:* any material that, in either concentration tested, exhibits a mean burning time less than the mean burning time of a 3:2 potassium bromate/cellulose mixture. *Liquids:* Any material that spontaneously ignites when mixed with cellulose in a 1:1 ratio, or which exhibits a mean pressure rise time less than the pressure rise time of a 1:1 perchloric acid (50%/cellulose mixture. *Unstable Reactives:* Substances that may polymerize, decompose, condense or self-react at ambient temperature and/or pressure and have a moderate potential to cause significant heat generation or explosion.); **4 (Water Reactivity):** Materials that react explosively with water without requiring heat or confinement. *Organic Peroxides:* Materials that are readily capable of detonation or explosive decomposition at normal temperature and pressures. *Explosives:* Division 1.1 & 1.2-explosive substances that have a mass explosion hazard or have a projection hazard. A mass explosion is one that affects almost the entire load instantaneously. *Compressed Gases:* No Rating. *Pyrophorics:* Add to the definition of Flammability "4". *Oxidizers:* No "4" rating. *Unstable Reactives:* Substances that may polymerize, decompose, condense or self-react at ambient temperature and/or pressure and have a high potential to cause significant heat generation or explosion.).

### NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS:

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

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

#### HEALTH HAZARD (continued):

**3 (continued):** Materials whose LD<sub>50</sub> for acute oral toxicity is greater than 5 mg/kg but less than or equal to 50 mg/kg. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC<sub>50</sub> for acute inhalation toxicity, if its LC<sub>50</sub> is less than or equal to 3000 ppm and that does not meet the criteria for degree of hazard 4. Compressed liquefied gases with boiling points between -30°C (-22°F) and -55°C (-66.5°F) that cause frostbite and irreversible tissue damage. Materials that are respiratory irritants. Cryogenic gases that cause frostbite and irreversible tissue damage. Materials that are corrosive to the respiratory tract. Materials that are corrosive to the eyes or cause irreversible corneal opacity. Materials that are corrosive to the skin. **4** (materials that, under emergency conditions, can be lethal): Gases and vapors whose LC<sub>50</sub> for acute inhalation toxicity less than or equal to 1,000 ppm. Dusts and mists whose LC<sub>50</sub> for acute inhalation toxicity is less than or equal to 0.5 mg/L. Materials whose LD<sub>50</sub> for acute dermal toxicity is less than or equal to 40 mg/kg. Materials whose LD<sub>50</sub> for acute oral toxicity is less than or equal to 5 mg/kg. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC<sub>50</sub> for acute inhalation toxicity, if its LC<sub>50</sub> is less than or equal to 1000 ppm.

#### FLAMMABILITY HAZARD: 0

Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand: Materials that will not burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in accordance with Annex D. **1** Materials that must be preheated before ignition can occur. Materials in this degree require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur: Materials that will burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in accordance with Annex D. Liquids, solids and semisolids having a flash point at or above 93.4°C (200°F) (i.e. Class IIIB liquids). Liquids with a flash point greater than 35°C (95°F) that do not sustain combustion when tested using the *Method of Testing for Sustained Combustibility*, per 49 CFR 173, Appendix H or the UN *Recommendation on the Transport of Dangerous Goods, Model Regulations* (current edition) and the related *Manual of Tests and Criteria* (current edition). Liquids with a flash point greater than 35°C (95°F) in a water-miscible solution or dispersion with a water non-combustible liquid/solid content of more than 85 percent by weight. Liquids that have no fire point when tested by ASTM D 92 Standard Test Method for Flash and Fire Points by Cleveland Open Cup, up to a boiling point of the liquid or up to a temperature at which the sample being tested shows an obvious physical change. Combustible pellets with a representative diameter of greater than 2 mm (10 mesh). Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. Most ordinary combustible materials. **2** Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not under normal conditions form hazardous atmospheres with air, but under high ambient temperatures or under moderate heating could release vapor in sufficient quantities to produce hazardous atmospheres with air: Liquids having a flash point at or above 37.8°C (100°F) and below 93.4°C (200°F) (i.e. Class II and Class IIIA liquids.) Solid materials in the form of powders or coarse dusts of representative diameter between 420 microns (40 mesh) and 2 mm (10 mesh) that burn rapidly but that generally do not form explosive mixtures in air. Solid materials in fibrous or shredded form that burn rapidly and create flash fire hazards, such as cotton, sisal and hemp. Solids and semisolids that readily give off flammable vapors. Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **3** Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions: Liquids having a flash point below 22.8°C (73°F) and having a boiling point at or above 37.8°C (100°F) and those liquids having a flash point at or above 22.8°C (73°F) and below 37.8°C (73°F) and below 37.8°C (100°F) (i.e. Class IB and IC liquids). Materials that, on account of their physical form or environmental conditions, can form explosive mixtures with air and are readily dispersed in air. Flammable or combustible dusts with a representative diameter less than 420 microns (40 mesh). Materials that burn with extreme rapidity, usually by reason of self-contained oxygen (e.g. dry nitrocellulose and many organic peroxides). Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **4** Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and will burn readily: Flammable gases. Flammable cryogenic materials. Any liquid or gaseous materials that is liquid while under pressure and has a flash point below 22.8°C (73°F) and a boiling point below 37.8°C (100°F) (i.e. Class IA liquids). Materials that ignite when exposed to air, Solids containing greater than 0.5 percent by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent.

**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.

## DEFINITIONS OF TERMS (Continued)

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

**INSTABILITY HAZARD (continued): 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: **LD<sub>50</sub>** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC<sub>50</sub>** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m<sup>3</sup>** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **Cancer Information:** The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. **Other Information:** **BEI** - ACGIH Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.

### ECOLOGICAL INFORMATION:

EC is the effect concentration in water. **BCF** = Bioconcentration Factor, which is used to determine if a substance will concentrate in lifeforms which consume contaminated plant or animal matter. **TL<sub>m</sub>** = median threshold limit; Coefficient of Oil/Water Distribution is represented by **log K<sub>ow</sub>** or **log K<sub>oc</sub>** and is used to assess a substance's behavior in the environment.

### REGULATORY INFORMATION:

#### U.S. and CANADA:

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **ACGIH**: American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. **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.

**EUROPEAN:** **EC** is the European Community (formerly known as the **EEC**, European Economic Community). **EINECS**: This the European Inventory of Now-Existing Chemical Substances. The **ARD** is the European Agreement Concerning the International Carriage of Dangerous Goods by Road and the **RID** are the International Regulations Concerning the Carriage of Dangerous Goods by Rail. **AUSTRALIAN:** **AICS** is the Australian Inventory of Chemical Substances. **NOHSC:** **NATIONAL OCCUPATIONAL HEALTH & SAFETY CODE.**