

SAFETY DATA SHEET

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

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

IDENTIFICATION OF THE MIXTURE

<u>TRADE/MATERIAL NAME:</u>	DuoSil[®] Ultra
<u>CHEMICAL NAMES:</u>	Silyl Terminated Polyurethane
<u>SYNONYMS:</u>	None
<u>RELEVANT USE of the SUBSTANCE:</u>	Sealant
<u>USES ADVISED AGAINST:</u>	Other than Relevant Use
<u>SUPPLIER/MANUFACTURER'S NAME (USA/Canada):</u>	Siroflex Incorporated
<u>Address:</u>	PO Box 26749 Greenville, SC 29616-1749
<u>Product Information/Emergency:</u>	1-864-458-9094 (8:00am to 5:00pm U.S. Eastern Standard Time)
<u>Emergency Phone:</u>	U.S., Canada: 1-800-359-6398 (24 hrs)
<u>EMAIL of Competent Person for Information on SDS:</u>	info@siroflexinc.com
<u>Website:</u>	www.siroflexinc.com

NOTE: ALL United States Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalent Standards, Canadian WHMIS [Controlled Products Regulations], Mexican NOM018-STPS 2000, SPRING Singapore, and Japanese JIS Z7250 required information is included in appropriate sections based on the U.S. ANSI Z400.1-2010 format. This product has been classified in accordance with the hazard criteria of the countries listed above.

2. HAZARD IDENTIFICATION

GLOBAL HARMONIZATION LABELING AND CLASSIFICATION: This product has been classified per UN GHS Standards under U.S. OSHA and other applicable regulations that require Global Harmonization compliance.

Classification: Carcinogenic Cat. 1B, Reproductive Toxicity Cat. 2, Aquatic Chronic Toxicity Cat. 3
Signal Word: Danger Hazard Statement Codes: H350, H361fd, H412
Precautionary Statement Codes: P201, P202, P273, P280, P308 + P313, P405, P501
Hazard Symbols: GHS08



EMERGENCY OVERVIEW: Product Description: This product is a colored, viscous paste with a mild acrylic odor.
Health Hazards: May be harmful if accidentally ingested. Inhalation of vapors or fume if product is heated may cause headache, nausea and respiratory irritation. Eye contact with vapors or fume may also cause irritation. Brief skin contact is not expected to cause adverse effect. Prolonged skin contact may cause irritation. This product contains a Crystalline Silica, a known human carcinogen and a suspect carcinogen by inhalation; however, this hazard is not expected to be significant due to viscosity of the product. This product contains a phthalate compound, which may be a hormone disruptor and/or cause harm to fetus during pregnancy, based on animal data. **Flammability Hazards:** This product may be combustible if exposed to direct flame or if highly heated for a prolonged period. If involved in a fire, this product will release smoke, acrid vapors and toxic gases (e.g., calcium, carbon, tin, titanium and nitrogen oxides, ammonia, formaldehyde and acrylic monomers). **Reactivity Hazards:** This product is not reactive.
Environmental Hazards: This product has not been tested for potential hazards if released to the environment; however it contains compounds that may cause long-term harm to aquatic organisms. All release should be avoided.
Emergency Considerations: Emergency responders should wear appropriate protection for the situation to which they respond.

3. COMPOSITION and INFORMATION ON INGREDIENTS

Chemical Name	CAS #	W/W%	LABEL ELEMENTS GHS Classification Hazard Statements
Proprietary Silyl Terminated Polyether Mixture		25.0-35.0	<u>Classification:</u> Not Applicable
Limestone (natural calcium carbonate)	1317-65-3	20.0-30.0	<u>Classification:</u> Not Applicable
Calcium Carbonate, Precipitated	471-34-1	10.0-30.0	<u>Classification:</u> Not Applicable
Diisononyl Phthalate	68515-48-0	10.0-15.0	SELF CLASSIFICATION <u>Classification:</u> Reproductive Toxicity Cat. 2 <u>Hazard Statement Codes:</u> H361fd
Titanium Dioxide (White only)	13463-67-7	2.0-5.0	SELF CLASSIFICATION <u>Classification:</u> Carcinogenic Cat. 2 <u>Hazard Statement Codes:</u> H351i
Reaction mass of Octadecanamide, 12-hydroxy-N-[2-[(1-oxododecyl) amino]ethyl]- and N,N'-ethane-1,2-diyibis(12-hydroxyoctadecan-1-amide) and Decanamide, N,N'-1,2-ethanediyibis-	123-26-2	1.0-3.0	SELF CLASSIFICATION <u>Classification:</u> Aquatic Chronic Toxicity Cat. 3 <u>Hazard Statement Codes:</u> H412

See Section 16 for full text of Ingredient Hazard and Precautionary Statements

3. COMPOSITION and INFORMATION ON INGREDIENTS (Continued)

Chemical Name	CAS #	W/W%	LABEL ELEMENTS GHS Classification Hazard Statements
Vinyltrimethoxysilane	2768-02-7	1.0-3.0	SELF CLASSIFICATION Classification: Flammable Liquid Cat. 3, Acute Inhalation Toxicity Cat. 4 Hazard Statement Codes: H225, H332
Stearic Acid	57-11-4	0.5-3.0	Classification: Not Applicable
Quartz	14808-60-7	0.0-0.5	SELF CLASSIFICATION Classification: Carcinogenic Cat. 1B Hazard Statement Codes: H350
Other trace components.		Balance	Classification: Not Applicable

See Section 16 for full text of Ingredient Hazard and Precautionary Statements

4. FIRST-AID MEASURES

DESCRIPTION OF FIRST AID MEASURES: Contaminated individuals must be taken for medical attention if any adverse effects occur. Remove contaminated clothing and shoes. Take a copy of this SDS to health professional with victim. Wash clothing and thoroughly clean shoes before reuse. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Take a copy of label and SDS to physician or health professional with the contaminated individual.

Skin Exposure: If adverse skin effects occur, discontinue use and flush contaminated area. Seek medical attention if adverse effect occurs after flushing.

Inhalation: If adverse effects occurs in event aerosols are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Seek medical attention if adverse effect continues after removal to fresh air.

Eye Exposure: If this product contaminates the eyes, rinse eyes under gently running water. Use sufficient force to open eyelids and then "roll" eyes while flushing. Minimum flushing is for 20 minutes. The contaminated individual must seek medical attention if any adverse effect continues after rinsing.

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. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow. If victim is convulsing, maintain an open airway and obtain immediate medical attention.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing skin disorders may be aggravated by overexposures to this product.

INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT IF NEEDED: Treat symptoms and eliminate exposure.

5. FIRE-FIGHTING MEASURES

FLASH POINT: Not determined.

AUTOIGNITION TEMPERATURE: Not available.

FLAMMABLE LIMITS (in air by volume, %): Not applicable.

FIRE EXTINGUISHING MEDIA: Use extinguishing materials suitable for the surrounding area.

UNSUITABLE FIRE EXTINGUISHING MEDIA: None known.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This product may be combustible if exposed to direct flame or if highly heated for a prolonged period. When involved in a fire, this material may decompose and produce irritating vapors and toxic gases (e.g., calcium, carbon, tin, titanium and nitrogen oxides, ammonia, formaldehyde and acrylic monomers).

