**SAFETY DATA SHEET**

PECORA CORPORATION®
Architectural Weatherproofing Products
U.S.A. • since 1862

# PECORA DECK HB1100-SA BASE [VEHICULAR AND PEDESTRIAN GRADES]

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

### 1.1 IDENTIFICATION of the SUBSTANCE or PREPARATION

| | |
|---|---|
| PRODUCT IDENTIFIER/TRADE NAME (AS LABELED) | **Pecora Deck HB1100-SA Base [Vehicular and Pedestrian Grades]** |
| OTHER MEANS OF IDENTIFICATION | None |
| RECOMMENDED PRODUCT USE: | Base |
| RESTRICTIONS ON USE: | Other than recommended use |

### 1.2 U.S. COMPANY/UNDERTAKING IDENTIFICATION:

| | |
|---|---|
| U.S. 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: | May 11, 2023 |
| REVISION DATE: | New |

This product is sold for commercial use. This SDS 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.

## 2. HAZARD IDENTIFICATION

**2.1 GLOBAL HARMONIZATION LABELING AND CLASSIFICATION:** Classified in accordance with Global Harmonization Standard under U.S. OSHA Hazard Communication Standard and Canadian WHMIS HPR-GHS 2015.

**2.1.1 Classification:**
Skin Irritation Category 2, Skin Sensitization Category 1, Eye Corrosion/Irritation Category 2A, Respiratory Sensitization Category 1, Specific Target Organ Toxicity (Liver, Kidneys) Repeated Exposure Category 2,

**2.1.2 Signal Word:** Danger

**2.1.3 Hazard Statements:**
H315: Causes skin irritation. H317: May cause an allergic skin reaction. H319: Causes serious eye irritation. H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled. H373: May cause damage to liver and kidneys through prolonged or repeated oral exposure.

**2.1.4 Hazards Not Otherwise Classified (HNOC):** None.

**2.1.5 Physical Hazards Not Otherwise Classified (PHNOC):** The 2-(2H-Benzotriazol-2-yl)-4,6,-di-tert-penthylphenol Persistent, Bioaccumulative, Toxic (PBT); Under Assessment as a Persistent Organic Pollutant (POP) compound.

**2.1.6 Precautionary Statements:**

2.1.6.1 Prevention:
P260: Do not breathe mists, sprays, fume. P264 + P265: Wash hands and other contamination areas thoroughly after handling. Do not touch eyes. P270: Do not eat, drink or smoke when using this product. P271: Use only outdoors or in a well-ventilated area. P272: Contaminated work clothing should not be allowed out of the workplace. P280: Wear protective gloves, clothing, eye protection and face protection. P284: In case of inadequate ventilation, wear respiratory protection.

2.6.1.2 Response:
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. P337 + P317: If eye irritation persists: get medical help. 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. P304 + P340: If inhaled, remove victim to fresh air and keep at rest in a position comfortable for breathing. P342 + P316: If experiencing respiratory symptoms: Get emergency medical help immediately. P321: Specific treatment (remove from exposure and treat symptoms). P391: Collect spillage.

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

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

**2.1.7 Hazard Symbols/Pictograms:** GHS07, GHS08

**2.2 Percent of Unknown Acute Toxicity:** This product is a mixture; the following are percentages of unknown acute toxicity, by route of exposure. All routes: > 80%

## 3. COMPOSITION AND INFORMATION ON INGREDIENTS

| Chemical Name | CAS # | W/W% | LABEL ELEMENTS<br>GHS Classification under U.S. OSHA Hazard Communication Standard, Canadian WHMIS (HPR-GHS) 2015<br>Hazard Statement Codes |
|---|---|---|---|
| Proprietary Prepolymer | | 75-85% | Classification: Not determined. |
| Proprietary Carbonate Ester | | 8-12% | Notified Classification: Eye Corrosion/Irritation Cat. 2A<br>Hazard Statements: H319: Causes serious eye irritation. |
| Dicyclohexyl-methae-4,4'-Diisocyanate | 5124-30-1 | 3-6% | Harmonized Classification: Acute Inhalation Toxicity Cat. 3, Skin Irritation Cat. 2, Skin Sensitization Cat. 1, Eye Corrosion/Irritation Cat. 2A, Respiratory Sensitization Cat. 1, Specific Target Organ Toxicity (Inhalation-Respiratory Irritation) Repeated Exposure Cat. 3<br>Hazard Statements: H331: Toxic if inhaled. H315: Causes skin irritation. H317: May cause an allergic skin reaction. H319: Causes serious eye irritation. H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled. H335: May cause respiratory irritation. |
| 2-(2H-Benzotriazol-2-yl)-4,6,-di-tert-penthylphenol | 25973-55-1 | 2-5% | Notified Classification: Specific Target Organ Toxicity (Liver, Kidneys) Repeated Exposure Cat. 2<br>Hazard Statements: H373: May cause damage to liver, kidney through prolonged or repeated oral exposure.<br>Physical Hazards Not Otherwise Classified (PNOC): Persistent, Bioaccumulative, Toxic (PBT); Under Assessment as a Persistent Organic Pollutant (POP) compound. |
| Titanium Dioxide | 13463-67-7 | 1-3% | Harmonized Classification: Carcinogen Cat. 2<br>Hazard Statements: H351i: Suspected of causing cancer (inhalation). |
| Other components less than 0.1% or compounds that do not contribute to the hazards of the product. | | Balance | Classification: Not Classified |

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

## 4. FIRST-AID MEASURES

**4.1 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.

**4.2 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 SDS to physician or other health professional with victim(s).

**4.2.1 Inhalation:** Although unlikely due to the paste form of the product, if aerosols of this material are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions.

**4.2.1.1 GHS Precautionary Statements for Inhalation Exposure:** P304 + P340: If inhaled, remove victim to fresh air and keep at rest in a position comfortable for breathing. P342 + P316: If experiencing respiratory symptoms: Get emergency medical help immediately.

**4.2.2 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.

**4.2.2.1 GHS Precautionary Statements for Skin Exposure:** P264: Wash contaminated tissues after handling. P302 + P352: IF ON SKIN: Wash with plenty of soap and water. P333 + P317: If skin irritation or rash occurs, get medical attention. P362 + P364: Take off contaminated clothing and wash it before reuse.

**4.2.3 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.

**4.2.3.1 GHS Precautionary Statements for Eye Exposure:** P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. P337 + P317: If eye irritation persists: get medical help.

