

# MATERIAL SAFETY DATA SHEET



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Product Name: SierraPine® Medite® FR2 MDF

Date Prepared: 09/01/05

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## 1. Composite Panel Product and Company Identification

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Product Identifier: Fire Retardant Medium Density Fiberboard (MDF) Panels  
General use: Re-manufacturing, construction and furniture processes.  
Product Description: A panel product manufactured from ligno-cellulosic materials bonded together with a synthetic resin or other suitable binder, and which may contain additives.

MANUFACTURER:  
SierraPine  
2685 North Pacific Highway  
Medford, OR 97501

EMERGENCY TELEPHONE NUMBERS:  
(541) 773-2522

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## 2. COMPOSITION/INFORMATION ON INGREDIENTS

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	<u>Wt %</u>	<u>CAS Registry #</u>
Ligno-cellulosic Materials	Proprietary	N/A
Polymerized Urea Formaldehyde Resin	Proprietary	9011-05-6
Additives	Proprietary	

OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200):

	<u>EXPOSURE LIMITS</u>
Formaldehyde CAS Registry # 50-00-0	OSHA PEL – TWA: 0.75 PPM OSHA PEL – STEL: 2 PPM ACGIH TLV – Ceiling: 0.30 PPM
Wood Dust/Ligno-cellulosic fiber <sup>1, 2</sup>	OSHA PEL – TWA 15.0 mg/m <sup>3</sup> (total dust) <sup>3</sup> 5.0 mg/m <sup>3</sup> (respirable fraction)
Wood Dust/Ligno-cellulosic fiber, Inhalable Fraction <sup>3</sup>	ACGIH TLV – TWA: 1.0 mg/m <sup>3</sup>

Additive 1	OSHA PEL – TWA 15.0 mg/m <sup>3</sup> (total dust) <sup>3</sup> 5.0 mg/m <sup>3</sup> (respirable fraction)
Additive 2	OSHA PEL – TWA: 10.0 mg/m <sup>3</sup> OSHA PEL – 5.0 mg/m <sup>3</sup> ACGIH TLV – Ceiling: 1.0 mg/ m <sup>3</sup>

1. In AFL-CIO v. OSHA 965 F. 2d 962 (11<sup>th</sup> Cir. 1992), the court overturned OSHA's 1989 Air Contaminants Rule, including the specific PELs for wood dust that OSHA had established at that time. The 1989 PELs were: TWA – 5.0 mg/m<sup>3</sup>; STEL (15 min.) – 10.0 mg/m<sup>3</sup>. These were total dust test based limits.<sup>3</sup> A common practice since 1989 has been to meet and exceed the lower 1989 limits which were supported by the wood products industry.

2. Wood dust is now officially regulated as an organic dust under the Particulates Not Otherwise Regulated (PNOR) or Inert or Nuisance Dust categories at PELs noted in the Composition/Information on Ingredients section of this MSDS. However, a number of states have incorporated provisions of the 1989 standard in their state plans. Additionally, OSHA has announced that it may cite companies under the OSH Act General Duty Clause under appropriate circumstances for non-compliance with the 1989 PELs.

3. Considerable debate continues to surround the inhalable-to-total dust conversion factor. ACGIH has proposed to use a ratio of 2.5 “for interpreting studies with exposure measurements based on total dust sampling” for purposes of defining a TLV for inhalable dust. However, a recent NIOSH paper states “In the case of exposures to wood dust, several studies with side-by-side sampling have revealed that inhalable sampling will increase the apparent dustiness of an atmosphere by between 150 and 400%, with an average closer to the higher end of this range.” [citing Harper (2002), Martin (1998), Tatum (2001), among others].

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### 3. HAZARDS IDENTIFICATION

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#### EMERGENCY OVERVIEW:

The product may release small quantities of formaldehyde in gaseous form. Emissions decrease through time as the panels age. Manual or mechanical cutting or abrasion processes performed on the product can result in generation of ligno-cellulosic fibers.

