## 1. PRODUCT IDENTIFICATION

<table>
<thead>
<tr>
<th>IDENTIFICATION of the SUBSTANCE or PREPARATION</th>
<th>Pecora Universal Color Pouches</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRADE NAME (AS LABELED):</td>
<td>Pecora Universal Color Pouches</td>
</tr>
<tr>
<td>PRODUCT DESCRIPTION:</td>
<td>Pigment Pastes</td>
</tr>
<tr>
<td>CHEMICAL NAME/CLASS:</td>
<td>Pigment/Silica and Color Carrier</td>
</tr>
<tr>
<td>SYNONYMS:</td>
<td>None</td>
</tr>
<tr>
<td>RELEVANT USE:</td>
<td>Colorants</td>
</tr>
<tr>
<td>USES ADVISED AGAINST:</td>
<td>Other Than Relevant Use</td>
</tr>
</tbody>
</table>

| COMPANY/UNDERTAKING IDENTIFICATION:           | Pecora Corporation             |
| 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:                             | September 01, 2013              |
| REVISION DATE:                                | October 3, 2014                 |

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 Z400.1-2010 format. This product has been classified in accordance with the hazard criteria of the countries listed above.

## 2. HAZARD IDENTIFICATION

GLOBAL HARMONIZATION LABELING AND CLASSIFICATION: This product has been classified per GHS Standards.

- **Classification:** Skin Irritation Cat. 2, Eye Irritation Cat. 2B, STOT (Inhalation-Respiratory Irritation) SE Cat. 3, STOT (Inhalation-Respiratory System) RE Cat. 2, Skin Sensitization Cat. 1
- **Signal Word:** Warning
- **Hazard Symbols/Pictogram:** GHS07, GHS08

**EMERGENCY OVERVIEW:**

**Physical Description:** These products are colorants which come in 51 different colors and are supplied in small pouches.

**Health Hazards:** Skin and eye contact may cause mechanical irritation (abrasion). Inhalation may cause irritation. Prolonged skin contact may cause dermatitis. As a vanadium compound, the Bismuth Vanadium Oxide pigment can be a skin sensitizer and may cause allergic reactions in susceptible individuals. Some of the pigments contain Titanium Dioxide and Carbon Black, which are suspect carcinogens. Some pigments contain iron oxides which can cause siderosis if contact is chronic. The Bismuth Vanadium Oxide pigment may cause adverse effects to the respiratory system by repeated inhalation.

**Flammability Hazard:** These products are not flammable or combustible; however, finely-divided dusts from the product can present a serious hazard of an air-dust explosion.

**Reactivity Hazard:** These products are not reactive.

**Environmental Hazard:** These products may pose a hazard to the environment, especially those that contain bismuth, copper or vanadium compounds.

**HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS®)**

<table>
<thead>
<tr>
<th>Health</th>
<th>2*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability</td>
<td>1</td>
</tr>
<tr>
<td>Physical Hazard</td>
<td>0</td>
</tr>
</tbody>
</table>

See Section 16 for definitions of ratings

0 = Minimal 3 = Serious
1 = Slight 4 = Severe
2 = Moderate * = Chronic

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

**CANADIAN WHMIS CLASSIFICATION:** Classes 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>LABEL ELEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proprietary Color Carrier</td>
<td>1344-28-1</td>
<td>90.0-97.0%</td>
<td>SELF CLASSIFICATION Classification: Not Applicable</td>
</tr>
<tr>
<td>Amorphous Fumed Silica</td>
<td>112945-52-5</td>
<td>3.0-6.0%</td>
<td>SELF CLASSIFICATION Classification: Not Applicable</td>
</tr>
<tr>
<td>Proprietary Dispersant</td>
<td>7631-86-9</td>
<td>1.0-5.0%</td>
<td>SELF CLASSIFICATION Classification: Not Applicable</td>
</tr>
</tbody>
</table>

The following are pigments that may be in each individual colored product; not all of the following materials are in every product color:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS #</th>
<th>W/W%</th>
<th>GHS Classification</th>
<th>Hazard Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Oxide</td>
<td>1333-86-4</td>
<td>0.0-20.0%</td>
<td>Not Applicable</td>
<td></td>
</tr>
<tr>
<td>Carbon Black</td>
<td>1309-37-1</td>
<td>0.0-35.0%</td>
<td>SELF CLASSIFICATION</td>
<td>Skin Sensitization Cat. 1B, STOT (Inhalation-Respiratory System)</td>
</tr>
<tr>
<td>Iron Oxide Red</td>
<td>13463-67-7</td>
<td>0.0-35.0%</td>
<td>SELF CLASSIFICATION</td>
<td>Carcinogenic Cat. 2</td>
</tr>
<tr>
<td>Titanium Dioxide</td>
<td>14059-33-7</td>
<td>0.0-5.0%</td>
<td>SELF CLASSIFICATION</td>
<td>Skin Sensitization Cat. 1B, STOT (Inhalation-Respiratory System)</td>
</tr>
<tr>
<td>Bismuth Vanadium Oxide</td>
<td>147-14-8</td>
<td>0.0-5.0%</td>
<td>SELF CLASSIFICATION</td>
<td>Aquatic Acute Cat. 2</td>
</tr>
<tr>
<td>Copper Phthalocyanine</td>
<td>11234-10-1</td>
<td>0.0-5.0%</td>
<td>SELF CLASSIFICATION</td>
<td>Carcinogenic Cat. 2</td>
</tr>
</tbody>
</table>

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 inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions.

