

# 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

<u>TRADE NAME (AS LABELED):</u>	<b>TECRON / FLEXRON</b>
<u>CHEMICAL NAME/CLASS:</u>	Neoprene/Inorganic Carbonate Mixture
<u>SYNONYMS:</u>	Not applicable
<u>PRODUCT USE:</u>	Firestop Product
<u>SUPPLIER/MANUFACTURER'S NAME:</u>	Nelson EGS
<u>ADDRESS:</u>	4135 E. 100 <sup>th</sup> East Ave. #100 Tulsa, Oklahoma 74146-3636
<u>CHEMTREC EMERGENCY NO.:</u>	1-800-424-9300 (United States)
<u>BUSINESS PHONE:</u>	(918) 627-5530/(800) 331-7325
<u>REVISION DATE:</u>	July 14, 2004

### 2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR					
			ACGIH- TLV		OSHA- PEL		IDLH mg/m <sup>3</sup>	OTHER 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>		
Neoprene	126-99-8	23-35	36 (skin)	NE	90 (skin) 35 (skin) [vacated 1989 PEL]	NE	1086	NIOSH REL: STEL = 3.5 Ceiling (15 min) Carcinogen: IARC-2B, MAK- 2, NIOSH-X, EPA-D
Magnesium Carbonate	12072-90-1	11-19	NE	NE	NE	NE	NE	NE
Kaolin (Clay)	1332-58-7	9-20	2 A4 (Not Classifiable as a Human Carcinogen) [Respirable fraction]	NE	15 (Total dust), 5 (Respirable fraction) 10 (Total dust) [vacated 1989 PEL]	NE	NE	NIOSH REL: TWA = 10 (Total dust), 5 (Respirable fraction)
Calcium Carbonate	471-34-1	8-15	10 [Respirable fraction]	NE	15 (Total dust), 5 (Respirable fraction)	NE	NE	NIOSH REL: TWA = 10 (Total dust), 5 (Respirable fraction)
Antimony Trioxide	1309-64-4	5-10	0.5 as Sb	NE	0.5 as Sb	NE	50 as Sb	NIOSH REL: TWA = 0.5 as Sb Carcinogen: IARC-2B, MAK- 2

NE = Not Established

C = Ceiling Limit

See Section 16 for Definitions of Terms Used

NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1998 format.

## 2. COMPOSITION and INFORMATION ON INGREDIENTS (Continued)

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR					
			ACGIH- TLV		OSHA- PEL		IDLH mg/m <sup>3</sup>	OTHER 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>		
Iron Oxide [exposure limits are for Iron Oxide dust & fume (Fe <sub>2</sub> O <sub>3</sub> ), as Fe]	1309-37-1	< 6	5 A4 (Not Classifiable as a Human Carcinogen) [Respirable fraction]	NE	10	NE	2500	NIOSH REL: TWA = 5 DFG MAK: TWA = 1.5 (Respirable fraction of the aerosol) Carcinogen: IARC-3
Tritolyl Phosphate	1330-78-5	2-12	NE	NE	NE	NE	NE	NE
Akrochlor R70	63449-39-8	1-5	NE	NE	NE	NE	NE	Carcinogen: IARC-2B, NTP-R
Zinc Borate, Hydrate	12447-61-9	1-5	NE	NE	NE	NE	NE	NE
Magnesium Oxide (exposure limits are for Magnesium Oxide fume)	1309-48-4	1-5	10	NE	15 (Total particulate) 1 (vacated 1989 PEL)	3 (vacated 1989 PEL)	750	DFG MAK: TWA = 1.5 (Respirable fraction of the aerosol) PEAK = 2•MAK 5 min (momentary value)
Zinc Oxide (exposure limits are for Zinc Oxide fume)	1314-13-2	1-5	5	10	5	10 (vacated 1989 PEL)	500	NIOSH REL: TWA = 5 STEL = 10 DFG MAK: TWA = 1.5 (Respirable fraction of the aerosol) Carcinogen: EPA-D
2-Imidazolidinethione	96-45-7	< 1	NE	NE	NE	NE	NE	NIOSH REL: Lowest feasible concentration; use encapsulated form. Carcinogen: IARC-2B, MAK-3, NIOSH-X, NTP-R
Other components which are present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).	Balance		None of the other components contribute significant additional hazards at the concentrations present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalent Standards and Canadian Workplace Hazardous Materials Identification System Standards (CPR 4).					

NE = Not Established

C = Ceiling Limit

See Section 16 for Definitions of Terms Used

NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1998 format.

## 3. HAZARD IDENTIFICATION

**EMERGENCY OVERVIEW:** This product is a brick red, odorless solid. As a solid, this product does not present a significant hazard by any route of exposure. If heated to decomposition, the chief health hazard associated with exposure to fumes would be the potential to slightly irritate the eyes, skin, nose, and other tissues that come in contact with vapors generated by the product. This product contains components that are known and suspected carcinogens and reproductive toxins. This product is not flammable or reactive. Thermal decomposition of this product produces irritating vapors and toxic gases (e.g., calcium oxides, carbon oxides, boron oxides, hydrogen chloride). Emergency responders must wear proper personal protective equipment for the releases to which they are responding.

