SAFETY DATA SHEET

Pecora P-165 Primer

1. PRODUCT IDENTIFICATION

<table>
<thead>
<tr>
<th>IDENTIFICATION of the SUBSTANCE or PREPARATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRADE NAME (AS LABELED):</td>
</tr>
<tr>
<td>Pecora P-165</td>
</tr>
<tr>
<td>PRODUCT DESCRIPTION:</td>
</tr>
<tr>
<td>Latex Paint</td>
</tr>
<tr>
<td>CHEMICAL NAME/CLASS:</td>
</tr>
<tr>
<td>Acrylic Latex Polymer</td>
</tr>
<tr>
<td>SYNONYMS:</td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>RELEVANT USE:</td>
</tr>
<tr>
<td>Masonry Primer</td>
</tr>
<tr>
<td>USES ADVISED AGAINST:</td>
</tr>
<tr>
<td>Other Than Relevant Use</td>
</tr>
</tbody>
</table>

| COMPANY/UNDERTAKING IDENTIFICATION:           |
| SUPPLIER/MANUFACTURER'S NAME:                 |
| Pecora Corporation                            |
| ADDRESS:                                      |
| 165 Wambold Road, Harleysville, PA 19438      |
| EMERGENCY PHONE:                              |
| 800-424-9300 (CHEMTREC, 24-hours)             |
| BUSINESS PHONE:                               |
| 215-723-6051 (Mon–Fri, 8 AM–5 PM ET)          |
| PREPARATION DATE:                             |
| January 1, 2012                               |
| REVISION DATE:                                |
| May 23, 2013                                  |

This product is sold for commercial use. This MSDS has been developed to address safety concerns of those individuals working with bulk quantities of this material, as well as those of potential users of this product in industrial/occupational settings. ALL United States Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalent Standards, and Canadian WHMIS [Controlled Products Regulations] and the Global Harmonization Standard required information is included in appropriate sections based on the U.S. ANSI Z400.1-2008 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 GHS Standards. |
| Classification: Acute Oral Toxicity Cat. 5 | Signal Word: None |
| Precautionary Statement Codes: P312 | Hazard Statement Codes: H303 |
| Hazard Symbols/Pictogram: None Applicable |

| EMERGENCY OVERVIEW: |
| PHYSICAL DESCRIPTION: This product is a viscous, colored liquid with a characteristic odor of latex. |
| HEALTH HAZARDS: CAUTION! May be harmful if ingested. Direct eye contact may cause irritation. Prolonged skin contact may cause irritation. |
| FLAMMABILITY HAZARD: This product not normally flammable or combustible, but may decompose to produce irritating fumes and gases, including ammonia, acetic acid, aluminum, titanium, carbon and nitrogen oxides. |
| REACTIVITY HAZARD: This product is not reactive. |
| ENVIRONMENTAL HAZARD: This product has not been tested for environmental impact; release of large quantity may cause harm to marine or terrestrial organisms. |

| HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS®) |
| Health | 1 | See Section 16 for definitions of ratings |
| Flammability | 1 | 0 = Minimal 
              1 = Slight  
              2 = Moderate  
              3 = Serious  
              4 = Severe  
              * = Chronic |
| Physical Hazard | 0 |

HMIS® is a registered trademark of the National Paint and Coatings Association.

| CANADIAN WHMIS CLASSIFICATION: Class D2B. See Section 15 (Regulatory Information) for all classification details. |
| U.S. OSHA REGULATORY STATUS: This material has a classification under the Global Harmonization Standard, as applied under OSHA regulations, as given earlier in this Section. |

3. MATERIAL IDENTIFICATION

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS #</th>
<th>W/W%</th>
<th>GHS Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proprietary Acrylic Polymer</td>
<td>20.0–30.0</td>
<td>Classification: Not Applicable</td>
<td></td>
</tr>
<tr>
<td>Nepheline Syenite</td>
<td>37244-96-5</td>
<td>10.0-25.0</td>
<td>Classification: Not Applicable</td>
</tr>
<tr>
<td>Titanium Dioxide</td>
<td>13463-67-7</td>
<td>8.0-20.0</td>
<td>Classification: Not Applicable</td>
</tr>
</tbody>
</table>

See Section 16 for full text of classification.
3. MATERIAL IDENTIFICATION (Continued)

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS #</th>
<th>W/W%</th>
<th>GHS Classification Hazard Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene Glycol</td>
<td>107-21-1</td>
<td>1.0-3.0</td>
<td>Classification: Acute Oral Toxicity Cat. 4</td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>1344-28-1</td>
<td>1.0-3.0</td>
<td>Classification: Not Applicable</td>
</tr>
</tbody>
</table>

Water and other trace components. Each of the other components is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens) or is considered to be non-hazardous.

See Section 16 for full text of classification

4. FIRST-AID MEASURES

PROTECTION OF FIRST AID RESPONDERS: Rescuers should not attempt to retrieve victims of exposure to this material without adequate personal protective equipment. Rescuers should be taken for medical attention, if necessary.

DESCRIPTION OF FIRST AID MEASURES: Remove victim(s) to fresh air, as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary. Remove and isolate contaminated clothing and shoes. Seek immediate medical attention. Take copy of label and MSDS to physician or other health professional with victim(s).

INHALATION: If dusts of this material are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions.

SKIN EXPOSURE: If the material contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 20 minutes. Do not interrupt flushing. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek immediate medical attention.

EYE EXPOSURE: If this product enters the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 20 minutes. Do not interrupt flushing.