Skin Exposure: If the product 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. Seek immediate medical attention.

Ingestion: If this product 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 cupfuls 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: Respiratory or skin conditions 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: Not determined.

AUTOIGNITION: Unknown.

FLAMMABLE LIMITS IN AIR: Unknown.
5. FIRE-FIGHTING MEASURES (Continued)

**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 material is not flammable or combustible; however, finely-divided dusts can pose a serious air/dust explosion hazard. Not sensitive to mechanical impact under normal conditions. Not sensitive to static discharge under normal conditions.

*Special Protective Actions for Fire-Fighters:* 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.

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6. ACCIDENTAL RELEASE MEASURES

**PERSONAL PRECAUTIONS AND EMERGENCY PROCEDURES:** Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. 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), and boots, hard hat, and Self-Contained Breathing Apparatus.

**METHODS FOR CLEAN-UP AND CONTAINMENT:**

- All Spills: Access to the spill area should be restricted. Carefully sweep or vacuum spilled material, avoiding generation of dusts. An explosion-proof vacuum should be used. Do not dry-sweep crystalline silica. Whenever possible, wet down with a water spray to minimize the amount of dust or use a vacuum equipped with HEPA filters. 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.

**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.

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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 dusts. Do not taste or swallow. Use only with adequate ventilation. 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.

**PRODUCT END USE:** This product is a Part C for an aggregate epoxy. Follow all industry standards for use of this product.

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

EXPOSURE LIMITS/CONTROL PARAMETERS (continued):

### 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 DFG MAK TWA DFG PREGNANCY RISK CAT</td>
<td>15 mg/m³ (total dust), 5 mg/m³ (inhalable fraction); 1.5 mg/m³ (respirable fraction)</td>
</tr>
<tr>
<td>Amorphous Silica</td>
<td>7361-85-9</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>Amorphous Fumed Silica</td>
<td>112945-52-5</td>
<td>OSHA PEL TWA/STEL NIOSH REL TWA</td>
<td>20 mppcf or 80 mg/m³ / % Sac2 6 mg/m³ (see NIOSH Pocket Guide Appendix C)</td>
</tr>
<tr>
<td>Bismuth Vanadium Oxide</td>
<td>14059-33-7</td>
<td>DFG MAK TWA DFG MAK GERM CELL MUTAGEN CAT.</td>
<td>Inhalable fraction 2</td>
</tr>
<tr>
<td>Carbon Black</td>
<td>1333-86-4</td>
<td>ACGIH TLV TWA OSHA PEL TWA NIOSH REL TWA NIOSH IDLH DFG MAK TWA</td>
<td>3 mg/m³ inhalable fraction 3.5 mg/m³ 3.5 mg/m³ (0.1 mg/m³ in presence of PAHs) (see NIOSH Pocket Guide Appendix C) 1750 mg/m³ As inhalable dust</td>
</tr>
<tr>
<td>Copper Phthalocyanine Exposure limits are for dusts and mists as Cu and fume</td>
<td>147-14-8</td>
<td>ACGIH TLV TWA OSHA PEL TWA NIOSH REL TWA NIOSH IDLH</td>
<td>Dusts &amp; Mists: 1 mg/m³; Fume: 0.2 mg/m³ Dusts &amp; Mists: 1 mg/m³; Fume: 0.1 mg/m³ Dusts &amp; Mists: 1 mg/m³; Fume: 0.1 mg/m³ 100 mg/m³ as Cu</td>
</tr>
<tr>
<td>Proprietary Color Carrier</td>
<td>NE</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>Iron Oxide, Red</td>
<td>1309-37-1</td>
<td>ACGIH TLV TWA OSHA PEL TWA NIOSH REL TWA NIOSH IDLH DFG MAK TWA</td>
<td>5 mg/m³ respirable fraction 10 mg/m³ fume 5 mg/m³ dust and fume, as Fe 2500 mg/m³, as Fe With the exception of iron oxides which are not biologically available</td>
</tr>
<tr>
<td>Proprietary Dispersant</td>
<td>NE</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>Proprietary Polymer</td>
<td>NE</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>Titanium Dioxide</td>
<td>13463-67-7</td>
<td>ACGIH TLV TWA OSHA PEL TWA NIOSH REL</td>
<td>10 mg/m³ NIC: 1 mg/m³ 15 mg/m³ total dust Lowest feasible concentration (LOQ 0.2 mg/m³)15 mg/m³ (ceiling) 15 min.</td>
</tr>
</tbody>
</table>

**Note:** mppcf: Millions of Particles per Cubic Foot  See Section 16 for Definitions of Terms Used.

### PERSONAL PROTECTIVE EQUIPMENT (PPE):


**Eye/Face Protection:** Use approved safety goggles or safety glasses. If necessary, refer to appropriate regulations and standards.