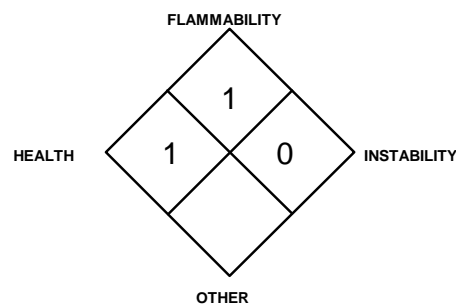
Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

SPECIAL PROTECTIVE ACTIONS FOR FIRE-FIGHTERS: Incipient fire

responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus (SCBA) and full protective equipment. Chemical resistant clothing may be necessary. Move containers from fire area if it can be done without risk to personnel. Water spray can be used to cool fire-exposed containers. Water fog or spray can also be used by trained firefighters to disperse this product's vapors and to protect personnel. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

NFPA RATING



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

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS AND EMERGENCY PROCEDURES: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. Call CHEMTREC (1-800-424-9300) for emergency assistance. Or if in Canada, call CANUTEC (613-996-6666). The atmosphere must at least 19.5 percent Oxygen before non-emergency personnel can be allowed in the area without Self-Contained Breathing Apparatus and fire protection.

PERSONAL PROTECTIVE EQUIPMENT: Proper protective equipment should be used. Use only non-sparking tools and equipment.

Small Spills: Wear rubber gloves, splash goggles, and appropriate body protection.

Large Spills: Minimum Personal Protective Equipment should be rubber gloves, rubber boots, face shield, and Tyvek suit.

6. ACCIDENTAL RELEASE MEASURES (Continued)

PERSONAL PROTECTIVE EQUIPMENT (continued):

Large Spills (continued): Minimum level of personal protective equipment for releases in which the level of oxygen is less than 19.5% or is unknown must be **Level B: triple-gloves (rubber gloves and nitrile gloves over latex gloves), boots, Tyvek or similar protective clothing, hard hat, and Self-Contained Breathing Apparatus.**

METHODS FOR CLEAN-UP AND CONTAINMENT: Spills of this product present minimal hazard.

Small Spills: Small releases can be carefully swept up or cleaned up using a damp sponge or polypads.

Large Spills: Access to the spill area should be restricted. For large spills, dike or otherwise contain spill and sweep-up or vacuum with non-sparking vacuum.

All Spills: Place all spill residue in a double plastic bag or other containment and seal. Close off sewers and take other measures to protect human health and the environment as necessary. Rinse area with soap and water solution and follow with a water rinse. Decontaminate the area thoroughly. Do not mix with wastes from other materials. Dispose of in accordance with applicable Federal, State, and local procedures (see Section 13, Disposal Considerations). For spills on water, contain, minimize dispersion and collect. Dispose of recovered material and report spill per regulatory requirements.

ENVIRONMENTAL PRECAUTIONS: Avoid release to the environment. Run-off water may be contaminated by other materials and should be contained to prevent possible environmental damage.

REFERENCE TO OTHER SECTIONS: See information in Section 8 (Exposure Controls – Personal Protection) and Section 13 (Disposal Considerations) for additional information.

7. HANDLING and USE

PRECAUTIONS FOR SAFE HANDLING: As with all chemicals, avoid getting this material ON YOU or IN YOU. Do not eat, drink, smoke, or apply cosmetics while handling this product. Wash hands thoroughly after handling this product or containers of this product. Avoid breathing fumes or vapors generated by this product. Use in a well-ventilated location.

CONDITIONS FOR SAFE STORAGE: Store containers in a cool, dry location, away from direct sunlight, sources of intense heat. Containers should be grounded and separated from oxidizing materials by a minimum distance of 20 ft. or by a barrier of non-combustible material at least 5 ft. high having a fire-resistance rating of at least 0.5 hours. Storage areas should be made of fire resistant materials. Post warning and “NO SMOKING” signs in storage and use areas as appropriate. Have appropriate extinguishing equipment in the storage area (e.g., sprinkler system, portable fire extinguishers). Recommended storage temperature: Minimum: -1°C (34°F); Maximum: 60°C (140°F). The recommended maximum duration of storage (shelf-life) is one year at the recommended storage temperature.

SPECIFIC END USE(S): This product is for use as a sealant. Follow all industry standards for use of this product.

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

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS/CONTROL PARAMETERS:

Ventilation and Engineering Controls: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided below (if applicable). Exhaust directly to the outside, taking necessary precautions for environmental protection.

Workplace Exposure Limits/Control Parameters: Due to form of the product, inhalation is unlikely. If heated to decomposition, exposure by inhalation may occur.

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR							
		ACGIH-TLVs		OSHA-PELs		NIOSH-RELS		NIOSH	OTHER
		TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	IDLH mg/m ³	mg/m ³
Calcium Carbonate	1317-65-3	NE	NE	15 (total dust); 1 (resp. fract.)	NE	10 (total dust); 1 (resp. fract.)	NE	NE	NE
Diisononyl Phthalate	68515-48-0	NE	NE	NE	NE	NE	NE	NE	NE
Proprietary Acrylic Polymer		NE	NE	NE	NE	NE	NE	NE	NE
Propylene Glycol	57-55-6	NE	NE	NE	NE	NE	NE	NE	AIHA WEEL: TWA: 10
Reaction mass of Octadecanamide, 12-hydroxy-N-[2-[(1-oxodecyl) amino]ethyl]- and N,N'-ethane-1,2-diylbis(12-hydroxyoctadecan-1-amide) and Decanamide, N,N'-1,2-ethanediybis-	123-26-2	NE	NE	NE	NE	NE	NE	NE	NE
Quartz, Crystalline Silica	14808-60-7	0.025 (resp. fract.)	NE	0.01 mg/m ³ (vacated 1989 PEL) 30 (total dust) % SO ₂ + 2 250 mppcf (resp. dust) % SiO ₂ + 5 or 10 (resp. dust) % SO ₂ + 2		0.05 (resp. dust) See Pocket Guide App. A	NE	25	Carcinogen: IARC-1, MAK-2 (resp.), NIOSH- Ca, NTP-K (resp.), TLV-A2

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

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

EXPOSURE LIMITS/CONTROL PARAMETERS (continued):

Workplace Exposure Limits/Control Parameters (continued):

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR							
		ACGIH-TLVs		OSHA-PELs		NIOSH-RELVs		NIOSH	OTHER
		TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	IDLH mg/m ³	mg/m ³
Titanium Dioxide	13463-67-7	10	NE	15 (total dust); 10 (vacated 1989 PEL)	NE	See Pocket Guide App. A	5000 (Ca)	Carcinogen: IARC-2B, MAK- 3A, NIOSH-Ca; TLV-A3	

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

PROTECTIVE EQUIPMENT: *The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132, including the Respiratory Protection Standard (29 CFR 1910.134), Eye Protection Standard 29 CFR 1910.13, the Hand Protection Standard 29 CFR 1910.138, and the Foot Protection Standard 29 CFR 1910.136), equivalent standards of Canada (including the Canadian CSA Respiratory Standard Z94.4-93-02, the CSA Eye Protection Standard Z94.3-M1982, Industrial Eye and Face Protectors and the Canadian CSA Foot Protection Standard Z195-M1984, Protective Footwear). Please reference applicable regulations and standards for relevant details.*

Respiratory Protection: Maintain airborne contaminant concentrations below exposure limits listed above, if applicable. For materials without listed exposure limits, minimize respiratory exposure. If necessary, use only respiratory protection authorized under appropriate regulations. Oxygen levels below 19.5% are considered IDLH by U.S. OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under U.S. OSHA's Respiratory Protection Standard (1910.134-1998).