**4.2.4 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 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.

**4.2.4.1 GHS Precautionary Statements for Ingestion Exposure:** None.

**4.3 MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Acute or chronic skin conditions or conditions of the pancreas may be aggravated by exposure to this product.

**4.4 IMPORTANT SYMPTOMS AND EFFECTS, WHETHER ACUTE OR DELAYED:** See Sections 2 (Hazard Identification) and 11 (Toxicological Information) for more detailed information.

**4.4.1 Acute:**

Symptoms/Effects: Aerosols are irritating to eyes and respiratory system. Direct eye contact may cause moderate to severe eye irritation. All potential effects are dependent on concentration and duration of exposure.

Symptoms/Effects After Inhalation: Although unlikely, due to paste form of product, if aerosols are inhaled, coughing, dry or sore throat, mucosal irritations, shortness of breath. Inhalation of fumes from product cause irritation of the respiratory tract.

Symptoms/Effects After Skin Contact: Dermatitis, dry skin.

Symptoms/Effects After Direct Eye Contact: Moderate to severe irritation of eye tissue from direct eye contact. Fumes may cause eye irritation.

Symptoms/Effects After Ingestion: Irritation of mucous membranes in the mouth, pharynx, esophagus and gastrointestinal tract.

**4.4.2 Chronic:**

Symptoms/Effects After Skin Contact: Dermatitis (dry, red skin, itching, cracking of the skin, skin inflammation), allergic skin reaction.

Symptoms/Effects After Eyes: None specifically known.

## 4. FIRST-AID MEASURES (Continued)

**4.4 IMPORTANT SYMPTOMS AND EFFECTS, WHETHER ACUTE OR DELAYED (continued):**

**4.4.2 Chronic (continued):**

Symptoms/Effects After Accidental Injection/Ingestion: None known.

Symptoms/Effects After Inhalation: Although unlikely due to paste form of product, possible irritation. Chronic inhalation of fumes or aerosols may cause respiratory sensitization and allergic reaction.

Symptoms/Effects No Specific Route of Exposure: Potential reproductive toxicity, carcinogenic effects, adverse effects on pancreas.

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

## 5. FIRE-FIGHTING MEASURES

**5.1 FLASH POINT:** > 104.4°C (> 220°F)

**5.2 AUTOIGNITION:** Not tested.

**5.3 FLAMMABLE LIMITS IN AIR:** Not tested.

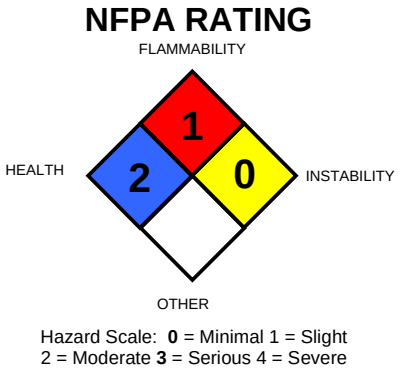
**5.4 FIRE EXTINGUISHING MEDIA:** Use materials appropriate for surrounding materials. ABC extinguishers, carbon dioxide, foam, dry chemical and flooding quantities of water.

**5.5 UNSUITABLE EXTINGUISHING MEDIA:** None known.

**5.6 SPECIAL HAZARDS ARISING FROM THE PRODUCT:** May ignite if highly heated for a prolonged period or if subjected to open flame. Not sensitive to mechanical impact. Closed containers may develop pressure and rupture in event of fire.

**5.6.1 Explosion Sensitivity to Mechanical Impact:** Not sensitive.

**5.6.2 Explosion Sensitivity to Static Discharge:** May be sensitive.




**5.7 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.

**5.7.1 GHS Precautionary Statements Fire Response:** Not applicable.

## 6. ACCIDENTAL RELEASE MEASURES

**6.1 PERSONAL PRECAUTIONS AND EMERGENCY PROCEDURES:** An accidental release may 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. Avoid contact with water.

**6.2 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.

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

**6.2.2 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.**

**6.3 METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP:**

**6.3.1 All Spills:** Eliminate all sources of ignition prior to spill response. Access to the spill area should be restricted. Spread should be limited by gently covering the spill with polypads. Absorb spilled liquid with clay, sand, polypads, or other suitable inert absorbent materials. 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. Monitor area for combustible vapor levels and confirm levels are below exposure limits given in Section 8 (Exposure Controls-Personal Protection), if applicable, and that levels are below applicable LELs (see Section 5 – Fire Fighting Measures) before non-response personnel are allowed into the spill area. Purge equipment with inert gas prior to reuse.

**6.3.2 GHS Statements for Spill Response:** None required.

**6.4 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.

## 6. ACCIDENTAL RELEASE MEASURES (Continued)

**6.5 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.

**6.6 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

**7.1 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, vapors or mist. Do not taste or swallow. Use only with adequate ventilation. Wash hands after handling this product. Contaminated clothing needs to be laundered prior to reuse. Keep away from heat and flame. In the event of a spill, follow practices indicated in Section 6: ACCIDENTAL RELEASE MEASURES. Keeping work areas clean is essential. Use work surfaces that can be easily decontaminated. Maintain good personal hygiene.

**7.1.1 GHS Statements for Safe Handling:** P260: Do not breathe mists, sprays, fume. P264 + P265: Wash hands and other contamination areas thoroughly after handling. Do not touch eyes. P270: Do not eat, drink or smoke when using this product. P271: Use only outdoors or in a well-ventilated area. P272: Contaminated work clothing should not be allowed out of the workplace. P280: Wear protective gloves, clothing, eye protection and face protection. P284: In case of inadequate ventilation, wear respiratory protection.

**7.2 CONDITIONS FOR SAFE STORAGE INCLUDING ANY INCOMPATIBILITIES:** Keep container tightly closed when not in use. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be stored in secondary containers or in a diked area, as appropriate. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Have appropriate extinguishing equipment in the storage area (such as sprinkler systems or portable fire extinguishers). Inspect all incoming containers before storage to ensure containers are properly labeled and not damaged. Empty containers may contain residual product; therefore, empty containers should be handled with care. Store container below 27°C (80°F) to avoid possible reactions related to heat and overpressure of containers. This product is not compatible with oxidizers, strong acids, or strong bases.

