FOREST TRIM FJ PRIMED

MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS, and European Union Standards

1. PRODUCT IDENTIFICATION

TRADE NAME (AS LABELED):	**ENGINEERED *CUNNINGHAMIA LANCEOLATA* PRIMED WOOD PRODUCTS**
CHEMICAL NAMES:	Wood products manufactured with a laminating glue and priming paint
PRODUCT USE:	Various Construction Uses
SYNONYMS:	
U.N. NUMBERS:	None
U.N. DANGEROUS GOODS CLASS/SUBSIDIARY RISK:	None
SUPPLIER/MANUFACTURER'S NAME (USA/Canada):	**GREENWOOD INTERNATIONAL INC**
Address:	3220 SW First Avenue, Suite 100 Portland, OR 97239
Emergency Phone:	
Business Phone:	1-503-222-3022 1-800-547-6814 (U.S./Canada Only)
SUPPLIER/IMPORTER'S NAME (Europe):	
Address:	
Emergency Phone:	
Business Phone:	
EMAIL:	safety@greenwood-intl.com
DATE OF PREPARATION:	March 18, 2008
DATE OF REVISION:	October 17, 2008

ALL United States Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalent Standards, Canadian WHMIS [Controlled Products Regulations], and European Union [Regulation (EC) 1907/2006 Annex II] required information is included in appropriate sections based on the U.S. ANSI Z400.1-2004 format. This product has been classified in accordance with the hazard criteria of the countries listed above.

NOTE: These products are "Articles" under the U.S. Federal OSHA Hazard Communication Standard (29 CFR 1910.1200), EU Directives, and the Canadian Workplace Hazardous Materials Standard. Refer to Section 15 (Regulatory Information) for specific regulatory citations. As articles, these products present negligible health and physical hazards under reasonably anticipated circumstances of use. Subsequently, a Material Safety Data Sheet is not required for these products under Standards cited above. This document is prepared to provide persons using these products with additional safety information.

2. HAZARD IDENTIFICATION

EU LABELING/CLASSIFICATION: As Articles, these products do not meet the definition of any hazard class as defined by the European Union Council Directives.

EMERGENCY OVERVIEW: Product Description: These products are solid, engineered *Cunninghamia Lanceolata* primed wood products manufactured with a laminating glue and priming paint. These products are comprised mostly of wood. The wood component is fir. The products have a finish on them that consists of two layers. The sealing layer is a mixture that contains wood powder and amino resin adhesive, alkene, high-polymer adhesive, and polyurethane adhesive. The top layer is constituted by a mixture that contains white wood powder and amino resin adhesive. The amino resin adhesive can be replaced by alkene, high-polymer adhesive or the polyurethane adhesive. **Health Hazards:** These products are considered manufactured articles and present negligible health hazards under typical use conditions. If these products are cut, sanded, or otherwise manipulated so that dusts or particles may be produced, inhalation can irritate the respiratory system. Dusts or particles may also irritate contaminated eyes. Handling these products without gloves may cause cuts and wood splinters. The wood used in these products may cause allergic skin respiratory reactions. **Flammability Hazards:** These products are formed from wood, laminating glue, and priming paint; they can ignite if exposed to flame. During a fire involving these products, care should be taken to avoid inhalation of fumes. **Reactivity Hazards:** Negligible. **Environmental Hazards:** Negligible. **Emergency Considerations:** Emergency responders must wear the proper personal protective equipment (and have appropriate fire-suppression equipment) suitable for the situation to which they are responding.

3. COMPOSITION and INFORMATION ON INGREDIENTS

These products are solid, engineered *Cunninghamia Lanceolata* primed wood products manufactured with a laminating glue and priming paint. These products are comprised mostly of wood. If these products are cut, sanded, or otherwise manipulated in a way that will generate dusts or particles, exposure to dust and particles of wood, glue, and paint is possible.

