

SAFETY DATA SHEET



Pecora Deck HB1100-SA Activator [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 Activator [Vehicular and Pedestrian Grades]
OTHER MEANS OF IDENTIFICATION	None
RECOMMENDED PRODUCT USE:	Activator
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 10, 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:

Reproductive Toxicity Category 2, Skin Irritation Category 2, Eye Corrosion/Irritation Category 2A, Skin Sensitization Category 1, Specific Target Organ Toxicity (Pancreas) Repeated Exposure Category 2, Aquatic Acute Toxicity Category 1, Aquatic Chronic Toxicity Category 1

2.1.2 Signal Word: Warning

2.1.3 Hazard Statements:

H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child. H317: May cause an allergic skin reaction. H319: Causes serious eye irritation. H373: May cause damage to pancreas through prolonged or repeated exposure. H400: Very toxic to aquatic life. H410: Very toxic to aquatic life with long-lasting effects.

2.1.4 Hazards Not Otherwise Classified (HNOC): The Proprietary Benzenediamine component is a suspect endocrine disruptor.

2.1.5 Physical Hazards Not Otherwise Classified (PHNOC): None known.

2.1.6 Precautionary Statements:

2.1.6.1 Prevention:

P203: Obtain, read and follow all safety instructions before use. 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. P273: Avoid release to the environment. P280: Wear protective gloves, clothing, eye protection and face protection.

2.6.1.2 Response:

P318: If exposed or concerned, get medical advice. 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. 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. P405: Store locked up.

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, GHS09



2.2 Percent of Unknown Acute Toxicity: This product is a mixture; the following are percentages of unknown acute toxicity, by route of exposure. Oral: 0% Dermal 0%, and Inhalation: > 55%.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Chemical Name	CAS #	W/W%	LABEL ELEMENTS GHS Classification under U.S. OSHA Hazard Communication Standard, Canadian WHMIS (HPR-GHS) 2015 Hazard Statement Codes
Bis(1,2,6,6-Pentamethyl-4-Piperidyl) Sebacate	41556-26-7	35-55	Notified Classification: Reproductive Toxicity Cat. 2, Skin Sensitization Cat. 1, Aquatic Acute Toxicity Cat. 1, Aquatic Chronic Toxicity Cat. 1 Hazard Statements: H361d: Suspected of damaging the unborn child. H317: May cause an allergic skin reaction. H400: Very toxic to aquatic life. H410: Very toxic to aquatic life with long-lasting effects.
Proprietary Benzenediamine		30-50	Harmonized Classification: Acute Oral Toxicity Cat. 4, Acute Dermal Toxicity Cat. 4, Eye Corrosion/Irritation Cat. 2A, Specific Target Organ Toxicity (Pancreas) Repeated Exposure Cat. 2, Aquatic Acute Toxicity Cat. 1, Aquatic Chronic Toxicity Cat. 1 Hazard Statements: H302 + H312: Harmful if swallowed or in contact with skin. H319: Causes serious eye irritation. H373: May cause damage to pancreas through prolonged or repeated exposure. H400: Very toxic to aquatic life. H410: Very toxic to aquatic life with long-lasting effects. Health Hazards Not Otherwise Classified (HNOC): Under Assessment as an Endocrine Disruptor
Methyl 1,2,6,6-Pentamethyl-4-Piperidyl Sebacate	82919-37-7	10-20	Notified Classification: Reproductive Toxicity Cat. 2, Skin Sensitization Cat. 1, Aquatic Acute Toxicity Cat. 1, Aquatic Chronic Toxicity Cat. 1 Hazard Statements: H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child. H317: May cause an allergic skin reaction. H400: Very toxic to aquatic life. H410: Very toxic to aquatic life with long-lasting effects.

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: 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: None required.

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: 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.