**7.2.1 GHS Statements for Storage:** P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

## 8. EXPOSURE CONTROLS - PERSONAL PROTECTION

**8.1 CONTROL PARAMETERS, INCLUDING OCCUPATIONAL EXPOSURE GUIDELINES AND THE SOURCE OF THOSE VALUES:**

**8.1.1 U.S. Occupational/Workplace Exposure Limits/Guidelines:**

| Chemical Name | CAS # | Guideline | Value |
|---|---|---|---|
| Dicyclohexylmethane-4,4'-Diisocyanate | 5124-30-1 | ACGIH TWA<br>NIOSH STEL/CEIL(C)<br>DFG MAK | 0.054 mg/m$^3$<br>0.11 mg/m$^3$ (ceiling)<br>Danger of Sensitization of the Skin |
| Proprietary Carbonate Ester | | DFG MAK TWA<br>DFG MAK PEAK<br>DFG MAK Pregnancy Risk Category | 8.5 mg/m$^3$<br>1●MAK; Excursion Factor: 1, 15 minutes average value, 4 per shift, 1-hr interval<br>C |
| Titanium Dioxide | 13463-67-7 | ACGIH TWA<br>OSHA TWA<br>NIOSH TWA<br>DFG MAK | 0.2 mg/m$^3$ (respirable fraction) ultrafine particles<br>15 mg/m$^3$ (total dust)<br>See Pocket Guide C<br>DFG MAK Pregnancy Risk Category C |

See Section 16 for Definitions of Terms Used.

**8.2 BIOLOGICAL MONITORING AND THE SOURCE OF THOSE VALUES:**

**8.2.1 ACGIH Biological Exposure Indices (BEIs):** Currently, no following BEI's have been established for components.

**8.3 ENGINEERING CONTROLS:**

**8.3.1 Ventilation and Engineering Controls:** Use with adequate, explosion proof ventilation to ensure exposure levels are maintained below the limits provided further in this section.

**8.4 INDIVIDUAL PROTECTION MEASURES, SUCH AS PERSONAL PROTECTIVE EQUIPMENT:** The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with applicable standards in the countries this SDS covers. Please reference applicable regulations and standards for relevant details.

**8.4.1 United States Standards:** U.S. OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132, including the Respiratory Protection Standard (29 CFR 1910.134); Eye Protection Standard 29 CFR 1910.13; Hand Protection Standard 29 CFR 1910.138; Foot Protection Standard 29 CFR 1910.136).

**8.4.2 Canada:** Canadian CSA Respiratory Standard Z94.4-93-02; CSA Eye Protection Standard Z94.3-M1982, Industrial Eye and Face Protectors; Canadian CSA Foot Protection Standard Z195-M1984, *Protective Footwear*).

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

**8.4.4 Skin Protection:** Wear chemical impervious gloves (e.g., Nitrile or Neoprene). Use triple gloves for spill response. If necessary, refer to appropriate regulations.

**8.4.5 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 chemical hazards, wear appropriate protective footwear. If necessary, refer to appropriate regulations.

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

**8.4 INDIVIDUAL PROTECTION MEASURES, SUCH AS PERSONAL PROTECTIVE EQUIPMENT (continued):**

**8.4.6 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 pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under appropriate regulations.

## 9. PHYSICAL and CHEMICAL PROPERTIES

**9.1 FORM:** Paste.
**9.2 COLOR:** Various.
**9.3 MOLECULAR WEIGHT:** Mixture.
**9.4 MOLECULAR FORMULA:** Mixture.
**9.5 ODOR:** Ester-like.
**9.6 ODOR THRESHOLD:** Not determined.
**9.7 BOILING POINT:** Not determined.
**9.8 FREEZING/MELTING POINT:** Not available.
**9.9 RELATIVE DENSITY/SPECIFIC GRAVITY (water = 1):** 1.06
**9.10 VAPOR DENSITY: (air = 1):** > 1
**9.11 VAPOR PRESSURE:** Not available.
**9.12 pH:** Not available.
**9.13 SOLUBILITY IN WATER:** Not soluble.
**9.14 OTHER SOLUBILITIES:** Not known.
**9.15 EVAPORATION RATE (nBuAc = 1):** Not available.
**9.16 VOLATILE ORGANIC COMPOUNDS (VOC):** 0 g/L
**9.17 FLAMMABILITY:** Slightly combustible.
**9.18 FLASH POINT:** > 104.4°C (> 220°F)
**9.19 AUTOIGNITION TEMPERATURE:** Not determined.
**9.20 FLAMMABLE LIMITS IN AIR:** Not tested.
**9.21 PERCENT VOLATILE BY VOLUME:** Not determined.
**9.22 COEFFICIENT WATER/OIL DISTRIBUTION:** Not available.
**9.23 VISCOSITY:** Not determined.
**9.24 HOW TO DETECT THIS SUBSTANCE (WARNING PROPERTIES):** The paste form of this product may act as a warning property in the event of an accidental release.

## 10. STABILITY and REACTIVITY

**10.1 REACTIVITY:** This product is not known to be reactive under normal circumstances of use and handling.
**10.2 CHEMICAL STABILITY:** Stable under normal circumstances of use and handling.
**10.3 POSSIBILITY OF HAZARDOUS REACTIONS/POLYMERIZATION:** This product is not expected polymerize.
**10.4 CONDITIONS TO AVOID:** Avoid contact with incompatible chemicals and exposure to ignition sources, prolonged heating or extreme temperatures.
**10.5 INCOMPATIBLE MATERIALS:** This product is not compatible with oxidizers, strong acids, strong bases, or water.
**10.6 HAZARDOUS DECOMPOSITION PRODUCTS:**

**10.6.1 Combustion:** Thermal decomposition of this product can generate carbon, iron, titanium and nitrogen oxides, dense black smoke, isocyanates, formaldehyde and other undetermined compounds.
**10.6.2 Hydrolysis:** May react.
**10.6.3: Other:** None.

## 11. TOXICOLOGICAL INFORMATION

**11.1 POTENTIAL HEALTH EFFECTS:** The most significant routes of occupational exposure are contact with skin and eyes. The symptoms of exposure to this product are as follows:

**11.1.1 Contact with Skin:** Causes skin irritation. Depending on the duration of skin contact, skin exposure can cause reddening, discomfort or irritation. Contains an isocyanate compound that can cause skin sensitization and allergic reaction in susceptible individuals. Symptoms can include reddening of skin, rash, welts and itching. Once sensitized, exposure to very small amount can cause reactions.
**11.1.1 Contact with Eyes:** Fumes from heating product may cause irritation, reddening and watering. Direct eye contact may cause more serious eye irritation.
**11.1.2 Skin Absorption:** Prolonged skin contact may be harmful by skin absorption as described under ingestion or inhalation.
**11.1.3 Ingestion:** Although ingestion is unlikely in the workplace, if swallowed, irritation of the mouth, throat, and other tissues of the gastro-intestinal system can occur, as well as cause nausea, vomiting, and diarrhea. Contains a compound that can cause liver and kidney adverse effects from chronic ingestion (as may occur from poor hygiene).