CHEMICAL NAME	CAS #	EINECS #	% w/w	EU CLASSIFICATION FOR COMPONENTS
Laminating Glue	Proprietary Mixture	Not Applicable	1–5	Hazard Classification: Not classified. Risk Phrases: Not classified.
Calcium Carbonate	471-34-1	207-439-9	Proprietary	Hazard Classification: Not classified. Risk Phrases: Not classified.
Ethylene	74-85-1	200-815-3	Proprietary	Hazard Classification: Extremely flammable. Risk Phrases: R 12; R 67 Symbol: F+

See Section 16 for full text of any applicable Ingredient Risk Phrases

3. COMPOSITION and INFORMATION ON INGREDIENTS (Continued)

CHEMICAL NAME	CAS #	EINECS #	% w/w	EU CLASSIFICATION FOR COMPONENTS
Laminating Glue (continued)	Proprietary Mixture	Not Applicable	1–5	Hazard Classification: Not classified. Risk Phrases: Not classified.
Polymethylene	25038-57-7	Unlisted	Proprietary	Hazard Classification: Not classified. Risk Phrases: Not classified.
Polyvinyl Alcohol	9002-89-5	Unlisted	Proprietary	Hazard Classification: Not classified. Risk Phrases: Not classified.
Vinyl Acetate Resin	25609-89-6	Unlisted	Proprietary	Hazard Classification: Not classified. Risk Phrases: Not classified.
Water	7732-18-5	231-791-2	Proprietary	Hazard Classification: Not classified. Risk Phrases: Not classified.
Priming Paint	Proprietary Mixture	Not Applicable	1–5	Hazard Classification: Not classified. Risk Phrases: Not classified.
Wood (*Cunninghamia Lanceolata*)	Not Applicable	Not Applicable	90–100	Hazard Classification: Not classified. Risk Phrases: Not classified.

See Section 16 for full text of any applicable Ingredient Risk Phrases

4. FIRST-AID MEASURES

If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Take a copy of label and MSDS to physician or health professional with the contaminated individual.

SKIN EXPOSURE: If adverse skin effects occur, discontinue use and flush contaminated area. Seek medical attention if adverse effect occurs after flushing.

EYE EXPOSURE: If dusts or particles from these products contaminate the eyes, rinse eyes under gently running water. Do not allow contaminated individual to rub eyes. Use sufficient force to open eyelids and then "roll" eyes while flushing. Minimum flushing is for 15 minutes. Seek medical attention.

INHALATION: If dusts or particulates from these products are inhaled remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Seek medical attention.

INGESTION: If dusts or particulates from these products are swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, DO NOT INDUCE VOMITING. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow. If victim is convulsing, maintain an open airway and obtain immediate medical attention.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing respiratory or skin conditions may be aggravated by exposure to dusts or particulates from these products.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate exposure.

5. FIRE-FIGHTING MEASURES

FLASH POINT: Not determined.

AUTOIGNITION TEMPERATURE: 400-500°F (204-260°C) for wood

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): Not applicable. Upper (UEL): Not applicable.

FIRE EXTINGUISHING MATERIALS: The following extinguishing materials are recommended for fires involving these products.

Water Spray: OK
Carbon Dioxide: OK
Foam: OK
Dry Chemical: OK
Halon: OK
Other: Any "ABC" Class

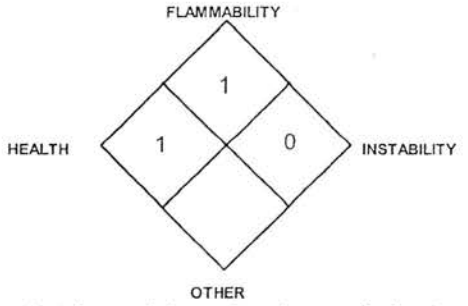
FIRE EXTINGUISHING MATERIALS NOT TO BE USED: None known.

UNUSUAL FIRE AND EXPLOSION HAZARDS: If involved in a fire, these products will ignite and burn, producing smoke and toxic compounds.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: These products are not sensitive to static discharge, however if highly dusty conditions are created while the product is sanded or otherwise manipulated, a severe hazard of an air/dust explosion may occur. Depending on moisture content and, more importantly, particle diameter, wood dust may explode in the presence of an ignition source. An airborne concentration of 40 grams (40,000 mg) of dust per cubic meter of air is often used as the LEL for wood dust.