#### POTENTIAL HEALTH EFFECTS:

##### ACUTE

##### INHALATION:

Gaseous formaldehyde may cause temporary irritation to nose and throat. Some reports suggest that formaldehyde may cause respiratory sensitization, such as asthma, and that pre-existing respiratory disorders may be aggravated by exposure. Ligno-cellulosic fibers may cause nasal dryness, irritation and obstruction. Coughing, wheezing, sneezing, sinusitis and prolonged colds have also been reported.

**EYE CONTACT:**

Gaseous formaldehyde may cause temporary irritation or a burning sensation. Ligno-cellulosic fibers can cause mechanical irritation.

**SKIN CONTACT:**

Both formaldehyde solutions (liquid) and various species of ligno-cellulosic fibers may evoke allergic contact dermatitis in sensitized individuals.

**INGESTION:**

Not likely to occur.

**CHRONIC**

Some reports suggest that formaldehyde may cause respiratory sensitization, such as asthma, and that pre-existing respiratory disorders may be aggravated by exposure. Other studies show no impact on respiratory sensitization. International Agency for Research on Cancer (IARC) classifies formaldehyde as a carcinogen to humans (Group 1). This classification is based primarily on IARC's evaluation of increased risk in the occurrence of cancers in the nasopharyngeal cavity (NPC) associated with occupational exposure to formaldehyde. The National Toxicology Program (NTP) includes formaldehyde in its Annual Report on carcinogens. OSHA regulates formaldehyde as a potential cancer agent.

In studies involving rats, formaldehyde has been shown to cause nasal cancer after long-term exposure to very high concentrations (14+ PPM), far above those normally found in the workplace.

Ligno-cellulosic fibers, depending on species, may cause respiratory sensitization and/or irritation. IARC classifies wood dust as a carcinogen to humans (Group 1). This classification is based primarily on IARC's evaluation of increased risk in the occurrence of adenocarcinomas of the nasal cavities and paranasal sinuses associated with exposure to wood dust. IARC did not find sufficient evidence to associate cancers of the oropharynx, hypopharynx, lung, lymphatic and hematopoietic systems, stomach, colon or rectum with exposure to wood dust. The National Toxicology Program (NTP) includes wood dust in its Annual Report on carcinogens.

**HMIS Ratings:** Health: 1      Fire: 0      Physical Hazard: 0  
Hazard Scale:    0 = *Minimal*    1 = *Slight*    2 = *Moderate*    3 = *Serious*    4 = *Severe*

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**4. FIRST AID MEASURES**

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**INHALATION:**

Ligno-cellulosic fibers may cause unpleasant obstruction in the nasal passages, resulting in dryness of nose, dry cough, sneezing and headaches. Remove to fresh air. Get medical attention if irritation persists, severe coughing or breathing difficulty occurs.

**EYE CONTACT:**

Ligno-cellulosic fibers may cause mechanical irritation. Treat dust in eye as foreign object. Flush eyes with large amounts of water. Remove to fresh air. If irritation persists, get medical attention.

**SKIN CONTACT:**

Wash affected areas with soap and water. Get medical attention if rash or irritation persists or dermatitis occurs.

**INGESTION:**

Not Applicable.

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## **5. FIRE FIGHTING MEASURES**

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**FIRE FIGHTING HAZARD:**

Wood is classified as a Class A combustible material.

**FLASHPOINT AND METHOD:**

Not Applicable.

**FLAMMABLE LIMITS:**

LFL: Ligno-cellulosic fibers: 40 grams per cubic meter of air

**AUTOIGNITION TEMPERATURE:**

- 1) 275 C (527 F): Source: Textbook of Wood Technology 4<sup>th</sup> Edition, A.J. Panshin & Carl de Zeeuw, 1980, McGraw-Hill Book Company New York, NY.  
200 C (392 F): Source: Principles of Fire Protection, Arthur E. Cote and Percy
- 2) Bugbee, 1988, National Fire Protection Association, Quincy, MA.
- 3) It is difficult to identify the specific ignition temperature of wood because of the large number of variables involved. Source: Essentials of Fire Fighting 4<sup>th</sup> Fourth Edition, 1998, Edited by Richard Hall and Barbara Adams, Fire Protection Publications, Oklahoma State University, Stillwater, OK.
- 4) Ignition of wood takes place when wood is subject to sufficient heat and in atmospheres that have sufficient oxygen. Ignition can be of two types: piloted or unpiloted. Piloted ignition occurs in the presence of an ignition source (such as a spark or flame). Unpiloted ignition is ignition that occurs where no pilot source is