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

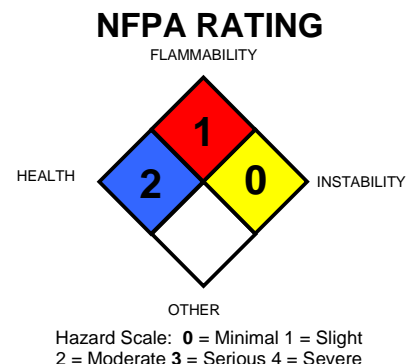
Symptoms/Effects After Inhalation: Possible irritation.

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:** P391: Collect spillage.
- 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.
- 6.5 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: P203: Obtain, read and follow all safety instructions before use. 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. P273: Avoid release to the environment. P280: Wear protective gloves, clothing, eye protection and face 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. P405: Store locked up.

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: Currently, there are no exposure guidelines for any component of this product.

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 1910.133; 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.

8.4.6 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: Liquid.

9.2 COLOR: Yellowish.

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): 1.02

9.10 VAPOR DENSITY: (air = 1): > 1

9.11 VAPOR PRESSURE: Not available.

9.12 pH: Not available.

9. PHYSICAL and CHEMICAL PROPERTIES (Continued)

- 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.
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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, alkaline earths, alkaline metals or water. May be incompatible with isocyanates, halogenated organics, peroxides, phenols (acidic), epoxides, anhydrides, and acid halides.
- 10.6 **HAZARDOUS DECOMPOSITION PRODUCTS:**
- 10.6.1 **Combustion:** Thermal decomposition of this product can generate carbon and nitrogen oxides, dense black smoke, isocyanates, isocyanic acid, hydrogen cyanide and other undetermined compounds.
- 10.6.2 **Hydrolysis:** May react.
- 10.6.3 **Other:** Due to the Proprietary Benzenediamine component, contact with some metals may generate extremely flammable hydrogen gas; hydrogen may also be generated when combined with strong reducing agents such as hydrides.
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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 several compounds that may 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:** Direct eye contact may cause more serious eye irritation. Aerosols may cause irritation, reddening and watering.
- 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.
- 11.1.4 **Inhalation:** Inhalation of aerosols 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.
- 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:** Due to the presence of the Proprietary Benzenediamine, prolonged exposure may cause adverse effects on the pancreas.
- 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. Prolonged exposure may cause adverse effects to the pancreas.
- 11.3 **TARGET ORGANS:**
- 11.3.1 **Short Term:** Skin, eyes, respiratory system.
- 11.3.2 **Long Term:** Skin, pancreas.
- 11.4 **OVERALL ACUTE TOXICITY ESTIMATES (ATE) FOR PRODUCT:**
- 11.4.1 **Oral ATE:** > 5000 mg/kg (0% unknown)
- 11.4.2 **Dermal ATE:** > 2500 mg/kg (0% unknown)
- 11.4.3 **Inhalation Vapor ATE:** > 54 mg/L (> 55% unknown)
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11. TOXICOLOGICAL INFORMATION (Continued)

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.

Proprietary Benzenediamine:

LD₅₀ (Oral-Rat) 783 mg/kg (OECD Guideline 401)
LD₅₀ (Dermal-Rat) 2000 mg/kg (OECD Guideline 402)
LC₅₀ (Inhalation-Rat) > 2.67 mg/L (No guideline available)

Reaction mass of bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate and methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate:

LD₅₀ (Oral-Rat) 3230 mg/kg (OECD Guideline 423)
LD₅₀ (Dermal-Rat) 3170 mg/kg (OECD Guideline 402)

11.6 REPEATED DOSE TOXICITY:

Proprietary Benzenediamine: The pancreas was identified as the target organ of toxicity in the repeated-dose studies that performed histopathological examinations. The changes in the pancreas generally consisted of multifocal acinar degeneration. These effects were identified as early as 14 days after commencement of treatment in a sub-acute study (Bolos 1989). Pancreatic toxicity was also observed in one of the sub-chronic and chronic studies, along with secondary signs of toxicity, including cataracts (Naismith 1987; Ciofalo 1992). Glucose deregulation was also identified in the chronic study (Ciofalo 1992).