## 11. TOXICOLOGICAL INFORMATION (Continued)

### 11.1 POTENTIAL HEALTH EFFECTS (continued):

**11.1.4 Inhalation:** Not a likely route of exposure due to the paste form of the product. If inhalation of fumes occurs, they may cause respiratory irritation, may irritate the tissues of the nose, mouth, throat, and upper respiratory system. Symptoms of exposure may include coughing, sneezing, and difficulty breathing. Contains an isocyanate compound that can cause respiratory sensitization and allergic reaction in susceptible individuals. Symptoms can cause difficulty breathing, coughing, wheezing and restricted airways.

**11.1.5 Injection:** Accidental injection of this product (e.g., puncture with a contaminated object) may cause burning, redness, and swelling in addition to the wound.

**11.1.6: Other Effects:** Although not a likely route of exposure, contains a compound that may cause adverse effects to the liver and kidneys by repeated ingestion.

### 11.2 DELAYED and IMMEDIATE EFFECTS and CHRONIC EFFECTS FROM SHORT-TERM and LONG-TERM EXPOSURE:

**11.2.1 Short-Term:** Direct eye contact may cause moderate to severe irritation. Skin contact and inhalation of fumes from heating the product may be irritating.

**11.2.2 Long-Term:** Prolonged or chronic skin contact may cause dermatitis or skin sensitization and allergic reaction in susceptible individuals. Chronic inhalation may cause respiratory sensitizer and allergic reactions. Chronic oral exposure may cause adverse effects to the liver and kidneys.

### 11.3 TARGET ORGANS:

**11.3.1 Short Term:** Skin, eyes, respiratory system.

**11.3.2 Long Term:** Skin, respiratory system, liver, kidneys.

**11.4 OVERALL ACUTE TOXICITY ESTIMATES (ATE) FOR PRODUCT:** Not possible to calculate due to lack of data by all routes.

**11.4.1 Oral ATE:** Not possible to calculate (> 80% unknown)

**11.4.2 Dermal ATE:** Not possible to calculate (> 80% unknown)

**11.4.3 Inhalation Vapor ATE:** Not possible to calculate (> 80% unknown)

**11.5 TOXICITY DATA:** The following toxicology data are available for components greater than 1% in concentration. Due to the large amount of data, only human data, LD50 Oral-Rat or Mouse, LD50 Skin-Rat or Mouse, LC50 Inhalation-Rat or Mouse and skin irritation data are provided in this SDS. Contact Pecora for more information.

**2-(2H-Benzotriazol-2-yl)-4,6,-di-tert-pentylphenol:**
$LD_{50}$ (Oral-Rat) > 7750 mg/kg (no Guideline available)
$LD_{50}$ (Dermal-Rabbit) > 1100 mg/kg (OECD Guideline 402)
$LC_{50}$ (Inhalation-Rat) 4 hours: > 1.6 mg/L (OECD Guideline 403)

**Dicyclohexylmethane-4,4'-Diisocyanate:**
$LD_{50}$ (Oral-Rat) 18,200 mg/kg (OECD Guideline 401)
$LD_{50}$ (Dermal-Rat) > 7000 mg/kg (OECD Guideline 402)
$LC_{50}$ (Inhalation-Rat) 4 hours: 0.43 mg/L (OECD Guideline 403)

**Proprietary Carbonate Ester:**
$LD_{50}$ (Oral-Rat) > 5000 mg/kg (OECD Guideline 401)
$LD_{50}$ (Dermal-Rabbit) > 2000 mg/kg (OECD Guideline 402)

**Titanium Dioxide:**
Standard Draize Test (Skin-Human) 300 µg/3 days-intermittent: Mild
$LD_{50}$ (Oral-Rat) 2000-5000 gm/kg
$LC_{50}$ (Inhalation-Rat) 4 hours: 3.43-6.86 mg/kg

### 11.6 REPEATED DOSE TOXICITY:

**2-(2H-Benzotriazol-2-yl)-4,6,-di-tert-pentylphenol:** In the TNO study (No. R 2640, 1968) the sub-chronic oral toxicity of the test substance was determined in rodents (rats). The study was conducted similar to the OECD-Guideline 408. Microscopic examination of the livers revealed a dose-dependent hepatic damage in both males and females. Further results were primarily extremely enlarged and altered parenchymal cells, binucleated hepatocytes, necrotic cells, and proliferation of bile ducts. Microscopic examination of kidneys revealed tubular nephrosis at the two highest feeding levels (81 and 173 mg/kg bw) in males. Repeated dose toxicity: via oral route - systemic effects (target organ) digestive: liver; urogenital: kidneys. Based on the data, the test substance has to be classified for specific target organ toxicity - repeated exposure (STOT RE): Cat. 2.

**11.7 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 suspected to be a carcinogen by the listed agency, see section 16 for definitions of other ratings.

| CHEMICAL | IARC | EPA | NTP | NIOSH | ACGIH-TLV | OSHA | PROP 65 |
|---|---|---|---|---|---|---|---|
| Titanium Dioxide | 2B | No | No | Ca | A3 | No | Yes (airborne particles of respirable size) |

ACGIH TLV-A3: Confirmed Animal Carcinogen with Unknown Relevance to Humans.. IARC-2B: Possibly Carcinogenic to Humans. NIOSH-Ca: Potential Occupational Carcinogen with no Further Categorization.

**11.8 IRRITANCY OF PRODUCT:** This product is irritating by eye and skin exposure. Aerosols may be irritating to the respiratory system and eyes. Direct eye contact may cause serious irritation.

**11.8.1 Skin Irritation:** The following data are available for a component of this product.

**Dicyclohexylmethane-4,4'-Diisocyanate:** This compound has been assessed in the OECD HPV programme, 2005 (OECD 404 Guideline). Cited from SIAR for SIAM20 (Paris, April 19 -22, 2005): Dicyclohexylmethane-4,4'-Diisocyanate is moderately to severe irritant to the skin of rabbits.

**11.8.2 Eye Irritation:** Multiple components have been given Eye Corrosion/Irritation Cat. 2A classification. The following data are available.

**Dicyclohexylmethane-4,4'-Diisocyanate:** The eye irritation properties of Dicyclohexylmethane-4,4'-Diisocyanate was investigated in a study according to OECD TG 405. Irritant effects were observed after instillation of Dicyclohexylmethane-4,4'-Diisocyanate into the eyes of rabbits (OECD TG 405).