available. The surface temperature of wood materials has been measured somewhere between 300 C and 400 C (572 F to 752 F) prior to piloted ignition. Unpiloted ignition depends on special circumstances that result in different ranges of ignition temperatures. At this time, it is not possible to give specific ignition data that apply to a broad range of cases. With convection heating of wood, unpiloted ignition has been reported as low as 270 C (518 F) and as high as 470 C (878 F). Source: Wood Handbook Wood as an Engineering Material, 1999, Forest Products Laboratory, U.S. Department of Agriculture, Madison, WI.

#### FIRE FIGHTING INSTRUCTIONS:

Fire fighting procedures for extinguishing a Class A fire should be followed.

Source: Essentials of Fire Fighting 4<sup>th</sup> Fourth Edition, 1998, Edited by Richard Hall and Barbara Adams, Fire Protection Publications, Oklahoma State University, Stillwater, OK.

- 1) When extinguishing a fire in a ligno-cellulosic fibers or fiber pile care needs to be taken. A direct stream of water, into the pile from a hose, could cause the burning material to become airborne creating a risk in spreading the fire to other areas. Source: Handbook of Industrial Loss Prevention, 1967, Factory Mutual Engineering Corporation, McGraw-Hill Book Company New York, NY.
- 2) Water is used to quench the burning material below its ignition temperature. The addition of Class A foams (sometimes referred to as wet water) may enhance water's ability to extinguish Class A fires, particularly those that are deep seated in bulk materials (such as piles of hay bales, sawdust piles, etc.). This is because the Class A foam agent reduces the water's surface tension, allowing it to penetrate more easily into piles of material. Class A fires are difficult to extinguish using oxygen-exclusion methods like CO<sub>2</sub> flooding or coating with foam because these methods do not provide the cooling effect needed for total extinguishment. Source: Essentials of Fire Fighting 4<sup>th</sup> Fourth Edition, 1998, Edited by Richard Hall and Barbara Adams, Fire Protection Publications Oklahoma State University, Stillwater, OK.

#### FIRE FIGHTING EQUIPMENT:

Use recommended Class A fire fighting equipment when fighting an incipient fire.

Source: Essentials of Fire Fighting 4<sup>th</sup> Fourth Edition, Edited by Richard Hall and Barbara Adams, Fire Protection Publications, Oklahoma State University, Stillwater, OK.

#### UNUSUAL FIRE OR EXPLOSION HAZARDS:

Sawing, sanding or machining can produce ligno-cellulosic fibers as a by-product that may present an explosion hazard.

NFPA Rating for Wood Dust (Scale 0-4):

Health = 1

Fire = 1

Reactivity = 0

Refer to the National Fire Protection Association's standard 664 "Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities" for more details on wood dust explosions. Copies of this standard are available from the NFPA web site ([www.nfpa.org](http://www.nfpa.org))

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## 6. ACCIDENTAL RELEASE MEASURES

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### LAND SPILL:

Generally not applicable to panel products, however if a spill occurs the applicable federal, provincial, state, and local regulations must be followed.

### WATER SPILL:

Generally not applicable to panel products, however if a spill occurs the applicable federal, provincial, state and local regulations must be followed.

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## 7. HANDLING AND STORAGE

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### STORAGE:

This product should not be stored where exposure to water could occur or near a source of ignition. Avoid storing in areas of high relative humidity and temperature. High temperature and inadequate ventilation could allow concentrations of gaseous formaldehyde in the storage area. Adequate ventilation of the storage area will help reduce the build-up of the gaseous formaldehyde. It is recommended to store product in an area of relative humidity and temperature that approximates end use.