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

**INHALATION:** During heating, breathing vapors given off by this product may irritate the nose, throat, or respiratory system. Symptoms of such exposure could include coughing and sneezing.

**CONTACT WITH SKIN or EYES:** Eye contact with the product can cause stinging, tearing, and redness from mechanical irritation. Skin contact with this product may be slightly irritating, especially after prolonged exposure. (continued on the following page)

### 3. HAZARD IDENTIFICATION (Continued)

**CONTACT WITH SKIN or EYES (continued):** Repeated skin contact may cause dermatitis (red, dry skin). Symptoms are generally alleviated when exposure ends.

**SKIN ABSORPTION:** Skin absorption is not anticipated to be a significant route of overexposure for any component of this product.

**INGESTION:** Though not anticipated to be a significant route of occupational exposure, ingestion of this product (especially in large amounts) can irritate the tissues of the mouth, esophagus, and other tissues of the digestive system. Symptoms of such overexposure can include vomiting, diarrhea, and nausea.

**INJECTION:** Though not anticipated to be a significant route of occupational exposure, injection of this material would cause pain, mild irritation, and swelling at the site of injection.




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

**ACUTE:** The most likely symptom of acute overexposure would be slight to moderate irritation of contaminated skin or eyes after contact with this product.

**CHRONIC:** This product contains components that are known and suspected carcinogens and reproductive toxins. Prolonged or repeated contact with the skin may cause dermatitis. See Section 11 (Toxicological Information) for additional data.

**TARGET ORGANS:** ACUTE: Skin, eyes.

CHRONIC: Skin.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM			
HEALTH		(BLUE)	2
FLAMMABILITY		(RED)	0
REACTIVITY		(YELLOW)	0
PROTECTIVE EQUIPMENT			C
EYES	RESPIRATORY	HANDS	BODY
	SEE SECTION 8		
For routine industrial applications			

**See Section 16 for Definition of Ratings**

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

### 4. FIRST-AID MEASURES

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

**SKIN EXPOSURE:** If this product contaminates the skin, begin decontamination with copious amounts of running water. Remove exposed or contaminated clothing, taking care not to contaminate eyes.

**EYE EXPOSURE:** If the product is contaminates the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have the contaminated individual "roll" eyes. The recommended minimum flushing time is 15 minutes.

**INHALATION:** If dusts of this product are inhaled, remove victim to fresh air.

**INGESTION:** If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING, unless directed by medical personnel. Have victim rinse mouth with water, if conscious. Never induce vomiting or give a diluent (e.g., water) to someone who is unconscious, having convulsions, or unable to swallow.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Preexisting dermatitis, and other skin disorders can be aggravated by exposure to this product. This product contains components that are known and suspected carcinogens and reproductive toxins.

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

### 5. FIRE-FIGHTING MEASURES

**FLASH POINT:** Not applicable.

**AUTOIGNITION TEMPERATURE:** Not applicable.

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

Lower (LEL): Not applicable.

Upper (UEL): Not applicable.

## 5. FIRE-FIGHTING MEASURES (Continued)

**FIRE EXTINGUISHING MATERIALS:** Select fire extinguishing media appropriate for the surrounding area.

Water Spray: YES (for cooling)

Carbon Dioxide: YES

Foam: YES

Dry Chemical: YES

Halon: YES

Other: Any "ABC" Class.

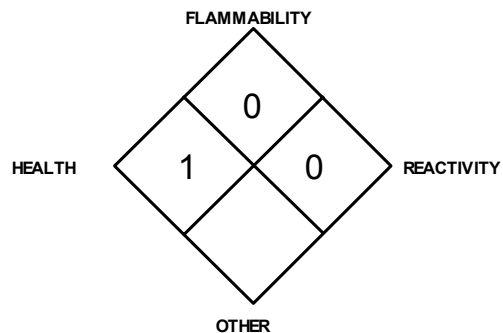
**UNUSUAL FIRE AND EXPLOSION HAZARDS:** This product is not combustible and does not contribute to the intensity of a fire. When involved in a fire, this material may decompose and produce irritating vapors, acrid smoke, and toxic gases (e.g., calcium oxides, carbon oxides, boron oxides, hydrogen chloride).

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

**SPECIAL FIRE-FIGHTING PROCEDURES:** Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move fire-exposed containers if it can be done without risk to firefighters. If possible, firefighters should control runoff water to prevent environmental contamination. Rinse contaminated equipment with soapy water before returning such equipment to service.

### NFPA RATING



**See Section 16 for  
Definition of Ratings**

## 6. ACCIDENTAL RELEASE MEASURES

**RELEASE RESPONSE:** Small releases can be cleaned up wearing gloves, goggles, and suitable body protection. In case of a large spill, clear the affected area, protect people, and respond with trained personnel. Minimum Personal Protective Equipment should be **Level B: triple-gloves (rubber gloves and nitrile gloves over latex gloves), tyvek or lab coat and boots, dust mask. Self-Contained Breathing Apparatus must be selected if releases which occur in confined or poorly ventilated areas or in situations in which the level of oxygen is below 19.5.**

Pick up spilled solid. Rinse area with soap and water solution and follow with a water rinse. Close off sewers and take other measures to protect human health and the environment, as necessary. Decontaminate the area thoroughly. Place all spilled material in an appropriate container and seal. Dispose of in accordance with applicable U.S. Federal, State, or local procedures, or appropriate Canadian standards (see Section 13, Disposal Considerations).