Eye Protection: Wear splash goggles or safety glasses as appropriate for the task.

Hand Protection: Wash hands and wrists before putting on and after removing gloves. During manufacture or other similar operations, wear the appropriate hand protection for the process. Use double gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this SDS. Because all gloves are to some extent permeable and their permeability increases with time, they should be changed regularly (hourly is preferable) or immediately if torn or punctured. If necessary refer to appropriate regulations.

Skin Protection: Use appropriate protective clothing for the task (e.g., lab coat, etc.). If necessary, refer to the U.S. OSHA Technical Manual (Section VII: Personal Protective Equipment) or other appropriate regulations. 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 and Canadian Standards.

9. PHYSICAL and CHEMICAL PROPERTIES

FORM: Paste.

MOLECULAR FORMULA: Mixture.

ODOR: Mild

FLAMMABLE LIMITS (in air by volume, %): Not applicable.

DECOMPOSITION TEMPERATURE: Not available.

AUTOIGNITION TEMPERATURE: Not available.

FREEZING/MELTING POINT: Not available.

VAPOR PRESSURE: Not available.

SPECIFIC GRAVITY (water = 1): 1.53

VAPOR DENSITY (air = 1): Not available.

SOLUBILITY IN WATER: Insoluble

COEFFICIENT WATER/OIL DISTRIBUTION: Not established.

HOW TO DETECT THIS SUBSTANCE (warning properties in event of accidental release): The appearance may be characteristics to distinguish a release of this product.

COLOR: White and various colors

MOLECULAR WEIGHT: Mixture.

ODOR THRESHOLD: Not available.

OXIDIZING PROPERTIES: Not applicable.

PERCENT VOLATILE: Not available.

FLASH POINT: >212°F

BOILING POINT: Not available.

pH: Not applicable.

BULK DENSITY: Not available.

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

SOLUBILITY IN SOLVENTS: Readily

10. STABILITY and REACTIVITY

CHEMICAL STABILITY: Stable when properly stored at recommended temperature (see Section 7, Handling and Storage).

DECOMPOSITION PRODUCTS: **Combustion:** If exposed to extremely high temperatures, thermal decomposition may generate irritating fumes and toxic gases (e.g., calcium, carbon, tin, titanium and nitrogen oxides, ammonia, styrene, formaldehyde and acrylic monomers). **Hydrolysis:** None known.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: This product is incompatible with strong oxidizers.

POSSIBILITY OF HAZARDOUS POLYMERIZATION OR REACTION: Will not occur.

CONDITIONS TO AVOID: Avoid exposure to or contact with extreme temperatures and incompatible chemicals.

11. TOXICOLOGICAL INFORMATION

SYMPTOMS OF EXPOSURE BY ROUTE OF EXPOSURE: The health hazard information provided below is pertinent to employees using this product in an occupational setting. The following paragraphs describe the symptoms of exposure by route of exposure.

Inhalation: Due to viscosity, inhalation is not a significant route of exposure. Vapors or fumes when used in an enclosed space, if heated or during curing may cause irritation of the respiratory system. Symptoms include nose irritation, dry or sore or burning throat, runny nose, shortness of breath.

Contact with Skin or Eyes: Direct eye contact may cause irritation, redness, and tearing from mechanical irritation. Prolonged or repeated skin exposures may cause dermatitis (dry red skin).

11. TOXICOLOGICAL INFORMATION (Continued)

SYMPTOMS OF EXPOSURE BY ROUTE OF EXPOSURE:

Skin Absorption: Some trace components can be absorbed through intact skin.

Unless contact is prolonged and covers a large area of skin, no significant adverse effects is expected.

Ingestion: Ingestion is not a significant route of occupational exposure and is unlikely to occur. If this product is swallowed, irritation of the mouth, throat, esophagus and other tissues of the digestive system may occur. Symptoms of ingestion may include nausea, vomiting, and diarrhea.

Injection: Accidental injection of this product, via laceration or puncture by a contaminated object can cause redness at the site of injection.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in

Lay Terms. Exposure to this product may cause the following health effects:

Acute: Inhalation of fumes or vapors may cause irritation of respiratory system. Eye contact may cause irritation.

Chronic: Prolonged or repeated skin exposure may cause dermatitis (dry red skin).

TARGET ORGANS: Acute: Skin, eyes, respiratory system. Chronic: Skin.

TOXICITY DATA: Currently, the following toxicological data are available for some components of 1% or more concentration.

ACRYLIC POLYMERS:

LD₅₀ (Oral-Rat) > 5000 mg/kg

LD₅₀ (Skin-Rabbit) > 5000 mg/kg

CALCIUM CARBONATE:

TDLo (Intravenous-Rat) 30 mg/kg: Vascular: BP lowering not characterized in autonomic section; Lungs, Thorax, or Respiration: changes in lung weight; Blood: other changes

TCLo (Inhalation-Rat) 84 mg/m³/4 hours/40 weeks-intermittent: Lungs, Thorax, or Respiration: fibrosis (interstitial); Liver: other changes; Kidney/Ureter/Bladder: other changes

TCLo (Inhalation-Rat) 250 mg/m³/2 hours/24 weeks-intermittent: Lungs, Thorax, or Respiration: fibrosis, focal (pneumoconiosis)

DIISONONYL PHTHALATE:

IC₅₀ (In vitro-Human-melanoma) > 1000 mg/L/48 hours: In Vitro Toxicity Studies: cell viability (lysosomal damage): neutral red assay etc.

LD₅₀ (Oral-Rat) >10,000 mg/kg: Lungs, Thorax, or Respiration: respiratory depression

LD₅₀ (Skin-Rabbit) > 3160 mg/kg

LC₅₀ (Inhalation-Rat) > 67 mg/m³/6 hours

LC₅₀ (Inhalation-Mouse) > 67 mg/m³/6 hours

LC₅₀ (Inhalation-Guinea Pig) > 67 mg/m³/6 hours

TDLo (Oral-Rat) 10,080 mg/kg/2 weeks-continuous: Liver: other changes

TDLo (Oral-Rat) 85,880 mg/kg/113 days-continuous: Liver: changes in liver weight; Kidney/Ureter/Bladder: changes in kidney weight; Related to Chronic Data: changes in ovarian weight

TDLo (Oral-Rat) 45,765 mg/kg/113 days-continuous: Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Oral-Rat) 11,413 mg/kg/113 days-continuous: Liver: changes in liver weight

TDLo (Oral-Rat) 44,800 mg/kg/70 days-continuous: Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Oral-Rat) 22,400 mg/kg/70 days-continuous: Liver: changes in liver weight; Kidney/Ureter/Bladder: changes in kidney weight

TDLo (Oral-Rat) 67,200 mg/kg/70 days-continuous: Related to Chronic Data: changes in testicular weight

TDLo (Oral-Rat) 16,450 mg/kg/70 days-continuous: Kidney/Ureter/Bladder: changes in kidney weight

TDLo (Oral-Rat) 32,900 mg/kg/70 days-continuous: Liver: changes in liver weight

TDLo (Oral-Rat) 45,000 mg/kg/90 days-continuous: Liver: changes in liver weight; Kidney/Ureter/Bladder: changes in kidney weight

