SAFETY DATA SHEET

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

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

IDENTIFICATION of the SUBSTANCE or PREPARATION:

TRADE NAME:	**NOVUS PLASTIC POLISH #2**
SYNONYMS:	Fine Scratch Remover, NOVUS No 2
PRODUCT CODE:	7030, 7032, 7033, 7072
CHEMICAL NAME/CLASS:	Aqueous Silica/Hydrocarbon Mixture
RELEVANT USES of the SUBSTANCE:	Clean and Restore Plastic Surfaces
USES ADVISED AGAINST:	Other than Relevant Use, Including Glass Polishing

COMPANY/UNDERTAKING IDENTIFICATION:

U.S. DISTRIBUTOR'S NAME:	**NOVUS, INC.**
ADDRESS:	650 Pelham Boulevard, Suite 100 St Paul, MN 55114
BUSINESS PHONE:	1-952-944-8000
EMERGENCY PHONE (medical):	1-800-420-8036 [24-hrs]
EMERGENCY PHONE (transport):	United States/Canada/Puerto Rico: 1-800/424-9300 (Chemtrec) [24-hrs] International: 1-703-527-3887 (Chemtrec) [24-hours]
EMAIL ADDRESS FOR SDS INFORMATION:	msds-info@novusglass.com
DATE OF PREPARATION:	April 22, 2005
DATE OF REVISION:	October 8, 2015

2. HAZARD IDENTIFICATION

OSHA HAZARD COMMUNICATION (GLOBAL HARMONIZATION), AND CANADIAN WHMIS LABELING AND CLASSIFICATION: This product would be classified as follows, per OSHA's Hazard Communication Standard (29CFR §1910.1200) and Canadian WHMIS standards. This is a self-classification.

Classification: Skin Irritation Category 2, Eye Irritation Category 2A, Specific Target Organ Toxicity (Inhalation-Respiratory Irritation) Single Exposure Category 3, Specific Target Organ Toxicity (Inhalation) Repeated Exposure Category 2

Signal Words: Warning

Hazard Statements: H315: Causes skin irritation. H319: Causes serious eye irritation. H335: May cause respiratory irritation. H373: May cause damage to respiratory system through prolonged or repeated exposure by inhalation.

Precautionary Statements:

Prevention: P260: Do not breathe vapors/spray. P264: Wash thoroughly after handling. P271: Use only outdoors or in a well-ventilated area. P280: Wear protective gloves and eye protection.

Response: P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P337 + P313: If eye irritation persists: Get medical advice/attention. P302 + P352: IF ON SKIN: Wash with plenty of soap and water. P332 + P313: If skin irritation occurs, get medical attention. P362: Take off contaminated clothing and wash it before reuse. P304 + P340: If inhaled, remove victim to fresh air and keep at rest in a position comfortable for breathing. P312: Call a POISON CENTER or doctor/physician if you feel unwell. P321: Specific treatment (remove from exposure and treat symptoms).

Storage: P403 + P405 + P233: Store locked up in a well-ventilated place. Keep container tightly closed.

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

Hazard Symbols/Pictograms: GHS08, GHS07

3. COMPOSITION and INFORMATION ON INGREDIENTS

Chemical Name	CAS #	W/W %	OSHA/WHMIS Classification Hazard Statements
Odorless Mineral Spirits	64742-48-9	7.0-13.0%	Due to the fact that this Mineral Spirits contains less than 0.1% benzene or other aromatic, H350 and H340 are not applicable. Classification: Flammable Liquid Cat. 3, Aspiration Toxicity Cat. 1 Hazard Statement Codes: H226, H304 Hazard Pictograms: GHS02, GHS08
Amorphous Silicas/ Diatomaceous Earths Mixture	68855-54-9	5.0-10.0%	SELF CLASSIFICATION Classification: Skin Irritation Cat. 2, Eye Irritation Cat. 2A, STOT (Inhalation-Respiratory Irritation) SE Cat. 3 Hazard Statement Codes: H315, H319, H335 Hazard Pictograms: GHS07
	61790-53-2	1.0-5.0%	
Polydimethyl Siloxane	63148-62-9	4.0-8.0%	Classification: Not Applicable

3. COMPOSITION and INFORMATION ON INGREDIENTS, continued

Chemical Name	CAS #	W/W %	OSHA/WHMIS Classification Hazard Statements
Morpholine	110-91-8	1.0-5.0%	Classification: Flammable Liquid Cat. 3, Acute Inhalation Toxicity Cat. 4, Acute Dermal Toxicity Cat. 4, Acute Oral Toxicity Cat. 4, Skin Corrosion Cat. 1B Hazard Statement Codes: H226, H332, H312, H302, H314 Hazard Pictograms: GHS02, GHS05, GHS07
Oleic Acid	112-80-1	1.0-5.0%	SELF CLASSIFICATION Classification: Skin Irritation Cat. 2 Hazard Statement Codes: H315 Hazard Pictograms: GHS07
Crystalline Silicas Mixture	14464-46-1	0-5.0%	SELF CLASSIFICATION Classification: STOT (Inhalation-Lung Damage) RE Cat. 2 Hazard Statement Codes: H373 Hazard Pictograms: GHS08
	14808-60-7	0-1.0%	
Water	7732-18-5	Balance	Classification: Not applicable.

4. FIRST-AID MEASURES

DESCRIPTION OF FIRST AID MEASURES: Contaminated individuals must be taken for medical attention if any adverse effects occur. Take a copy of label and SDS to health professional with victim.

SKIN EXPOSURE: If this product contaminates the skin, begin decontamination with running water. Minimum flushing is for 20 minutes. The contaminated individual must seek medical attention if any adverse effects occur after flushing.

EYE EXPOSURE: If this product enters the eyes, open contaminated individual's eyes while under gently running water. Use sufficient force to open eyelids. Have contaminated individual "roll" eyes. Minimum flushing is for 20 minutes. Contaminated individual must seek medical attention if adverse effect continues after flushing.

INHALATION: If mists or sprays of this product are inhaled, remove victim to fresh air. The contaminated individual must seek medical attention if any adverse effects occur.

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.

MOST IMPORTANT SYMPTOMS/EFFECTS (ACUTE & CHRONIC): See Sections 2 (Hazard Identification) and 11 (Toxicological Information) for description of possible health effects from exposure to this product.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Skin disorders, respiratory conditions, and central nervous system conditions may be aggravated by prolonged overexposure to this product.

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

5. FIRE-FIGHTING MEASURES

FIRE EXTINGUISHING MEDIA: Use extinguishing material suitable to the surrounding fire, including halon, carbon dioxide, dry chemical, ABC class.

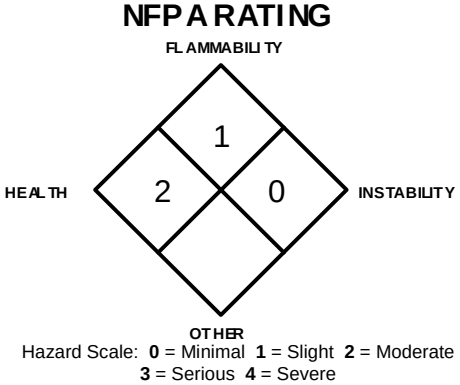
UNSUITABLE FIRE EXTINGUISHING MEDIA: None known.