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

### 7. HANDLING and STORAGE

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

**STORAGE AND HANDLING PRACTICES:** All employees who handle this material should be trained to handle it safely. Open containers slowly on a stable surface. Containers of this product must be properly labeled. Empty containers may contain residual amounts of this product; therefore, empty containers should be handled with care. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials (see Section 10, Stability and Reactivity). Material should be stored in secondary containers or in a diked area as appropriate. Keep container tightly closed when not in use. Inspect all incoming containers before storage to ensure containers are properly labeled and not damaged.

**PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT:** Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely, if necessary. Collect all rinsates and dispose of according to applicable U.S. Federal, State, or local procedures and appropriate Canadian standards.

### 8. EXPOSURE CONTROLS - PERSONAL PROTECTION

**VENTILATION AND ENGINEERING CONTROLS:** Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in Section 2 (Composition and Information on Ingredients) if applicable. Eye wash station/safety showers should be near locations where this product is used or stored.

**RESPIRATORY PROTECTION:** None normally required for routine use. Airborne contaminant concentrations must be maintained below guidelines listed in Section 2 (Composition and Information on Ingredients). 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).

**EYE PROTECTION:** Splash goggles or safety glasses.

## 8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

**HAND PROTECTION:** Wear Neoprene Rubber gloves for routine industrial use. Use triple gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this MSDS.

**BODY PROTECTION:** Use body protection appropriate for task.

## 9. PHYSICAL and CHEMICAL PROPERTIES

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

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

**SOLUBILITY IN WATER:** Insoluble

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

**PARTITION COEFFICIENT (n-octanol/water):** Not applicable.

**ODOR THRESHOLD:** Not established.

**APPEARANCE, ODOR and COLOR:** This is brick red, odorless solid.

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

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

**MELTING/FREEZING POINT:** > 1000°C (1832°F)

**BOILING POINT:** Not established.

**pH:** Not applicable.

## 10. STABILITY and REACTIVITY

**STABILITY:** Stable.

**DECOMPOSITION PRODUCTS:** Thermal decomposition can generate calcium oxides, carbon oxides, boron oxides, and hydrogen chloride.

**MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:** Strong acids, strong bases, strong oxidizers.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS TO AVOID:** Avoid exposure or contact to extreme temperatures, incompatible chemicals.

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

## 11. TOXICOLOGICAL INFORMATION

**TOXICITY DATA:** The specific toxicology data available for components greater than 1% in concentration are as follows.

**AKROCHLOR R70:** Currently, there are no toxicological data available for this compound.

### ANTIMONY TRIOXIDE:

Gene Conversion and Mitotic Recombination (*Bacillus subtilis*) = 50 mmol/L

Sister Chromatid Exchange (lung, hamster) = 90 mg/L

Eye Irritancy (rabbit) = 100 mg; Mild

TCLo (inhalation, rat) = 72 µg/m<sup>3</sup>/24 hours/17 weeks/continuous; Blood: pigmented or nucleated red blood cells; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: true cholinesterase, Metabolism (Intermediary) - lipids including transport

TCLo (inhalation, rat) = 270 mg/m<sup>3</sup>/1–21 days post; Teratogenic effects

TCLo (inhalation, rat) = 270 mg/m<sup>3</sup>/1–21 days post; Reproductive effects

TCLo (inhalation, rat) = 4200 mg/m<sup>3</sup>/52 weeks/intermittent; Carcinogenic effects

TCLo (inhalation, rat) = 82 µg/m<sup>3</sup>/female 1–21 days after conception; Reproductive: Fertility: pre-implantation mortality (e.g. reduction in number of implants per female; total number of implants per corpora lutea), Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)

TC (inhalation, rat) = 4 mg/m<sup>3</sup>/1 years/intermittent; Equivocal tumorigenic agent

TC (inhalation, rat) = 1600 mg/m<sup>3</sup>/52 weeks/intermittent; Neoplastic effects

TC (inhalation, rat) = 50 mg/m<sup>3</sup>/7 hours/52 weeks/intermittent; Carcinogenic effects

### ANTIMONY TRIOXIDE (continued):

TDLo (subcutaneous, rat) = 25688 mg/kg/13 weeks/intermittent; Cardiac: other changes

TDLo (intratesticular, rat) = 23320 µg/kg/male 1 day pre-mating; Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count), testes, epididymis, sperm duct.