NFPA RATING



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

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus (SCBA) and full protective equipment. Move containers from fire area if it can be done without risk to personnel. Water spray can be used to cool fire-exposed containers. Water fog or spray can also be used by trained firefighters to disperse these products' vapors and to protect personnel. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Due to the form of these products, there is no hazard of a release. Waste can be disposed of as non-hazardous waste materials. Dispose of in accordance with appropriate U.S. Federal, State and local regulations, regulations of the EU and its member states, or regulations of Canada and its Provinces.

7. HANDLING and USE

SAFE WORK AND HYGIENE PRACTICES: Do not eat, drink, smoke, or apply cosmetics while handling these products. Wash hands thoroughly after handling these products or containers of these products. Avoid breathing dusts generated by these products if cut, sanded, or otherwise manipulated. Use in a well-ventilated location. Follow SPECIFIC USE INSTRUCTIONS supplied with these products.

STORAGE AND HANDLING PRACTICES: Employees must be trained to properly use these products. Keep away from heat, sparks, and other sources of ignition. Do not cut or sand doors in unventilated areas. Store in a cool, dry, ventilated area away from sources of heat or flame and away from material with which it is incompatible (see Section 10, Stability and Reactivity). Storage areas should be made of fire resistant materials. Post warning and "NO SMOKING" signs in storage and use areas as appropriate. Have appropriate extinguishing equipment in the storage area (i.e., sprinkler system, portable fire extinguishers).

SPECIFIC USES: These products are used in construction.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION, ENGINEERING, AND OCCUPATIONAL EXPSOURE CONTROLS: Normal room ventilation should be sufficient during normal use and handling.

EXPOSURE LIMITS/GUIDELINES: These products are solid, engineered *Cunninghamia Lanceolata* primed wood products manufactured with a laminating glue and priming paint. As manufactured, exposure to individual components is not expected. If these products are cut, sanded, or otherwise manipulated in a way that dusts will be produced, the following exposure limits may be applicable.

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR							
		ACGIH-TLVs		OSHA-PELs		NIOSH-RELs		NIOSH	OTHER
		TWA mg/m³	STEL mg/m³	TWA mg/m³	STEL mg/m³	TWA mg/m³	STEL mg/m³	IDLH mg/m³	mg/m³
Laminating Glue	Proprietary Mixture	NE	NE	NE	NE	NE	NE	NE	NE
Calcium Carbonate	471-34-1	NE	NE	15 (total dust); 5 (resp. fraction)	NE	10 (total dust); 5 (resp. fraction)	NE	NE	NE
Ethylene	74-85-1	230	NE	NE	NE	NE	NE	NE	Carcinogen: IARC-3, MAK-3B, TLV-A4
Polymethylene	25038-57-7	NE	NE	NE	NE	NE	NE	NE	NE
Polyvinyl Alcohol	9002-89-5	NE	NE	NE	NE	NE	NE	NE	Carcinogen: IARC-3
Vinyl Acetate Resin	25609-89-6	NE	NE	NE	NE	NE	NE	NE	NE
Water	7732-18-5	NE	NE	NE	NE	NE	NE	NE	NE
Priming Paint	Proprietary Mixture	NE	NE	NE	NE	NE	NE	NE	NE
Wood Dusts, Softwood	Not Applicable	NE	NE	5 (vacated 1989 PEL)	10 (vacated 1989 PEL)	1	NE	NE	Carcinogen: MAK-3B, NIOSH-Ca, NTP-K

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

INTERNATIONAL OCCUPATIONAL EXPOSURE LIMITS: Currently, the following international exposure limits are established for wood dusts and other components. The limits presented may not be the most current; please check with competent authority in each country for most recent limits in place for components.