**Skin Protection:** Wear chemical impervious gloves (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 dust from this product is 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 pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under appropriate regulations and standards. The following are NIOSH respiratory equipment guidelines for some of the pigments.

### CARBON BLACK

**CONCENTRATION**

**RESPIRATORY PROTECTION**

- Up to 17.5 mg/m³: Any Dust and Mist Respirator.
- Up to 35 mg/m³: Any Dust and Mist Respirator except single-use and quarter-mask respirators, or any Supplied-Air Respirator (SAR).
- Up to 87.5 mg/m³: Any SAR operated in a continuous-flow mode, or any Powered, Air-Purifying Respirator (PAPR) with a dust and mist filter.
- Up to 175 mg/m³: 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, or any Self-Contained Breathing Apparatus (SCBA) with a full facepiece, or any SAR with a full facepiece.
- Up to 1750 mg/m³: 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 self-contained breathing apparatus 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.
8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

PERSONAL PROTECTIVE EQUIPMENT (continued):

Respiratory Protection (continued):

**CARBON BLACK (continued)**

**CONCENTRATION** | **RESPIRATORY PROTECTION**
---|---
Based on NIOSH REL at Concentrations Above the NIOSH REL, or Where There is No REL, at Any Detectable Concentration: 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.

**IRON OXIDE**

**CONCENTRATION** | **RESPIRATORY PROTECTION**
---|---
Up to 50 mg/m³: Any dust, mist, and fume respirator, or any Supplied-Air Respirator (SAR).
Up to 125 mg/m³: Any SAR operated in a continuous-flow mode, or any Powered, Air-Purifying Respirator (PAPR) with a dust, mist, and fume filter.
Up to 250 mg/m³: Any Air-Purifying, Full-Facepiece Respirator with a high-efficiency particulate filter, or any SAR that has a tight-fitting facepiece and is operated in a continuous-flow mode, or any PAPR with a tight-fitting facepiece and a high-efficiency particulate filter, or any Self-Contained Breathing Apparatus (SCBA) with a full facepiece, or any SAR with a full facepiece.
Up to 2500 mg/m³: Any SAR operated in a 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.

**TITANIUM DIOXIDE**

**CONCENTRATION** | **RESPIRATORY PROTECTION**
---|---
At Concentrations Above the NIOSH REL, or Where There is No REL, at Any Detectable Concentration: Any Self-Contained Breathing Apparatus (SCBA) that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any Supplied-Air Respirator (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.

9. PHYSICAL and CHEMICAL PROPERTIES

**FORM:** Colorant paste.
**MOLECULAR WEIGHT:** Varies.
**ODOR:** None.
**SPECIFIC GRAVITY:** Varies.
**SOLUBILITY IN WATER:** Insoluble.
**MELTING POINT:** Not applicable.
**VOC** (less water and exempt): 50 g/L
**FLASH POINT:** Not flammable or combustible.
**CRITICAL TEMPERATURE:** Not applicable.
**pH:** Not available.
**OTHER SOLUBILITIES:** None.
**COLORS:** 51 different colors.
**MOLECULAR FORMULA:** Varies
**ODOR THRESHOLD:** Not applicable.
**VAPOR PRESSURE, mm Hg @ 20°C:** Practically zero.
**EVAPORATION RATE (BuAc = 1):** Not applicable.
**WEIGHT % VOC:** Not applicable.
**AUTOIGNITION TEMPERATURE:** Not applicable.
**FLAMMABLE LIMITS (in air by volume, %):** Not applicable.
**VISCOSITY:** Not applicable.

10. STABILITY and REACTIVITY

**CHEMICAL STABILITY:** Stable at normal temperature.

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

**INCOMPATIBLE MATERIALS:** This material is not compatible with strong oxidizers and strong acids.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Combustion: None. Hydrolysis: None.

**POSSIBILITY OF HAZARDOUS REACTIONS/POLYMERIZATION:** Will not occur.

11. TOXICOLOGICAL INFORMATION

**POTENTIAL HEALTH EFFECTS:** The most significant routes of occupational overexposure are inhalation and contact with skin and eyes. The symptoms of overexposure to this material are as follows:

- **Contact with Skin or Eyes:** Skin contact may cause abrasion. Prolonged skin contact may cause irritation. Skin contact can cause staining due to the pigments. Eye contact will cause mechanical irritation, with redness, pain and tearing.
- **Skin Absorption:** This product does not skin absorb.
- **Ingestion:** Ingestion may result in gastric upset, abdominal pain. Ingestion of large amount may be harmful.
- **Inhalation:** Inhalation of this product will cause mechanical irritation to the respiratory system, cough or sore throat. Chronic inhalation causes damage to the lungs. Refer to ‘Other Potential Health Effects’ for more information.
- **Injection:** Accidental injection of this product (e.g. puncture with a contaminated object) may cause redness, and swelling in addition to the wound.