Refer to the Composite Panel Association (CPA) Technical Bulletin titled "*Storage and Handling of Particleboard and MDF*" for further information. Available on website ([www.pbmdf.com](http://www.pbmdf.com))

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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### ENGINEERING CONTROLS:

Certain activities of the re-manufacturing process of this product could possibly produce ligno-cellulosic fibers or gaseous formaldehyde. Provide adequate general and local exhaust ventilation to keep airborne contaminant concentration levels below the applicable levels.

### PERSONAL PROTECTIVE EQUIPMENT (PPE)

#### RESPIRATOR:

Wear NIOSH/MSHA approved respirator when the allowable exposure limits may be exceeded.

**PROTECTIVE CLOTHING:**

Wear side shield safety glasses during the re-manufacturing of this product. Other protective equipment such as gloves and outer garments may be needed depending on dust conditions.

**GENERAL HYGIENE:**

Practice proper personal hygiene.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**Physical Description:** light to dark colored solid, color and odor are dependent on the wood species.

Boiling Point: not applicable	pH: not applicable
Evaporation Rate: not applicable	Solubility in Water (% by weight): Insoluble
Freezing Point: not applicable	Specific Gravity: generally < 1
Melting Point: not applicable	Vapor Density: not applicable
Molecular Formula: not applicable	Vapor Pressure: not applicable
Molecular Weight: not applicable	Viscosity: not applicable
Oil-Water Distribution Coefficient: not applicable	% Volatile by volume (70°F): not applicable

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## 10. STABILITY AND REACTIVITY

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**STABILITY:**

Stable under normal conditions.

**REACTIVITY:**

Avoid product contact with open flame and any temperature sources that could induce thermal decomposition. Avoid product contact with oxidizing agents, drying oils and strong acids. For further information on the reactivity of wood products, refer to Chapter 17 of the Wood Handbook ([Wood Handbook Wood as an Engineering Material, 1999, Forest Products Laboratory, U.S. Department of Agriculture, Madison, WI](#))

**HAZARDOUS DECOMPOSITION:**

Thermal and/or thermal-oxidative decomposition can produce irritating and toxic fumes and gases, including carbon monoxide, hydrogen cyanide, polynuclear aromatic hydrocarbons, aldehydes and organic acids.

**HAZARDOUS POLYMERIZATION:**

Will not occur.

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## **11. TOXICOLOGICAL INFORMATION**

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**Wood Dust:**

Wood dust (softwood or hardwood: OSHA Hazard Rating = 3.3; moderately toxic with probable oral lethal dose to humans being 0.5 – 5 g/kg (about 1 pound for a 70 kg or 150 pound person). Source: OSHA Regulated Hazardous Substances, Government Institutes, Inc., February 1990.

Wood dust (generated from sawing, sanding or machining the product) may cause nasal dryness, irritation, coughing and sinusitis. National Toxicology Program (NTP) and the International Agency for Research on Cancer (IARC) classify wood dust as a human carcinogen (IARC Group 1). This classification is based primarily on increased risk in the occurrence of adenocarcinomas of the nasal cavities and paranasal sinuses associated with exposure to wood dust. The evaluation did not find sufficient evidence to associate cancers of the oropharynx, hypopharynx, lung, lymphatic and hematopoietic systems, stomach, colon or rectum with exposure to wood dust.

**Formaldehyde:**

OSHA Hazard Rating = 3 for local and systemic acute and chronic exposures; highly toxic. Irritation studies: human skin, 150 ug/3 days, intermittent exposure produce mild results; human eye, 1 ppm/6 minutes produced mild results.

Toxicity studies: human inhalation TC<sub>LO</sub> of 17 mg/m<sup>3</sup> for 30 minutes produced eye and pulmonary results; human inhalation TC<sub>LO</sub> of 300 ug/m<sup>3</sup> produced nose and central nervous system results; LC<sub>50</sub> (rat, inhalation = 1000 mg/m<sup>3</sup>, 30 minutes; LC<sub>50</sub> (mice, inhalation = 400 mg/m<sup>3</sup>, 120 minutes.