TCLo (inhalation, guinea pig) = 45 mg/m<sup>3</sup>/10 weeks/intermittent; Lungs, Thorax, or Respiration - fibrosis, focal (pneumoconiosis); Liver: fatty liver degeneration; Related to Chronic Data: death

LD<sub>50</sub> (oral, rat) > 20 g/kg

LD<sub>50</sub> (oral, rat) > 34600 mg/kg; Somnolence (general depressed activity); Skin and Appendages: hair

LD<sub>50</sub> (subcutaneous, rat) = 7904 mg/kg

LD<sub>50</sub> (intraperitoneal, rat) = 3250 mg/kg

LD<sub>50</sub> (intraperitoneal, mouse) = 172 mg/kg

LDLo (skin, rabbit) = 2 g/kg

LDLo (subcutaneous, rabbit) = 2500 mg/kg

LDLo (intravenous, dog) = 3 mg/kg

**CALCIUM CARBONATE:** Currently, there are no toxicological data available for this compound.

### IRON OXIDE:

TDLo (subcutaneous, rat) = 135 mg/kg; Equivocal tumorigenic agent

LD<sub>50</sub> (intraperitoneal, rat) = 5500 mg/kg

LD<sub>50</sub> (intraperitoneal, mouse) = 5400 mg/kg

LDLo (subcutaneous, dog) = 30 mg/kg

### KAOLIN:

TDLo (oral, rat) = 590 g/kg/female 37 days pre; Reproductive effects

**MAGNESIUM CARBONATE:** Currently, there are no toxicological data available for this compound.

### MAGNESIUM OXIDE:

TCLo (inhalation, human) = 400 mg/m<sup>3</sup>

TCLo (inhalation, rat) = 1120 µg/m<sup>3</sup>/24 hours/29 days/continuous; Brain and Coverings: recordings from specific areas of CNS; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: true cholinesterase

TDLo (intratracheal, hamster) = 480 mg/kg/30 weeks/intermittent; Equivocal tumorigenic agent

### NEOPRENE:

Mutation in Microorganisms (*Salmonella typhimurium*) = 70 µmol/L

Mutation in Microorganisms (*Salmonella typhimurium*) = 2 pph/4 hours

Sex Chromosome Loss and Nondisjunction (oral, *Drosophila*) = 5700 µmol/L/3 days/intermittent

Cytogenetic Analysis (unreported, human) = 1 mg/m<sup>3</sup>

Cytogenetic Analysis (inhalation, rat) = 1960 µg/m<sup>3</sup>/16 weeks

Cytogenetic Analysis (inhalation, mouse) = 320 µg/m<sup>3</sup>/4 weeks/continuous

Dominant Lethal Test (inhalation, rat) = 4 µg/L/48 days/intermittent

Micronucleus Test (inhalation, mouse) = 1480 µg/m<sup>3</sup>/2 hours/2 days/intermittent

Morphological Transformation (hamster, embryo) = 125 mg/L

# 11. TOXICOLOGICAL INFORMATION (Continued)

## TOXICITY DATA (continued):

### NEOPRENE (continued):

Standard Draize Test (skin, rabbit) = 500  $\mu$ L/24 hours; Severe

TDLo (oral, rat) = 9100  $\mu$ g/kg/26 weeks/intermittent; Changes in liver weight; Changes in spleen weight; Enzyme inhibition, induction, or change in blood or tissue levels: dehydrogenases

TDLo (oral, rat) = 9100  $\mu$ g/kg/male 26 weeks pre-mating; Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count)

TDLo (oral, rat) = 1680 mg/kg/3 weeks/intermittent; Liver: hepatitis (hepatocellular necrosis), diffuse, other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: hepatic microsomal mixed oxidase (dealkylation, hydroxylation, etc.)

TDLo (oral, rat) = 1 mg/kg/female 11–12 days after conception/ Reproductive: Specific Developmental Abnormalities: Central Nervous System, Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)

TDLo (oral, rat) = 1 mg/kg/female 9–10 days after conception; Reproductive: Specific Developmental Abnormalities: other developmental abnormalities

TDLo (oral, mouse) = 63 mg/m<sup>3</sup>/21 days/intermittent; Immunological Including Allergic: decreased immune response

TDLo (subcutaneous, mouse) = 42 mg/kg/21 days/intermittent; Immunological Including Allergic: decreased immune response; Biochemical: Metabolism (Intermediary): other proteins

TCLo (inhalation, rat) = 161 ppm/6 hours/4 weeks/intermittent; Liver: changes in liver weight; Kidney, Ureter, Bladder: changes in bladder weight; Nutritional and Gross Metabolic: weight loss or decreased weight gain

TCLo (inhalation, rat) = 220  $\mu$ g/m<sup>3</sup>/24 hours/60 days/continuous; Brain and Coverings: other degenerative changes; Liver: other changes; Induction, or change in blood or tissue levels: phosphatases

TCLo (inhalation, rat) = 200 mg/m<sup>3</sup>/24 hours/91 days/continuous; Brain and Coverings: other degenerative changes; Gastrointestinal: ulceration or bleeding from large intestine; Blood: changes in spleen

TCLo (inhalation, rat) = 50 ppm/6 hours/2 years/intermittent; Changes in lung weight; Skin and Appendages: hair; Nutritional and Gross Metabolic: weight loss or decreased weight gain

TCLo (inhalation, rat) = 32 ppm/6 hours/16 days/intermittent; Sense Organs and Special Senses (Olfaction): effect, not otherwise specified