11.7 CARCINOGENIC POTENTIAL: No component is known to cause carcinogenic effects or is listed by an agency tracking carcinogenic potential.

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: No specific data of components indicate significant skin irritation in humans or from animal testing.

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

Proprietary Benzenediamine: Two eye irritation studies reported positive findings. In one study, all of the effects were reversible. In the second study, corneal opacity was observed in one animal up to 21 days post treatment. This finding was, however, considered spurious because only one animal out of the fifteen used from both studies exhibited such a response. Therefore, these data support the GHS classification criteria for substances that may cause Reversible effects on the eye (Category 2).

11.9 SENSITIZATION TO THE PRODUCT: Multiple components have been classified as skin sensitizers as indicated below.

11.9.1 Skin Sensitization:

Bis(1,2,2,6,6-Pentamethyl-4-Piperidyl)Sebacate and Methyl 1,2,2,6,6-Pentamethyl-4-Piperidyl Sebacate: Positive results were reported in a maximization test (Ciba-Geigy, 1982), and in an additional optimization tests (Ciba-Geigy, 1982). In all studies, significant differences between control animals and test animals were reported. The test items are therefore considered to possess skin-sensitizing (contact allergenic) potency in albino guinea-pigs and requires classification.

11.9.2 Respiratory Sensitization: No data.

11.10 ENDOCRINE TOXICITY: The Proprietary Benzenediamine component is a suspect 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:

Reaction mass of bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate and methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate: In reproductive toxicity testing per OECD Guideline 443, a significant reduction in implantation sites in uteri was observed on gestational day 6 when compared with untreated controls. The blastocysts of stressed mothers showed reduced average cell numbers in the trophoectoderm and the inner cell mass lineages, which was indicated to contribute to the factors responsible for the decreased implantation rate. However, since it cannot be completely proven at this point that the reduced numbers number of implantation sites are solely triggered by maternal toxicity and maternal stress, the test article is classified for reproduction toxicity with category 2.

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. This product will not biodegrade in the environment and so poses a long-term environmental hazard.

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

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. The following aquatic toxicity data are available for components that present toxicity hazards to aquatic organisms.

Proprietary Benzenediamine:

LC₅₀ (fish) 96 hrs: 183 mg/L
EC₅₀ (*Daphnia magna* Giant water flea) 48 hours: 2.2 mg/L
EC₅₀ (Freshwater Green Algae) 72 hours: 104 mg/L

Reaction mass of bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate and methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate:

LC₅₀ (fish) 96 hrs: 0.97 mg/L
EC₅₀ (*Desmodesmus subspicatus* Green Algae) 72 hours: 168 mg/L
NOEC (*Desmodesmus subspicatus* Green Algae) 72 hours: 0.22 mg/L

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

12.6 ENDOCRINE DISRUPTORS: The Proprietary Benzenediamine 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: P273: Avoid release to the environment.

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): Per U.S. DOT regulations, under 49 CFR 172.101.

UN Identification Number: UN 3082
Proper Shipping Name: Environmentally hazardous substances, liquid, n.o.s. (bis(1,2,2,6,6-pentamethyl-4-piperdiyl)Sebacate; benzenediamine)
Hazard Class Number and Description: 9 (Miscellaneous Hazard)
Packing Group: PG III
DOT Label(s) Required: Class 9 (Miscellaneous Hazard)
North American Emergency Response Guidebook Number (2020): 171
Marine Pollutant: No component is listed as a Marine Pollutant (as defined by 49 CFR 172.101).