Exposure to gaseous formaldehyde at elevated levels may cause temporary irritation to the nose and throat as well as lead to respiratory disorders. However, in a thorough review of sensory/respiratory irritation studies of formaldehyde from the standpoint of occupational exposure, an expert panel has observed that exposure up to concentrations of 0.3 ppm failed to produce irritation. With regard to respiratory disorders, studies have concluded the threshold for long term chronic pulmonary effects is between 0.4 and 3 ppm and for chronic obstructive pulmonary disease is 2 ppm. Pre-existing respiratory disorders may be aggravated by exposure.

Epidemiology studies of workers exposed to formaldehyde have failed to consistently identify an association between formaldehyde exposure and cancer. In animal studies, rats and mice exposed to high levels of formaldehyde developed nasal cancer while hamsters did not. These exposure levels are far above those levels normally found in the workplace. Formaldehyde is classified

by IARC as carcinogenic to humans (Group 1). A working group of IARC has determined that there is sufficient evidence that formaldehyde causes nasopharyngeal cancer in humans, a rare cancer in developed countries. NTP included formaldehyde in the annual report on carcinogens. OSHA regulates formaldehyde as a potential carcinogen for exposures exceeding 0.5 ppm. Sources: OSHA Regulated Hazardous Substances. Government Institutes, Inc., February 1990; Registry of Toxic Effects of Chemical Substances (RTECS), national Institute for Occupational Safety and Health, Canadian Centre for Occupational Health and Safety, CCINFO May 1995.

**Additional Toxicity Date:** See acute and chronic health effects provided in Section 3: Hazard identification.

**Target Organs:** See acute and chronic health effects provided in Section 3: Hazard Identification.

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## 12. ECOLOGICAL INFORMATION

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### Ecotoxicity

#### A. General Product Information

Not available for product in purchased form. See Component Analysis.

#### B. Component Analysis – Aquatic Toxicity Formaldehyde (50-00-0)

##### Test & Species

Test & Species	Concentration	Conditions
96 Hr LC <sub>50</sub> fathead minnow	24.1 mg/L	flow through
96 Hr LC <sub>50</sub> bluegill	0.10 mg/L	flow through
5 min EC <sub>50</sub> photobacterium phosphorium	9.0 mg/L	
15 min EC <sub>50</sub> photobacterium phosphorium	7.26 mg/L	
25 min EC <sub>50</sub> photobacterium phosphorium	6.81 mg/L	
96 Hr EC <sub>50</sub> water flea	20 mg/L	

### Environmental Fate

Not available for product in purchased form.

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## 13. DISPOSAL CONSIDERATIONS

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### General Product Information

This panel product is recyclable. It is the user's responsibility to determine at the time of disposal whether your product meets any applicable criteria for hazardous waste disposal. Disposal must follow applicable federal, provincial, state and local regulations.

### EPA Waste Number & Descriptions

This product in purchased form is not considered hazardous waste under federal hazardous waste regulations 40 CFR 261. If the product is altered by processing, use or contamination, waste can be tested using methods described in 40 CFR 261 to determine whether the altered product meets the criteria for hazardous waste. State, provincial and local requirements for waste disposal may be different than U.S. federal regulations.

### **Disposal Instructions**

If disposed or discarded in its purchased form, ordinary trash collection is acceptable. It is the user's responsibility to determine at the time of disposal whether your product meets RCRA criteria for hazardous waste. Follow applicable federal, state, provincial and local regulations.

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## **14. TRANSPORT INFORMATION**

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Department of Transportation (DOT): This product is not a DOT hazardous material.

It is the purchaser's responsibility to see if this product meets any regulations depending on their location.

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## **15. REGULATORY INFORMATION**

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### **US Federal Regulations**

#### A. General Product Information

**OSHA:** Wood products are not hazardous under the criteria of the Federal OSHA Hazard communication Standard 29 CFR 1910.1200. However, formaldehyde emissions and wood dust generated by sawing, sanding or machining this product may be hazardous. This product contains formaldehyde.