**Propylene Carbonate:** Ultrapure Propylene Carbonate is a moderate irritant (class 5 on a 1-8 scale) to the rabbit eye.

**11.8.1 Respiratory Irritation:** The following data are available for a component of this product.

**Dicyclohexylmethane-4,4'-Diisocyanate:** The eye irritation properties of Dicyclohexylmethane-4,4'-Diisocyanate was investigated in a study according to OECD TG 405 Repeated dose studies indicate that this compound causes irritation of the respiratory tract per OECD TG 405.

**11.9 SENSITIZATION TO THE PRODUCT:** Contains a compound that has been classified as a skin and respiratory sensitizer as indicated below.

**11.9.1 Skin Sensitization:** The following data are available for a component of this product.

**Dicyclohexylmethane-4,4'-Diisocyanate:** The result of LLNA testing point to a high potency, but as this test system reveals positive results for skin as well as respiratory sensitizers (and the substance is in fact classified for respiratory sensitization) it cannot be conclusively evaluated whether the indicated potency directly relates to skin sensitization. Human experience show positive patch test reactions indicating skin sensitization, but this seems not to be a very frequent observation.

## 11. TOXICOLOGICAL INFORMATION (Continued)

**11.9 SENSITIZATION TO THE PRODUCT (continued):**

**11.9.2 Respiratory Sensitization:** The following data are available for a component of this product.

**Dicyclohexylmethane-4,4'-Diisocyanate:** Lung sensitization study following intradermal induction. For inhalation challenge the criteria specified in OECD TG 403 were fulfilled in so far as these are applicable to this study. Following induction, slight skin reactions at the injection sites occurred. No deaths or anaphylactic reactions were observed during challenge, and no clinical signs or specific abnormalities were observed at necropsy. The histopathological evaluation of lungs revealed a marked influx of eosinophils in test material-sensitized guinea-pigs, a characteristic feature of asthma and airway hypersensitivity.

**11.10 ENDOCRINE TOXICITY:** No component is known or suspected to be an endocrine disruptor. Endocrine disruptors can cause adverse effects on the immune system and other adverse effects.

**11.11 TOXICOLOGICAL SYNERGISTIC PRODUCTS:** None known.

**11.12 REPRODUCTIVE TOXICITY INFORMATION:** This product has not been tested for reproductive toxicity.

**11.12.1 Mutagenicity:** No component has been shown to cause mutagenic effects in humans or in animal testing.

**11.12.2 Embryotoxicity/Teratogenicity:** No data.

**11.12.3 Reproductive Toxicity:** No data.

## 12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

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

**12.2 PERSISTENCE AND BIODEGRADABILITY:** This product has not been tested for persistence or biodegradability. The following information is available for a component of this product.

**2-(2H-Benzotriazol-2-yl)-4,6,-di-tert-pentylphenol:** This compound has been identified as a Persistent Bioaccumulative and Toxic (PBT) substance and is therefore a harmful chemical that persists overtime (does not biodegrade easily in the environment) and is especially hazardous for human health and ecosystems. In addition, this compound is under assessment to determine if is also a POP, Persistent Organic Pollutant (an organic compound that has toxic properties, persists in the environment, accumulates in food chains and poses a risk to human health and the environment).

**12.3 BIO-ACCUMULATION POTENTIAL:** This product has not been tested for bio-accumulation potential; however, it contains a substance that is classified as bioaccumulative (see above).

**12.4 ECOTOXICITY:** This product has not been tested for aquatic or animal toxicity; however, all components are classified as very acutely and chronically toxic to aquatic organisms. All release to terrestrial, atmospheric and aquatic environments should be avoided. No data indicated acute aquatic toxicity for any component.

**12.5 OTHER ADVERSE EFFECTS:** This product is not expected to have any ozone depletion potential.

**12.6 ENDOCRINE DISRUPTORS:** No component is a suspect endocrine disruptor. Endocrine disruptors that find their way into the environment can cause adverse effects on aquatic and terrestrial organisms.

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

**12.7.1 GHS Statements for Environmental Exposure Controls:** None applicable.

## 13. DISPOSAL CONSIDERATIONS

**13.1 U.S. PREPARING WASTES FOR DISPOSAL:** As supplied, this product should be tested to see if it meets the criteria of 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.

**13.1.1 GHS Statements for Disposal:** P501: Dispose of contents of containers in accordance with all local, regional, national and international regulations.

**13.1.2 U.S. EPA WASTE NUMBER:** None applicable.

**13.2 CANADIAN HAZARDOUS WASTE REGULATIONS:** As supplied, this product should be tested to see if it meets the criteria of hazardous wastes per Canadian Environmental Protection Agency) regulations and the Canadian Environmental Protection Act, 1999 (CEPA).

**13.2.1 CEPA Substances Lists:** Currently, no component of this found is found on the CEPA Priority Substances Lists.

## 14. TRANSPORTATION INFORMATION

**14.1 U.S. DEPARTMENT OF TRANSPORTATION (DOT):** Not regulated per U.S. DOT regulations, under 49 CFR 172.101.

**14.2 TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS (TDG):** Not regulated per regulations of Transport Canada.

**14.3 INTERNATIONAL AIR TRANSPORT ASSOCIATION SHIPPING INFORMATION (IATA):** Not regulated per the International Air Transport Association.

**14.4 INTERNATIONAL MARITIME ORGANIZATION SHIPPING INFORMATION (IMO):** Not regulated per the International Maritime Organization.

# 15. REGULATORY INFORMATION

This is not an exhaustive list of regulations that may impact this product under applicable jurisdictions.

## 15.1 U.S. REGULATIONS:

**15.1.1 U.S. SARA Reporting Requirements:** The following 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.

| CHEMICAL | SECTION 302 EHS (TPQ) (40 CFR 355, Appendix A) | SECTION 304 RQ (40 CFR Table 302.4) | SECTION 313 TRI (threshold) (40 CFR 372.65) |
|---|---|---|---|
| Dicyclohexylmethan-4,4'-Diisocyanate (EPCRA Section 313 Diisocyanate category) | No | No | Yes |

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

**15.1.3 U.S. TSCA Inventory Status:** All components of this product listed by CAS# in Section 3 (Composition and Information on Ingredients) are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

**15.1.4 U.S. CERCLA Reportable Quantity (RQ):**Not applicable.

**15.1.5 U.S. Clean Air Act (CA 112r) Threshold Quantity (TQ):** Not applicable.

**15.1.6 California Safe Drinking Water and Toxic Enforcement Act (Proposition 65):** The Titanium Dioxide component is listed on the Proposition 65 lists, but only as airborne, unbound particles of respirable size, which is not applicable to this product. As such, the Proposition 65 warning for Titanium Dioxide is not applicable to this product.