INGESTION: If this material is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING, unless directly by medical personnel. Have victim rinse mouth with water or give several cupsfuls of water, if conscious. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Dermatitis or other 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 overexposure.

5. FIRE-FIGHTING MEASURES

FLASH POINT: > 93°C (> 200°F)

AUTOIGNITION: Unknown.

EXTINGUISHING MEDIA:

SUITABLE EXTINGUISHING MEDIA: Use extinguishing material suitable to the surrounding fire, including foam, halon, carbon dioxide and dry chemical.

UNSUITABLE EXTINGUISHING MEDIA: None known.

PROTECTION OF FIREFIGHTERS:

SPECIAL HAZARDS ARISING FROM THE SUBSTANCE: This product is not normally flammable or combustible but can decompose if highly heated for a prolonged period. Irritating gases and fumes including ammonia, acetic acid, aluminum, carbon, nitrogen and titanium oxides may be produced.

SPECIAL PROTECTIVE ACTIONS FOR FIREFIGHTERS: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move containers from fire area if it can be done without risk to personnel. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS AND EMERGENCY PROCEDURES: An accidental release can result in a fire. Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. Eliminate any possible sources of ignition, and provide maximum explosion-proof ventilation. Use only non-sparking tools and equipment during the response. 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: Responders should wear the level of protection appropriate to the type of chemical released, the amount of the material spilled, and the location where the incident has occurred.

Small Spills: For releases of 1 drum or less, Level D Protective Equipment (gloves, chemical resistant apron, boots, and eye protection) should be worn.

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, fire-retardant clothing and boots, hard hat, and Self-Contained Breathing Apparatus.
6. ACCIDENTAL RELEASE MEASURES (Continued)

METHODS FOR CLEAN-UP AND CONTAINMENT:
All Spills: Access to the spill area should be restricted. Spread should be limited by gently covering the spill with polypads. Scrape up or pick-up spilled material, placing in suitable containers. Absorb any residual on appropriate material, such as sand. All contaminated absorbents and other materials should be placed in an appropriate container and seal. Do not mix with wastes from other materials. Dispose of in accordance with applicable Federal, State, and local procedures (see Section 13, Disposal Considerations). Dispose of recovered material and report spill per regulatory requirements. Remove all residue before decontamination of spill area. Clean spill area with soap and copious amounts of water.

ENVIRONMENTAL PRECAUTIONS: Minimize use of water to prevent environmental contamination. Prevent spill or rinsate from contaminating storm drains, sewers, soil or groundwater. Place all spill residues in a suitable container and seal. Do not discharge effluent containing this product into streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA.

OTHER INFORMATION: U.S. regulations may require reporting of spills of this material that reach surface waters if a sheen is formed. If necessary, the toll-free phone number for the US Coast Guard National Response Center is 1-800-424-8802.

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: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat or drink while handling this material. Avoid contact with eyes, skin, and clothing. Avoid breathing fumes, dusts, vapors or mist. Do not taste or swallow. Use only with adequate ventilation. Keep away from heat and flame. In the event of a spill, follow practices indicated in Section 6: ACCIDENTAL RELEASE MEASURES.

CONDITIONS FOR SAFE STORAGE: This product is stable under ordinary conditions of handling, use and storage. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials (see Section 10: STABILITY AND REACTIVITY). Keep container tightly closed when not in use. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. To prolong shelf life, store at temperatures below 1-60°C (34-140°F).

PRODUCT END USE: This product is used as a sealer. Follow all industry standards for use of this product.

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.

OCCUPATIONAL/WORKPLACE EXPOSURE LIMITS/GUIDELINES:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS#</th>
<th>Guideline</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Oxide</td>
<td>1344-28-1</td>
<td>OSHA PEL TWA</td>
<td>15 mg/m³ (total dust), 5 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DFG MAK TWA</td>
<td>4 mg/m³ (inhalable fraction); 1.5 mg/m³ (respirable fraction)</td>
</tr>
<tr>
<td>Ethylene Glycol</td>
<td>107-21-1</td>
<td>ACGIH TLV STEL/CEILING</td>
<td>100 mg/m³ (ceiling)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OSHA PEL STEL/CEILING</td>
<td>Vacated 1989 PEL: 125 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DFG MAK TWA</td>
<td>10 mg/m³ (skin)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DFG PEAK</td>
<td>2xMAK 15 minute average value, 1-hr interval, 4 per shift (skin)</td>
</tr>
<tr>
<td>Nepheline Syenite</td>
<td>37244-96-5</td>
<td>None Established</td>
<td>None Established</td>
</tr>
<tr>
<td>Proprietary Acrylic Polymer</td>
<td>31855-00-0</td>
<td>None Established</td>
<td>None Established</td>
</tr>
<tr>
<td>Titanium Dioxide</td>
<td>13463-67-7</td>
<td>ACGIH TLV TWA</td>
<td>10 mg/m³ NIC: 1 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OSHA PEL TWA</td>
<td>15 mg/m³ total dust</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NIOSH REL.</td>
<td>Lowest feasible concentration (LOQ 0.2 mg/m³)</td>
</tr>
</tbody>
</table>

NE = Not Established. NIC = Notice of Intended Change. See Section 16 for Definitions of Terms Used.


EYE/FACE PROTECTION: Use approved safety goggles or safety glasses. If necessary, refer to appropriate regulations and standards.

SKIN PROTECTION: Wear chemical impervious garments (e.g., Nitrile or Neoprene). Use triple gloves for spill response. If necessary, refer to appropriate regulations and standards.