TCLo (inhalation, rat) = 80 ppm/6 hours/2 years/intermittent; Tumorigenic: Carcinogenic by RTECS criteria; Sense Organs and Special Senses (Olfaction): tumors

TCLo (inhalation, rat) = 4 mg/m<sup>3</sup>/24 hours/female 3–4 days after conception; Effects on Embryo or Fetus: fetal death

### NEOPRENE (continued):

TCLo (inhalation, rat) = 4 mg/m<sup>3</sup>/24 hours/female 11–12 days after conception; Reproductive: Specific Developmental Abnormalities: Central Nervous System

TCLo (inhalation, rat) = 10 ppm/4 hours/female 3–20 days after conception; Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants)

TCLo (inhalation, rat) = 150  $\mu$ g/m<sup>3</sup>/24 hours/male 19 weeks pre-mating; Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count)

TCLo (inhalation, rat) = 500 mg/m<sup>3</sup>/5 hours/female 17 weeks pre-mating; Reproductive: Menstrual cycle changes or disorders

TCLo (inhalation, rat) = 500 mg/m<sup>3</sup>/5 hours/female 30 weeks pre-mating; Reproductive: Maternal Effects: ovaries, fallopian tubes

TCLo (inhalation, mouse) = 32 ppm/6 hours/2 years/intermittent; Tumorigenic: Carcinogenic by RTECS criteria; Liver: tumors; Lungs, Thorax, or Respiration: tumors

TCLo (inhalation, mouse) = 1260 mg/m<sup>3</sup>/14 days/intermittent; Endocrine: changes in thymus weight; Immunological Including Allergic: decrease in cellular immune, decrease in humoral immune

TCLo (inhalation, mouse) = 200 mg/m<sup>3</sup>/24 hours/91 days/continuous; Gastrointestinal: ulceration or bleeding from large intestine; Blood: changes in spleen; Related to Chronic Data: death

TCLo (inhalation, hamster) = 162 ppm/6 hours/4 weeks/intermittent; Liver: hepatitis (hepatocellular necrosis), zonal; Nutritional and Gross Metabolic: weight loss or decreased weight gain; Related to Chronic Data: death

TCLo (inhalation, hamster) = 50 ppm/6 hours/78 weeks/intermittent; Nutritional and Gross Metabolic: weight loss or decreased weight gain

LD<sub>50</sub> (oral, rat) = 450 mg/kg

LC<sub>50</sub> (inhalation, rat) = 11,800 mg/m<sup>3</sup>/4 hours

LDLo (subcutaneous, rat) = 500 mg/kg; Behavioral: convulsions or effect on seizure threshold; Lungs, Thorax, or Respiration: dyspnea, cyanosis

LD<sub>50</sub> (oral, mouse) = 146 mg/kg

LC<sub>50</sub> (inhalation, mouse) = 23,000 mg/m<sup>3</sup>

LDLo (subcutaneous, mouse) = 1 g/kg; Behavioral: convulsions or effect on seizure threshold; Lungs, Thorax, or Respiration: dyspnea, cyanosis

LDLo (subcutaneous, cat) = 100 mg/kg

LCLo (inhalation, cat) = 1290 mg/m<sup>3</sup>/8 hours

LDLo (subcutaneous, pigeon) = 13 g/kg

LDLo (intravenous, rabbit) = 96 mg/kg; Blood: other changes; Skin and Appendages: dermatitis, other (after systemic exposure)

LCLo (inhalation, rabbit) = 3870 mg/m<sup>3</sup>/8 hours

### TRITOLYL PHOSPHATE:

Open Irritation Test (skin, rabbit) = 500 mg; Mild

### TRITOLYL PHOSPHATE (continued):

Standard Draize Test (eye, rabbit) = 500 mg/24 hours; Mild

TDLo (oral, woman) 70 mg/kg/14 days; Peripheral Nerve and Sensation: flaccid paralysis without anesthesia (usually neuromuscular blockage); Behavioral: changes in motor activity (specific assay), muscle weakness

TDLo (oral, rat) = 20,300 mg/kg/16 days/intermittent; Behavioral: changes in motor activity (specific assay); Endocrine: changes in thymus weight; Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (oral, rat) = 23,400 mg/kg/13 weeks/intermittent; Liver: changes in liver weight; Kidney, Ureter, Bladder: changes in bladder weight; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol)

TDLo (oral, rat) = 252 mg/kg/6 weeks/continuous; Immunological Including Allergic: decrease in cellular immune response, decrease in humoral immune response

TDLo (oral, rat) = 24 g/kg/60 days/intermittent; Endocrine: other changes

TDLo (oral, rat) = 4550 mg/kg/male 13 weeks pre-mating; Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count), testes, epididymis, sperm duct

TDLo (oral, rat) = 13,200 mg/kg/male 66 days pre-mating; Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count), testes, epididymis, sperm duct

TDLo (oral, rat) = 16 g/kg/male 66 days pre-mating/female 24 days pre-mating, 22 days after conception; Reproductive: fetal death

TDLo (oral, mouse) = 1750 mg/kg/male 7 days pre-mating; Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count), testes, epididymis, sperm duct; Effects on Newborn: live birth index (measured after birth)