TDLo (Oral-Rat) 20,657 mg/kg/13 weeks-continuous: Liver: changes in liver weight; Kidney/Ureter/Bladder: changes in kidney weight

TDLo (Oral-Rat) 12,600 mg/kg/21 days-continuous: Liver: changes in liver weight; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: multiple enzyme effects

TDLo (Oral-Rat) 1133 gm/kg/4 years-continuous: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Kidney/Ureter/Bladder: Kidney tumors

TDLo (Oral-Rat) 405 gm/kg/79 weeks-continuous: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Liver: tumors

TDLo (Oral-Rat) 10 gm/kg: female 6-15 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)

TDLo (Oral-Rat) 153 gm/kg: male 70 day(s) pre-mating female 70 day(s) pre-mating: 3 week(s) post-birth: Reproductive: Effects on Newborn: live birth index (measured after birth), weaning or lactation index (e.g., # alive at weaning per # alive at day 4)

TDLo (Oral-Rat) 510 gm/kg: male 70 day(s) pre-mating female 70 day(s) pre-mating: 3 week(s) post-birth: Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain)

TDLo (Oral-Rat) 20 gm/kg: male 70 day(s) pre-mating female 70 day(s) pre-mating: 21 day(s) post-birth: Reproductive: Fertility: litter size (e.g. # fetuses per # alive at day 4) measured before birth; Specific Developmental Abnormalities: hepatobiliary system; Effects on Newborn: growth statistics (e.g.%, reduced weight gain)

TDLo (Oral-Rat) 79 gm/kg: male 70 day(s) pre-mating female 70 day(s) pre-mating: 21 day(s) post-birth: Reproductive: Specific Developmental Abnormalities: hepatobiliary system, urogenital system

TDLo (Oral-Rat) 109 mg/kg: Multi-Generations: Reproductive: Fertility: litter size (e.g. # fetuses per litter; measured before birth); Specific Developmental Abnormalities: hepatobiliary system



HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD	(BLUE)	1*
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FLAMMABILITY HAZARD	(RED)	1
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PHYSICAL HAZARD	(YELLOW)	0
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PROTECTIVE EQUIPMENT

EYES	RESPIRATORY	HANDS	BODY
	SEE SECTION 8		SEE SECTION 8

For Routine Industrial Use and Handling Applications

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

DIISONONYL PHTHALATE (continued):

TDLo (Oral-Rat) 219 mg/kg: Multi-Generations: Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain)

TDLo (Oral-Rat) 39 gm/kg: male 70 day(s) pre-mating female 70 day(s) pre-mating: 21 day(s) post-birth: Reproductive: Specific Developmental Abnormalities: urogenital system

TDLo (Oral-Rat) 1000 mg/kg: female 6-15 day(s) after conception: Reproductive: Specific Developmental Abnormalities: urogenital system

TDLo (Oral-Rat) 5000 mg/kg: female 6-15 day(s) after conception: Reproductive: Specific Developmental Abnormalities: musculoskeletal system

TDLo (Oral-Rat) 10 gm/kg: female 6-15 day(s) after conception: Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants); Specific Developmental Abnormalities: musculoskeletal system, urogenital system

TDLo (Oral-Rat) 33 gm/kg: male 10 week(s) pre-mating female 10 week(s) pre-mating: 3 week(s) post-birth: Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain)

TDLo (Oral-Rat) 16,500 mg/kg: female 14 day(s) after conception: 3 day(s) post-birth: Reproductive: Specific Developmental Abnormalities: urogenital system

TDLo (Oral-Rat) 10,000 mg/kg: female 6-15 day(s) after conception: Reproductive: Maternal Effects: other effects; Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)

TDLo (Oral-Mouse) 10,080 mg/kg/2 weeks-continuous: Liver: other changes, changes in liver weight

TDLo (Oral-Mouse) 6720 mg/kg/1 week-intermittent: Liver: changes in liver weight; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: other oxidoreductases; Biochemical: Metabolism (Intermediary): lipids including transport

TDLo (Oral-Mouse) 2520 mg/kg/2 weeks-intermittent: Liver: changes in liver weight

TDLo (Oral-Mouse) 1086 gm/kg/4 years-continuous: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Liver: tumors

TDLo (Oral-Mouse) 2764 gm/kg/4 years-continuous: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Liver: tumors

TDLo (Oral-Mouse) 65700 mg/kg/2 years-intermittent: Tumorigenic: neoplastic by RTECS criteria, increased incidence of tumors in susceptible strains; Liver: tumors

TDLo (Oral-Dog) 182,000 mg/kg/13 weeks-continuous: Liver: other changes, changes in liver weight; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: multiple enzyme effects

TDLo (Oral-Monkey) 7 gm/kg/14 days-intermittent: Blood: changes in other cell count (unspecified)

TDLo (Oral-Monkey) 227,500 mg/kg/13 weeks-continuous: Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Unreported-Rat) 41,250 mg/kg: female 14 day(s) after conception: 3 day(s) post-birth: Reproductive: Specific Developmental Abnormalities: urogenital system

PROPYLENE GLYCOL:

Standard Draize Test (Skin-Human) 500 mg/7 days: Mild

Standard Draize Test (Skin-Human) 104 mg/3 days-intermittent: Moderate

Standard Draize Test (Skin-Man) 10%/2 days

Standard Draize Test (Skin-Child) 30%/96 hours-continuous: Moderate

Open Irritation Test (Skin-woman) 30%/96 hours: Mild

TDLo (Oral-Child) 79 gm/kg/56 weeks-intermittent: Brain and Coverings: changes in surface EEG; Behavioral: general anesthetic, convulsions or effect on seizure threshold

TDLo (Skin-Human) 10 pph: Skin and Appendages: dermatitis, allergic (after topical exposure)

11. TOXICOLOGICAL INFORMATION (Continued)

TOXICITY DATA (continued):

PROPYLENE GLYCOL (continued):