14.2 TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS (TDG): Per regulations of Transport Canada.

UN Identification Number: UN 3082
Proper Shipping Name: Environmentally hazardous substances, liquid, n.o.s. (bis(1,2,2,6,6-pentamethyl-4-piperdiyl)Sebacate; benzenediamine)
Hazard Class Number and Description: 9 (Miscellaneous Hazard)
Packing Group: PG III
Hazard Shipping Label(s) Required: Class 9 (Miscellaneous Hazard)
Special Provisions: 16, 99
Excepted Quantities: E1
Explosive Limit & Limited Quantity Index: 5 L
ERAP Index: None
Passenger Carrying Ship Index: None
Passenger Carrying Road Or Rail Vehicle Index: None
Marine Pollutant: The of this product meet the criteria of the Canadian TDG to be Marine Pollutants.

14.3 INTERNATIONAL AIR TRANSPORT ASSOCIATION SHIPPING INFORMATION (IATA): Per the International Air Transport Association.

UN Identification Number: UN 3082
Proper Shipping Name: Environmentally hazardous substances, liquid, n.o.s. (bis(1,2,2,6,6-pentamethyl-4-piperdiyl)Sebacate; benzenediamine)
Hazard Class or Division: 9 (Miscellaneous Hazard)
Hazard Label(s) Required: Class 9 (Miscellaneous Hazard)
Packing Group: III
Excepted Quantities: E1
Passenger and Cargo Aircraft Packing Instruction: 964
Passenger and Cargo Aircraft Maximum Net Quantity per Pkg.: 450 L
Passenger and Cargo Aircraft Limited Quantity Packing Instruction: Y964
Passenger and Cargo Aircraft Limited Quantity Maximum Net Quantity per Pkg.: 30 kg G
Cargo Aircraft Only Packing Instruction: 964
Cargo Aircraft Only Maximum Net Quantity per Pkg.: 450 L
Special Provisions: A97, A158, A197, A215
ERG Code: 9L

14. TRANSPORTATION INFORMATION (Continued)

14.4 INTERNATIONAL MARITIME ORGANIZATION SHIPPING INFORMATION (IMO): Per the International Maritime

Organization.

UN No.: 3082
Proper Shipping Name: Environmentally hazardous substances, liquid, n.o.s.
(bis(1,2,2,6,6-pentamethyl-4-piperdiyl)Sebacate;
benzenediamine)
Hazard Class Number: 9 (Miscellaneous Hazard)
Labels: Class 9 (Miscellaneous Hazard)
Packing Group: III
Special Provisions: 274, 335, 969
Limited Quantities: 5 L
Excepted Quantities: E1
Packing: Instructions: P001, LP01; Provisions: PP1
IBCs: Instructions: IBC03; Provisions: None
Tanks: Instructions: T4; Provisions: TP1, TP29
EmS: F-A, S-F
Stowage Category: Category A.
Segregation: None
Marine Pollutant: This product meets the criteria of the IMO to be a Marine Pollutant.

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: 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.

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 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.

15.1.7 California Safe Drinking Water And Toxic Enforcement Act (Proposition 65): No component is listed on the Proposition 65 lists.

15.2 CANADIAN REGULATIONS:

15.2.1 Canadian DSL/NDL Inventory Status: The components of this product 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*	0 = Minimal	3 = Serious
Flammability	1	1 = Slight	4 = Severe
Physical Hazard	0	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 10, 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.

16. OTHER INFORMATION (Continued)

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.

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

WEEL: Workplace Environmental Exposure Limits from the AIHA.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS:

This rating system was developed by the National Paint and Coating Association and has been adopted by industry to identify the degree of chemical hazards.

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

FLAMMABILITY HAZARD: 0 Minimal Hazard: Materials that will not burn in air when exposure to a temperature of 815.5°C (1500°F) for a period of 5 minutes. **1 Slight Hazard:** Materials that must be pre-heated before ignition can occur. Material requires considerable pre-heating, under all ambient temperature conditions before ignition and combustion can occur. This usually includes the following: Materials that will burn in air when exposed to a temperature of 815.5°C (1500°F) for a period of 5 minutes or less; Liquids, solids and semisolids having a flash point at or above 93.3°C (200°F) (e.g., OSHA Class IIIB); and Most ordinary combustible materials (e.g., wood, paper, etc.).