TDLo (oral, mouse) = 4464 mg/kg/male 7 days pre-mating/female 7 days pre-mating, 22 days after conception; Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain)

TDLo (oral, mouse) = 7250 mg/kg/female 7 days pre-mating/female 1–22 days after conception; Reproductive: Effects on Newborn: live birth index (measured after birth)

TDLo (oral, mouse) = 2250 mg/kg/male 7 days pre-mating /female 7 days pre-mating, 22 days after conception; Reproductive: Effects on Newborn: germ cell effects (in offspring)

TDLo (oral, mouse) = 52 g/kg/13 weeks/intermittent; Somnolence (general depressed activity); Changes in serum composition (e.g. TP, bilirubin, cholesterol); Enzyme inhibition, induction, or change in blood or tissue levels: true cholinesterase

# 11. TOXICOLOGICAL INFORMATION (Continued)

## TOXICITY DATA (continued):

### TRITOLYL

#### PHOSPHATE (continued):

TDLo (oral, mouse) = 10,220 mg/kg/16 days/intermittent; Behavioral: changes in motor activity (specific assay); Liver: changes in liver weight; Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (oral, cat) = 2100 mg/kg/6 weeks/intermittent; Tremor, excitement; Related to Chronic Data: death

LDLo (oral, human) = 1800 mg/kg

LD<sub>50</sub> (oral, rat) = 3 g/kg

LD<sub>50</sub> (oral, mouse) = 3900 mg/kg

LDLo (subcutaneous, mouse) = 12 mg/kg; Peripheral Nerve and Sensation: spastic paralysis with or without sensory change; Behavioral: somnolence (general depressed activity); Lungs, Thorax, or Respiration: cyanosis

LD<sub>50</sub> (oral, chicken) > 10 g/kg

LD<sub>50</sub> (skin, cat) = 1500 mg/kg; Peripheral Nerve and Sensation: flaccid paralysis without anesthesia (usually neuromuscular blockage); Behavioral: ataxia

LDLo (oral, rabbit) = 100 mg/kg

LD<sub>50</sub> (parenteral, rabbit) = 100 mg/kg

LDLo (oral, dog) = 500 mg/kg

#### TRITOLYL PHOSPHATE (continued):

LDLo (skin, rabbit) = 1 g/kg; Gastrointestinal: changes in structure or function of salivary glands, hypermotility, diarrhea; Inhibition, induction, or change in blood or tissue levels: true cholinesterase

#### ZINC BORATE, HYDRATE:

Currently, there are no toxicological data available for this compound.

#### ZINC OXIDE:

DNA Adduct (*Escherichia coli*) = 3000 ppm

Cytogenetic Analysis (inhalation, rat) = 100 µg/m<sup>3</sup>

Morphological Transformation (embryo, hamster) = 1 mg/L

Unscheduled DNA Synthesis (embryo, hamster) = 1 mg/L

Unscheduled DNA synthesis (inhalation, guinea pig) = 5300 µg/m<sup>3</sup>/3 hours/6 days

Sister Chromatid Exchange (embryo, hamster) = 300 µg/L

Standard Draize Test (eye, rabbit) = 500 mg/24 hours; mild

TDLo (oral, rat) = 6846 mg/kg/female 1–22 days after conception; Reproductive: Specific Developmental Abnormalities: homeostasis; stillbirth; Effects on Newborn: growth statistics

#### ZINC OXIDE (continued):

TCLo (inhalation, human) = 600 mg/m<sup>3</sup>; cough, dyspnea, other changes

TDLo (oral, rat) = 17431 mg/kg/90 days/continuous; Behavioral: changes in motor activity (specific assay)

TCLo (inhalation, guinea pig) = 5900 µg/m<sup>3</sup>/3 hours/3 days/intermittent; change in blood or tissue levels: phosphatases, dehydrogenases

TCLo (inhalation, guinea pig) = 4600 µg/m<sup>3</sup>/3 hours/6 days/intermittent; other changes, changes in lung weight

TDLo (oral, chicken) = 32,203 mg/kg/4 weeks/continuous; changes in growth hormone; evidence of thyroid hypofunction; weight loss or decreased weight gain

TDLo (oral, domestic mammal) = 3584 mg/kg/4 weeks/intermittent; changes in structure or function of endocrine pancreas; changes in serum composition; changes in metals, not otherwise specified

LDLo (oral, human) = 500 mg/kg

LD (oral, rat) > 8437 mg/kg

LD<sub>50</sub> (intraperitoneal, rat) 240 mg/kg

LD<sub>50</sub> (oral, mouse) = 7950 mg/kg

LC<sub>50</sub> (inhalation, mouse) = 2500 mg/m<sup>3</sup>

**SUSPECTED CANCER AGENT:** Components of this product are listed by agencies as follows:

**Akrochlor R70:** IARC-2B (Possibly Carcinogenic to Humans); NTP-R, Reasonably Anticipated to be a Human Carcinogen.

**Antimony Trioxide:** IARC-2B (Possibly Carcinogenic to Humans); MAK-2 (Substances that are Considered to be Carcinogenic to Man).