**OTHER POTENTIAL HEALTH EFFECTS:** Prolonged or repeated exposure to fine airborne silica dust may cause severe scarring of the lungs, a disease called silicosis. The risk of developing and the severity of silicosis depends on the airborne concentration of respirable-size silica dust to which an employee is exposed (see Sampling and Analysis section) and duration of exposure. Silicosis usually develops gradually over 20 years or more of exposure. Particles with diameters less than 1 micrometre and freshly cleaved particles (for example, those produced by sandblasting) are considered most hazardous.
Silica dust can accumulate in the lungs. Inhaled particles are deposited at various locations within the respiratory tract, depending on their shape, mass, aerodynamic characteristics and other physical properties. Most, but not all, silica is cleared from the lungs after inhalation and deposition.

The elimination of particles continues for many years after the last exposure. Silica is slightly absorbed into the body. Absorbed silica is deposited mainly in the liver, spleen and regional lymph nodes. Silicic acid absorbed into the blood stream is excreted through the kidneys.

Bismuth compounds are often poorly absorbed. Should absorption occur, exposure may cause loss of appetite, headache, skin rash, dermatitis, kidney, bladder or liver injury, and jaundice. Repeated or prolonged exposure may cause a black line or spots on gums, foul breath and excess saliva.

Repeated exposure to Vanadium compounds by inhalation can cause bronchitis, bronchospasms, severe cough and asthma-like disease. Repeated exposure to vanadium compounds can cause adverse effects on the blood including anemia, and red blood cell damage, and abnormal increase in red blood cell volume, gastrointestinal disorders, nervous system disorders and abnormal blood or protein in the urine.

Chronic exposure to Iron Oxides can cause siderosis, which is a deposition of iron particles into tissues, causing yellow staining.

TARGET ORGANS: Acute: Eyes, respiratory system. Chronic: Lungs, liver, blood, central nervous and gastrointestinal systems.

CHRONIC EFFECTS: The Carbon Black and Titanium Dioxide components are suspect carcinogens. Chronic exposure may also cause other adverse effects described under ‘Other Health Effects’.

11. TOXICOLOGICAL INFORMATION (Continued)

OTHER POTENTIAL HEALTH EFFECTS (continued): Several reliable studies have found silicosis in employees with exposure to considerably less than 1 mg/m³ respirable quartz. Early symptoms of silicosis (cough, mucous production and shortness of breath upon exertion) are non-specific, so the development of silicosis may not be detected until advanced stages of the disease. Silicosis may continue to develop even after exposure to crystalline silica has stopped. Evidence of silicosis can normally be seen on an X-ray. Silicosis can vary in severity from minimal to severe. In cases of mild silicosis, there is typically no significant respiratory impairment, although there is X-ray evidence of lung injury. In severe cases, significant and increasingly severe respiratory impairment develops. There is no proven effective treatment for the disease. Life expectancy may be reduced, depending on the severity of the case. Death is not usually a direct result of silicosis, but cardiac failure (cor pulmonale) may occur as the heart has increasing difficulty pumping blood through the scar tissue in the lungs. Silicosis may be complicated by the development of bacterial infections, including tuberculosis. Accelerated silicosis results from exposure to high concentrations of crystalline silica over a period of 5 to 10 years. The disease continues to develop even after exposure stops and is often associated with autoimmune diseases, for example, scleroderma (a skin disease involving thickening of the skin). "Acute" silicosis (also referred to as "silicotic alveolar proteinosis") is rare in humans, but can develop if very high concentrations of crystalline silica dust are inhaled over a relatively short period of time (1-2 years) and has occurred in occupations such as sandblasting or tunnelling where exposure controls were minimal. Acute silicosis may result in death within a few years, often with tuberculosis as a complication.

AMPHOROUS SILICA:

Current, the following toxicity data are available for the components of this product in 1% concentration or more.
## TOXICITY DATA

<table>
<thead>
<tr>
<th>CHEMICAL</th>
<th>EPA</th>
<th>IARC</th>
<th>NTP</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>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Amorphous Silica</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

### OXIDE, RED (continued):

TDLo (Intracutreal-Mouse) 12 mg/kg; Lungs, Thorax, or Respiration: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: other Enzymes

TDLo (Subcutaneous-Mouse) 135 mg/kg; Tumorigenic: equivocal tumorigenic agent by RTFCES criteria; tumors at site of application