SPECIAL HAZARDS ARISING FROM THE SUBSTANCE: This product presents a moderate eye and skin-contact hazard to firefighters. This material must be substantially preheated before ignition to occur. When involved in a fire, this material may decompose and produce irritating vapors and toxic gases (including silicon, nitrogen and carbon oxides).

Explosion Sensitivity to Mechanical Impact: Not applicable.

Explosion Sensitivity to Static Discharge: Vapors may be sensitive to static discharge if water has evaporated.

SPECIAL PROTECTIVE ACTIONS FOR FIRE-FIGHTERS: Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Chemical resistant clothing may be necessary. Move containers from fire area if it can be done without risk to personnel. Water spray can be used to cool fire-exposed containers. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas. Rinse contaminated equipment thoroughly with soapy water before returning such equipment to service.



6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS AND EMERGENCY PROCEDURES: Proper protective equipment should be used. In the event of a spill, clear the area and protect people. Eliminate all sources of ignition before cleanup begins. Use non-sparking tools. The atmosphere must have levels of components lower than those listed in Section 8, (Exposure Controls and Personal Protective Equipment) if applicable, and have at least 19.5 percent oxygen before personnel can be allowed into the area without Self-Contained Breathing Apparatus (SCBA).

6. ACCIDENTAL RELEASE MEASURES, Continued

PERSONAL PROTECTIVE EQUIPMENT: Use proper protective equipment and 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. Minimum level of personal protective equipment for releases in which the level of oxygen is less than 19.5% or is unknown must be **Level B: triple-gloves (rubber gloves and nitrile gloves over latex gloves), chemical resistant suit and boots, hard hat, and Self-Contained Breathing Apparatus.**

METHODS FOR CLEAN-UP AND CONTAINMENT: Avoid allowing contact with water on spilled substance or inside containers.

Small Spills: Absorb spilled material with polypads or other suitable, non-reacting sorbent, avoiding generation of aerosols, wearing gloves, goggles and apron. Place spilled material in appropriate container for disposal, sealing tightly. Remove all residue before decontamination of spill area.

Large Spills: Access to the spill area should be restricted. Spread should be limited by diking spill area. Absorb spilled liquid with polypads or other suitable absorbent materials.

All Spills: Place all spill residue in a double plastic bag or other containment and seal. 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 STORAGE

PRECAUTIONS FOR SAFE HANDLING: All employees who handle this material should be trained to handle it safely. Keep container tightly closed when not in use. As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing vapors or mists generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately.

CONDITIONS FOR SAFE STORAGE: Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Storage areas should be made of fire resistant materials. Empty containers may contain residual product; therefore, empty containers should be handled with care.

SPECIFIC END USE(S): This product is used for cleaning and restoring plastic surfaces. Follow all industry standards for use of this product.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

OCCUPATIONAL/WORKPLACE EXPOSURE LIMITS/GUIDELINES:

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
Amorphous Silica	68855-54-9	NE	NE	NE	NE	NE	NE	NE	NE
Crystalline Silica	14808-60-7	NE	NE	Total Dust: 30 mg/m^3 / % SiO_2 + 2 Resp. Fract.: 250 mppcf / % SiO_2 + 5 0.1 (vacated 1989 PEL)	or Resp. Fract.: 10 mg/m^3 / % SiO_2 + 2	0.005 (resp. dust) See Pocket Guide Append. A		50	NE
Crystalline Silica, Cristobalite	14464-46-1	0.025 (resp. fract.)	NE	½ the value calculated from the respirable dust formula for quartz 0.05 (vacated 1989 PEL)		0.005 (resp. dust) See Pocket Guide Append. A		25	NE
Diatomaceous Earth	61790-53-2	NE	NE	20 mppcf 6 (vacated 1989 PEL)	or 80 mg/m^3 / % SiO_2 + 2	6	NE	NE	NE
Mineral Spirits	64742-48-9	NE	NE	NE	NE	NE	NE	NE	Novus OEL: TWA = 500 ppm
Morpholine	110-91-8	71 (skin)	Skin	70 (skin)	Skin	70 (skin)	105 (skin)	NE	DFG MAKs: TWA = 36; PEAK = 2•MAK 15 min average value, 1-hr interval, 4 per shift; DFG MAK Pregnancy Risk Classification: D
Oleic Acid	112-80-1	NE	NE	NE	NE	NE	NE	NE	NE
Polydimethyl Siloxane	63148-62-9	NE	NE	NE	NE	NE	NE	NE	NE

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

8. EXPOSURE CONTROLS - PERSONAL PROTECTION, Continued

INTERNATIONAL EXPOSURE LIMITS: Currently, the following international exposure limits are in force the components of this product. Exposure limits change and should be checked.

CRYSTALLINE SILICA:
Australia: TWA = 0.1 mg/m^3, JUL 2008
Belgium: TWA = 0.1 mg/m^3 (resp. dust), MAR 2002
Denmark: TWA = 0.1 mg/m^3 (respirable), OCT 2002
Denmark: TWA = 0.3 mg/m^3 (total), OCT 2002
Finland: TWA = 0.05 mg/m^3, resp. dust, SEP 2009
France: VME = 0.1 mg/m^3, (resp), FEB 2006
Japan: OEL-C = 0.03 mg/m^3 (respirable), APR 2007
Korea: TWA = 0.1 mg/m^3, 2006
Mexico: TWA = 0.1 mg/m^3 (respirable), 2004
The Netherlands: MAC-TGG = 0.075 mg/m^3, 2003
New Zealand: TWA = 0.2 mg/m^3 (respirable dust), JAN 2002
Norway: TWA = 0.1 mg/m^3 (resp. dust), JAN 1999
Norway: TWA = 0.3 mg/m^3 (total dust), JAN 1999
Russia: TWA = 1 mg/m^3, STEL = 3 mg/m^3, JUN 2003
Sweden: TWA = 0.1 mg/m^3 (resp. dust), JUN 2005
Switzerland: MAK-W = 0.15 mg/m^3, DEC 2006
Thailand: TWA = 10 mg/m^3 (resp. dust), JAN 1993
Thailand: TWA = 30 mg/m^3 (total dust), JAN 1993
United Kingdom: TWA = 0.3 mg/m^3 (respirable), 2005
In Argentina, Bulgaria, Colombia, Jordan, Singapore, Vietnam check ACGIH TLV