BODY PROTECTION: Use body protection appropriate for task (e.g., lab coat, coveralls, Tyvek suit). If necessary, refer to the OSHA Technical Manual (Section VII: Personal Protective Equipment) or appropriate Standards of Canada. 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 appropriate regulations and standards.

RESPIRATORY PROTECTION: If mists or sprays from this product are created during use, use appropriate respiratory protection. If necessary, use only respiratory protection authorized in appropriate regulations. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressuredemand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under appropriate regulations and standards.
9. PHYSICAL and CHEMICAL PROPERTIES

FORM: Viscous liquid.
MOLECULAR WEIGHT: Mixture.
ODOR THRESHOLD: Not available.
SPECIFIC GRAVITY: 1.37-1.39
RELATIVE VAPOR DENSITY (air = 1): Heavier than air.
SOLUBILITY IN WATER: Insoluble.
MELTING/FREEZING POINT: Not available.
VOC (less water and exempt): 100 Gms/L, 0.8 lbs/gal
FLASH POINT: > 93°C (> 200°F)
pH: Not available.

COLOR: Colored.
MOLECULAR FORMULA: Mixture.
ODOR: Characteristic of latex.
VAPOR PRESSURE, mm Hg @ 20°C: 0.05
EVAPORATION RATE (BuAc = 1): < 1
OTHER SOLUBILITIES: Not available.
BOILING POINT: 100°C (212°F)
WEIGHT % VOC: 59-61
AUTOIGNITION TEMPERATURE: Not established.
WEIGHT PER GALLON: 11.0-11.2 lbs

10. STABILITY and REACTIVITY

CHEMICAL STABILITY: Stable under normal circumstances of use and handling.
CONDITIONS TO AVOID: Avoid contact with incompatible chemicals and exposure to extreme temperatures.
INCOMPATIBLE MATERIALS: This product is not compatible with strong acids and oxidizers and materials incompatible with water.
HAZARDOUS DECOMPOSITION PRODUCTS: 
Combustion: Thermal decomposition of this product can generate dusts, irritating fumes, and toxic gases (e.g., ammonia, acetic acid, aluminum, titanium, carbon and nitrogen oxides).
Hydrolysis: None known.
POSSIBILITY OF HAZARDOUS REACTIONS/POLYMERIZATION: This product is not expected to undergo hazardous polymerization, decomposition, condensation, or self-reactivity.

11. TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS: The most significant routes of occupational overexposure to this product are as follows:

CONTACT WITH SKIN or EYES: Contact may mildly irritate the skin and cause redness and discomfort. Prolonged or repeated skin contact may cause dermatitis (dry, red skin). Eye contact may cause redness, pain, and tearing.
SKIN ABSORPTION: No information is available on possible hazards by skin absorption.
INGESTION: May be harmful if swallowed. If the product is swallowed, it may mildly irritate the mouth, throat, and other tissues of the gastrointestinal system and may cause nausea, vomiting, and diarrhea.
INHALATION: Overexposure to vapors of this product generated during curing, or dusts of this product generated during use after curing may mildly irritate the respiratory tract and cause coughing and sneezing.
INJECTION: Accidental injection of this product (e.g. puncture with a contaminated object) may cause irritation and redness, in addition to the wound.

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

CHRONIC EFFECTS: Prolonged or repeated skin contact may cause dermatitis (dry, red skin).

TOXICITY DATA: There are currently no toxicity data available for this product; the following toxicology information is available for components greater than 1% in concentration.

**ALUMINUM OXIDE:**
- TCLo (Inhalation-Rat) 200 mg/m³: Structural or functional change in trachea or bronchi; chronic pulmonary edema; Related to Chronic Data: death
- TCLo (Inhalation-Rabbit) 200 mg/m³: Structural or functional change in trachea or bronchi; Lungs, Thorax, or Respiration: chronic pulmonary edema; Related to Chronic Data: death
- TCLo (Implant-Rat) 90 mg/kg: Tumorigenic:equivocal tumorogenic agent by RTECS criteria; Lungs, Thorax, or Respiration: tumors
- TCLo (Implant-Rabbit) 200 mg/kg: Tumorigenic: neoplastic by RTECS criteria; Tumorigenic: tumors at site of application

**ETHYLENE GLYCOL (continued):**
- DLo (Implant-Rat) 200 mg/kg: Tumorigenic:equivocal tumorogenic agent by RTECS criteria; tumors at site of application
- LDLo (Intraperitoneal-Mouse) > 3600 mg/kg
- TCLo (Intraperitoneal-Mouse) > 3600 mg/kg: Structural or functional change in trachea or bronchi; chronic pulmonary edema; Related to Chronic Data: death
- LDLo (Intraperitoneal-Rat) 200 mg/kg: Tumorigenic: equivocal tumorogenic agent by RTECS criteria; Lungs, Thorax, or Respiration: other changes
- LDLo (Implant-Rat) 200 mg/kg: Tumorigenic:equivocal tumorogenic agent by RTECS criteria; tumors at site of application
- LDLo (Implant-Rabbit) 200 mg/kg: Tumorigenic:equivocal tumorogenic agent by RTECS criteria; tumors at site of application
- LDLo (Implant-Mouse) 500 mg/kg: Tumorigenic: equivocal tumorogenic agent by RTECS criteria; tumors at site of application
- LDLo (Implant-Rabbit) 200 mg/kg: Tumorigenic: equivocal tumorogenic agent by RTECS criteria; tumors at site of application
- LDLo (Intraperitoneal-Mouse) > 3600 mg/kg
- LDLo (Intraperitoneal-Rat) 200 mg/kg: Tumorigenic:equivocal tumorogenic agent by RTECS criteria; Lungs, Thorax, or Respiration: other changes
- LDLo (Implant-Rat) 200 mg/kg: Tumorigenic: equivocal tumorogenic agent by RTECS criteria; tumors at site of application
- LDLo (Implant-Rabbit) 200 mg/kg: Tumorigenic: equivocal tumorogenic agent by RTECS criteria; tumors at site of application
11. TOXICOLOGICAL INFORMATION (Continued)