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

FLAMMABILITY HAZARD (continued): 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 coarse 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.

16. OTHER INFORMATION (Continued)

DEFINITIONS OF TERMS (Continued)

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

PHYSICAL HAZARD (continued): 3 Water Reactivity: Materials that may form explosive reactions with water. **Organic Peroxides:** Materials that are capable of detonation or explosive reaction but require a strong initiating source or must be heated under confinement before initiation; or materials that react explosively with water. **Explosives:** Division 1.3 explosives. Explosive substances that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but do not have a mass explosion hazard. **Compressed Gases:** Pressure ≥ 514.7 psi absolute at 21.1°C (70°F) [500 psig]. **Pyrophorics:** No Rating. **Oxidizers:** Packing Group I oxidizers. Solids: any material that, in either concentration tested, exhibits a mean burning time less than the mean burning time of a 3:2 potassium bromate/cellulose mixture. Liquids: any material that spontaneously ignites when mixed with cellulose in a 1:1 ratio, or which exhibits a mean pressure rise time less than the pressure rise time of a 1:1 perchloric acid (50%)/cellulose mixture. **Unstable Reactives:** Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure and have a moderate potential (or moderate risk) to cause significant heat generation or explosion. **4 Water Reactivity:** Materials that react explosively with water without requiring heat or confinement. **Organic Peroxides:** Materials that are readily capable of detonation or explosive decomposition at normal temperature and pressures. **Explosives:** Division 1.1 & 1.2 explosives. Explosive substances that have a mass explosion hazard or have a projection hazard. A mass explosion is one that affects almost the entire load instantaneously. **Compressed Gases:** No Rating. **Pyrophorics:** Add to the definition of Flammability 4. **Oxidizers:** No 4 rating. **Unstable Reactives:** Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure and have a high potential (or high risk) to cause significant heat generation or explosion.

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS:

HEALTH HAZARD: 0 Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials. Gases and vapors with an LC₅₀ for acute inhalation toxicity greater than 10,000 ppm. Dusts and mists with an LC₅₀ for acute inhalation toxicity greater than 200 mg/L. Materials with an LD₅₀ for acute dermal toxicity greater than 2000 mg/kg. Materials with an LD₅₀ for acute oral toxicity greater than 2000 mg/kg. Materials essentially non-irritating to the respiratory tract, eyes, and skin. **1** Materials that, under emergency conditions, can cause significant irritation. Gases and vapors with an LC₅₀ for acute inhalation toxicity greater than 5,000 ppm but less than or equal to 10,000 ppm. Dusts and mists with an LC₅₀ for acute inhalation toxicity greater than 10 mg/L but less than or equal to 200 mg/L. Materials with an LD₅₀ for acute dermal toxicity greater than 1000 mg/kg but less than or equal to 2000 mg/kg. Materials that slightly to moderately irritate the respiratory tract, eyes and skin. Materials with an LD₅₀ for acute oral toxicity greater than 500 mg/kg but less than or equal to 2000 mg/kg. **2** Materials that, under emergency conditions, can cause temporary incapacitation or residual injury. Gases with an LC₅₀ for acute inhalation toxicity greater than 3,000 ppm but less than or equal to 5,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC₅₀ for acute inhalation toxicity, if its LC₅₀ is less than or equal to 5000 ppm and that does not meet the criteria for either degree of hazard 3 or degree of hazard 4. Dusts and mists with an LC₅₀ for acute inhalation toxicity greater than 2 mg/L but less than or equal to 10 mg/L. Materials with an LD₅₀ for acute dermal toxicity greater than 200 mg/kg but less than or equal to 1000 mg/kg. Compressed liquefied gases with boiling points between -30°C (-22°F) and -55°C (-66.5°F) that cause severe tissue damage, depending on duration of exposure. Materials that are respiratory irritants. Materials that cause severe, but reversible irritation to the eyes or are lachrymators. Materials that are primary skin irritants or sensitizers. Materials whose LD₅₀ for acute oral toxicity is greater than 50 mg/kg but less than or equal to 500 mg/kg. **3** Materials that, under emergency conditions, can cause serious or permanent injury. Gases with an LC₅₀ for acute inhalation toxicity greater than 1,000 ppm but less than or equal to 3,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater its LC₅₀ for acute inhalation toxicity, if its LC₅₀ is less than or equal to 3000 ppm and that does not meet the criteria for degree of hazard 4. Dusts and mists with an LC₅₀ for acute inhalation toxicity greater than 0.5 mg/L but less than or equal to 2 mg/L. Materials with an LD₅₀ for acute dermal toxicity greater than 40 mg/kg but less than or equal to 200 mg/kg. Materials that are corrosive to the respiratory tract. Materials that are corrosive to the eyes or cause irreversible corneal opacity. Materials corrosive to the skin. Cryogenic gases that cause frostbite and irreversible tissue damage. Compressed liquefied gases with boiling points below -55°C (-66.5°F) that cause frostbite and irreversible tissue damage. Materials with an LD₅₀ for acute oral toxicity greater than 5 mg/kg but less than or equal to 50 mg/kg. **4** Materials that, under emergency conditions, can be lethal. Gases with an LC₅₀ for acute inhalation toxicity less than or equal to 1,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than ten times its LC₅₀ for acute inhalation toxicity, if its LC₅₀ is less than or equal to 1000 ppm. Dusts and mists whose LC₅₀ for acute inhalation toxicity is less than or equal to 0.5 mg/L. Materials whose LD₅₀ for acute dermal toxicity is less than or equal to 40 mg/kg. Materials whose LD₅₀ for acute oral toxicity is less than or equal to 5 mg/kg.