**HUD:** The Department of Housing and Urban Development (HUD) regulation 24 CFR 3280 sets emission standards and provides for 3<sup>rd</sup> party certification of particleboard and MDF formaldehyde emissions.

**ANSI A208.2-2002 MEDIUM DENSITY FIBERBOARD (MDF):** This industry-consensus standard limits formaldehyde emissions from MDF. SierraPine<sup>®</sup> Medite<sup>®</sup> FR2 MDF is voluntarily manufactured and certified to this standard of formaldehyde emissions.

#### B. Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

**Formaldehyde (50-00-0)**

SARA 302: 500lb. TPQ

CERCLA: 100lb final RQ; 45.4 kg final RQ

**State Regulations**

**Component Analysis – State**

The following components appear on one or more of the following state hazardous substances lists and may also appear on similar lists in states not on the chart:

Component	CAS	CA	MA	MN	NJ	PA	RI
Formaldehyde	50-00-0	yes	yes	yes	yes	yes	yes
Wood dust, all soft and hard woods	none	no	no	yes	no	yes	yes

**Additional Regulatory Information**

**Component Analysis – WHMIS IDL**

No components are listed in the WHMIS IDL.

**Component Analysis – Inventory**

Component	CAS#	TSCA	CAN	EEC
Formaldehyde	50-00-0	yes	DSL	EINECS

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**16. OTHER INFORMATION**

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DEFINITIONS OF ACRONYMS:

- ACGIH: American Conference of Governmental Industrial Hygienists
- ANSI: American National Standards Institute
- C: Ceiling Limit
- CAS: Chemical Abstract Services Number
- CERCLA: Comprehensive Environmental Response Compensation & Liability Act
- CFR : Code of Federal Regulations
- CWA : Clean Water Act
- DOT: Department of Transportation
- EC<sub>50</sub>: Effective concentration that inhibits endpoints for 50% of control population
- EPA: Environmental Protection Agency
- FDA: Food and Drug Administration
- HCS: Hazard Communication Standard

HMIS: Hazard Material Information System  
IARC: International Agency for Research on Cancer  
LC<sub>LO</sub>: Lowest lethal concentration of a substance  
LC<sub>50</sub>: Concentration of a material expected to kill 50% of an animal test group  
LD<sub>LO</sub>: Lowest lethal dose of a material  
LD<sub>50</sub>: Dose of a material expected to kill 50% of an animal test group  
LEL: Lower Explosive Limit  
LFL: Lower Flammability Limit  
MSHA: Mining Safety and Health Administration  
NA: Not Applicable  
NFPA: National Fire Protection Association  
NIOSH: National Institute for Occupational Safety and Health, U.S. Public Health Service, U.S. Department of Health and Human Services  
NPRI: Canadian National Pollution Release Inventory  
NTP: National Toxicology Program  
OSHA: Occupational Safety and Health Administration, U.S. Department of Labor  
PEL: Permissible Exposure Limit  
PPE: Personal Protective Equipment  
RCRA: Resource Conservation and Recovery Act  
RQ: Reportable Quantity  
SARA: Superfund Amendments and Reauthorization Act  
STEL: Short Term Exposure Limit  
STP: Standard Temperature and Pressure  
TC<sub>LO</sub>: Lowest concentration in air resulting in a toxic effect  
TDG: Canadian Transportation of Dangerous Goods  
TLV: Threshold Limit Value  
TSCA: Toxic Substances Control Act  
TWA: Time-weighted Average  
UFL: Upper Flammable Limit  
WHMIS: Workplace Hazardous Material Information System

DISCLAIMER:

This information was believed to be accurate at the time of preparation, and compiled from sources believed to be reliable. Products and/or articles manufactured from this product may have characteristics that are significantly different; therefore, it is the user's responsibility to investigate and understand other pertinent information and to comply with all applicable laws and regulations. There is no warranty of any kind, express or implied, concerning product or merchantability or fitness thereof for any purpose. Buyer assumes all risk of use, storage and handling of the product in compliance with applicable Federal, State and local laws and regulations. SierraPine, a

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