ETHYLENE GLYCOL (continued):

TCLo (Inhalation-Mouse) 1000 mg/m^6/6 hours: female 6-15 day(s) after conception: Reproductive:
Fertility: per-implantation mortality (e.g. decrease in number of implants per female; total number of implants per corpora lutea); Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus); Specific Developmental Abnormalities: musculoskeletal system

TCLo (Inhalation-Rabbit) 12 mg/kg: female 6-15 day(s) after conception: Reproductive:
Fertility: litter size (e.g. fetuses per litter, measured before birth); Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus); Specific Developmental Abnormalities: musculoskeletal system

TCLo (Intraperitoneal-Rabbit) 85,230 mg/kg: Kidney/Ureter/Bladder: changes in bladder weight; Liver: other changes; changes in liver weight; Kidney/Ureter/Bladder: changes in bladder weight

TCLo (Oral-Rat) 26,150 mg/kg/10 days-continuous: Kidney/Ureter/Bladder: changes in tubules; Liver: degenerative changes; Vascular: structural changes in vessels; Lungs, Thorax, or Respiration: structural or functional change in trachea or bronchi

TCLo (Oral-Rat) 11,100 mg/kg: Brain and Coverings: other degenerative changes; Behavioral: general anesthetic

TCLo (Oral-Rat) 12 mL/kg/6 days-intermittent: Nutritional and Gross Metabolic: changes in volume increased

TCLo (Oral-Rat) 25,000 mg/kg/10 days-intermittent: Nutritional and Gross Metabolic: weight loss or decreased weight gain

TCLo (Oral-Rat) 85,230 mg/kg/90 days-continuous: Kidney/Ureter/Bladder: changes in urine composition; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Nutritional and Gross Metabolic: changes in blood or tissue levels: phosphatases

TCLo (Oral-Rat) 2000 mg/kg: Brain and Coverings: increased intracranial pressure; Liver: other changes; Kidney/Ureter/Bladder: changes in urine composition

TCLo (Oral-Rat) 300 mg/kg/6 hours/28 hours-intermittent: Kidney/Ureter/Bladder: other changes in urine composition; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Nutritional and Gross Metabolic: changes in blood or tissue levels: phosphatases

TCLo (Oral-Rat) 25,000 mg/kg/10 days-continuous: Kidney/Ureter/Bladder: changes in tubules; Liver: degenerative changes; Vascular: structural changes in vessels; Lungs, Thorax, or Respiration: structural or functional change in trachea or bronchi

TCLo (Oral-Rat) 1110 mg/kg: Brain and Coverings: other degenerative changes; Kidney/Ureter/Bladder: other changes in urine composition; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Nutritional and Gross Metabolic: changes in blood or tissue levels: phosphatases

TCLo (Oral-Rat) 1000 mg/kg: Brain and Coverings: increased intracranial pressure; Liver: other changes; Kidney/Ureter/Bladder: changes in urine composition

TCLo (Oral-Rat) 120 mg/kg: Blood: changes in bone marrow (not otherwise specified)
11. TOXICOLOGICAL INFORMATION (Continued)

ETHYLENE GLYCOL (continued):  
TDLo (Oral-Rat) 12.5 mg/kg: female 6-15 days after conception: Reproductive: Specific Developmental Abnormalities: craniofacial (including nose and tongue), musculoskeletal system, effects in females (including adrenal, thyroid, growth retardation, death)  
TDLo (Oral-Rat) 25 mg/kg: female 6-15 days after conception: Reproductive: Female: uterus, cervix, vagina; Fertility: litter size (e.g. # fetuses per litter; measured before birth); Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)

TDLo (Oral-Rat) 51.94 mg/kg: male 13 week(s) pre-mating: Reproductive: Paternal Effects: testes, epididymis, sperm duct

TDLo (Oral-Rat) 33.750 mg/kg: female 6-20 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus); Specific Developmental Abnormalities: craniofacial, musculoskeletal system; Effects on newborn: live birth index (measured after birth)

TDLo (Oral-Rat) 28,000 mg/kg: female 6-19 day(s) after conception: Reproductive: Fertility: abortion; Effects on newborn: stillbirth

TDLo (Oral-Mouse) 33.750 mg/kg: female 6-20 day(s) after conception: Reproductive: Fertility: litter size (e.g. # fetuses per litter; measured before birth); Effects on newborn: viability index (e.g., # alive at day 4 per # born alive), growth statistics (e.g.%, reduced weight gain)

TDLo (Oral-Mouse) 486 mg/kg/2 weeks-continuous: Liver: hepatitis (hepatocellular necrosis); Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Oral-Mouse) 1081 g/kg/2 years-continuous: Liver: hepatitis (hepatocellular necrosis), zonal; Kidney/Ureter/Bladder: changes in tubules (including acute renal failure, acute tubular necrosis); Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Oral-Rat) 88,720 mg/kg: female 7-14 day(s) after conception: Reproductive: Effects on Embryo or Fetus: stillbirth; other measures of fertility