CRYSTALLINE SILICA, CRISTOBALITE:
Australia: TWA = 0.1 mg/m^3, JUL 2008
Belgium: TWA = 0.1 mg/m^3 (resp. dust), MAR 2002
Denmark: TWA = 0.1 mg/m^3 (respirable), OCT 2002
Denmark: TWA = 0.3 mg/m^3 (total), OCT 2002
Finland: TWA = 0.05 mg/m^3, resp. dust, SEP 2009
France: VME = 0.1 mg/m^3, (resp), FEB 2006
Japan: OEL-C = 0.03 mg/m^3 (respirable), APR 2007
Korea: TWA = 0.1 mg/m^3, 2006
Mexico: TWA = 0.1 mg/m^3 (respirable), 2004
The Netherlands: MAC-TGG = 0.075 mg/m^3, 2003
New Zealand: TWA = 0.2 mg/m^3 (respirable dust), JAN 2002
Norway: TWA = 0.1 mg/m^3 (resp. dust), JAN 1999
Russia: STEL = 1 mg/m^3 (total dust), JUN 2003
Sweden: TWA = 0.1 mg/m^3 (resp. dust), JUN 2005
Switzerland: MAK-W = 0.15 mg/m^3, DEC 2006
Thailand: TWA = 10 mg/m^3, JAN 1993
United Kingdom: TWA = 0.3 mg/m^3 (respirable), 2005
In Argentina, Bulgaria, Colombia, Jordan, Singapore, Vietnam check ACGIH TLV

DIATOMACEOUS EARTH:
Australia: TWA 10 mg/m^3, JUL 2008
Belgium: TWA 10 mg/m^3, MAR 2002
Belgium: TWA 3 mg/m^3 (resp. dust), MAR 2002
Denmark: TWA = 1.5 mg/m^3 (respirable, with no quartz), OCT 2002
Finland: TWA 5 mg/m^3, SEP 2009
Germany: MAK = 4 mg/m^3 (inhalable), 2005
Korea: TWA = 10 mg/m^3, 2006
Mexico: TWA = 10 mg/m^3 (inhalable), 2004
Mexico: TWA = 3 mg/m^3 (respirable), 2004
New Zealand: TWA = 10 mg/m^3 (inspirable dust), JAN 2002
Norway: TWA = 1.5 mg/m^3 (resp. dust), JAN 1999
Switzerland: MAK-W = 4 mg/m^3, DEC 2006
Thailand: TWA = 80 mg/m^3, JAN 1993
United Kingdom: TWA = 1.2 mg/m^3 (resp. dust), OCT,2007
In Argentina, Bulgaria, Colombia, Jordan, Korea, New Zealand, Singapore, Vietnam check ACGIH TLV

MORPHOLINE:
Australia: TWA =20 ppm (71 mg/m^3), JUL 2008
Belgium: TWA =10 ppm (36 mg/m^3), MAR 2002
Belgium: STEL = 20 ppm (72 mg/m^3), Skin, MAR 2002
Denmark: TWA = 20 ppm (70 mg/m^3), OCT 2002
EC: TWA = 36 mg/m^3 (10 ppm); STEL = 72 mg/m^3 (20 ppm), FEB 2006
Finland: TWA = 10 ppm (36 mg/m^3), STEL = 20 ppm (72 mg/m^3), Skin, SEP2009
France: VME = 20 ppm (70 mg/m^3), VLE = 30 ppm (105 mg/m^3), FEB2006
Germany: MAK = 36 mg/m^3 (10 mL/m^3), 2005
Hungary: TWA = 70 mg/m^3, STEL 70 mg/m^3, Skin, SEP 2000
Korea: TWA = 20 ppm (70 mg/m^3), STEL = 30 ppm (105 mg/m^3), skin, 2006
Mexico: TWA = 20 ppm (70 mg/m^3); STEL = 30 ppm (skin), 2004
The Netherlands: MAC-TGG = 36 mg/m^3, Skin, 2003
New Zealand: TWA = 20 ppm (71 mg/m^3), skin, JAN 2002
Norway: TWA = 20ppm (70 mg/m^3), JAN1 999
The Philippines: TWA = 20 ppm (70 mg/m^3), Skin, JAN1993
Poland: MAC(TWA) 7= 0 mg/m^3, MAC(STEL) = 100 mg/m^3, JAN1999
Russia: TWA = 0.5 mg/m3, STEL = 1.5 mg/m^3, Skin, JUN2003
Sweden: TWA = 10 ppm (35 mg/m^3); STEL = 15 ppm (50 mg/m^3), Skin, JUN2005
Switzerland: MAK-W = 10 ppm (36 mg/m^3), KZG-W = 20 ppm (72 mg/m^3), Skin, DEC2006
United Kingdom: TWA = 10 ppm (36 mg/m^3); STEL = 20 ppm (72 mg/m^3), skin, OCT2007
In Argentina, Bulgaria, Colombia, Jordan, Korea, New Zealand, Singapore, Vietnam check ACGIH TLV

OLEIC ACID:
Russia: STEL = 5 mg/m^3, JUN 2003

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Use a mechanical fan or vent area to outside. Use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits provided in this section, if applicable. Use a non-sparking, grounded, explosion-proof ventilation system separate from other exhaust ventilation systems. Exhaust system in manner consistent with prevention of release to atmosphere. An eyewash and safety shower should be readily accessible.

ENVIRONMENTAL EXPOSURE CONTROLS: Refer to Sections 6, 7 and 13 for information on controlling exposure to this product to the environment.

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* U.S. Federal OSHA Respiratory Protection (29 CFR 1910.134), OSHA Eye Protection 29 CFR 1910.133, OSHA Hard Protection 29 CFR 1910.138, OSHA Foot Protection 29 CFR 1910.136 and OSHA Body Protection 29 CFR1910.132)*, equivalent standards of Canada (including CSA Respiratory Standard Z94.4-02,* Z94.3-M1982, *Industrial Eye and Face Protectors and* CSA Standard Z195-02, *Protective Footwear). Please reference applicable regulations and standards for relevant details.*

RESPIRATORY PROTECTION: Maintain the Oxygen level above 19.5% in the workplace and exposure limits below levels given earlier in this section, if applicable. 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. If necessary, use only respiratory protection authorized in appropriate regulations to assist in equipment selection. The following are NIOSH respiratory protection guidelines for crystalline silica, in the event that this product creates residual dusts. Also provided are guidelines for Morpholine. These guidelines are given to assist in selection of respiratory protective equipment.

CRYSTALLINE SILICA

CONCENTRATION	RESPIRATORY PROTECTION
Up to 0.5 mg/m^3:	Any Air-Purifying Respirator with a high-efficiency particulate filter.
Up to 1.25 mg/m^3:	Any Powered, Air-Purifying Respirator (PAPR) with a high-efficiency particulate filter, or any Supplied-Air Respirator (SAR) operated in a continuous-flow mode.
Up to 2.5 mg/m^3:	Any Air-Purifying, Full-Facepiece Respirator with a high-efficiency particulate filter, or any PAPR with a tight-fitting facepiece and a high-efficiency particulate filter.
Up to 25 mg/m^3:	Any SAR operated in a pressure-demand or other positive-pressure mode.

Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Any SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any SAR that has a full facepiece and is operated in a

pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in pressure-demand or other positive-pressure mode.

Escape: Any Air-Purifying, Full-Facepiece Respirator with a high-efficiency particulate filter, or any appropriate escape-type, SCBA.

MORPHOLINE

CONCENTRATION	RESPIRATORY PROTECTION
Up to 500 ppm:	Any Supplied-Air Respirator (SAR) operated in a continuous-flow mode, or any Powered Air-Purifying Respirator (PAPR) with organic vapor cartridge(s), or any Air-Purifying Full-Facepiece Respirator equipped with organic vapor cartridge(s), or any Air-Purifying, Full-Facepiece Respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister, or any PAPR with a tight-fitting facepiece and organic vapor cartridge(s), or any Self-contained Breathing Apparatus (SCBA) with a full facepiece, or any SAR with a full facepiece.
Up to 1, 400 ppm	Any Supplied-Air Respirator (SAR) that has a full facepiece and is operated in a pressure-demand or other positive pressure mode.

Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions:

Any SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any SAR that has a full-facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Escape: Any Air-Purifying, Full-Facepiece Respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister, or any appropriate escape-type, SCBA.

EYE PROTECTION: Use approved safety goggles or safety glasses. If necessary, refer to appropriate regulations to assist in equipment selection.

HAND PROTECTION: Wear butyl rubber, Teflon™, Barricade™, Chemrel™, nitrile or similar gloves for routine industrial use. Use triple gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this SDS. If necessary, refer to applicable regulations and standards.

BODY PROTECTION: Use body protection appropriate for task. Safety shoes are recommended when handling cylinders. 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. If necessary, refer to appropriate regulations to assist in equipment selection.

9. PHYSICAL and CHEMICAL PROPERTIES

PHYSICAL STATE: Viscous liquid.
COLOR: Opaque, tan.
MOLECULAR FORMULA: Mixture.
MOLECULAR WEIGHT: Mixture.
ODOR: Hydrocarbon.
ODOR THRESHOLD: Not established.
pH: 8.5-9.
MELTING/FREEZING POINT: Not established.
BOILING POINT: Not established.
FLASH POINT (Pensky-Martens Closed Tester): >93.3°C (200°F).
EVAPORATION RATE (nBuAc = 1): Not established; based on ingredients the comparative evaporation rate is expected to be <1.
FLAMMABLE LIMITS (in air by volume, %): Not established.
VAPOR PRESSURE, mm Hg @ 50°C: Not established.
RELATIVE VAPOR DENSITY (air = 1): Not established; based on ingredients the relative vapor density is expected to be >1.
SPECIFIC GRAVITY (23°C, water = 1): 1.01
SOLUBILITY: Soluble in water, except for inorganic ingredients.
COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT): Not established.
AUTOIGNITION TEMPERATURE: Not established.
VISCOSITY (cP): ~7000-9000
HOW TO DETECT THIS SUBSTANCE (identification/warning properties): The odor is a distinguishing characteristic of this product.

10. STABILITY and REACTIVITY

REACTIVITY: Not considered a reactivity hazard.
CHEMICAL STABILITY: Stable under typical, environmental conditions in a workplace in the absence of contaminates.
DECOMPOSITION PRODUCTS: *Combustion:* Silicon, nitrogen and carbon oxides. *Hydrolysis:* None known.
MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong oxidizers, strong acids, strong bases.
POSSIBILITY OF HAZARDOUS REACTIONS: None known.
CONDITIONS TO AVOID: Exposure to water, moist air, and ultraviolet light, incompatible chemicals, high temperatures.

11. TOXICOLOGICAL INFORMATION

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

INHALATION: Inhalation is not anticipated to be a significant route of overexposure to this product. If mists of this product are inhaled, Irritation of the nose and other tissues of the upper respiratory system may occur. Inhalation of high concentrations of vapors (as may occur if this material is used in a poorly ventilated area), can result in symptoms of central nervous system depression (e.g., headaches, dizziness, nausea). Symptoms are generally alleviated upon breathing fresh air. This product may contain Crystalline Silica, which is known to cause cancer by inhalation. If this product is used in a manner that creates dust (such as application of product with a mechanical polishing wheel), use of respiratory protection is required.

CONTACT WITH SKIN or EYES: Depending on the duration and concentration of overexposure, eye contact can cause irritation and reddening. Skin contact can cause reddening, discomfort, and irritation. Symptoms are generally alleviated upon rinsing.

SKIN ABSORPTION: Skin absorption is a potential route of exposure for the Morpholine component of this product. Symptoms of such exposure would include those listed under “Contact with Eyes or Skin”. If a large area of skin is involved, system toxicity can occur.

INGESTION: Ingestion is not anticipated to be a likely route of exposure to this product in the workplace. If this material is swallowed, it may cause headache, nausea, and vomiting. While not anticipated to occur, due to product viscosity, aspiration of this liquid may cause life-threatening lung damage.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD	(BLUE)	2*
FLAMMABILITY HAZARD	(RED)	1
PHYSICAL HAZARD	(YELLOW)	0

PROTECTIVE EQUIPMENT

EYES	RESPIRATORY	HANDS	BODY
	SEE SECTION 8		SEE SECTION 8

For Routine Industrial Use and Handling Applications

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

INJECTION: Though not anticipated to be a likely route of occupational exposure, injection of this material (via puncture or laceration by a contaminated object) may cause local reddening, tissue swelling, and discomfort in addition to the wound.

OTHER HEALTH EFFECTS: Components, including Crystalline Silica, are known or suspected carcinogens. This product contains compounds that may damage the lungs through acute and chronic inhalation exposure.

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

Acute: This material may be irritating to the eyes, skin, and mucous membranes. Inhalation of high concentrations of this product’s vapors can cause dizziness, headaches, and nausea. While unlikely, if swallowed, aspiration of this liquid may cause life-threatening lung damage.

Chronic: Repeated skin contact can cause dermatitis (inflammation of the skin, resulting in redness and dryness). Contains compounds with known or suspected carcinogenic effects (see “Other Health Effects”).

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

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

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

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

DIATOMACEOUS EARTH: IARC-3 (Unclassifiable as to Carcinogenicity in Humans)

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

OLEIC ACID: MAK-3A (Substances for Which the Criteria for Classification in Category 4 or 5 are fulfilled, but for which the database is insufficient for the establishment of a MAK value)

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

IRRITANCY OF PRODUCT: This product can be mildly irritating to contaminated eyes, skin and mucous membranes.

SENSITIZATION TO THE PRODUCT: Components of this product are not known to cause human skin or respiratory sensitization.

REPRODUCTIVE TOXICITY INFORMATION: Currently, there is no information on the potential human mutagenic, embryotoxic, teratogenic or reproductive effects from this product. Animal data from the Morpholine component has shown both positive and negative mutagenic results, with no conclusions possible on mutagenicity. The Mineral Spirits component is classified under European regulations as a potential mutagenic compound, although no data is available to support this classification.

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

11. TOXICOLOGICAL INFORMATION (Continued)

TOXICITY DATA: The specific toxicology data available for the components of this product present in greater than 1 percent concentration are presented below:

AMORPHOUS SILICA:

Currently, there are no toxicological data for this compound.