TDLo (Parenteral-Infant) 10 gm/kg/3 days-continuous: Nutritional and Gross Metabolic: other changes
TDLo (Skin-Human) 5 mg/kg/7 days-intermittent: Skin and Appendages: primary irritation (after topical exposure)
TDLo (Skin-Human) 4.5 mg/kg/3 days-intermittent: Skin and Appendages: primary irritation (after topical exposure)
TDLo (Skin-Human) 10 pph/48 hours-continuous: Skin and Appendages: dermatitis, allergic (after topical exposure)
TDLo (Skin-Man) 0.03 mL/kg/22 days-intermittent: Skin and Appendages: cutaneous sensitization, experimental (after topical exposure)
TDLo (Intravenous-Woman) 5167 mg/kg/13 days-continuous: Nutritional and Gross Metabolic: metabolic acidosis
Standard Draize Test (Eye-Rabbit) 100 mg; Mild
Standard Draize Test (Eye-Rabbit) 500 mg/24 hours: Mild
LD₅₀ (Oral-Rat) 20 gm/kg
LD₅₀ (Oral-Mouse) 22 gm/kg
LD₅₀ (Oral-Mouse) 20,300 mg/kg: Behavioral: ataxia, tetany; Lungs, Thorax, or Respiration: respiratory depression
LD₅₀ (Oral-Rabbit) 18,500 mg/kg
LD₅₀ (Oral-Dog) 22 mg/kg
LD₅₀ (Oral-Dog) 22,000 mg/kg: Behavioral: ataxia, tetany; Lungs, Thorax, or Respiration: respiratory depression
LD₅₀ (Oral-Guinea Pig) 18,350 mg/kg
LD₅₀ (Oral-Guinea Pig) 19,000 mg/kg: Behavioral: ataxia, tetany Lungs, Thorax, or Respiration: respiratory depression
LD₅₀ (Oral-Quail) > 2080 mg/kg
LD₅₀ (Skin-Rabbit) 20,800 mg/kg
LD₅₀ (Skin-Rabbit) 20,800 mg/kg: Behavioral: ataxia, tetany; Lungs, Thorax, or Respiration: respiratory depression
LD₅₀ (Intraperitoneal-Rat) 6660 mg/kg
LD₅₀ (Intraperitoneal-Mouse) 9718 mg/kg: Lungs, Thorax, or Respiration: chronic pulmonary edema; Kidney/Ureter/Bladder: changes in both tubules and glomeruli; Blood: changes in spleen
LD₅₀ (Intraperitoneal-Mouse) 11,400 mg/kg: Behavioral: ataxia, tetany Lungs, Thorax, or Respiration: respiratory depression
LD₅₀ (Subcutaneous-Rat) 22,500 mg/kg
LD₅₀ (Subcutaneous-Rat) 28,000 mg/kg: Behavioral: ataxia, tetany Lungs, Thorax, or Respiration: respiratory depression
LD₅₀ (Subcutaneous-Mouse) 17,370 mg/kg: Behavioral: changes in motor activity (specific assay), muscle contraction or spasticity; Lungs, Thorax, or Respiration: cyanosis
LD₅₀ (Subcutaneous-Mouse) 17,400 mg/kg: Behavioral: ataxia, tetany Lungs, Thorax, or Respiration: respiratory depression
LD₅₀ (Intravenous-Rat) 6800 mg/kg: Behavioral: ataxia, tetany Lungs, Thorax, or Respiration: respiratory depression
LD₅₀ (Intravenous-Rat) 6423 mg/kg
LD₅₀ (Intravenous-Mouse) 8000 mg/kg: Behavioral: ataxia, tetany Lungs, Thorax, or Respiration: respiratory depression
LD₅₀ (Intravenous-Mouse) 6630 mg/kg
LD₅₀ (Intravenous-Dog) 26 gm/kg
LD₅₀ (Intravenous-Rabbit) 6500 mg/kg
LD₅₀ (Intramuscular-Rat) 14 gm/kg
LD₅₀ (Intramuscular-Rat) 20,000 mg/kg: Behavioral: ataxia, tetany Lungs, Thorax, or Respiration: respiratory depression
LDLo (Oral-Rabbit) 20,000 mg/kg: Behavioral: ataxia, tetany Lungs, Thorax, or Respiration: respiratory depression

PROPYLENE GLYCOL (continued):

LDLo (Intramuscular-Rabbit) 6300 mg/kg: Behavioral: somnolence (general depressed activity), coma; Lungs, Thorax, or Respiration: respiratory stimulation
LDLo (Subcutaneous-Guinea Pig) 15,500 mg/kg
LDLo (Subcutaneous-Guinea Pig) 15,500 mg/kg: Behavioral: ataxia, tetany Lungs, Thorax, or Respiration: respiratory depression
LDLo (Intravenous-Chicken) 27 gm/kg: Vascular: other changes
LDLo (Intravenous-Rabbit) 4200 mg/kg: Behavioral: ataxia, tetany Lungs, Thorax, or Respiration: respiratory depression
LDLo (Intramuscular-Mouse) 6300 mg/kg: Behavioral: ataxia, tetany Lungs, Thorax, or Respiration: respiratory depression
TDLo (Oral-Rat) 88,269 mg/kg/30 days-intermittent: Endocrine: hyperglycemia
Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: phosphatases, transaminases
TDLo (Oral-Rat) 84 mL/kg/30 days-continuous: Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol) Blood: changes in leukocyte (WBC) count; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: multiple enzyme effects
TDLo (Oral-Dog) 3650 mg/kg/2 years-intermittent: Blood: normocytic anemia, other hemolysis with or without anemia
TDLo (Skin-Mouse) 1,284,800 mg/kg/2 years-intermittent: Skin and Appendages: tumors
TDLo (Intraperitoneal-Rat) 19,500 mg/kg: Behavioral: ataxia, tetany Lungs, Thorax, or Respiration: respiratory depression
TDLo (Intraperitoneal-Mouse) 100 mg/kg: female 11 day(s) after conception: Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants)
TDLo (Intraperitoneal-Mouse) 100 mg/kg: female 15 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)
TDLo (Inhalation-Rat) 2180 mg/m³/6 hours/90 days-intermittent: Behavioral: food intake (animal); Endocrine: changes in spleen weight; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: dehydrogenases
DNA Inhibition (Subcutaneous-Mouse) 8000 mg/kg
Cytogenetic Analysis (Subcutaneous-Mouse) 8000 mg/kg
Cytogenetic Analysis (Hamster Fibroblast) 32 gm/L
TITANIUM DIOXIDE:
Standard Draize Test (Skin-Human) 300 µg/3 days-intermittent: Mild
TC (Inhalation-Rat) 10 mg/m³/18 hours/2 years-intermittent: Tumorigenic: carcinogenic by RTECS criteria; Lungs, Thorax, or Respiration: tumors
TDLo (Inhalation-Rat) 250 mg/m³/6 hours/2 years-intermittent: Tumorigenic: carcinogenic by RTECS criteria; Lungs, Thorax, or Respiration: tumors
TD (Intramuscular-Rat) 260 mg/kg/84 weeks-intermittent: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Blood: lymphoma, including Hodgkin's disease; Tumorigenic: tumors at site of application
TDLo (Intratracheal-Mouse) 100 mg/kg: Tumorigenic: increased incidence of tumors in susceptible strains
TDLo (Intramuscular-Rat) 360 mg/kg/2 years-intermittent: Tumorigenic: neoplastic by RTECS criteria; Blood: lymphoma, including Hodgkin's disease; Tumorigenic: tumors at site of application
DNA Damage (Human Lung) 100 µg/plate
DNA Damage (Human Lung) 20 µg/disk/4 hours
Sister Chromatid Exchange (Human Lymphocyte) 2 µmol/L/72 hours
Micronucleus Test (Human Lymphocyte) 5 µmol/L/72 hours
Micronucleus Test (Intraperitoneal-Mouse) 3 gm/kg/3 days-continuous
Micronucleus Test (Hamster Ovary) 5 µmol/L
DNA Inhibition (Hamster Lung) 500 mg/L
Sister Chromatid Exchange (Hamster Ovary) 1 µmol/L

IRRITANCY OF PRODUCT: Inhalation of fumes if product if heated or if applied in confined space may cause respiratory irritation. Eye contact may cause irritation. Prolonged skin contact may cause irritation.

SENSITIZATION OF PRODUCT: This product contains trace amounts of Formaldehyde, which is known to cause skin sensitization. Persons susceptible or already sensitized to Formaldehyde may experience an allergic reaction.