CALCIUM CARBONATE:
The Netherlands: MAC-TGG = 10 mg/m³, 2003

WOOD DUSTS:
Austria: TRK = 2 mg/m³ (inhalable), JAN 2006
Denmark: TWA = 2 mg/m³ (total), OCT 2002
EC: TWA = 5 mg/m³ (inhalable), APR 2004
Sweden: TWA = 2 mg/m³, Carcinogen, JAN1999
Switzerland: MAK-W = 2 mg/m³ (hard wood), JAN1993

WOOD DUSTS (continued):
Switzerland: MAK-W = 5 mg/m³ (soft wood), JAN1993
Turkey: TWA 10 mg/m³ (soft wood), JAN1993
United Kingdom: TWA = 5 mg/m³ (sen), 2005
In Argentina, Bulgaria, Colombia, Jordan, Korea, New Zealand, Singapore, Vietnam check ACGIH TLV

WOOD DUSTS, SOFTWOOD:
Mexico: TWA = 5 mg/m³; STEL = 10 mg/m³, 2004
United Kingdom: TWA = 5 mg/m³ (sen), 2005

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132), equivalent standards of Canada (including CSA Standard Z94.4-02 and CSA Standard Z94.3-07), or standards of EU member states (including EN 529:2005 for respiratory PPE, CEN/TR 15419:2006 for hand protection, and CR 13464:1999 for face/eye protection). Please reference applicable regulations and standards for relevant details.

RESPIRATORY PROTECTION: A respirator is not required for routine conditions of use of these products. In conditions of use where dusts are produced, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-02, or the European Standard EN 529:2005 and EU member state standards. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998). The following are NIOSH respiratory protection equipment guidelines for Wood Dusts.

WOOD DUSTS

Concentration	Respiratory Protection
At Concentrations Above the NIOSH REL, or Where There Is No REL, At Any Detectable Concentration:	Any Self-Contained Breathing Apparatus (SCBA) that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any Supplied-Air Respirator (SAR) that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in pressure-demand or other positive-pressure mode.
Escape:	Any Air-Purifying, Full-Facepiece Respirator with a high-efficiency particulate filter, or any appropriate escape-type, SCBA.

EYE PROTECTION: Not normally needed during normal use. In conditions where dusts or other particulates may be produced, wear protective eyewear. If necessary, refer to U.S. OSHA 29 CFR 1910.133, Canadian CSA Standard Z94.3-07, or the European Standard CR 13464:1999.

HAND PROTECTION: Wear leather or other type glove that can protect against abrasion and splinters when handling these products. If necessary, refer to U.S. OSHA 29 CFR 1910.138, appropriate Standards of Canada, or the European Standard CEN/TR 15419:2006.

BODY/SKIN PROTECTION: Not normally needed during normal use. If a hazard of flying particles or wood chips is possible, a construction-type apron or other type of clothing may be prudent. If necessary, refer to appropriate Standards of Canada, the European Standard CEN/TR 15419:2006. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136 and the Canadian CSA Standard Z195-02, *Protective Footwear*.

9. PHYSICAL and CHEMICAL PROPERTIES

BOILING POINT: Not applicable.
FREEZING/MELTING POINT: Not applicable.
EVAPORATION RATE (water = 1): Not applicable.
SOLUBILITY IN WATER: Not applicable.
VAPOR PRESSURE (air = 1): Not applicable.
DENSITY: Not applicable.
ODOR THRESHOLD: Not applicable.
pH: Not applicable.
COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

APPEARANCE, ODOR, AND COLOR: These products are solid, engineered *Cunninghamia Lanceolata* primed wood products manufactured with a laminating glue and priming paint and a two-layered finish that contains wood powders, amino resin adhesive, alkene, high-polymer adhesive, and/or a polyurethane adhesive.

HOW TO DETECT THIS SUBSTANCE (warning properties in event of accidental release): These products do not present a hazard of release.

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: Depending on moisture content, availability of oxygen, and temperature, thermal decomposition products include carbon oxides, water, ash, and soot.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Because these products are combustible, they are not compatible with strong oxidizing agents.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Avoid exposure to or contact with sparks, flames, other sources of ignition, extreme temperatures, and incompatible chemicals.

11. TOXICOLOGICAL INFORMATION

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: As manufactured, these products pose minimal health hazard. If cut, sanded, or otherwise manipulated, inhalation and eye contact with dusts may be irritating.

INHALATION: Wood dusts may irritate the nose, throat, and respiratory system. Symptoms can include nasal dryness, coughing, sneezing, sinusitis, headaches, and prolonged colds. Inhalation of large amounts of dusts can cause chest pains and chemical pneumonitis.