CRYSTALLINE SILICA (QUARTZ):

LCLo (Inhalation-Human) 300 mg/m^3/10 years-intermittent: Systemic effects

TCLo (Inhalation-Human) 16 mppcf/8 hours/17.9 years-intermittent: Pulmonary system effects

TCLo (Inhalation-Rat) 50 mg/m^3/6 hours/71 weeks-intermittent: Carcinogenic effects

TCLo (Inhalation-Rat) 80 mg/m^3/26 weeks-intermittent: Lungs, Thorax, or Respiration: fibrosis, focal (pneumoconiosis); Blood: changes in spleen; Immunological Including Allergic: decrease in cellular immune

TCLo (Inhalation-Rat) 108 mg/m^3/6 hours/3 days-intermittent: Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: phosphatases, Enzyme inhibition, induction, or change in blood or tissue levels: other oxidoreductases, Metabolism (Intermediary): other proteins

TCLo (Inhalation-Rat) 58 mg/m^3/13 weeks-intermittent: Lungs, Thorax, or Respiration: other changes; Endocrine: changes in thymus weight; Blood: changes in leukocyte (WBC) count

TCLo (Inhalation-Mouse) 1475 µg/m^3/8 hours/21 weeks-intermittent: Lungs, Thorax, or Respiration: other changes

TCLo (Inhalation-Mouse) 4932 µg/m^3/24 hours/39 weeks-continuous: Endocrine: changes in spleen weight; Immunological Including Allergic: decrease in humoral immune response

TCLo (Inhalation-Guinea Pig)28 mg/m^3/3 weeks-continuous: Lungs, Thorax, or Respiration: other changes, changes in lung weight; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: other

TDLo (Intraperitoneal-Rat) 45 mg/kg: Carcinogenic effects

TDLo (Intratracheal-Rat) 90 mg/kg: Equivocal tumorigenic agent

TDLo (Intratracheal-Rat) 90 mg/kg: AR

TDLo (Intratracheal-Rat) 111 mg/kg: Carcinogenic effects

TDLo (Intratracheal-Rat) 111 mg/kg: AR

TDLo (Intratracheal-Rat) 100 mg/kg/19 weeks-intermittent: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Lungs, Thorax, or Respiration: tumors

TDLo (Intrapleural-Rat) 90 mg/kg: Carcinogenic effects

TDLo (Intrapleural-Hamster) 83 mg/kg: Tumorigenic: neoplastic by RTECS criteria, tumors at site of application

TDLo (Implant-Rat) 900 mg/kg: Neoplastic effects

TDLo (Implant-Mouse) 4000 mg/kg: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Kidney, Ureter, Bladder: tumors

TDLo (Implant-Mouse) 4000 mg/kg: Equivocal tumorigenic agent

TDLo (Intravenous-Rat) 90 mg/kg: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Blood: lymphoma, including Hodgkin's disease

TD (Intraperitoneal-Rat) 90 mg/kg/4 weeks-intermittent: Equivocal tumorigenic agent

TD (Intraperitoneal-Rat) 450 mg/kg/4 weeks-intermittent: Neoplastic effects

TD (Implant-Rat) 4554 mg/kg: Equivocal tumorigenic agent

TD (Intrapleural-Rat) 200 mg/kg: Equivocal tumorigenic agent

TD (Intrapleural-Rat) 100 mg/kg: Carcinogenic effects

TD (Intrapleural-Rat) 100 mg/kg: Neoplastic effects

TD (Intrapleural-Rat) 100 mg/kg: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Lungs, Thorax, or Respiration: fibrosis, focal (pneumoconiosis), tumors

LDLo (Intravenous-Rat) 90 mg/kg

LDLo (Intratracheal-Rat) 200 mg/kg

LDLo (Intravenous-Mouse) 40 mg/kg

LDLo (Intravenous-Dog, adult) 20 mg/kg

Micronucleus Test (Human-Lung) 40 µg/cm^2

Micronucleus Test (Hamster-Lung) 160 µg/cm^2

CRYSTALLINE SILICA CRISTOBALITE:

TCLo (Inhalation-Human) 16 mppcf/8 hours/17.9 years-intermittent: Lungs, Thorax, or Respiration: fibrosis, focal (pneumoconiosis), Lungs, cough, dyspnea

TCLo (Inhalation-Mouse) 70 mg/m^3/5 hours/12 days-intermittent: Lungs, Thorax, or Respiration: fibrosis, focal (pneumoconiosis), fibrosis (interstitial), other changes

TCLo (Inhalation-Mouse) 43 mg/m^3/5 hours/9 days-intermittent: Lungs, Thorax, or Respiration: pleural effusion, other changes

LDLo (Intratracheal-Rat) 200 mg/kg: Lungs, Thorax, or Respiration: fibrosis, focal (pneumoconiosis)

TDLo (Intratracheal-Rat) 10 mg/kg: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TDLo (Intratracheal-Rat) 20 mg/kg: Lungs, Thorax, or Respiration: fibrosis (interstitial); Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TDLo (Intrapleural-Rat) 90 mg/kg: Tumorigenic: carcinogenic by RTECS criteria; Blood: lymphoma, including Hodgkin's disease

TD (Intrapleural-Rat) 100 mg/kg: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Blood: lymphoma, including Hodgkin's disease

DIATOMACEOUS EARTH:

Currently, there are no toxicological data for this compound.

MORPHOLINE:

Open Irritation Test (Skin-Rabbit) 500 mg: Moderate

Standard Draize Test (Eye-Rabbit) 2 mg: Severe

LC_{50} (Inhalation-Rat) 8000 ppm/8 hours

LC_{50} (Inhalation-Mouse) 1320 mg/m^3/2 hours: Sense Organs and Special Senses (Eye): lacrymation; Behavioral: ataxia; Lungs, Thorax, or Respiration: cyanosis

LC_{50} (Inhalation-Mouse) 12,000 mg/m^3: Behavioral: alteration of classical conditioning

LC_{50} (Inhalation-Mouse) 1.35 g/m^3

LC_{50} (Inhalation-Mammal-Species Unspecified) 12,000 mg/m^3

LD_{16} (Oral-Rat) 700 mg/kg: Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count)

LD_{50} (Oral-Rat) 1738 mg/kg: Kidney/Ureter/Bladder: changes in blood vessels or in circulation of kidney

LD_{50} (Oral-Mouse) 525 mg/kg: Behavioral: sleep, somnolence (general depressed activity)

LD_{50} (Oral-Mouse) 1200 mg/kg

LD_{50} (Oral-Mammal-Species Unspecified) 1220 mg/kg

LD_{50} (Skin-Rabbit) 500 µL/kg

LD_{50} (Intraperitoneal-Mouse) 413 mg/kg: Reproductive: Paternal Effects: testes, epididymis, sperm duct

LD_{50} (Subcutaneous-Mouse) 458 mg/kg

LD (Oral-Rat) 1500 mg/kg

LD (Oral-Rat) 2300 mg/kg: Brain and Coverings: changes in circulation (hemorrhage, thrombosis, etc.); Cardiac: cardiomyopathy including infarction, other changes

LC (Inhalation-Mouse) 0.45 g/m^3/2 hours: Behavioral: irritability; Lungs, Thorax, or Respiration: dyspnea; Gastrointestinal: nausea or vomiting

LC (Inhalation-Mouse) 1.67 g/m^3/2 hours: Blood: hemorrhage; Nutritional and Gross Metabolic: weight loss or decreased weight gain

LC (Inhalation-Mouse) 1.98 g/m^3/2 hours

TCLo (Inhalation-Rat) 70 mg/m^3/4 hours/17 weeks-intermittent: Vascular: BP lowering not characterized in autonomic section; Blood: changes in leukocyte (WBC) count