## 15.2 CANADIAN REGULATIONS:

**15.2.1 Canadian DSL/NDSL Inventory Status:** The components of this product listed by CAS# in Section 3 (Composition and Information on Ingredients) are on the DSL Inventory.

**15.2.2 Canadian Environmental Protection Act (CEPA) Priorities Substances Lists:** Not applicable.

**15.2.3 Canadian WHMIS (HPR-GHS) 2015 Classification and Symbols:** See Section 2 Hazard Identification.

# 16. OTHER INFORMATION

## 16.1 HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS®)

| | |
|---|---|
| **Health** | **2*** |
| **Flammability** | **1** |
| **Physical Hazard** | **0** |

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

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

**16.2 REFERENCES AND DATA SOURCES:** Contact the supplier for information.

**16.3 METHODS OF EVALUATING INFORMATION FOR THE PURPOSE OF CLASSIFICATION:** Global Harmonization Standard (GHS) criteria were used to classify this product.

**16.4 DATE OF PREPARATION:** May 11, 2023

**16.5 REVISION DETAILS:** New.

**16.6 DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES**

The information presented in this Safety Data Sheet is presented in good faith based on data believed to be accurate as of the date this 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.

## DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on an SDS. 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.

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

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

**LOQ:** Limit of Quantitation.

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

**NIC:** Notice of Intended Change.

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

**NIOSH RELs:** NIOSH's Recommended Exposure Limits.

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

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

**STEL:** Short Term Exposure Limit, usually a 15-minute time-weighted average (TWA) exposure that should not be exceeded at any time during a workday, even if the 8-hr TWA is within the TLV-TWA, PEL-TWA or REL-TWA.

**TLV:** Threshold Limit Value. An airborne concentration of a substance that represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour.

**KEY ACRONYMS (continued)**:

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

**WEEL:** Workplace Environmental Exposure Limits from the AIHA.

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

**HEALTH HAZARD: 0** Minimal Hazard: No significant health risk, irritation of skin or eyes not anticipated. *Skin Irritation*: Essentially non-irritating. Mechanical irritation may occur. PII or Draize = 0. *Eye Irritation*: Essentially non-irritating, minimal effects clearing in < 24 hours. Mechanical irritation may occur. Draize = 0. *Oral Toxicity $LD_{50}$ Rat*: > 5000 mg/kg. *Dermal Toxicity $LD_{50}$ Rat or Rabbit*: > 2000 mg/kg. *Inhalation Toxicity 4-hrs $LC_{50}$ Rat*: > 20 mg/L. **1** Slight Hazard: Minor reversible injury may occur; may irritate the stomach if swallowed; may defat the skin and exacerbate existing dermatitis. *Skin Irritation*: Slightly or mildly irritating. PII or Draize > 0 < 5. *Eye Irritation*: Slightly to mildly irritating, but reversible within 7 days. Draize > 0 ≤ 25. *Oral Toxicity $LD_{50}$ Rat*: > 500–5000 mg/kg. *Dermal Toxicity $LD_{50}$ Rat or Rabbit*: > 1000–2000 mg/kg. *Inhalation Toxicity $LC_{50}$ 4-hrs Rat*: > 2–20 mg/L. **2** Moderate Hazard: Temporary or transitory injury may occur; prolonged exposure may affect the CNS. *Skin Irritation*: Moderately irritating; primary irritant; sensitizer. PII or Draize ≥ 5, with no destruction of dermal tissue. *Eye Irritation*: Moderately to severely irritating; reversible corneal opacity; corneal involvement or irritation clearing in 8–21 days. Draize = 26–100, with reversible effects. *Oral Toxicity $LD_{50}$ Rat*: > 50–500 mg/kg. *Dermal Toxicity $LD_{50}$ Rat or Rabbit*: > 200–1000 mg/kg. *Inhalation Toxicity $LC_{50}$ 4-hrs Rat*: > 0.5–2 mg/L. **3** Serious Hazard: Major injury likely unless prompt action is taken and medical treatment is given; high level of toxicity; corrosive. *Skin Irritation*: Severely irritating and/or corrosive; may cause destruction of dermal tissue, skin burns, and dermal necrosis. PII or Draize > 5–8, with destruction of tissue. *Eye Irritation*: Corrosive, irreversible destruction of ocular tissue; corneal involvement or irritation persisting for more than 21 days. Draize > 80 with effects irreversible in 21 days. *Oral Toxicity $LD_{50}$ Rat*: > 1–50 mg/kg. *Dermal Toxicity $LD_{50}$ Rat or Rabbit*: > 20–200 mg/kg. *Inhalation Toxicity $LC_{50}$ 4-hrs Rat*: > 0.05–0.5 mg/L.

# 16. OTHER INFORMATION (Continued)

## DEFINITIONS OF TERMS (Continued)

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

**HEALTH HAZARD (continued): 4** Severe Hazard: Life-threatening; major or permanent damage may result from single or repeated exposure; extremely toxic; irreversible injury may result from brief contact. *Skin Irritation*: Not appropriate. Do not rate as a 4, based on skin irritation alone. *Eye Irritation*: Not appropriate. Do not rate as a 4, based on eye irritation alone. *Oral Toxicity $LD_{50}$ Rat*: ≤ 1 mg/kg. *Dermal Toxicity $LD_{50}$ Rat or Rabbit*: ≤ 20 mg/kg. *Inhalation Toxicity $LC_{50}$ 4-hrs Rat*: ≤ 0.05 mg/L.