DNA Damage (Human Lung) 40 µg/disk/4 hours

## TITANIUM DIOXIDE

<table>
<thead>
<tr>
<th>Standard Draize Test (Skin-Human) 300 µg/3 days-intertemptic: Mild</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC (Inhalation-Rat) 10 mg/m²/18 hours/2 years-intemceptive: Tumorigenic: carcinogenic by RTFCES criteria; Lungs, Thorax, or Respiration: tumors</td>
</tr>
<tr>
<td>LD (Intratracheal-Rat) &gt; 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>
</tr>
<tr>
<td>TD (Intramuscular-Rat) 260 mg/kg/8 weeks-intempective; Tumorigenic: equivocal tumorigenic agent by RTFCES criteria; Blood: lymphoma, including Hodgkin's disease; Tumorigenic: tumors at site of application</td>
</tr>
<tr>
<td>TDLo (Oral-Rat) 60 mg/kg; Gastrointestinal: hypermotility, diarrhea, other changes</td>
</tr>
<tr>
<td>TDLo (Intramuscualar-Rat) 360 mg/kg/2 years-intempective; Tumorigenic: neoplastic by RTFCES criteria; Blood: lymphoma, including Hodgkin's disease; Tumorigenic: tumors at site of application</td>
</tr>
<tr>
<td>TDLo (Intracutreal-Rat) 1.25 mg/kg; Vascular: regional or general arteriolar constriction; Lungs, Thorax, or Respiration: other changes</td>
</tr>
<tr>
<td>TDLo (Intracutreal-Rat) 1.6 mg/kg; Lungs, Thorax, or Respiration: other changes</td>
</tr>
<tr>
<td>TDLo (Intracutreal-Rat) 5 mg/kg; Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation</td>
</tr>
<tr>
<td>TDLo (Intracutreal-Mouse) 100 mg/kg; Tumorigenic: increased incidence of tumors in susceptible strains</td>
</tr>
<tr>
<td>TDLo (Inhalation-Rat) 1 mg/kg; Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation</td>
</tr>
<tr>
<td>TDLo (Intracutreal-Mouse) 100 mg/kg; Tumorigenic: increased incidence of tumors in susceptible strains</td>
</tr>
<tr>
<td>TDLo (Inhalation-Rat) 10 mg/m²/13 weeks-intempective; Lungs, Thorax, or Respiration: sputum; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation</td>
</tr>
<tr>
<td>TDLo (Inhalation-Rat) 10 mg/m²/13 weeks-intempective; Lungs, Thorax, or Respiration: other changes; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation</td>
</tr>
<tr>
<td>TDLo (Inhalation-Mouse) 20 mg/kg/4 days-intempective; Lungs, Thorax, or Respiration: sputum; Immunological Including Allergic: increase in cellular immune response; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation</td>
</tr>
<tr>
<td>TDLo (Inhalation-Mouse) 3000 µg/kg/4 weeks-intempective; Lungs, Thorax, or Respiration: other changes; Immunological Including Allergic: increase in cellular immune response; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation</td>
</tr>
<tr>
<td>TDLo (Parenteral-Mouse) 36 µg/kg/3 days-intemperate: Immunological Including Allergic: increase in humoral immune response</td>
</tr>
</tbody>
</table>

### MUTATION IN MICROORGANISMS

<table>
<thead>
<tr>
<th>CHEMICAL</th>
<th>EPA</th>
<th>IARC</th>
<th>NTP</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>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Amorphous Silica</td>
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<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

### CARCINOGENIC POTENTIAL:

The following table summarizes the carcinogenicity listing for the components of this product. "NO" indicates that the substance is not considered to be or expected to be a carcinogen by the listed agency, see section 16 for definitions of other rankings.
11. TOXICOLOGICAL INFORMATION (Continued)

<table>
<thead>
<tr>
<th>CHEMICAL</th>
<th>EPA</th>
<th>IARC</th>
<th>NTP</th>
<th>NIOSH</th>
<th>ACGIH</th>
<th>OSHA</th>
<th>PROP 65</th>
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</thead>
<tbody>
<tr>
<td>Amorphous Fumed Silica</td>
<td>No</td>
<td>3</td>
<td>No</td>
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<td>No</td>
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<tr>
<td>Bismuth Vanadium Oxide</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>A4</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Carbon Black</td>
<td>No</td>
<td>2B</td>
<td>No</td>
<td>Ca (in presence of PAHs)</td>
<td>A3</td>
<td>No</td>
<td>Yes (airborne unbound particles of respirable size)</td>
</tr>
<tr>
<td>Copper Phthalocyanine</td>
<td>D</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Proprietary Color Carrier</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Iron Oxide, Red</td>
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<td>3</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Proprietary Dispersant</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Proprietary Polymer</td>
<td>No</td>
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<td>No</td>
</tr>
<tr>
<td>Titanium Dioxide</td>
<td>No</td>
<td>2B</td>
<td>No</td>
<td>Ca</td>
<td>A3</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>


IRRITANCY OF PRODUCT: This product may irritate contaminated tissue, especially if contact is prolonged. Eye irritation may be severe or cause burns.

SENSITIZATION TO THE PRODUCT: Some of the pigments in these products may cause skin sensitization.

TOXICOLOGICAL SYNERGISTIC PRODUCTS: There is disagreement about whether tobacco smoke increases the severity of the effect of silica dust on respiratory impairment. A synergistic effect between smoking and silica and/or silicosis on risk of lung cancer, is also likely.