TCLo (Inhalation-Rat) 250 ppm/6 hours/13 weeks-intermittent: Lungs, Thorax, or Respiration: fibrosis, focal (pneumoconiosis)

TCLo (Inhalation-Rat) 0.07 g/m^3/2 weeks-intermittent: Peripheral Nerve and Sensation: recording from peripheral motor nerve; Vascular: BP elevation not characterized in autonomic section; Blood: other changes

TCLo (Inhalation-Rat) 0.008 g/m^3/61 days-intermittent: Vascular: BP lowering not characterized in autonomic section; Blood: changes in other cell count (unspecified)

MORPHOLINE (continued):

TCLo (Inhalation-Rat) 0.07 g/m^3/122 days-intermittent: Liver: other changes; Kidney/Ureter/Bladder: other changes; Blood: changes in leukocyte (WBC) count

TCLo (Inhalation-Rat) 0.07 g/m^3/30 days-intermittent: Blood: changes in other cell count (unspecified)

TCLo (Inhalation-Rat) 0.008 g/m^3/122 days-intermittent: Blood: changes in spleen; Immunological Including Allergic: decrease in cellular immune response

TCLo (Inhalation-Mouse) 0.1 g/m^3/2 hours: Lungs, Thorax, or Respiration: other changes

TCLo (Inhalation-Guinea Pig) 70 mg/m^3/4 hours/17 weeks-intermittent: Liver: liver function tests impaired; Kidney/Ureter/Bladder: other changes in urine composition

TCLo (Inhalation-Guinea Pig) 0.07 g/m^3/2 weeks-intermittent: Peripheral Nerve and Sensation: recording from peripheral motor nerve

TCLo (Inhalation-Guinea Pig) 0.07 g/m^3/30 days-intermittent: Blood: other changes, changes in leukocyte (WBC) count

TCLo (Inhalation-Guinea Pig) 0.008 g/m^3/61 days-intermittent: Liver: liver function tests impaired; Kidney/Ureter/Bladder: other changes in urine composition

TDLo (Oral-Rat) 24 g/kg/30 days-intermittent: Gastrointestinal: necrotic changes; Kidney/Ureter/Bladder: changes in tubules (including acute renal failure, acute tubular necrosis); Related to Chronic Data: death

TDLo (Oral-Rat) 500 mg/kg

TDLo (Oral-Mouse) 2560 mg/kg/1 year-continuous: Tumorigenic: neoplastic by RTECS criteria; Lungs, Thorax, or Respiration: bronchiogenic carcinoma; Liver: tumors

TDLo (Oral-Guinea Pig) 13,500 mg/kg/30 days-intermittent: Gastrointestinal: necrotic changes; Kidney/Ureter/Bladder: changes in tubules (including acute renal failure, acute tubular necrosis); Related to Chronic Data: death

TDLo (Skin-Rabbit) 9 g/kg/10 days-intermittent: Liver: fatty liver degeneration; Skin and Appendages: primary irritation (after topical exposure); Related to Chronic Data: death

TDLo (Skin-Mouse) 100 pph/15 minutes: Skin and Appendages: corrosive (after topical exposure)

TDLo (Skin-Guinea Pig) 27 g/kg/30 days-intermittent: Kidney/Ureter/Bladder: changes in both tubules and glomeruli; Skin and Appendages: primary irritation (after topical exposure); Related to Chronic Data: death

TDLo (Ocular-Rabbit) 100 pph: Sense Organs and Special Senses (Eye): conjunctive irritation, corneal damage, effect, not otherwise specified

LDLo (Oral-Mouse) 1200 mg/kg

LDLo (Oral-Guinea Pig) 100 mg/kg: Sense Organs and Special Senses (Olfaction): effect, not otherwise specified; Gastrointestinal: ulceration or bleeding from stomach, ulceration or bleeding from small intestine

LDLo (Unreported-Rat) 1600 mg/kg

Morphological Transformation (Mouse-Fibroblast) 125 mg/L

Morphological Transformation (Mouse Lymphocyte) 1 µL/L

Mutation in Mammalian Somatic Cells (Mouse Lymphocyte) 1 g/L

Sister Chromatid Exchange (Hamster Ovary) 160 mg/L

Cytogenetic Analysis (Inhalation-Rat) 0.07 mg/L/122 days-intermittent

MINERAL SPIRITS:

Currently, there are no toxicological data for this compound.

OLEIC ACID:

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

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

Open Irritation Test (Skin-Rabbit) 500 mg: Mild

LD_{50} (Oral-Rat) 25,000 mg/kg

LD_{50} (Oral-Mouse) 28,000 mg/kg LD_{50} (Intravenous-Rat) 2400 µg/kg: Lungs, Thorax, or Respiration: acute pulmonary edema, other changes

LD_{50} (Intravenous-Mouse) 230 mg/kg: Behavioral: convulsions or effect on seizure threshold

11. TOXICOLOGICAL INFORMATION (Continued)

TOXICITY DATA, continued:

OLEIC ACID (continued):

LD_{50} (Intraperitoneal-Mouse) 282 mg/kg

LD (Intravenous-Rabbit) > 55 mg/kg: Lungs, Thorax, or Respiration: other changes

LD (Intravenous-Monkey) > 40 µL/kg: Lungs, Thorax, or Respiration: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: dehydrogenases, other Enzymes

TDLo (Skin-Mouse) 1500 mg/kg/3 days-intermittent: Blood: other changes

TDLo (Skin-Mouse) 6 mL/kg/10 days-intermittent: Tumorigenic: carcinogenic by RTECS criteria; Skin and Appendages: tumors; Tumorigenic: facilitates action of known carcinogen

TDLo (Intravenous-Rat) 0.15 mL/kg: Lungs, Thorax, or Respiration: acute pulmonary edema, other changes, changes in lung weight

TDLo (Intravenous-Rat) 100 mg/kg: Lungs, Thorax, or Respiration: changes in pulmonary vascular resistance, acute pulmonary edema, other changes

TDLo (Intravenous-Rat) 100 mg/kg: 100 mg/kg: Blood: hemorrhage, changes in serum composition (e.g. TP, bilirubin, cholesterol); Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: other oxidoreductases

TDLo (Intravenous-Guinea Pig) 15 µL/kg: Lungs, Thorax, or Respiration: changes in pulmonary vascular resistance, respiratory depression

TDLo (Intravenous-Dog) 0.08 mg/kg: Lungs, Thorax, or Respiration: respiratory depression, other changes; Blood: other changes

TDLo (Intravenous-Monkey) 0.08 mg/kg: Immunological Including Allergic: increase in humoral immune response; Biochemical: Metabolism (Intermediary): other proteins

OLEIC ACID (continued):

TDLo (Intradermal-Guinea Pig) 400 µg/kg: Immunological Including Allergic: hypersensitivity delayed

TDLo (Intraperitoneal-Mouse) 2712 mg/kg/6 weeks-intermittent: Immunological Including Allergic: autoimmune

TDLo (Subcutaneous-Rabbit) 390 mg/kg/17 weeks-intermittent: Tumorigenic: equivocal tumorigenic agent by RTECS criteria, tumors at site of application