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

**PHYSICAL HAZARD: 0** *Water Reactivity*: Materials that do not react with water. *Organic Peroxides*: Materials that are normally stable, even under fire conditions and will not react with water. *Explosives*: Substances that are Non-Explosive. *Compressed Gases*: No Rating. *Pyrophorics*: No Rating. *Oxidizers*: No 0 rating. *Unstable Reactives*: Substances that will not polymerize, decompose, condense, or self-react.). **1** *Water Reactivity*: Materials that change or decompose upon exposure to moisture. *Organic Peroxides*: Materials that are normally stable but can become unstable at high temperatures and pressures. These materials may react with water but will not release energy violently. *Explosives*: Division 1.5 & 1.6 explosives. Substances that are very insensitive explosives or that do not have a mass explosion hazard. *Compressed Gases*: Pressure below OSHA definition. *Pyrophorics*: No Rating. *Oxidizers*: Packaging Group III oxidizers; Solids: any material that in either concentration tested, exhibits a mean burning time less than or equal to the mean burning time of a 3:7 potassium bromate/cellulose mixture and the criteria for Packing Group I and II are not met. Liquids: any material that exhibits a mean pressure rise time less than or equal to the pressure rise time of a 1:1 nitric acid (65%)/cellulose mixture and the criteria for Packing Group I and II are not met. *Unstable Reactives*: Substances that may decompose condense, or self-react, but only under conditions of high temperature and/or pressure and have little or no potential to cause significant heat generation or explosion hazard. Substances that readily undergo hazardous polymerization in the absence of inhibitors. **2** *Water Reactivity*: Materials that may react violently with water. *Organic Peroxides*: Materials that, in themselves, are normally unstable and will readily undergo violent chemical change but will not detonate. These materials may also react violently with water. *Explosives*: Division 1.4 explosives. Explosive substances where the explosive effects are largely confined to the package and no projection of fragments of appreciable size or range are expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package. *Compressed Gases*: Pressurized and meet OSHA definition but < 514.7 psi absolute at 21.1°C (70°F) [500 psig]. *Pyrophorics*: No Rating. *Oxidizers*: Packing Group II oxidizers. Solids: any material that, either in concentration tested, exhibits a mean burning time of less than or equal to the mean burning time of a 2:3 potassium bromate/cellulose mixture and the criteria for Packing Group I are not met. Liquids: any material that exhibits a mean pressure rise time less than or equal to the pressure rise of a 1:1 aqueous sodium chlorate solution (40%)/cellulose mixture and the criteria for Packing Group I are not met. *Reactives*: Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure, but have a low potential (or low risk) for significant heat generation or explosion. Substances that readily form peroxides upon exposure to air or oxygen at room temperature. **3** *Water Reactivity*: Materials that may form explosive reactions with water. *Organic Peroxides*: Materials that are capable of detonation or explosive reaction but require a strong initiating source or must be heated under confinement before initiation; or materials that react explosively with water. *Explosives*: Division 1.3 explosives. Explosive substances that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but do not have a mass explosion hazard. *Compressed Gases*: Pressure ≥ 514.7 psi absolute at 21.1°C (70°F) [500 psig]. *Pyrophorics*: No Rating. *Oxidizers*: Packing Group I oxidizers. Solids: any material that, in either concentration tested, exhibits a mean burning time less than the mean burning time of a 3:2 potassium bromate/cellulose mixture. Liquids: any material that spontaneously ignites when mixed with cellulose in a 1:1 ratio, or which exhibits a mean pressure rise time less than the pressure rise time of a 1:1 perchloric acid (50%)/cellulose mixture. *Unstable Reactives*: Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure and have a moderate potential (or moderate risk) to cause significant heat generation or explosion. **4** *Water Reactivity*: Materials that react explosively with water without requiring heat or confinement. *Organic Peroxides*: Materials that are readily capable of detonation or explosive decomposition at normal temperature and pressures. *Explosives*: Division 1.1 & 1.2 explosives. Explosive substances that have a mass explosion hazard or have a projection hazard. A mass explosion is one that affects almost the entire load instantaneously. *Compressed Gases*: No Rating. *Pyrophorics*: Add to the definition of Flammability 4. *Oxidizers*: No 4 rating.

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

**PHYSICAL HAZARD (continued): 4 (continued):** *Unstable Reactives*: Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure and have a high potential (or high risk) to cause significant heat generation or explosion. *Pyrophorics*: Add to the definition of Flammability 4. *Oxidizers*: No 4 rating. *Unstable Reactives*: Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure and have a high potential (or high risk) to cause significant heat generation or explosion.

**NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS:**

**HEALTH HAZARD: 0** Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials. Gases and vapors with an $LC_{50}$ for acute inhalation toxicity greater than 10,000 ppm. Dusts and mists with an $LC_{50}$ for acute inhalation toxicity greater than 200 mg/L. Materials with an $LD_{50}$ for acute dermal toxicity greater than 2000 mg/kg. Materials with an $LD_{50}$ 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 $LC_{50}$ for acute inhalation toxicity greater than 5,000 ppm but less than or equal to 10,000 ppm. Dusts and mists with an $LC_{50}$ for acute inhalation toxicity greater than 10 mg/L but less than or equal to 200 mg/L. Materials with an $LD_{50}$ 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 $LD_{50}$ for acute oral toxicity greater than 500 mg/kg but less than or equal to 2000 mg/kg. **2** Materials that, under emergency conditions, can cause temporary incapacitation or residual injury. Gases with an $LC_{50}$ 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 $LC_{50}$ for acute inhalation toxicity, if its $LC_{50}$ 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 $LC_{50}$ for acute inhalation toxicity greater than 2 mg/L but less than or equal to 10 mg/L. Materials with an $LD_{50}$ for acute dermal toxicity greater than 200 mg/kg but less than or equal to 1000 mg/kg. Compressed liquefied gases with boiling points between -30°C (-22°F) and -55°C (-66.5°F) that cause severe tissue damage, depending on duration of exposure. Materials that are respiratory irritants. Materials that cause severe, but reversible irritation to the eyes or are lachrymators. Materials that are primary skin irritants or sensitizers. Materials whose $LD_{50}$ 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 or permanent injury. Gases with an $LC_{50}$ for acute inhalation toxicity greater than 1,000 ppm but less than or equal to 3,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater its $LC_{50}$ for acute inhalation toxicity, if its $LC_{50}$ is less than or equal to 3000 ppm and that does not meet the criteria for degree of hazard 4. Dusts and mists with an $LC_{50}$ for acute inhalation toxicity greater than 0.5 mg/L but less than or equal to 2 mg/L. Materials with an $LD_{50}$ for acute dermal toxicity greater than 40 mg/kg but less than or equal to 200 mg/kg. Materials that are corrosive to the respiratory tract. Materials that are corrosive to the eyes or cause irreversible corneal opacity. Materials corrosive to the skin. Cryogenic gases that cause frostbite and irreversible tissue damage. Compressed liquefied gases with boiling points below -55°C (-66.5°F) that cause frostbite and irreversible tissue damage. Materials with an $LD_{50}$ for acute oral toxicity greater than 5 mg/kg but less than or equal to 50 mg/kg. **4** Materials that, under emergency conditions, can be lethal. Gases with an $LC_{50}$ 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 $LC_{50}$ for acute inhalation toxicity, if its $LC_{50}$ is less than or equal to 1000 ppm. Dusts and mists whose $LC_{50}$ for acute inhalation toxicity is less than or equal to 0.5 mg/L. Materials whose $LD_{50}$ for acute dermal toxicity is less than or equal to 40 mg/kg. Materials whose $LD_{50}$ for acute oral toxicity is less than or equal to 5 mg/kg.