REPRODUCTIVE TOXICITY INFORMATION: No specific information available.

BIOLOGICAL EXPOSURES INDICES (BEIs): There are no BEI’s established for this material.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

MOBILITY: This is not expected to have significant mobility in soil.

PERSISTENCE AND BIODEGRADABILITY: This material persists and does not biodegrade.

BIO-ACCUMULATION POTENTIAL: This material has no bio-accumulation potential.

ECOTOXICITY: No data available.

OTHER ADVERSE EFFECTS: This material has no 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 component of this product is 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: No; 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.
ADDITIONAL U.S. REGULATIONS (continued):
Other U.S. Federal Regulations: Not applicable.
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65): The Carbon Black component (airborne, unbound particles of respirable size) is found on the Proposition 65 List of chemicals known to the state to cause cancer. Due to the form of the product, this Proposition 65 warning is not applicable to this compound in this product.

ADDITIONAL CANADIAN REGULATIONS:
Canadian DSL/NDSL Inventory Status: This material is listed on the DSL Inventory.
Canadian Environmental Protection Act (CEPA) Priorities Substances Lists: No component is on the CEPA Priorities Substances Lists.
Canadian WHMIS Regulations: Material is classified as a Controlled Product, Hazard Class D2B (Irritation/Sensitization) 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
WARNING! CHRONIC INHALATION MAY CAUSE DAMAGE TO RESPIRATORY SYSTEM. INHALATION AND SKIN CONTACT MAY BE IRRITATING, ESPECIALLY IF EXPOSURE IS PROLONGED. CAUSES MECHANICAL IRRITATION TO THE EYES. MAY CONTAIN COMPOUNDS THAT CAN CAUSE SKIN SENSITIZATION AND ALLERGIC REACTION IN SUSCEPTIBLE INDIVIDUALS. MAY CONTAIN COMPOUNDS THAT ARE SUSPECT CARCINOGENS. Cancer hazard depends on duration of inhalation exposure. Avoid contact with eyes, skin, and clothing. Avoid breathing dusts. Do not taste or swallow. Wash thoroughly after handling. Keep container tightly closed. Use only with adequate ventilation. Keep away from heat and flame. Wear gloves, eye protection, respiratory protection, and appropriate body protection. FIRST-AID: In case of contact, immediately flush skin and eyes with plenty of water. Remove contaminated clothing and shoes. Get medical attention if irritation develops or persists. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, do not induce vomiting. Get medical attention. IN CASE OF FIRE: Use water fog, foam, dry chemical, or CO₂. IN CASE OF SPILL: Do not dry sweep. Wet material and shovel of vacuum. Place all spill residue in an appropriate container and seal. Dispose of in accordance with U.S. Federal, State, and local hazardous waste disposal regulations and those of Canada.

GLOBAL HARMONIZATION LABELING AND CLASSIFICATION:
Classified in accordance with the Global Harmonization System. 
Classification: Skin Irritation Category 2, Eye Irritation Category 2B, Specific Target Organ Toxicity (Inhalation-Respiratory Irritation) Single Exposure Category 3, Specific Target Organ Toxicity (Inhalation-Respiratory System) Repeated Exposure Category 2, Skin Sensitization Category 1
Signal Word: Warning
Hazard Statements: H315 + H320: Causes skin and eye irritation. H335: May cause respiratory irritation. H373: May cause damage to respiratory system, liver or blood system through prolonged or repeated exposure. H317: May cause an allergic skin reaction.
Precautionary Statements:
Response: P302 + P352: IF ON SKIN: Wash with plenty of soap and water. P333 + P313: If skin irritation or rash occurs, get medical attention. P362 + P364: Take off contaminated clothing and wash it before reuse. P305 + P315 + 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. P304 + P340: If inhaled, remove victim to fresh air and keep at rest in a position comfortable for breathing. P321: Specific treatment (remove from exposure and treat symptoms). Refer to other portions of precautionary text on this label, SDS or other product information sheets, as appropriate.
Disposal: P501: Dispose of contents/containers in accordance with all local, regional, national and international regulations.

Hazard Symbols/Pictogram: GHS07, GHS08

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.
A large number of abbreviations and acronyms appear on a MSDS. Some of these, 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.

DEFINITIONS OF TERMS
Mutagen Categories: A risk of damage to the developing embryo or fetus has been unequivocally demonstrated. Exposure of pregnant women can lead to damage of the embryo or fetus that will not readily disappear. Category 4 for germ cell mutagens cannot apply. At some time in the future, it is conceivable that a Category 4 could be established for genotoxic substances with primary targets other than DNA (e.g., partly aneugenic substances) if it is shown that the results make this seem sensible. It is clear that germ cell mutagens, the potency of which is considered to be so low that, provided the MAK value is observed, their contribution to genetic risk for humans is considered to be negligible.