TCLo (Inhalation-Rat) 30 mg/m^3/4 hours: Behavioral: alteration of classical conditioning; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Immunological Including Allergic: hypersensitivity delayed

Cytogenetic Analysis (Yeast-*Saccharomyces cerevisiae*) 100 mg/L

Cytogenetic Analysis (Hamster Fibroblast) 2500 µg/L

Unscheduled DNA Synthesis (Rectal-Mouse) 35 mg/kg

POLYDIMETHYL SILOXANE:

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

Standard Draize Test (Eye-Rabbit) 100 µL/24 hours: Mild

LD_{50} (Oral-Rat) > 24 g/kg: Gastrointestinal: hypermotility, diarrhea

LD_{50} (Oral-Rat) > 17 g/kg: Kidney/Ureter/Bladder: other changes; Nutritional and Gross Metabolic: other changes

LD_{50} (Skin-Rabbit) > 2 g/kg: Behavioral: food intake (animal); Gastrointestinal: hypermotility, diarrhea; Skin and Appendages: dermatitis, other (after systemic exposure)

POLYDIMETHYL SILOXANE(continued):

LD (Oral-Rat) > 5 g/kg

LD (Intramuscular-Rat) > 1200 µL/kg: Immunological Including Allergic: increase in humoral immune response

LD (Skin-Rabbit) > 10,200 mg/kg

LDLo (Intraperitoneal-Mouse) 16 mL/kg: Gastrointestinal: hypermotility, diarrhea, Immunological Including Allergic: decrease in cellular: decrease in humoral immune response

TDLo (Oral-Rat) 1800 mL/kg/26 weeks-continuous: Lungs, Thorax, or Respiration: changes in lung weight; Liver: changes in liver weight; Kidney/Ureter/Bladder: other changes in urine composition

TDLo (Oral-Rat) 227 g/kg: Sense Organs and Special Senses (Eye): corneal damage; Behavioral: food intake (animal); Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol)

TDLo (Subcutaneous-Rat) 10 g/kg: female 6-15 day(s) after conception: Reproductive: Specific Developmental Abnormalities: musculoskeletal system

TDLo (Subcutaneous-Rat) 8 g/kg: female 15-22 day(s) after conception: Reproductive: Effects on Newborn: stillbirth

TDLo (Subcutaneous-Rabbit) 260 mg/kg: female 6-18 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetal death; Reproductive: Specific Developmental Abnormalities: body wall

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ECOTOXICITY: This product may have significant, adverse effects on aquatic plants and animals if accidentally released to an aquatic environment. The following are aquatic toxic data for some components of this product.

MORPHOLINE:

LC_{50} (bluegill) 96 hours = 350 mg/L

LC_{50} (daphnia) 24 hours = 100 mg/L

EC_{50} (Daphnia magna) 24 hours = 119 mg/L (immobilization)

OLEIC ACID:

LC_{50} (*Pimephales promelas* Fathead minnow, juvenile 4-8 wk, length 1.1-3.1 cm) 96 hours = 205,000 µg/L; Conditions: freshwater, static, 18-22°C, dissolved oxygen < or =4.0 mg/L

PERSISTENCE AND BIODEGRADABILITY: This product has not been tested for persistence or biodegradability. The following information is available for some components.

MORPHOLINE:

If released to soil, this compound may volatilize from dry soil surfaces, but not from moist soil. This material in soil will move with soil moisture and is expected to leach extensively. Based on screening test results, biodegradation may be significant, but only after a long adaptation period. When released to natural waters this material will not tend to bioconcentrate, volatilize, or sorb to sediment or organic particulate matter in the water column. While morpholine is biodegradable in screening tests, it is unlikely that significant morpholine degradation would occur because of the long lag period required. This compound reacts with photochemically-produced hydroxyl radicals in the atmosphere resulting in an estimated half-life of 2.6 hrs.

OLEIC ACID:

If released to air, a vapor pressure of 5.46X10-7 mm Hg at 25°C indicates this compound will exist in both the vapor and particulate phases in the atmosphere. Vapor-phase material will be degraded in the atmosphere by reaction with ozone; half-lives of about 2.1 and 1.4 hours for the cis- and trans- isomers, respectively, are calculated for this reaction. Particulate-phase oleic acid will be removed from the atmosphere by wet or dry deposition. This compound does not contain chromophores that absorb at wavelengths > 290 nm and therefore is not expected to be susceptible to direct photolysis by sunlight. If released to soil, undissociated material is expected to have no mobility based upon an estimated Koc of 340,000. The pKa of oleic acid is 5.02, indicating that this compound will exist almost entirely in anion form in the environment and anions generally do not adsorb more strongly to soils containing organic carbon and clay than their neutral counterparts. Biodegradation is expected to be an important fate process in soil based on half-lives of 0.2 and 0.66 days in screening tests. If released into water, undissociated this compound is expected to adsorb to suspended solids and sediment based upon the estimated Koc. This material was biodegraded 25-30% in the water column in field studies. Based upon the pKa this material will exist almost entirely in the anion form at pH values of 5 to 9 and therefore volatilization from water surfaces is not expected to be an important fate process. Hydrolysis is not expected to be an important environmental fate process since this compound lacks functional groups that hydrolyze under environmental conditions.

BIO-ACCUMULATION POTENTIAL: This product has not been tested for bio-accumulation potential. The following is information for some components.

MORPHOLINE:

Because this compound is miscible with water and has a very low measured octanol/water partition coefficient, log Kow -0.86, its tendency to bioconcentrate in aquatic organisms should be extremely low. An experimentally determined BCF for morpholine was < 2.8.

OLEIC ACID:

An estimated BCF of 10 was calculated in fish for this compound, using a log Kow of 7.64 and a regression-derived equation. According to a classification scheme, this BCF suggests the potential for bioconcentration in aquatic organisms is low.

MOBILITY: This product has not been tested for mobility in soil. The following information is available for some components.

MORPHOLINE:

Using a measured log octanol/water partition coefficient (log Kow) of -0.86 and a regression equation, the estimated Koc for this compound is 8. The Koc estimated from molecular structure is 5. According to a suggested classification scheme, this estimated Koc suggests that this compound is highly mobile in soil.

OLEIC ACID:

The Koc of undissociated oleic acid is estimated as 340,000, using a log Kow of 7.64 and a regression-derived equation. According to a classification scheme, this estimated Koc value suggests that this compound is expected to be immobile in soil. The pKa of oleic acid is 5.02, indicating that this compound will exist almost entirely in anion form in the environment and anions generally do not adsorb more strongly to soils containing organic carbon and clay than their neutral counterparts.

12. ECOLOGICAL INFORMATION, Continued

OTHER ADVERSE EFFECTS: Components of this product are 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.
RESULTS OF PBT and vPvB ASSESSMENT: No data available. PBT and vPvB assessments are part of the chemical safety report required for some substances in European Union Regulation (EC) 1907/2006, Article 14.