**FLAMMABILITY HAZARD: 0** Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand. Materials that will not burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes, in 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 according with Annex D of NFPA 704. Liquids, solids, and semisolids having a flash point at or above 93.4°C (200°F) (e.g., Class IIIB liquids). Liquids with a flash point greater than 35°C (95°F) that do not sustain combustion when tested using the *Method of Testing for Sustained Combustibility*, per 49 CFR 173, Appendix H or the UN *Recommendations on the Transport of Dangerous Goods, Model Regulations* (current edition) and the related *Manual of Tests and Criteria* (current edition). Liquids with a flash point greater than 35°C (95°F) in a water-miscible solution or dispersion with a water non-combustible liquid/solid content of more than 85% by weight. Liquids that have no fire point when tested by ASTM D 92, *Standard Test Method for Flash and Fire Points by Cleveland Open Cup*, up to the boiling point of the liquid or up to a temperature at which the sample being tested shows an obvious physical change. Combustible pellets with a representative diameter of greater than 2 mm (10 mesh). Most ordinary combustible materials. Solids containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **2** Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not under normal conditions form hazardous atmospheres with air, but under high ambient temperatures or under moderate heating could release vapor in sufficient quantities to produce hazardous atmospheres with air. Liquids having a flash point at or above 37.8°C (100°F) and below 93.4°C (200°F) (e.g., Class II and Class IIIA liquids.) Solid materials in the form of powders or coarse dusts of representative diameter between 420 microns (40 mesh) and 2 mm (10 mesh) that burn rapidly but that generally do not form explosive mixtures with air. Solid materials in fibrous or shredded form that burn rapidly and create flash fire hazards, such as cotton, sisal, and hemp. Solids and semisolids that readily give off flammable vapors. Solids containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **3** Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions. Liquids having a flash point below 22.8°C (73°F) and having a boiling point at or above 37.8°C (100°F) and those liquids having a flash point at or above 22.8°C (73°F) and below 37.8°C (100°F) (e.g., Class IB and IC liquids). Materials that on account of their physical form or environmental conditions can form explosive mixtures with air and are readily dispersed in air. Flammable or combustible dusts with representative diameter less than 420 microns (40 mesh). Materials that burn with extreme rapidity, usually by reason of self-contained oxygen (e.g., dry nitrocellulose and many organic peroxides). Solids containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **4** Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and will burn readily. Flammable gases. Flammable cryogenic materials. Any liquid or gaseous materials that is liquid while under pressure and has a flash point below 22.8°C (73°F) and a boiling point below 37.8°C (100°F) (e.g., Class IA liquids). Materials that ignite when exposed to air, Solids containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent.

## DEFINITIONS OF TERMS (Continued)

### NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS

**INSTABILITY HAZARD: 0** Materials that in themselves are normally stable, even under fire conditions. Materials that have an instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) below 0.01 W/mL. Materials that do not exhibit an exotherm at temperatures less than or equal to 500°C (932°F) when tested by differential scanning calorimetry. **1** Materials that in themselves are normally stable, but that can become unstable at elevated temperatures and pressures. Materials that have an instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 0.01 W/mL and below 10 W/mL. **2** Materials that readily undergo violent chemical change at elevated temperatures and pressures. Materials that have an instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 10 W/mL and below 100W/mL. **3** Materials that in themselves are capable of detonation or explosive decomposition or explosive reaction, but that require a strong initiating source or that must be heated under confinement before initiation. Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 100 W/mL and below 1000 W/mL. Materials that are sensitive to thermal or mechanical shock at elevated temperatures and pressures. **4** Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures. Materials that are sensitive to localized thermal or mechanical shock at normal temperatures and pressures. Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) of 1000 W/mL or greater.

### FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). Flash Point: Minimum temperature at which a liquid gives off sufficient vapor to form an ignitable mixture with air near the surface of the liquid or within the test vessel used. Autoignition Temperature: Minimum temperature of a solid, liquid, or gas required to initiate or cause self-sustained combustion in air with no other source of ignition. LEL: Lowest concentration of a flammable vapor or gas/air mixture that will ignite and burn with a flame. UEL: Highest concentration of a flammable vapor or gas/air mixture that will ignite and burn with a flame.

### TOXICOLOGICAL INFORMATION:

**Human and Animal Toxicology:** Possible health hazards, as derived from human data, animal studies, or from the results of studies with similar compounds are presented. $LD_{50}$: Lethal Dose (solids & liquids) that kills 50% of the exposed animals. $LC_{50}$: Lethal Concentration (gases) that kills 50% of the exposed animals. ppm: Concentration expressed in parts of material per million parts of air or water. $mg/m^3$: Concentration expressed in weight of substance per volume of air. mg/kg: Quantity of material, by weight, administered to a test subject, based on their body weight in kg. TDLo: Lowest dose to cause a symptom. TCLo: Lowest concentration to cause a symptom. TDo, LDLo, and LDo, or TC, TCo, LCLo, and LCo: Lowest dose (or concentration) to cause lethal or toxic effects.

### TOXICOLOGICAL INFORMATION (continued):

**Cancer Information:** IARC: International Agency for Research on Cancer. NTP: National Toxicology Program. RTECS: Registry of Toxic Effects of Chemical Substances. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. **Other Information:** BEI: ACGIH Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.

### REPRODUCTIVE INFORMATION:

A mutagen is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical that causes damage to a developing embryo (e.g., within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical that causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance that interferes in any way with the reproductive process.

### ECOLOGICAL INFORMATION:

EC: Effect concentration in water. BCF: Bioconcentration Factor, which is used to determine if a substance will concentrate in life forms that consume contaminated plant or animal matter. TLm: Median threshold limit. log $K_{OW}$ or log $K_{OC}$: Coefficient of Oil/Water Distribution is used to assess a substance's behavior in the environment.

### REGULATORY INFORMATION:

**U.S.:**

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

**CANADA:**

WHMIS: Canadian Workplace Hazardous Materials Information System. TC: Transport Canada. DSL/NDSL: Canadian Domestic/Non-Domestic Substances List.