TDLo (Oral-Rat) 28,000 mg/kg: female 6-15 day(s) after conception: Reproductive: Fertility: death; other measures of fertility

TDLo (Unreported-Mouse) 750 mg/kg: Multi-generations: Reproductive: Effects on Embryo or Fetus: stillbirth; Effects on newborn: other measures of fertility

TDLo (Unreported-Mouse) 7500 mg/kg: female 6-15 day(s) after conception: Reproductive: Effects on Embryo or Fetus: single embryo death; Specific Developmental Abnormalities: craniofacial (including nose and tongue); musculoskeletal system; Effects on newborn: live birth index (measured after birth)

TDLo (Oral-Rabbit) 88,720 mg/kg: female 7-14 day(s) after conception: Reproductive: Fertility: post-implantation, viability (e.g. dead and/or resorbed implants per total number of implants); Effects on newborn: stillbirth, live birth index (measured after birth)

TDLo (Oral-Rabbit) 15 mg/kg: female 6-15 day(s) after conception: Reproductive: Maternal Effects: uterus, cervix, vagina; Fertility: pre-implantation mortality (e.g. reduction in number of implants per female; total number of implants per corpora lutea), other measures of fertility

TDLo (Oral-Rabbit) 88,720 mg/kg: female 7-14 day(s) after conception: Reproductive: Effects on newborn: live birth index (measured after birth); Specific Developmental Abnormalities: craniofacial (including nose and tongue); musculoskeletal system

TDLo (Oral-Rabbit) 413 mg/kg: male 15 week(s) pre-mating female 15 week(s) pre-mating: 3 week(s) pre-mating: Reproductive: Effects on newborn: live birth index (measured after birth); Specific Developmental Abnormalities: craniofacial, musculoskeletal system

TDLo (Oral-Mouse) 1.7 g/kg: Multi-generations: Reproductive: Specific Developmental Abnormalities: craniofacial, musculoskeletal system; Effects on newborn: growth statistics (e.g.%, reduced weight gain)

TDLo (Oral-Mouse) 850 mg/kg: Multi-generations: Reproductive: Specific Developmental Abnormalities: urogenital system

ETHYLENE GLYCOL (continued):  
TDLo (Oral-Rabbit) 28,000 mg/kg/14 days-interruption: Kidney/Ureter/Bladder: changes in tubules (including acute renal failure, acute tubular necrosis); Related to Chronic Data: death

TDLo (Oral-Rabbit) 28 mg/kg: female 6-19 day(s) after conception: Reproductive: Male Effects: other effects

TDLo (Oral-Monkey) 5751 mg/kg/22 week(s)-interruption: Kidney/Ureter/Bladder: changes in tubules (including acute renal failure, acute tubular necrosis)

TDLo (Skin-Mouse) 100 ph/2 days-interruption: Behavioral: tremor; Vascular: other changes; Skin and Appendages: primary irritation (after topical exposure)

TDLo (Skin-Mouse) 100 ph/10 days-interruption: Kidney/Ureter/Bladder: changes in tubules (including acute renal failure, acute tubular necrosis); Blood: hemorrhage; Related to Chronic Data: death

TDLo (Skin-Mouse) 100 ph/2 hours: Behavioral: food intake (animal)

TDLo (Skin-Rabbit) 100 ph/7 days-interruption: Skin and Appendages: primary irritation (after topical exposure)

TDLo (Ocular-Rabbit) 100 php: Sense Organs and Special Senses (Eye): lacrimation, conjunctive irritation

TDLo (Subcutaneous-Rat) 3000 mg/kg: Kidney/Ureter/Bladder: renal function tests depressed

TDLo (Subcutaneous-Mouse) 5000 mg/kg: Kidney/Ureter/Bladder: renal function tests depressed

TDLo (Unreported-Rat) 9.1 mg/kg/26 weeks-interruption: Reproductive: Paternal Effects: testes, epididymis, sperm duct; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: multiple enzyme effects

TDLo (Unreported-Rat) 50,000 mg/kg: female 6-15 day(s) after conception: Reproductive: Effects on Embryo or Fetus: toxicosis (except death, e.g., stunted fetus); Specific Developmental Abnormalities: other developmental abnormalities; Effects on newborn: growth statistics (e.g.%, reduced weight gain)

TDLo (Unreported-Rat) 5000 mg/kg: Multi-generations: Reproductive: Effects on Embryo or Fetus: toxicosis (except death, e.g., stunted fetus); Specific Developmental Abnormalities: other developmental abnormalities; Effects on newborn: growth statistics (e.g.%, reduced weight gain)

TDLo (Unreported-Rat) 7500 mg/kg: female 6-15 day(s) after conception: Reproductive: Effects on Embryo or Fetus: toxicosis (except death, e.g., stunted fetus); Specific Developmental Abnormalities: other developmental abnormalities; Effects on newborn: growth statistics (e.g.%, reduced weight gain)

TDLo (Unreported-Rat) 750 mg/kg: Male 6-19 day(s) after conception: Reproductive: Effects on embryonic development, other measures of fertility

Cyto genetic Analysis (Oral-Rat) 1200 mg/kg  
Mutation in Mammalian Somatic Cells (Mouse Lymphocyte) 100 mmol/L