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

QUARTZ SILICA: ACGIH-TLV-A2 (Suspected Human Carcinogen); IARC-1 (Carcinogenic to Humans); MAK-1 (Substances that Cause Cancer in Man and Can Be Assumed to Make a Significant Contribution to Cancer Risk); NIOSH-Ca (Potential Occupational Carcinogen with No Further Categorization); NTP-K (Known to Be a Human Carcinogen)

TITANIUM DIOXIDE: ACGIH TLV-A3 (Confirmed Animal Carcinogen); IARC-3 (Unclassifiable as to Carcinogenicity in Humans); NIOSH-Ca (Potential Occupational Carcinogen, with No Further Categorization)

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

REPRODUCTIVE TOXICITY INFORMATION: This product has not been tested for reported mutagenic, embryotoxic, teratogenic or reproductive toxicity. The following information is available for the Diisononyl Phthalate component:

Embryotoxicity/Teratogenicity: Exposure to phthalates has been reported to result in increased incidence of developmental abnormalities such as cleft palate and skeletal malformations, and increased fetal death in experimental animal studies. The most sensitive system is the immature male reproductive tract, with phthalate exposure resulting in increased incidence of undescended testes, decreased testes weight, decreased anogenital distance (distance between the anus and the base of the penis), and other effects.

Reproductive Toxicity: Phthalates are classified as endocrine disruptors or hormonally-active agents (HAAs) because of their ability to interfere with the endocrine system in the body.

ACGIH BIOLOGICAL EXPOSURE INDICES (BEIs): 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.

MOBILITY: This product has not been tested for mobility in soil.

PERSISTENCE AND BIODEGRADABILITY: This product has not been tested for persistence or biodegradability. The mineral components are not expected to biodegrade to great extent.

BIO-ACCUMULATION POTENTIAL: This product has not been tested for bio-accumulation potential.

ECOTOXICITY: This product has not been tested for aquatic or animal toxicity. All releases to terrestrial, atmospheric and aquatic environments should be avoided. The following aquatic toxicity data are available for the product a component.

REACTION MASS OF OCTADECANAMIDE, 12-HYDROXY-N-[2-[(1-OXODECYL) AMINO]ETHYL]- AND N,N'-ETHANE-1,2-DIYLBIS(12-HYDROXYOCTADECAN-1-AMIDE) AND DECANAMIDE, N,N'-1,2-ETHANEDIYLBIS-

LC₅₀ (*Oncorhynchus mykiss* rainbow trout) 96 hours = > 100 mg/L (Method: OECD Test Guideline 203)

EC₅₀ (*Daphnia magna* Water flea) 48 hours = 94.9 mg/L (Method: OECD Test Guideline 202)

EC₅₀ (*Pseudokirchneriella subcapitata* algae) 72 hours = 43.2 mg/L (Method: OECD Test Guideline 201, Growth inhibition)

EC₁₀ (*Pseudokirchneriella subcapitata* algae) 72 hours = 37 mg/L (Method: OECD Test Guideline 201, Growth inhibition)

OTHER ADVERSE EFFECTS: This material is not listed as having ozone depletion potential.

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

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHODS: It is the responsibility of the generator to determine at the time of disposal whether the product meets the criteria of a hazardous waste per regulations of the area in which the waste is generated and/or disposed of. Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority. Shipment of wastes must be done with appropriately permitted and registered transporters.

DISPOSAL CONTAINERS: Waste materials must be placed in and shipped in appropriate 5-gallon or 55-gallon poly or metal waste pails or drums. Permeable cardboard containers are not appropriate and should not be used. Ensure that any required marking or labeling of the containers be done to all applicable regulations.

PRECAUTIONS TO BE FOLLOWED DURING WASTE HANDLING: Wear proper protective equipment when handling waste materials.

U.S. EPA WASTE NUMBER: Not applicable.

14. TRANSPORTATION INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION REGULATIONS: This product is not classified as dangerous goods, per U.S. DOT regulations, under 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 AIR TRANSPORT ASSOCIATION (IATA): This product is not classified as dangerous goods under rules of IATA.

15. REGULATORY INFORMATION

UNITED STATES REGULATIONS:

U.S. SARA Reporting Requirements: This product is not subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA Hazard Categories (Section 311/312, 40 CFR 370-21): ACUTE: Yes; CHRONIC: No; FIRE: No; REACTIVE: No; SUDDEN RELEASE: No

U.S. SARA Threshold Planning Quantity (TPQ): There are no specific Threshold Planning Quantities for components. The default Federal SDS 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): Not applicable.

U.S. TSCA Inventory Status: Components of this product are listed on the TSCA Inventory.

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65): The Quartz and Diisononyl Phthalate components are on the California Proposition 65 lists. WARNING: This product contains chemicals known to the State of California to cause cancer.

CANADIAN REGULATIONS:

Canadian DSL/NDSL Inventory Status: Components are on the DSL or NDSL Inventories.

Canadian Environmental Protection Act (CEPA) Priorities Substances Lists: Components are not on the CEPA Priorities Substances Lists.

Canadian WHMIS Classification and Symbols: This product is classified as a Controlled Product, Hazard Class D2B (Immediate Acute Toxicity/Irritation, Potential Evidence of Carcinogenic and Reproductive Toxicity Potential) as per the Controlled Product Regulations.



16. OTHER INFORMATION

LABELING (Precautionary Statements) ANSI LABELING (Z129.1): **CAUTION!** MAY CAUSE IRRITATION BY INHALATION AND EYE CONTACT. PROLONGED SKIN CONTACT MAY CAUSE IRRITATION. CONTAINS TRACE AMOUNT OF CRYSTALLINE SILICA, A KNOWN HUMAN CARCINOGEN. CONTAINS PHTHALATE COMPOUND WHICH MAY HAVE ADVERSE EFFECTS ON FERTILITY AND FETUS DURING PREGNANCY. CONTAINS COMPOUND THAT CAN CAUSE LONG-TERM HARM TO AQUATIC ORGANISMS.

16. OTHER INFORMATION (Continued)

LABELING (Precautionary Statements) ANSI LABELING (continued): Avoid breathing fumes or vapors. Do not taste or swallow. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear appropriate eye, hand, and body protection. Avoid exposure to elevated temperatures. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water for at least 20 minutes while removing contaminated clothing and shoes. Get medical attention if irritation develops or persists. 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. **IN CASE OF FIRE:** Use water fog, foam, dry chemical, or CO₂. **IN CASE OF SPILL:** Sweep or vacuum spilled material, avoiding generation of dusts and place in suitable container. Place residual in appropriate container and seal. Dispose of in accordance with U.S. Federal, State, and local hazardous waste disposal regulations. Consult Safety Data Sheet for additional information.

GLOBAL HARMONIZATION AND JAPANESE JIS Z7253 LABELING AND CLASSIFICATION: This product has been classified per UN GHS Standards under U.S applicable regulations that require Global Harmonization compliance.

Classification: Carcinogenic Category 1B, Reproductive Toxicity Category 2, Aquatic Chronic Toxicity Category 3

Signal Word: Danger

Hazard Statements: H350: May cause cancer. H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child. H412: Harmful to aquatic life with long-lasting effects.

Precautionary Statements:

Prevention: P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P273: Avoid release to the environment. P280: Wear protective gloves, clothing, eye protection and face protection.

Response: P308 + P313: IF exposed or concerned: Get medical advice/attention.

Storage: P405: Store locked up.

Disposal: P501: Dispose of contents/containers in accordance with all local, regional, national and international regulations.