**2-Imidazolinethione:** IARC-2B (Possibly Carcinogenic to Humans); NTP-R (Reasonably Anticipated to be a Human Carcinogen); NIOSH-X (Carcinogen Defined with no Further Categorization); MAK-3 (Substances that cause concern that they could be carcinogenic for man)

**Iron Oxide:** IARC-3 (Unclassifiable as to Carcinogenicity in Humans); TLV-A4 (Not Classifiable as a Human Carcinogen)

**Kaolin:** TLV-A4, Not Classifiable as a Human Carcinogen

**Neoprene:** IARC-2B (Possibly Carcinogenic to Humans); MAK-2 (Substances that are considered to be carcinogenic to man); NIOSH-X (Carcinogen Defined with no Further Categorization); EPA-D (Not Classifiable as to human Carcinogenicity)

**Zinc Oxide:** EPA-D (Not Classifiable as to Human Carcinogenicity)

**IRRITANCY OF PRODUCT:** This product may be slightly irritating to contaminated tissue, especially after prolonged or repeated exposure.

**SENSITIZATION TO THE PRODUCT:** The components of this product are not known to be sensitizers with repeated or prolonged use.

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

**Mutagenicity:** This product is not reported to produce mutagenic effects in humans. Human mutation data are available for Neoprene (a component of this product); these data were obtained during clinical studies on specific human tissues exposed to high doses of this compound. Animal mutation data are available for Antimony Oxide, 2-Imidazolinethione, and Zinc Oxide (components of this product); these data were obtained during clinical studies on specific animal tissues exposed to high doses of these compounds.

**Embryotoxicity:** This product is not reported to produce embryotoxic effects in humans.

**Teratogenicity:** This product is not reported to cause teratogenic effects in humans. Clinical studies on test animals exposed to relatively high doses of Antimony Oxide, Neoprene, 2-Imidazolinethione, Tritolyl Phosphate, and Zinc Oxide (components of this product) provided teratogenic data.

**Reproductive Toxicity:** This product is not reported to cause reproductive effects in humans. Clinical studies on test animals exposed to relatively high doses of Antimony Oxide, Neoprene, 2-Imidazolinethione, Tritolyl Phosphate, and Zinc Oxide (components of this product) provided reproductive toxicity data.

## 11. TOXICOLOGICAL INFORMATION (Continued)

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) associated with the components of this product.

## 12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: This product will persist in the environment.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: This product may be harmful to contaminated plant and animal-life (especially if large quantities are released). Refer to Section 11 (Toxicological Information) for additional information on effects on animals.

EFFECT OF CHEMICAL ON AQUATIC LIFE: This product may be harmful to contaminated aquatic plant and animal life.

## 13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with regulations of Canada and its Provinces. 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.

## 14. TRANSPORTATION INFORMATION

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

PROPER SHIPPING NAME: Not applicable.

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 (1996): Not applicable.

MARINE POLLUTANT: This product is not designated by the DOT to be a Marine Pollutant (49 CFR 172.101, Appendix B).

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This material is not considered as dangerous goods by Transport Canada.

IATA DESIGNATION: This material is not considered as dangerous goods by the International Air Transport Association.

UPS SHIPPING: This material is not considered as Hazardous Materials by the United Parcel Service.

## 15. REGULATORY INFORMATION

### ADDITIONAL U.S. REGULATIONS:

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

CHEMICAL NAME	SARA 302 (40 CFR 355, Appendix A)	SARA 304 (40 CFR Table 302.4)	SARA 313 (40 CFR 372.65)
Antimony Trioxide	No	Yes	Yes
2-Imidazolinethione	No	Yes	Yes
Neoprene	No	Yes	Yes
Zinc Oxide	No	Yes (as a Zinc Compound)	Yes

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

U.S. CERCLA REPORTABLE QUANTITY (RQ): Antimony Trioxide = 1000 lb (454 kg); 2-Imidazolinethione = 10 lb (4.5 kg); Neoprene = 100 lb (45.4 kg).

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



OTHER U.S. FEDERAL REGULATIONS: Not applicable.

## 15. REGULATORY INFORMATION (Continued)

**U.S. STATE REGULATORY INFORMATION:** Components of this product are covered under specific State regulations, as denoted below:

**Alaska - Designated Toxic and Hazardous Substances:** Iron Oxide, Magnesium Oxide Fume, Neoprene, Zinc Oxide Fume.

**California - Permissible Exposure Limits for Chemical Contaminants:** Calcium Carbonate, Iron Oxide, Kaolin, Magnesium Oxide Fume, Neoprene, Zinc Oxide Fume.

**Florida - Substance List:** Antimony Trioxide, 2-Imidazolinethione, Iron Oxide, Magnesium Oxide Fume, Neoprene, Zinc Oxide Fume.

**Illinois - Toxic Substance List:** 2-Imidazolinethione, Iron Oxide, Kaolin, Magnesium Oxide Fume, Zinc Oxide Fume.

**Kansas - Section 302/313 List:** 2-Imidazolinethione, Neoprene.

**Massachusetts - Substance List:** Antimony Trioxide, 2-Imidazolinethione, Iron Oxide, Magnesium Oxide Fume, Neoprene, Zinc Oxide Fume.