TITANIUM DIOXIDE:  
Standard Draize Test (Skin-Human) 300 µg/3 days-interruption: Mild  
Inhalation (Rat) 10 mg/m³/18 hours/2 years-interruption: Tumorigenic: carcinogenic by RTECS criteria; Lungs, Thorax, or Respiration: tumors

LD (Intratracheal-Rat) > 100 µg/kg: Lungs, Thorax, or Respiration: structural or functional change in trachea or bronchi; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: other enzymes

TD (Intramuscular-Rat) 260 mg/kg/84 weeks-interruption: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Blood: lymphoma, including Hodgkin's disease; Tumorigenic: tumors at site of application

TDLo (Oral-Rat) 60 mg/kg: Gastrointestinal: hypermotility, diarrhea, other changes

TDLo (Subcutaneous-Rat) 360 mg/kg/2 years-interruption: Tumorigenic: neoplastic by RTECS criteria; Blood: lymphoma, including Hodgkin's disease; Tumorigenic: tumors at site of application

TDLo (Intratracheal-Rat) 1.25 mg/kg: Vascular: regional or arterial aneurism; other changes

TDLo (Intratracheal-Rat) 1.0 mg/kg: Regional or arterial aneurism; other changes

TDLo (Intratracheal-Rat) 0.8 mg/kg: Regional or arterial aneurism; other changes

TDLo (Intratracheal-Rat) 0.5 mg/kg: Regional or arterial aneurism; other changes

Strontium (Subcutaneous-Rat) 360 mg/kg/2 years-interruption: Tumorigenic: neoplastic by RTECS criteria; Lungs, Thorax, or Respiration: chronic pulmonary edema, other changes

TCLo (Inhalation-Rat) 50 mg/m³/6 hours/13 weeks-interruption: Lungs, Thorax, or Respiration: structural or functional change in trachea or bronchi

TCLo (Inhalation-Rat) 10 mg/m³/6 hours/13 weeks-interruption: Lungs, Thorax, or Respiration: fibrosis (interstitial), other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Rat) 10 mg/m³/13 weeks-interruption: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Rat) 50 mg/m³/13 weeks-interruption: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Rat) 250 mg/m³/13 weeks-interruption: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TCLo (Inhalation-Rat) 250 mg/m³/6 hours/2 years-interruption: Tumorigenic: carcinogenic by RTECS criteria; Lungs, Thorax, or Respiration: tumors

TCLo (Inhalation-Rat) 10 mg/m³/6 hours/13 weeks-interruption: Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
11. TOXICOLOGICAL INFORMATION (Continued)

TOXICITY DATA (continued):

<table>
<thead>
<tr>
<th>CHEMICAL</th>
<th>EPA</th>
<th>IARC</th>
<th>NIOSH</th>
<th>ACGIH</th>
<th>OSHA</th>
<th>PROP 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Oxide</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Ethylene Glycol</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>A4</td>
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<tr>
<td>Nepheline Syenite</td>
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<td>Proprietary Acrylic Polymer</td>
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</tr>
<tr>
<td>Titanium Dioxide</td>
<td>No</td>
<td>2B</td>
<td>Ca</td>
<td>A4, NIC: A3</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

IARC 2B: Possibly Carcinogenic to Humans. ACGIH TLV-A3: Confirmed Animal Carcinogen. ACGIH TLV-A4: Not Classifiable as a Human Carcinogen. NIOSH-Ca (Potential Occupational Carcinogen with No Further Categorization)

IRRITANCY OF PRODUCT: This product may mildly irritate contaminated tissue, especially if contact is prolonged. Eye irritation may be more pronounced.

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

TOXICOLOGICAL SYNERGISTIC PRODUCTS: None known.

REPRODUCTIVE TOXICITY INFORMATION: This product has not been tested for reproductive toxicity. No component is known to have mutagenic, embryotoxic, teratogenic or reproductive toxicity effects in humans.

BIOLGICAL EXPOSURES INDICES (BEIs): There are no BEI’s established for any component of this product at this time.

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.

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. The following data are available for the Ethylene Glycol component.

ETHYLENE GLYCOL:

- LD₅₀ (Carassius auratus goldfish) 24 hours = > 5,000 mg/L modified ASTM D 1345
- LC₅₀ (Pseudonitzia reticulata Guppies) 7 days = 49,300 ppm/Conditions of bioassay not specified
- LC₅₀ (Rainbow trout) 96 hours = 18,500 mg/L/Conditions of bioassay not specified
- LC₅₀ (Crangon crangon Brown shrimp) 48 hours = >100 mg/L aerated salt water
- LC₅₀ (Goldfish) 24 hours = 10,000 mg/L at 20°C static conditions

ETHEYLE GLYCOL:

- Toxicity Threshold-Cell Multiplication Inhibition Test (Pseudomonas putida Bacteria): 10,000 mg/L
- Toxicity Threshold-Cell Multiplication Inhibition Test (Entosiphon sulcatum Protozoa) and (Uronema pardaczi Chatton-Lwoff): > 10,000 mg/L
- Toxicity Threshold-Cell Multiplication Inhibition Test (Microcystis aeruginosa Algae): 2,000 mg/L
- Toxicity Threshold-Cell Multiplication Inhibition Test (Scenedesmus quadricauda Green algae) > 10,000 mg/L

OTHER ADVERSE EFFECTS: This material is not expected to have any 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

PREPARING WASTES FOR DISPOSAL: As supplied, this product would not be a hazardous waste as defined by U.S. federal regulation (40 CFR 261) if discarded or disposed. State and local regulations may differ from federal regulations. The generator of the waste is responsible for proper waste determination and management.