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 all appropriate 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 impermeable containers (such as 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 considered as Dangerous Goods, per regulations of Transport Canada.
INTERNATIONAL AIR TRANSPORT ASSOCIATION DESIGNATION: This material is NOT considered as dangerous goods, per rules of IATA.
INTERNATIONAL MARITIME ORGANIZATION (IMO): This product is NOT considered as dangerous goods, per rules of the IMO.
ENVIRONMENTAL HAZARDS: This product does not meet the criteria of environmentally hazardous according to the criteria of the UN Model Regulations (as reflected in the IMDG Code, ADR, RID, and ADN); components are not specifically listed in Annex III under MARPOL 73/78.

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:
U.S. SARA REPORTING REQUIREMENTS: The components of this product are NOT subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.
U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for this product. 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: The components of this product listed are listed on the TSCA Inventory.
OTHER U.S. FEDERAL REGULATIONS: Not applicable.
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): The Crystalline Silica (airborne particles of respirable size) in this product is on the California Proposition 65 lists. WARNING! This product contains a compound known to the State of California to cause cancer.
ADDITIONAL CANADIAN REGULATIONS:
CANADIAN DSL/NDSL INVENTORY: The components of this product listed are listed on the DSL Inventory.
CANADIAN ENVIRONMENTAL PROTECTION AGENCY (CEPA) PRIORITY SUBSTANCES LISTS: The components of this product are not on the Priority Substances Lists.
OTHER CANADIAN REGULATIONS: Not applicable.

16. OTHER INFORMATION

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc. • PO Box 1961, Hilo, HI 96721 (800) 969-4846
NOVUS INC. CHEMISTRY DEPARTMENT • 650 Pelham Boulevard, Suite 100 • St Paul, MN 55114 (952) 944-8000
REFERENCES AND DATA SOURCES: Contact the supplier for information.
METHODS OF EVALUATING INFORMATION FOR THE PURPOSE OF CLASSIFICATION: Bridging principles were used to classify this product.
REVISION DETAILS: April 2012: Review and up-date entire SDS to comply with EU CLP 1272: 2008 and GHS.

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. NOVUS 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, NOVUS 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.

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

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

LOQ: Limit of Quantitation.

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

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

NIC: Notice of Intended Change.

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

NIOSH RELs: NIOSH's Recommended Exposure Limits.

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

SKIN: Used when a there is a danger of cutaneous absorption.

STEL-Short Term Exposure Limit: Short Term Exposure Limit, usually a 15-minute time-weighted average (TWA) exposure that should not be exceeded at any time during a workday, even if the 8-hr TWA is within the TLV-TWA, PEL-TWA or REL-TWA.**TLV-Threshold Limit Value:** An airborne concentration of a substance that represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour.

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

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

HEALTH HAZARD:

0 (Minimal Hazard: No significant health risk, irritation of skin or eyes not anticipated. *Skin Irritation*: Essentially non-irritating. PII or Draize = "0". *Eye Irritation*: Essentially non-irritating, or minimal effects which clear in < 24 hours [e.g. mechanical irritation]. Draize = "0". *Oral Toxicity LD_{50} Rat*: < 5000 mg/kg. *Dermal Toxicity LD_{50}Rat or Rabbit*: < 2000 mg/kg. *Inhalation Toxicity 4-hrs LC_{50} Rat*: < 20 mg/L.); **1** (Slight Hazard: Minor reversible Injury may occur; slightly or mildly irritating. *Skin Irritation*: Slightly or mildly irritating. *Eye Irritation*: Slightly or mildly irritating. *Oral Toxicity LD_{50} Rat*: > 500-5000 mg/kg. *Dermal Toxicity LD_{50}Rat or Rabbit*: > 1000-2000 mg/kg. *Inhalation Toxicity LC_{50}* 4-hrs *Rat*: > 2-20 mg/L) **2** (Moderate Hazard: Temporary or transitory injury may occur. *Skin Irritation*: Moderately irritating; primary irritant; sensitizer. PII or Draize > 0, < 5. *Eye Irritation*: Moderately to severely irritating and/or corrosive; reversible corneal opacity; corneal involvement or irritation clearing in 8-21 days. Draize > 0, ≤ 25. *Oral Toxicity LD_{50} Rat*: > 50-500 mg/kg. *Dermal Toxicity LD_{50}Rat or Rabbit*: > 200-1000 mg/kg. *Inhalation Toxicity LC_{50} 4-hrs Rat*: > 0.5-2 mg/L.) **3** (Serious Hazard: Major injury likely unless prompt action is taken and medical treatment is given; high level of toxicity; corrosive. *Skin Irritation*: Severely irritating and/or corrosive; may destroy dermal tissue, cause skin burns, dermal necrosis. PII or Draize > 5-8 with destruction of tissue. *Eye Irritation*: Corrosive, irreversible destruction of ocular tissue; corneal involvement or irritation persisting for more than 21 days. Draize > 80 with effects irreversible in 21 days. *Oral Toxicity LD_{50} Rat*: > 1-50 mg/kg. *Dermal Toxicity LD_{50}Rat or Rabbit*: > 20-200 mg/kg. *Inhalation Toxicity LC_{50} 4-hrs Rat*: > 0.05-0.5 mg/L.); **4** (Severe Hazard: Life-threatening; major or permanent damage may result from single or repeated exposure. *Skin Irritation*: Not appropriate. Do not rate as a "4", based on skin irritation alone. *Eye Irritation*: Not appropriate. Do not rate as a "4", based on eye irritation alone. *Oral Toxicity LD_{50} Rat*: ≤ 1 mg/kg. *Dermal Toxicity LD_{50}Rat or Rabbit*: ≤ 20 mg/kg. *Inhalation Toxicity LC_{50} 4-hrs Rat*: ≤ 0.05 mg/L).

FLAMMABILITY HAZARD:

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

PHYSICAL HAZARD:

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

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

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS:

HEALTH HAZARD: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury);**3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury).

FLAMMABILITY HAZARD: **0** Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand. **1** Materials that must be preheated before ignition can occur. Materials in this degree require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur **2** Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not under normal conditions form hazardous atmospheres with air, but under high ambient temperatures or under moderate heating could release vapor in sufficient quantities to produce hazardous atmospheres with air. **3** Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions. **4** Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and will burn readily.

INSTABILITY HAZARD: **0** Materials that in themselves are normally stable, even under fire conditions. **1** Materials that in themselves are normally stable, but that can become unstable at elevated temperatures and pressures. **2** Materials that readily undergo violent chemical change at elevated temperatures and pressures. **3** Materials that in themselves are capable of detonation or explosive decomposition or explosive reaction, but that require a strong initiating source or that must be heated under confinement before initiation. **4** Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures.

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the **N**ational **F**ire **P**rotection **A**ssociation (**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_{50}** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC_{50}** - 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^3** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **Cancer Information:** The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. **Other Information: BEI** - ACGIH Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.

ECOLOGICAL INFORMATION:

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

REGULATORY INFORMATION:

U.S. and CANADA:

ACGIH: American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. **O**ccupational **S**afety and **H**ealth **A**dministration (**OSHA**). **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act **(SARA)**; the Canadian Domestic/Non-Domestic Substances List **(DSL/NDSL)**; the U.S. Toxic Substance Control Act **(TSCA)**; Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act **(CERCLA or Superfund)**; and various state regulations. This section also includes information on the precautionary warnings which appear on the material's package label. **OSHA** - U.S. Occupational Safety and Health Administration.

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