11. TOXICOLOGICAL INFORMATION (Continued)

INHALATION (continued): Dusts from some species of wood can cause respiratory sensitization and allergic reaction in susceptible individuals. Symptoms can include sneezing, coughing, wheezing and respiratory distress. Once sensitized, exposure to very small amounts of dust can cause allergic reaction.

CONTACT WITH SKIN or EYES: Dusts of this product can mildly irritate contaminated skin. Splinters from the wood can puncture skin tissue. Splinters that remain in the skin or eyes can cause infection. These products may cause sensitization and allergic skin reaction in sensitive individuals. Symptoms can include redness, itching, and welts. Dusts particles and wood splinters can irritate or damage eye tissue.

SKIN ABSORPTION: These products do not present any hazard of skin absorption.

INGESTION: Ingestion is not a likely route of exposure to these products. Though this is not an anticipated route of occupational exposure, ingestion of large volumes of dusts or wood fibers can be highly toxic by ingestion. Such exposure may cause nausea, vomiting, severe abdominal distress/pain, and diarrhea. Blood may appear in vomit or stools.

INJECTION: Injection is not a likely route of exposure to these products.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Lay Terms**. Overexposure to these products may cause the following health effects:

Acute: Inhalation of wood dusts can be irritating. Eye contact with wood dusts or particles can irritate or damage the eyes. Ingestion of dusts or wood fiber can be harmful or fatal.

Chronic: Chronic inhalation exposure may permanently damage the lungs.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

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

PROTECTIVE EQUIPMENT

EYES	RESPIRATORY	HANDS	BODY
	SEE SECTION 8		SEE SECTION 8

For Routine Industrial Use and Handling Applications

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

TARGET ORGANS: Acute: Skin (mechanical injury). Respiratory system, eyes (dust exposure). Chronic: Respiratory system, skin.

TOXICITY DATA: As an article, these products do not present a health hazard by inhalation, ingestion, or skin contact. The following animal toxicological data are available for wood dusts, calcium carbonate, and polyvinyl alcohol.

CALCIUM CARBONATE:

Standard Draize Test (skin, rabbit) = 500 mg/24 hours; Moderate

Standard Draize Test (eye, rabbit) = 750 ug/24 hours; Severe

LD_{50} (oral, rat) = 6450 mg/kg

POLYVINYL ALCOHOL:

TDLo (oral, rat) = 22500 mg/kg/45 days/intermittent; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: phosphatases

POLYVINYL ALCOHOL (continued):

TCLo (inhalation, rat) = 45 mg/m^3/2 hours/15 days/intermittent; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Blood: changes in erythrocyte (RBC) count; Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (subcutaneous, rat) = 2500 mg/kg; Tumorigenic

TDLo (implant, rat) = 10 g/kg; Tumorigenic: equivocal tumorigenic agent; Immunological Including Allergic: increase in cellular immune response

POLYVINYL ALCOHOL (continued):

TD (implant, rat) = 3768 mg/kg; Tumorigenic: equivocal tumorigenic agent; Tumorigenic: tumors at site of application

LD_{50} (oral, rat) > 20 g/kg

LD_{50} (oral, mouse) = 14700 mg/kg

WOOD DUSTS:

TDLo (Intratracheal-Rat) 7000 mg/kg/4 weeks-intermittent: Lungs, Thorax, or Respiration: other changes

TCLo (Inhalation-Rat) 1683.5 mg/kg/13 weeks-intermittent: Lungs, Thorax, or Respiration: consolidation, (interstitial)

IRRITANCY OF PRODUCT: Dusts generated by cutting or sanding of these products may irritate the respiratory system and eyes.

SENSITIZATION OF PRODUCT: Exposure to wood dusts may cause respiratory and skin sensitization.

SUSPECTED CANCER AGENT: The components of these products are listed by agencies tracking the carcinogenic potential of chemical compounds as follows:

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

POLYVINYL ALCOHOL: IARC-3 (Unclassifiable as to Carcinogenicity in Humans)

WOOD DUSTS, SOFTWOOD: MAK-3B (Unclassifiable as to Carcinogenicity in Humans); NIOSH-Ca (Potential Occupational Carcinogen, with No Further Categorization); NTP-K (Known to Be a Human Carcinogen)

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

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects these products and their components on human and animal reproductive systems.