Hazard Symbols: GHS08

COMPONENT CLASSIFICATION:

Labeling and Classification Full Text under GHS:

Diisononyl Phthalate: This is a self-classification.

Classification: Reproductive Toxicity Category 2

Hazard Statements: H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.

Quartz, Crystalline Silica: This is a self-classification.

Classification: Carcinogenic Category 1B

Hazard Statements: H350: May cause cancer.

Reaction mass of Octadecanamide, 12-hydroxy-N-[2-[(1-oxodecyl) amino]ethyl]- and N,N'-ethane-1,2-diylbis(12-hydroxyoctadecan-1-amide) and Decanamide, N,N'-1,2-ethanediybis-

Classification: Aquatic Chronic Toxicity Category 3

Hazard Statements: H412: Harmful to aquatic life with long-lasting effects.

Titanium Dioxide: This is a self-classification.

Classification: Carcinogenic Category 2

Hazard Statements: H350i: May cause cancer by inhalation.

Vinyltrimethoxysilane: This is a self-classification.

Classification: Flammable Liquid Category 3, Acute Inhalation Toxicity Category 4

Hazard Statements: H226: Flammable liquid and vapour. H332: Harmful if inhaled.

REVISION DETAILS: New.

REFERENCES AND DATA SOURCES: Contact the supplier for information.

METHODS OF EVALUATING INFORMATION FOR THE PURPOSE OF CLASSIFICATION: Criteria of the GHS were used for classification.

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc. • PO Box 1961, Hilo, HI 96721-1961 • (800) 441-3365

DATE OF PRINTING: April 9, 2019

REVISION HISTORY: New.

DEFINITION OF TERMS

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

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

EXPOSURE LIMITS IN AIR:

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

DFG MAKs: Federal Republic of Germany Maximum Concentration Values in the workplace. Exposure limits are given as TWA (Time-Weighted Average) or PEAK (short-term exposure) values.

DFG MAK Germ Cell Mutagen Categories: **1:** Germ cell mutagens that have been shown to increase the mutant frequency in the progeny of exposed humans. **2:** Germ cell mutagens that have been shown to increase the mutant frequency in the progeny of exposed mammals. **3A:** Substances that 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 that 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 that 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.

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: 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, 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 exposure concentration for a conventional 8-hr (TLV, PEL) or up to a 10-hr (REL) workday and a 40-hr workweek.

WEEL: Workplace Environmental Exposure Limits from the AIHA.

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. Mechanical irritation may occur. PII or Draize = 0. **Eye Irritation:** Essentially non-irritating, minimal effects clearing in < 24 hours. Mechanical irritation may occur. Draize = 0. **Oral Toxicity LD₅₀ Rat:** > 5000 mg/kg. **Dermal Toxicity LD₅₀ Rat or Rabbit:** > 2000 mg/kg. **Inhalation Toxicity 4-hrs LC₅₀ Rat:** > 20 mg/L. **1 Slight Hazard:** Minor reversible injury may occur; may irritate the stomach if swallowed; may defat the skin and exacerbate existing dermatitis. **Skin Irritation:** Slightly or mildly irritating. PII or Draize > 0 < 5. **Eye Irritation:** Slightly to mildly irritating, but reversible within 7 days. Draize > 0 ≤ 25. **Oral Toxicity LD₅₀ Rat:** > 500–5000 mg/kg. **Dermal Toxicity LD₅₀ Rat or Rabbit:** > 1000–2000 mg/kg. **Inhalation Toxicity LC₅₀ 4-hrs Rat:** > 2–20 mg/L. **2 Moderate Hazard:** Temporary or transitory injury may occur; prolonged exposure may affect the CNS. **Skin Irritation:** Moderately irritating; primary irritant; sensitizer. PII or Draize ≥ 5, with no destruction of dermal tissue. **Eye Irritation:** Moderately to severely irritating; reversible corneal opacity; corneal involvement or irritation clearing in 8–21 days. Draize = 26–100, with reversible effects. **Oral Toxicity LD₅₀ Rat:** > 50–500 mg/kg. **Dermal Toxicity LD₅₀ Rat or Rabbit:** > 200–1000 mg/kg. **Inhalation Toxicity LC₅₀ 4-hrs Rat:** > 0.5–2 mg/L. **3 Serious Hazard:** Major injury likely unless prompt action is taken and medical treatment is given; high level of toxicity; corrosive. **Skin Irritation:** Severely irritating and/or corrosive; may cause destruction of dermal tissue, skin burns, and dermal necrosis. PII or Draize > 5–8, with destruction of tissue. **Eye Irritation:** Corrosive, irreversible destruction of ocular tissue; corneal involvement or irritation persisting for more than 21 days. Draize > 80 with effects irreversible in 21 days. **Oral Toxicity LD₅₀ Rat:** > 1–50 mg/kg. **Dermal Toxicity LD₅₀ Rat or Rabbit:** > 20–200 mg/kg. **Inhalation Toxicity LC₅₀ 4-hrs Rat:** > 0.05–0.5 mg/L. **4 Severe Hazard:** Life-threatening; major or permanent damage may result from single or repeated exposures; extremely toxic; irreversible injury may result from brief contact. **Skin Irritation:** Not appropriate. Do not rate as a 4, based on skin irritation alone. **Eye Irritation:** Not appropriate. Do not rate as a 4, based on eye irritation alone. **Oral Toxicity LD₅₀ Rat:** ≤ 1 mg/kg. **Dermal Toxicity LD₅₀ Rat or Rabbit:** ≤ 20 mg/kg. **Inhalation Toxicity LC₅₀ 4-hrs Rat:** ≤ 0.05 mg/L.

FLAMMABILITY HAZARD: 0 Minimal Hazard: Materials that will not burn in air when exposure to a temperature of 815.5°C (1500°F) for a period of 5 minutes. **1 Slight Hazard:** Materials that must be pre-heated before ignition can occur. Material requires considerable pre-heating, under all ambient temperature conditions before ignition and combustion can occur. This usually includes the following: 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) (i.e. OSHA Class IIIB); and Most ordinary combustible materials (e.g. wood, paper, etc.). **2 Moderate Hazard:** Materials that will 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 with air. This usually includes the following: 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;