**Michigan - Critical Materials Register:** Antimony Compounds, 2-Imidazolinethione, Neoprene, Zinc Compounds.

**Minnesota - List of Hazardous Substances:** Antimony Trioxide, Iron Oxide, Kaolin, Magnesium Oxide Fume, Neoprene, Zinc Oxide Fume.

**Missouri - Employer Information/Toxic Substance List:** Antimony Trioxide, Iron Oxide, Kaolin, Magnesium Oxide, Neoprene, Zinc Oxide.

**New Jersey - Right to Know Hazardous Substance List:** Antimony Trioxide, 2-Imidazolinethione, Iron Oxide, Magnesium Oxide, Neoprene, Zinc Oxide Fume.

**North Dakota - List of Hazardous Chemicals, Reportable Quantities:** Antimony Trioxide, 2-Imidazolinethione.

**Pennsylvania - Hazardous Substance List:** Antimony Trioxide, 2-Imidazolinethione, Iron Oxide, Kaolin, Magnesium Oxide, Neoprene, Zinc Oxide.

**Rhode Island - Hazardous Substance List:** Antimony Trioxide, 2-Imidazolinethione, Iron Oxide, Magnesium Oxide Fume, Neoprene, Zinc Oxide.

**Texas - Hazardous Substance List:** Iron Oxide, Magnesium Oxide Fume, Neoprene, Zinc Oxide Fume.

**West Virginia - Hazardous Substance List:** Iron Oxide, Magnesium Oxide Fume, Neoprene, Zinc Oxide Fume.

**Wisconsin - Toxic and Hazardous Substances:** Iron Oxide, Magnesium Oxide Fume, Neoprene, Zinc Oxide Fume.

**CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):** Antimony Trioxide, and 2-Imidazolinethione (components of this product) are on the California Proposition 65 lists. **WARNING!** This product contains chemicals known to the State of California to cause cancer, birth defects, and other reproductive harm.

**ANSI LABELING (Z129.1):** **WARNING!** CONTAINS KNOWN AND POTENTIAL CARCINOGENS. MAY CAUSE REPRODUCTIVE HARM. MAY IRRITATE SKIN AND EYES. MAY BE HARMFUL IF INGESTED OR INHALED. Avoid contact with skin, eyes, or clothing. Wash thoroughly after handling. Work in well-ventilated area. Do not taste or swallow. Wear gloves, goggles, and appropriate body protection. **FIRST-AID:** In case of contact with skin or eyes, flush skin with plenty of water for 15 minutes. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, do not induce vomiting. Get medical attention if adverse effects develop. **IN CASE OF FIRE:** Use water fog, dry chemical, CO<sub>2</sub>, or "alcohol" foam. **IN CASE OF SPILL:** Pick up carefully. For large spills, dike area. Consult Material Safety Data Sheet for additional information.

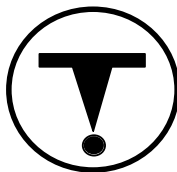
### **ADDITIONAL CANADIAN REGULATIONS:**

**CANADIAN DSL/NDL INVENTORY STATUS:** The components of this product are listed on the DSL/NDL 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 SYMBOLS:** **Class D2A** [Material Causing Other Toxic Effect, based on IARC classification 2B for Antimony Trioxide, Akrochlor R70, 2-Imidazolinethione, and Neoprene (components of this product)]



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## 16. OTHER INFORMATION

### **PREPARED BY:**

CHEMICAL SAFETY ASSOCIATES, Inc.  
9163 Chesapeake Drive, San Diego, CA 92123-1002  
(619) 565 - 0302

### **DATE OF PRINTING:**

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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. Nelson EGS 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, Nelson EGS 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 which uniquely identifies each constituent. It is used for computer-related searching.

### 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.

**OSHA** - U.S. Occupational Safety and Health Administration.

**PEL** - Permissible Exposure Limit - 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 which was vacated by Court Order. **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. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **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**). NIOSH issues exposure guidelines called Recommended Exposure Levels (**RELs**). When no exposure guidelines are established, an entry of **NE** is made for reference.

### HAZARD RATINGS:

**HAZARDOUS MATERIALS IDENTIFICATION SYSTEM:** Health Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); **3** (Class IB and IC flammable liquids with flash points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]). Reactivity Hazard: **0** (normally stable); **1** (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).

**NATIONAL FIRE PROTECTION ASSOCIATION:** Health Hazard: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure causes death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

### 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. 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:

This section explains the impact of various laws and regulations on the material. **U.S.:** **EPA** is the U.S. Environmental Protection Agency. **DOT** is the U.S. Department of Transportation. **SARA** is the Superfund Amendments and Reauthorization Act. **TSCA** is the U.S. Toxic Substance Control Act. **CERCLA (or Superfund)** refers to the Comprehensive Environmental Response, Compensation, and Liability Act. Labeling is per the American National Standards Institute (**ANSI Z129.1**). **CANADA:** **CEPA** is the Canadian Environmental Protection Act. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **TC** is Transport Canada. **DSL/NDL** are the Canadian Domestic/Non-Domestic Substances Lists.