Damage to the developing embryo or fetus that will not readily disappear. Category 4 for germ cell mutagens cannot apply. At some time in the future, it is conceivable that a Category 4 could be established for genotoxic substances with primary targets other than DNA (e.g., partly aneugenic substances) if it is shown that the results make this seem sensible. It is clear that germ cell mutagens, the potency of which is considered to be so low that, provided the MAK value is observed, their contribution to genetic risk for humans is considered to be negligible.

Toxicity 4: Slight Hazard: Material that in either concentration tested, exhibits a mean burning time of less than the mean burning time of a 3:2 potato/bromate mixture and the criteria for Packing Group I are not met. Materials that exhibit a mean pressure rise time less than or equal to the pressure rise time of a 1.1 peroxides/organics (no solution) or of detonation or explosion. Explosives: Division 1 & 2 explosives. Explosives that have a mass heat of explosion greater than 10,000 MJ/kg. This category includes substances that will not readily disperse to air or water, but may still be expected to cause significant heat generation or explosion. Explosives: Division 1 & 2 explosives. Explosives that have a mass heat of explosion greater than 10,000 MJ/kg. This category includes substances that will not readily disperse to air or water, but may still be expected to cause significant heat generation or explosion.

Hazardous Materials Identification System Hazard Ratings (continued):
Flammability Hazard: Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature and have a low potential (or low risk) for significant heat generation or explosion. Explosives: Division 1 & 2 explosives. Explosives that have a mass heat of explosion greater than 10,000 MJ/kg. This category includes substances that will not readily disperse to air or water, but may still be expected to cause significant heat generation or explosion.

National Fire Protection Association Hazard Ratings:
Health Hazard 0: Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials. Gases and vapors with an LC₅₀ for acute inhalation toxicity greater than 10,000 ppm. Dusts and mists with an LC₅₀ for acute inhalation toxicity greater than 200 mg/L.

Flammability Hazard (continued): 3 Serious Hazard: Liquids and solids that can be ignited under ordinary conditions. Materials that have a flash point below 22°C (72°F) and have a boiling point below 23°C (73°F) and below 37°C (100°F) (i.e., OSHA Class IB and IC). Materials that on account of their physical form or environmental conditions can form explosive mixtures with air and are readily dispersed in air (e.g., flammable or combustible liquids, mists or droplets of these liquids, and Materials that are extremely flammable, 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 and have a low potential (or low risk) for significant heat generation or explosion. Explosives: Division 1 & 2 explosives. Explosives that have a mass heat of explosion greater than 10,000 MJ/kg. This category includes substances that will not readily disperse to air or water, but may still be expected to cause significant heat generation or explosion.

Lethal Dose: Acute Oral LD₅₀: Rat or Rabbit ≥ 5000 mg/kg. Dermal Toxicity LD₅₀: Rat or Rabbit: ≥ 2000 mg/kg. Inhalation Toxicity: Rat or Rabbit ≥ 10,000 mg/L. The material will not burn in air when exposed to a temperature of 815°C (1500°F) for a period of 5 minutes. 2 Moderate Hazard: Materials that must be pre-heated before ignition will occur, although the material requires considerable pre-heating under all ambient conditions before ignition and combustion can occur. This usually includes the following: The material will not burn in air when exposed to a temperature of 815°C (1500°F) for a period of 5 minutes or less; Liquids, solids and semi-solids with a flash point at or above 93.3°C (200°F) (i.e., OSHA Class III-B) and Most ordinary combustible materials (e.g. wood, paper, etc.). 3 Serious Hazard: Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this hazard degree will not readily disperse to air or water, but will burn in air when exposed to temperatures of 22°C (72°F) and below 37°C (100°F) and will not burn in air when exposed to a temperature of 815°C (1500°F) for a period of 5 minutes or less. 4 Severe Hazard: Materials that will burn in air when exposed to a temperature of 815°C (1500°F) for a period of 5 minutes or less; Liquids, solids and semi-solids with a flash point at or above 93.3°C (200°F) (i.e., OSHA Class III-B) and Most ordinary combustible materials (e.g. wood, paper, etc.). 5 Flammable Hazard: Materials that must be heated to relatively high ambient temperatures before ignition can occur. Materials in this hazard degree will not readily disperse to air or water, but will burn in air when exposed to temperatures of 22°C (72°F) and below 37°C (100°F) (i.e., OSHA Class II-B). Toxicity LD₅₀: Rat or Rabbit: > 2000 mg/kg. Inhalation Toxicity: Rat or Rabbit ≥ 10,000 mg/L. The material will not burn in air when exposed to a temperature of 815°C (1500°F) for a period of 5 minutes or less. 1 Minimal Hazard: Materials that are essentially non-flammable (e.g. cotton, sisal, hemp); and Solids and semi-solids (e.g. viscous and slow flowing as asphalt) that readily escape within 30 minutes without suffering escape-preventing or permanent injury. 2 Slight Hazard: Materials that will burn in air when exposed to a temperature of 815°C (1500°F) for a period of less than 30 minutes but not more than 2 hours. 3 Moderate Hazard: Materials that will burn in air when exposed to a temperature of 815°C (1500°F) for a period of less than 30 minutes but not more than 2 hours. 4 Severe Hazard: Materials that will burn in air when exposed to a temperature of 815°C (1500°F) for a period of less than 30 minutes but not more than 2 hours.
HEALTH HAZARD (continued): 3 Materials that, under emergency conditions, can cause serious or permanent injury. Gases with an LEC 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 LEC for acute inhalation toxicity, if its LEC is less than or equal to 3,000 ppm and that does not meet the criteria for degree of hazard 4. Dusts and mists with an LEC for acute inhalation toxicity greater than 0.5 mg/L, but less than or equal to 2 mg/L. Materials with an LDC for acute dermal toxicity greater than 40 mg/kg, but less than or equal to 200 mg/kg. Materials that are corrosive to the respiratory tract. Materials that are corrosive to the eyes or cause irreversible corneal opacity. Materials corrosive to the skin. Cyanogenic gases that cause frothbite and irreversible tissue damage. Compressed liquefied gases with boiling points below -55°C (-66.5°F) that cause frostbite and irreversible tissue damage. Materials with an LDC for acute oral toxicity greater than 5 mg/kg but less than or equal to 50 mg/kg. Materials that, under emergency conditions, can be lethal. Gases with an LCN for acute inhalation toxicity less than or equal to 1,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than ten times its LCN for acute inhalation toxicity, if its LCN is less than or equal to 1,000 ppm. Dusts and mists whose LCN for acute inhalation toxicity is less than or equal to 40 mg/kg. Materials whose LD50 for acute oral toxicity is less than or equal to 5 mg/kg.

