

MATERIAL SAFETY DATA SHEET



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Product Name: SierraPine® ARREIS™ MDF

Date Prepared: 04/21/06

1. Composite Panel Product and Company Identification

Product Identifier: Unfinished, no added formaldehyde, medium density fiberboard (MDF) panels

General use: Cabinetry, furniture, millwork and general woodworking substrate.

Product Description: A panel product manufactured from ligno-cellulosic materials bonded together with a synthetic resin or other suitable binder, which may contain other additives.

MANUFACTURER:
SierraPine
2685 North Pacific Highway
Medford, OR 97501

EMERGENCY TELEPHONE NUMBERS:
(541) 773-2522

2. COMPOSITION/INFORMATION ON INGREDIENTS

	<u>Wt %</u>	<u>CAS Registry #</u>
Ligno-cellulosic Materials	Proprietary	N/A
Methylene-diphenyl-diisocyanate (MDI)	Proprietary	101-68-8

OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200):

	<u>EXPOSURE LIMITS</u>
Wood Dust/Ligno-cellulosic fiber ^{1, 2}	OSHA PEL – TWA 15.0 mg/m ³ (total dust) ³ 5.0 mg/m ³ (respirable fraction)
Wood Dust/Ligno-cellulosic fiber, Inhalable Fraction ³	ACGIH TLV – TWA: 1.0 mg/m ³
Methylene-diphenyl-diisocyanate (MDI) ⁴	OSHA PEL – TWA: .02 PPM ACGIH TLV – TWA: .005 PPM

1. In AFL-CIO v. OSHA 965 F. 2d 962 (11th 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/m³; STEL (15 min.) – 10.0 mg/m³. These were total dust test based limits.³ 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].

4. This ingredient is the polymerized form of MDI resin. There is no detectable MDI monomer in the product as purchased.

3. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS:

ACUTE

INHALATION:

Ligno-cellulosic fibers may cause nasal dryness, irritation and obstruction. Coughing, wheezing, sneezing, sinusitis and prolonged colds have also been reported.

EYE CONTACT:

Ligno-cellulosic fibers can cause mechanical irritation.

SKIN CONTACT:

Various species of ligno-cellulosic fibers may evoke allergic contact dermatitis in sensitized individuals.

INGESTION:

Not likely to occur.

CHRONIC

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*

4. FIRST AID MEASURES

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.

5. FIRE FIGHTING MEASURES

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 4th 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 4th 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 4th 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 CO₂ flooding or coating with foam because these methods do not provide the cooling effect needed for total extinguishment. Source: Essentials of Fire Fighting 4th 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 4th 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)

6. ACCIDENTAL RELEASE MEASURES

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.

7. HANDLING AND STORAGE

HANDLING:

While there are manufacturer precautions for handling MDI resin in its raw form, there are no special handling precautions required for products containing MDI resin in the purchased form of MDF. Product with 100% MDI adhesive releases no formaldehyde.

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. 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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

Certain activities of the re-manufacturing process of this product could possibly produce ligno-cellulosic fibers. 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

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

10. STABILITY AND REACTIVITY

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.

11. TOXICOLOGICAL INFORMATION

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.

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.

12. ECOLOGICAL INFORMATION

Ecotoxicity

A. General Product Information

Not available for product in purchased form.

Environmental Fate

Not available for product in purchased form.

13. DISPOSAL CONSIDERATIONS

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.

14. TRANSPORT INFORMATION

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.

15. REGULATORY INFORMATION

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, wood dust generated by sawing, sanding or machining this product may be hazardous.

HUD: The Department of Housing and Urban Development (HUD) regulation 24 CFR 3280 sets emission standards and provides for 3rd party certification of particleboard and MDF manufactured with urea-formaldehyde resin for formaldehyde emissions. SierraPine[®] ARREIS[®] MDF is manufactured with no added formaldehyde, and is exempted from certification requirements by this HUD standard.

ANSI A208.2-2002 MEDIUM DENSITY FIBERBOARD (MDF): This industry-consensus standard limits formaldehyde emissions from MDF. SierraPine[®] ARREIS[™] MDF is manufactured with no added formaldehyde and as such, is certified by the Composite Panel Association's Environmentally Preferable Product (EPP) grademark program and also by Scientific Certification Systems (SCS).

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
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.

16. OTHER INFORMATION

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
 EC₅₀: 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_{LO}: Lowest lethal concentration of a substance
 LC₅₀: Concentration of a material expected to kill 50% of an animal test group
 LD_{LO}: Lowest lethal dose of a material
 LD₅₀: 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_{LO}: 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 California limited partnership, will not be liable for claims relating to any party's use of or reliance on information and data contained herein regardless of whether it is claimed the information and data are inaccurate, incomplete or otherwise misleading.