FLAMMABILITY HAZARD: 0 Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand. Materials that will not burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes, in 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) (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.

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

FLAMMABILITY HAZARD (continued): 2 (continued): 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.

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 100 W/mL. **3** Materials that in themselves are capable of detonation or explosive decomposition or explosive reaction, but that require a strong initiating source or that must be heated under confinement before initiation. Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 100 W/mL and below 1000 W/mL. Materials that are sensitive to thermal or mechanical shock at elevated temperatures and pressures. **4** Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures. Materials that are sensitive to localized thermal or mechanical shock at normal temperatures and pressures. Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) of 1000 W/mL or greater.

FLAMMABILITY LIMITS IN AIR:

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

TOXICOLOGICAL INFORMATION:

Human and Animal Toxicology: Possible health hazards, as derived from human data, animal studies, or from the results of studies with similar compounds are presented. **LD₅₀:** Lethal Dose (solids & liquids) that kills 50% of the exposed animals. **LC₅₀:** Lethal Concentration (gases) that kills 50% of the exposed animals. **ppm:** Concentration expressed in parts of material per million parts of air or water. **mg/m³:** Concentration expressed in weight of substance per volume of air. **mg/kg:** Quantity of material, by weight, administered to a test subject, based on their body weight in kg. **TDLo:** Lowest dose to cause a symptom. **ICLo:** Lowest concentration to cause a symptom. **IDO, LDLo, and LDo, or IC, TCo, LCLo, and LCo:** Lowest dose (or concentration) to cause lethal or toxic effects. **Cancer Information:** **IARC:** International Agency for Research on Cancer. **NTP:** National Toxicology Program. **RTECS:** Registry of Toxic Effects of Chemical Substances. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. **Other Information:** **BEI:** ACGIH Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.

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. **ISCA:** U.S. Toxic Substance Control Act. **CERCLA:** Comprehensive Environmental Response, Compensation, and Liability Act. Marine Pollutant status according to the DOT; CERCLA or Superfund; and various state regulations. This section also includes information on the precautionary warnings that appear on the material's package label.

CANADA:

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