FLAMMABILITY HAZARD: 1 Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand. Materials that will not burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in accordance with Annex D of NFPA 704. 1 Materials that must be preheated before ignition can occur. Materials in this degree require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur. Materials that will burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in accordance with Annex D of NFPA 704. Liquids, solids, and semisolids having a flash point at or above 93.4°C (200°F) (i.e. Class IB liquids). Liquids with a flash point greater than 35°C (95°F) that do not sustain combustion when tested using the Method of Testing for Sustained Combustibility, per 49 CFR 173, Appendix H or the UN Recommendations on the Transport of Dangerous Goods, Model Regulations (current edition) and the related Manual of Tests and Criteria (current edition). Liquids with a flash point greater than 35°C (95°F) in a water-miscible solution or dispersion with a water non-combustible liquid/solid content of more than 85% by weight. Liquids that have no fire point when tested by ASTM D 92, Standard Test Method for Flash and Flash Points by Cleveland Open Cup. Up to the boiling point of the liquid or up to a temperature at which the sample being tested shows an obvious physical change. Combustible pellets with a representative diameter of greater than 2 mm (10 mesh). Most ordinary combustible solids. Materials containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. 2 Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not normally come into contact with air to combust. Much of the information related to fire and explosion is derived from the National Fire Protection Association (NFPA). FLAMMABILITY LIMITS IN AIR: Much of the information related to fire and explosion is derived from the National Fire Protection Association (NFPA). Flash Point: Minimum temperature at which a liquid gives off sufficient vapor to form an ignitable mixture with air near the surface of the liquid or within the test vessel used. Autoignition Temperature: Minimum temperature of a solid, liquid, or gas required to initiate or cause self-sustained combustion in air with no other source of ignition. LFL: Lowest concentration of a flammable vapor or gas mixture that will ignite and burn with a flame. UFL: Highest concentration of a flammable vapor or gas mixture that will ignite and burn with a flame. TOXICOLOGICAL INFORMATION: Human and Animal Toxicology: Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. LD10: Lethal Dose (solids & liquids) that kills 10% of the exposed animals. LD50: Lethal Concentration (gases) that kills 50% of the exposed animals. LD100: Concentration expressed in parts of material per million parts of air or water. mg/m3, Concentration expressed in weight of substance per volume of air. mg/L. Quantity of material, by weight, administered to a test subject, based on their body weight in kg. LDLo: Lowest dose to cause a symptom. LCLo: Lowest concentration to cause a symptom. LC100: Lowest concentration of a chemical in air at which a chronic effect is known to occur. LC50: Lowest dose (or concentration) to cause lethal or toxic effects. Cancer Information: IARC: International Agency for Research on Cancer NTP: National Toxicology Program. ATSDR: Registry of Toxic Effects of Chemical Substances. BEI: Biological Exposure Indices. IARC: Integrated Toxicity Information: A substance is a chemical that causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generations. A mutagen is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An endocrine is a chemical that causes damage to a developing embryo through a mechanism other than causing birth defects. CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act. DOT: U.S. Department of Transportation. SARA: Superfund Amendments and Reauthorization Act. TSCA: U.S. Toxic Substances Control Act. TSCA: Comprehensive Environmental Response, Compensation, and Liability Act. DOT, CERCLA or Superfund, and various state regulations. This section also includes information on the precautionary warnings that appear on the material’s package label.