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

FLAMMABILITY HAZARD (continued): 3 (continued) Solid materials in a fibrous or shredded form that may burn rapidly and create flash fire hazards (e.g. cotton, sisal, hemp); and Solids and semisolids (e.g. viscous and slow flowing as asphalt) 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. This usually includes the following: Liquids having a flash point below 22.8°C (73°F) and having a boiling point at or above 38°C (100°F) and those liquids having a flash point at or above 22.8°C (73°F) and below 37.8°C (100°F) (i.e. 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); and 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 that will burn readily. This usually includes the following: 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) (i.e. OSHA Class IA); and Materials that ignite spontaneously when exposed to air at a temperature of 54.4°C (130°F) or below (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. **Compressed Gases:** No Rating. **Pyrophorics:** No Rating. **Oxidizers:** No 0 rating. **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 violently. **Explosives:** Division 1.5 & 1.6 explosives. 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 oxidizers; 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 explosion hazard. Substances that readily undergo hazardous polymerization in the absence of inhibitors. **2 Water Reactivity:** Materials that may react violently with water. **Organic Peroxides:** Materials that, in themselves, are normally unstable and will readily undergo violent chemical change, but will not detonate. These materials may also react violently with water. **Explosives:** Division 1.4 explosives. Explosive substances where the explosive effects 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 oxidizers. 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. **Reactives:** Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure, but have a low potential (or low risk) 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 1.3 explosives. Explosive substances that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but do not have a mass explosion hazard. **Compressed Gases:** Pressure ≥ 514.7 psi absolute at 21.1°C (70°F) [500 psig]. **Pyrophorics:** No Rating. **Oxidizers:** Packing Group I oxidizers. 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 (or moderate risk) 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 explosives. 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 (or high risk) 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 with an LC₅₀ for acute inhalation toxicity greater than 10,000 ppm. Dusts and mists with an LC₅₀ for acute inhalation toxicity greater than 200 mg/L. Materials with an LD₅₀ for acute dermal toxicity greater than 2000 mg/kg. Materials with an LD₅₀ for acute oral toxicity greater than 2000 mg/kg. Materials essentially non-irritating to the respiratory tract, eyes, and skin. **1** Materials that, under emergency conditions, can cause significant irritation. Gases and vapors with an LC₅₀ for acute inhalation toxicity greater than 5,000 ppm but less than or equal to 10,000 ppm. Dusts and mists with an LC₅₀ for acute inhalation toxicity greater than 10 mg/L but less than or equal to 200 mg/L. Materials with an LD₅₀ for acute dermal toxicity greater than 1000 mg/kg but less than or equal to 2000 mg/kg. Materials that slightly to moderately irritate the respiratory tract, eyes and skin. Materials with an LD₅₀ for acute oral toxicity greater than 500 mg/kg but less than or equal to 2000 mg/kg. **2** Materials that, under emergency conditions, can cause temporary incapacitation or residual injury. Gases with an LC₅₀ for acute inhalation toxicity greater than 3,000 ppm but less than or equal to 5,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC₅₀ for acute inhalation toxicity, if its LC₅₀ is less than or equal to 5000 ppm and that does not meet the criteria for either degree of hazard 3 or degree of hazard 4. Dusts and mists with an LC₅₀ for acute inhalation toxicity greater than 2 mg/L but less than or equal to 10 mg/L. Materials with an LD₅₀ for acute dermal toxicity greater than 200 mg/kg but less than or equal to 1000 mg/kg. 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. Materials whose LD₅₀ for acute oral toxicity is greater than 50 mg/kg but less than or equal to 500 mg/kg.

DEFINITION OF TERMS (Continued)

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

HEALTH HAZARD (continued): **3** Materials that, under emergency conditions, can cause serious or permanent injury. Gases with an LC₅₀ for acute inhalation toxicity greater than 1,000 ppm but less than or equal to 3,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater its LC₅₀ for acute inhalation toxicity, if its LC₅₀ is less than or equal to 3000 ppm and that does not meet the criteria for degree of hazard 4. Dusts and mists with an LC₅₀ for acute inhalation toxicity greater than 0.5 mg/L but less than or equal to 2 mg/L. Materials with an LD₅₀ for acute dermal toxicity greater than 40 mg/kg but less than or equal to 200 mg/kg. Materials that are corrosive to the respiratory tract. Materials that are corrosive to the eyes or cause irreversible corneal opacity. Materials corrosive to the skin. Cryogenic gases that cause frostbite and irreversible tissue damage. Compressed liquefied gases with boiling points below -55°C (-66.5°F) that cause frostbite and irreversible tissue damage. Materials with an LD₅₀ for acute oral toxicity greater than 5 mg/kg but less than or equal to 50 mg/kg. **4** Materials that, under emergency conditions, can be lethal. Gases with an LC₅₀ for acute inhalation toxicity less than or equal to 1,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than ten times its LC₅₀ for acute inhalation toxicity, if its LC₅₀ is less than or equal to 1000 ppm. Dusts and mists whose LC₅₀ for acute inhalation toxicity is less than or equal to 0.5 mg/L. Materials whose LD₅₀ for acute dermal toxicity is less than or equal to 40 mg/kg. Materials whose LD₅₀ for acute oral toxicity is less than or equal to 5 mg/kg.

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 according with Annex D of NFPA 704. **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 according with Annex D of NFPA 704. Liquids, solids, and semisolids having a flash point at or above 93.4°C (200°F) (i.e. Class IIB 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 *Recommendations 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% 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 the 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). Most ordinary combustible materials. Solids containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **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 with 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% 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 (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 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% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. 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% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent.

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

INSTABILITY HAZARD: 0 Materials that in themselves are normally stable, even under fire conditions. Materials that have an 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 instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 0.01 W/mL and below 10 W/mL. **2** Materials that readily undergo violent chemical change at elevated temperatures and pressures. Materials that have an 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 are sensitive to localized thermal or mechanical shock 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.

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 vapor to form an ignitable mixture with air near the surface of the liquid or within the test vessel used. **Autoignition Temperature:** Minimum temperature of a solid, liquid, or gas required to initiate or cause self-sustained combustion in air with no other source of ignition. **LEL:** Lowest concentration of a flammable vapor or gas/air mixture that will ignite and burn with a flame. **UEL:** Highest concentration of a flammable vapor or gas/air mixture that will ignite and burn with a flame.

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. **LD₅₀:** Lethal Dose (solids & liquids) that kills 50% of the exposed animals. **LC₅₀:** Lethal Concentration (gases) that kills 50% of the exposed animals. **ppm:** Concentration expressed in parts of material per million parts of air or water. **mg/m³:** Concentration expressed in weight of substance per volume of air. **mg/kg:** Quantity of material, by weight, administered to a test subject, based on their body weight in kg. **TDLo:** Lowest dose to cause a symptom. **TCLo:** Lowest concentration to cause a symptom. **TD₀, LDLo,** and **LD₀** or **TC, TC₀, LCLo,** and **LC₀:** Lowest dose (or concentration) to cause lethal or toxic effects. **Cancer Information:** **IARC:** International Agency for Research on Cancer. **NTP:** National Toxicology Program. **RTECS:** Registry of Toxic Effects of Chemical Substances. **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: Effect concentration in water. **BCF:** Bioconcentration Factor, which is used to determine if a substance will concentrate in life forms that consume contaminated plant or animal matter. **TL₅₀:** Median threshold limit. **log K_{ow}** or **log K_{oc}:** Coefficient of Oil/Water Distribution is used to assess a substance's behavior in the environment.

REGULATORY INFORMATION:

U.S.:

EPA: U.S. Environmental Protection Agency. **ACGIH:** American Conference of Governmental Industrial Hygienists, a professional association that establishes exposure limits. **OSHA:** U.S. Occupational Safety and Health Administration. **NIOSH:** National Institute of Occupational Safety and Health, which is the research arm of OSHA. **DOT:** U.S. Department of Transportation. **IC:** Transport Canada. **SARA:** Superfund Amendments and Reauthorization Act. **TSCA:** U.S. Toxic Substance Control Act. **CERCLA:** Comprehensive Environmental Response, Compensation, and Liability Act. Marine Pollutant status according to the DOT; CERCLA or Superfund; and various state regulations. This section also includes information on the precautionary warnings that appear on the material's package label.

CANADA:

WHMIS: Canadian Workplace Hazardous Materials Information System. **IC:** Transport Canada. **DSL/NDL:** Canadian Domestic/Non-Domestic Substances List.