U.S. EPA WASTE NUMBER: Not applicable.

14. TRANSPORTATION INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION: 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 SHIPPING INFORMATION (IATA): This product is NOT classified as dangerous goods, per the International Air Transport Association.

INTERNATIONAL MARITIME ORGANIZATION SHIPPING INFORMATION (IMO): This product is NOT classified as dangerous goods, per the International Maritime Organization.
15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:
U.S. SARA REPORTING REQUIREMENTS: No components of this product are subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.
U.S. SARA HAZARD CATEGORIES (SECTION 311/312, 40 CFR 370-21): ACUTE: Yes; CHRONIC: Yes; FIRE: No; REACTIVE: No;
SUDDEN RELEASE: No
U.S. TSCA INVENTORY STATUS: All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.
U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.
U.S. CLEAN AIR ACT (CA 112r) THRESHOLD QUANTITY (TQ): Not applicable.
OTHER U.S. FEDERAL REGULATIONS: Not applicable.
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component is found on the Proposition 65 List of chemicals.

ADDITIONAL CANADIAN REGULATIONS:
CANADIAN DSL/DSL INVENTORY STATUS: The components of this product are listed on the DSL Inventory.
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: No component of this product is on the CEPA Priorities Substances Lists.
CANADIAN WHMIS REGULATIONS: This product is classified as a Controlled Product, D2B (Immediate Acute Toxicity/Irritation) as per the Controlled Product Regulations.

ADDITIONAL MEXICAN REGULATIONS:
MEXICAN WORKPLACE REGULATIONS (NOM-018-STPS-2000): This product is not classified as hazardous.

16. OTHER INFORMATION

WARNINGS (per ANSI Z129.1): WARNING! HARMFUL IF INGESTED. MAY CAUSE EYE, SKIN, AND RESPIRATORY TRACT IRRITATION, ESPECIALLY IF EXPOSURE IS PROLONGED. COMBUSTIBLE-MAY IGNITE IF HIGHLY HEATED FOR PROLONGED PERIOD OR IF SUBJECTED TO DIRECT FLAME. Avoid contact with eyes, skin, and clothing. Avoid breathing fumes, dusts, vapors or mist. Do not taste or swallow. Wash thoroughly after handling. Keep container tightly closed.

PRECAUTIONARY STATEMENTS:
Hazard Statements: H303: May be harmful if swallowed.
Precautionary Statements:
Prevention: None applicable.
Response: P312: Call a POISON CENTER or doctor if you feel unwell.
Storage: None applicable.
Disposal: None applicable.

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES
The information presented in this Material Safety Data Sheet is presented in good faith based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. In no case shall the descriptions, information, data or designs provided be considered a part of our terms and conditions of sale.

All materials may present hazards and should be used with caution. Because many factors may affect processing or application/use, we recommend that you make tests to determine the suitability of a product for your particular purpose prior to use. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices or applicable federal, state, or local laws or regulations. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

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: May 2013: Up-date and revise entire MSDS to include current GHS requirements.
DATE OF PRINTING June 12, 2013
DEFINITIONS OF TERMS

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

**KEY ACRONYMS**

**CHEMTREC**: Chemical Transportation Emergency Center, a 24-hour emergency information and/or emergency assistance to emergency responders.

**CEILING LEVEL**: The concentration that shall not be exceeded during any part of the working day. Exceeding this concentration would result in significant health hazards.

**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.

**DRAIZE**: Category 4: the genotoxic effects in mammalian somatic cell in vivo; in exceptional cases, substances for which there are data on genotoxic effects in mammalian somatic cells in vivo and/or genotoxic effects in mammalian germ cells, must be shown to reach the genic cells in an active form.

**HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued)**

**FLAMMABILITY HAZARD**: 0 Minimal Hazard: Materials that will not burn in air when exposed to a temperature of 815.5°C (1500°F) for a period of 5 minutes. 1 Slight Hazard: Materials that must not be ignited, but if ignited, can cause flash fires. 2 Moderate Hazard: 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 93.0°C (200°F) (i.e. OSHA Class IIIB); and Most ordinary combustible materials (non-flammable, paper, etc.). 3 Severe Hazard: Materials that will burn in air when exposed to a temperature of 815.5°C (1500°F) for a period of less than 1 minute; Liquids, solids and semisolids having a flash point at or above 22.8°C (73°F). 4 Extreme Hazard: Materials that will burn in air when exposed to a temperature of 815.5°C (1500°F) for a period of less than 1 second; Materials that have a flash point less than 22.8°C (73°F) and have a boiling point less than 37.8°C (100°F) (i.e. OSHA Class III). 5 Special Hazard: Materials that are spontaneously flammable or which ignite under almost all ambient temperature conditions. 6 Total Hazard: Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures, or, unaffected by ambient temperature, are 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 73.8°C (100°F) (i.e. OSHA Class III A and III B). Materials that are on or under ambient temperature may escape within 30 minutes without suffering escape-preventing or permanent injury.

**HAZARDS**: Materials that may cause injury or that may be harmful if inhaled, swallowed, or absorbed through skin. They may cause injury by one or more of the following: Corrosiveness, Irritation, Sensitization, Toxicity, etc.