Mutagenicity: Due to the form of these products, they are not anticipated to produce mutagenic effects in humans.

Embryotoxicity: Due to the form of these products, they are not anticipated to produce embryotoxic effects in humans.

Teratogenicity: Due to the form of these products, they are not anticipated to cause teratogenic effects in humans.

Reproductive Toxicity: Due to the form of these products, they are not anticipated to cause reproductive effects in humans.

11. TOXICOLOGICAL INFORMATION (Continued)

REPRODUCTIVE TOXICITY INFORMATION (continued):

A mutagen is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryo toxin is a chemical that causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across 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.

ACGIH BIOLOGICAL EXPOSURE INDICES (BEIs): ACGIH Biological Exposure Indices (BEIs) are not applicable to these products.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

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

PERSISTENCE AND BIODEGRADABILITY: As wood products, these products will decompose in the environment, although at a slower rate than natural wood due to laminating glue and priming paint.

BIO-ACCUMULATION POTENTIAL: This product has not been tested for bio-accumulation potential. No information is available for components.

ECOTOXICITY: These products are not anticipated to cause harm to plants and animals.

OTHER ADVERSE EFFECTS: These products do not contain any component with known ozone depletion potential.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: These products may be disposed of as non-hazardous waste. Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Check with the competent authority in your area for specific guidance on disposal.

U.S. EPA WASTE NUMBER: Not applicable.

EUROPEAN EWC WASTE CODES: 03 01 05: Wastes from Wood Processing and the Production of Panels and Furniture, Pulp, Paper and Cardboard: sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04.

14. TRANSPORTATION INFORMATION

U.S. DEPARTMENT OF TRANSPORATION 49 CFR 172.101: These products are NOT classified as Dangerous Goods, per regulations of the DOT.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: These products are NOT classified as Dangerous Goods, per regulations of Transport Canada.

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA): These products are NOT as dangerous goods under rules of IATA.

INTERNATIONAL MARITIME ORGANIZATION (IMO) DESIGNATION: These products are NOT classified as Dangerous Goods by the International Maritime Organization.

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR): These products are NOT classified by the United Nations Economic Commission for Europe to be dangerous goods.

15. REGULATORY INFORMATION

UNITED STATES REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: As formed articles, these products are not subject to SARA reporting requirements.

U.S. SARA HAZARD CATEGORIES (SECTION 311/312, 40 CFR 370-21): ACUTE: No; CHRONIC: No; FIRE: Yes; REACTIVE: No; SUDDEN RELEASE: No

U.S. SARA THRESHOLD PLANNING QUANTITY: Not applicable.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

U.S. TSCA INVENTORY STATUS: These products are articles and are not subject to the requirements of TSCA.

OTHER U.S. FEDERAL REGULATIONS: This product meets the definition of an "Article" under the U.S. Federal OSHA Hazard Communication Standard (29 CFR 1910.1200). For further information, the definition of "Article" is provided below.

Article means a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, *e.g.*, minute or trace amounts of a hazardous chemical, and does not pose a physical hazard or health risk to employees.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this product is on the CA Proposition 65 Lists.

ANSI LABELING (Z129.1): These are manufactured articles; no label information is required under OSHA 29 CFR 1910.1200 or ANSI Z400.1 to address the chemical hazards.

15. REGULATORY INFORMATION (Continued)

CANADIAN REGULATIONS:

CANADIAN DSL INVENTORY: These are manufactured items and are not subject to the DSL requirements under CEPA.

OTHER CANADIAN REGULATIONS: These products meet the definition of an article under WHMIS Regulations [Hazardous Products Act, 6 & 7, Part II (Sections 11 and 12)].

CANADIAN ENVIRONMENTAL PROTECTION AGENCY (CEPA) PRIORITIES SUBSTANCES LISTS: Not applicable.

CANADIAN WHMIS CLASSIFICATION and SYMBOLS: Not applicable.

EUROPEAN UNION REGULATIONS:

LABELING/CLASSIFICATION: As Articles, these products do not meet the definition of any hazard class as defined by the European Union Council Directive 67/548/EEC and subsequent directives.

Classification: Not applicable. Risk Phrases: Not applicable.

Safety Phrases: Not applicable. Annex II Hazard Symbol: Not applicable.

16. OTHER INFORMATION

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc.
PO Box 3519, La Mesa, CA 91944-3519
(800) 441-3365 • (619) 670-0609

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DEFINITIONS OF TERMS

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

CAS #: This is the Chemical Abstract Service Number that uniquely identifies each constituent.

EXPOSURE LIMITS IN AIR:

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

DFG MAKs: Federal Republic of Germany Maximum Concentration Values in the workplace. Exposure limits are given as TWA (Time-Weighted Average) or PEAK (short-term exposure) values.

DFG MAK Germ Cell Mutagen Categories: 1: Germ cell mutagens that have been shown to increase the mutant frequency in the progeny of exposed humans. **2:** Germ cell mutagens that have been shown to increase the mutant frequency in the progeny of exposed mammals. **3A:** Substances that have been shown to induce genetic damage in germ cells of human of animals, or which produce mutagenic effects in somatic cells of mammals *in vivo* and have been shown to reach the germ cells in an active form. **3B:** Substances that are suspected of being germ cell mutagens because of their genotoxic effects in mammalian somatic cell *in vivo*; in exceptional cases, substances for which there are no *in vivo* data, but that are clearly mutagenic in vitro and structurally related to known in vivo mutagens. **4:** Not applicable (Category 4 carcinogenic substances are those with non-genotoxic mechanisms of action. By definition, germ cell mutagens are genotoxic. Therefore, a Category 4 for germ cell mutagens cannot apply. At some time in the future, it is conceivable that a Category 4 could be established for genotoxic substances with primary targets other than DNA [e.g. purely aneugenic substances] if research results make this seem sensible.) **5:** Germ cell mutagens, the potency of which is considered to be so low that, provided the MAK value is observed, their contribution to genetic risk for humans is expected not to be significant.

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

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

LOQ: Limit of Quantitation.

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

NIC: Notice of Intended Change.

EXPOSURE LIMITS IN AIR (continued):

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 a 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 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.

DEFINITIONS OF TERMS (Continued)

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

HEALTH HAZARD (continued): **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. **4** Severe Hazard: Life-threatening; major or permanent damage may result from single or repeated exposures; 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℃ (1500℉) 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℃ (1500℉) for a period of 5 minutes or less; Liquids, solids and semisolids having a flash point at or above 93.3℃ (200℉) (i. e. 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℃ (100℉); 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℃ (73℉) and having a boiling point at or abov e 38℃ (100℉) and those liquids having a flash point at or above 22.8℃ (73 ℉) and below 37.8℃ (100℉) (i.e. OSHA Class IB and IC); Materials that on account of their physical form or environmental conditions can form explosive mixtures with air and are readily dispersed in air (e.g., 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℃ (73℉) and a boiling point below 37.8℃ (100℉) (i.e. OSHA Class IA); and Materials that ignite spontaneously when exposed to air at a temperature of 54.4℃ (130 ℉) 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.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

PHYSICAL HAZARD (continued): **2 (continued)** 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℃ (70℉) [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℃ (70℉) [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 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℃ (68℉) 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℃ (-22℉) and -55℃ (-66.5℉) 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℃ (68℉) 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.

DEFINITIONS OF TERMS (Continued)

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

HEALTH HAZARD (continued): **3 (continued)** 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 (-6 6.5°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 acco rding 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) (i.e. 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) (i.e. 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 boilin g 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) (i.e. 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) (i.e. 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 (48 2°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.

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

INSTABILITY HAZARD: **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/m L 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. **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.

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: This section explains the impact of various laws and regulations on the material.

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.

EUROPE:

EU: European Union (formerly known as the EEC, European Economic Community). EINECS: European Inventory of Now-Existing Chemical Substances. ARD: European Agreement Concerning the International Carriage of Dangerous Goods by Road. RID: International Regulations Concerning the Carriage of Dangerous Goods by Rail.