**PHYSICAL HAZARD**: 0 Water Reactivity: Materials that do not react with water. Organic Peroxides: Materials that do not ignite under fire conditions or that do not polymerize, decompose, or self-react. 1 Water Reactivity: Materials that react with water, but do not polymerize, decompose, or self-react. 2 Water Reactivity: Materials that may polymerize, decompose, 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 with water. Organic Peroxides: Materials that may polymerize, decompose, or self-react under fire conditions. Calculated or tested with water. Explosives: Substances that are non-explosive. Compressed Gases: No Rating. Pyrophorics: No Rating. Oxidizers: No rating. Unstable Reactives: Substances that will not polymerize, decompose, or self-react. 3 Water Reactivity: Materials that may react with water. Organic Peroxides: Materials that may polymerize, decompose, or self-react under fire conditions. Calculated or tested with water. Explosives: Division 1.5 and 1.6 explosives. Substances that are very sensitive explosives. Explosives that do not burn but do cause severe burning of exposed materials. Pyrophorics: No Rating. Oxidizers: Division 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 5.7 potassium bromate/cellulose mixture and the criteria for Packing Group I and II are 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. Materials under almost all conditions. This usually includes: 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 73.8°C (100°F) (i.e. OSHA Class III A and III B). Materials that are on or under ambient temperature may escape within 30 minutes without suffering escape-preventing or permanent injury.

**PAKING GROUPS**

**Division 1.2**: Compressed Gases. **Division 1.3**: Explosives. **Division 1.4**: Oxidizers. **Division 1.5**: Pyrophorics. **Division 1.6**: Explosives. Division 1.7: No Rating.

**REACTIVE MATERIALS**: Materials that are capable of detonation or explosive reaction, but require a strong initiation. They can only be handled under containment. Inadequate handling of reactive materials can cause explosive reactions with water, requiring special handling procedures.**

**TWA**: 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.

**PEL-TWA or REL-TWA**: The concentration that shall not be exceeded during any part of the working day. 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.

**KEY ACRONYMS**

**AEGL**: Acute Exposure Guideline Levels. 1: No rating. 2: No rating. 3: No rating. Unstable Reactives: Substances that will not polymerize, decompose, or self-react. 3 Water Reactivity: Materials that may react with water. Organic Peroxides: Materials that may polymerize, decompose, or self-react under fire conditions. Calculated or tested with water. Explosives: Division 1.5 and 1.6 explosives. Substances that are very sensitive explosives. Explosives that do not burn but do cause severe burning of exposed materials. Pyrophorics: No Rating. Oxidizers: Division 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 5.7 potassium bromate/cellulose mixture and the criteria for Packing Group I and II are 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. Materials under almost all conditions. This usually includes: 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 73.8°C (100°F) (i.e. OSHA Class III A and III B). Materials that are on or under ambient temperature may escape within 30 minutes without suffering escape-preventing or permanent injury.

**LO: Limit of Quantitation.**

**NE: Not Established.**

When no exposure guidelines are established, an entry of NE is made for reference.

**NF: Notice of Intended Change.**

**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 on the 1983 TWA and the June, 1983. Air Contaminants Readings (Federal Register. 58, 35525-35585: 40919). 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**: Use of protective clothing is obvious in a danger of cutaneous absorption.

**STEEL**: 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-hour 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 TLV. The current TWA is the time-weighted average concentration for a 6-hour (TWA, PEL-TWA, TWA) or 15-minute (REL-TWA) workday and a 40-hour workweek.

**WEEL**: Workplace Environmental Exposure Limits from the AIHA.
DEFINITIONS OF TERMS (Continued)

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/m³. Materials with a LCI50 for acute oral 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 50 mg/m³ but less than or equal to 100 mg/m³. 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 50 mg/kg but less than or equal to 200 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 (-6.6°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 lacrimators. 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. 3 Materials that, under emergency conditions, can cause serious but reversible irritation to the skin or with slight chance of dermal sensitization. Materials whose 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 than its LC50 for acute inhalation toxicity, if its LC50 is less than or equal to 1000 ppm and that does not meet the criteria for degree of hazard 1 or degree of hazard 2. Materials whose LC50 for acute oral toxicity greater than 5 mg/kg but less than or equal to 20 mg/kg. 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 cause severe irritation of the eyes, cause either temporary or permanent sensory damage to the skin. Cryogenic gases that cause frothbite and irreversible tissue damage. Compressed liquefied gases with boiling points below -55°C (-6.6°F) that cause frothbite and irreversible tissue damage. Materials with an LC50 for acute oral toxicity greater than 5 mg/kg but less than or equal to 50 mg/kg 3 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 its LC50 for acute inhalation toxicity, if its LC50 is less than or equal to 1000 ppm. Dusts and mists with an LC50 for acute inhalation toxicity less than or equal to 0.5 mg/L. Materials whose LD50 for acute oral 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 LIMITS IN AIR:

Materials that in themselves are capable of detonation or of self-sustained combustion in air. Materials that readily undergo violent chemical change at elevated temperatures and pressures. Materials that on account of their physical form or environmental conditions can form explosive atmospheres with air under almost all ambient temperatures or, though unaffected by temperature, can form flammable atmospheres with air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in accordance with Annex D of NFPA 704. Liquids, solids, and semisolids that readily form an ignitable mixture with air near the surface of the liquid or within the test vessel used. Materials that must be preheated before ignition can occur. Materials in this degree require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur: Materials that will burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in accordance with Annex D of NFPA 704. 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:

ECOLOGICAL INFORMATION:

TOXICOLOGICAL INFORMATION:

M a t e r i a l s  t h a t  u n d e r e m e r g e ncy  c o n d i t i o n s,  w o u l d  o f f e r  n o  h a z a r d  b ey o n d

REGULATORY INFORMATION:

May 23, 2013

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