



Medium-Density Fiberboard

Flakeboard Company Limited
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Markham, Ontario
Canada, L3R 0G4

Phone Number: (905) 475-9686
Revision Date: 12/21/2010

Flakeboard America Limited
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1. Product Identification

Product	Sales Location(s)
Medium-Density Fiberboard	<p>Canadian Regional Center 80 Tiverton Court, Suite 701 Markham, Ontario, Canada, L3R 0G4 Tel: (905) 475-9686 Fax: (905) 475-3827</p> <p>US Eastern Regional Center 515 River Crossing Drive, Ste 110 Fort Mill, SC 29715 Tel: (877) 273-7680 Fax: (800) 808-1454</p> <p>US Western Regional Center 2550 NE Old Salem Road, Albany, OR 97321 Tel: (888) 650-6302 Fax: (541) 928-4116</p>

Synonyms: MDF, Fiberboard.

This MSDS is applicable for all Flakeboard MDF including specialty products such as Fibrex®, moisture-resistant (MR), flame-retardant (FR), laminated panels including thermally fused melamine (TFM) and no added urea-formaldehyde resin (VESTA) and VESTA FR.

2. Hazardous Ingredients/Identity Information

Name	CAS#	Percent	Agency	Exposure Limits	Comments
Formaldehyde	50-00-0	<0.1 by weight	OSHA ACGIH	PEL-TWA 0.75 ppm PEL-STEL 2 ppm TLV-Ceiling 0.3 ppm*	

* Based on sensory exposure

3. Hazard Identification

Appearance and Odor: Straw yellow (light brown). No distinctive odor. Flame-retardant (FR), moisture-resistant (MR), and no added urea-formaldehyde resin (Vesta) and VESTA FR products may have red, green, or blue color additives, respectively. Laminated panels will have decorative colors on surfaces.

Primary Health Hazards: Wood dust and formaldehyde vapor.

Primary Route(s) of Exposure:

Ingestion: Skin: Inhalation: Eye:

Medical Conditions Generally Aggravated by Exposure: Wood dust or formaldehyde may aggravate pre-existing respiratory conditions or allergies.

Signs and Symptoms of Exposure (Wood Dust):

Acute: Wood dust can cause eye irritation. Certain species of wood dust can elicit allergic contact dermatitis in sensitized individuals. Wood dust may cause respiratory irritation, nasal dryness, coughing, sneezing, wheezing as a result of inhalation.

Chronic: Wood dust, depending on the species, may cause allergic contact dermatitis and respiratory sensitization with prolonged, repetitive contact or exposure to elevated dust levels. Prolonged exposure to wood dust has been reported by some observers to be associated with nasal cancer.

Carcinogenicity Listings (Wood Dust):

- NTP: Known Human Carcinogen
- IARC Monographs: Group 1 – Carcinogenic to Humans
- OSHA Regulated: Not listed

NTP: According to its *Tenth Report on Carcinogens*, NTP states, "Wood dust is known to be a human carcinogen based on sufficient evidence of carcinogenicity from studies in humans. An association between wood dust exposure and cancer of the nose has been observed in many case reports, cohort studies, and case-control studies that specifically addressed nasal cancer. Strong and consistent associations with cancer of the nasal cavities and paranasal sinuses were observed both in studies of people whose occupations are associated with wood dust exposure and in studies that directly estimated wood dust exposure."

IARC - Group 1: Carcinogenic to humans; sufficient evidence of carcinogenicity. This classification is primarily based on studies showing an association between occupational exposure to wood dust and adenocarcinoma of the nasal cavities and paranasal sinuses. IARC did not find sufficient evidence of an association between occupational exposure to wood dust and cancers of the oropharynx, hypopharynx, lung, lymphatic and hematopoietic systems, stomach, colon or rectum.

Signs and Symptoms of Exposure (Formaldehyde):

Acute: May cause temporary irritation of skin, eyes, or respiratory system. May cause sensitization in susceptible individuals.

Chronic: Numerous epidemiological studies have failed to demonstrate a relationship between formaldehyde exposure and nasal cancer or pulmonary diseases such as emphysema or lung cancer. Universities Associated for Research and Education in Pathology Inc. (UAREP) concluded that there was no "convincing evidence" that formaldehyde exposure causes cancer in humans. Rats exposed to 14 ppm of formaldehyde for 24 months in the laboratory developed nasal cancer. Exposure of 6 ppm did not result in statistically significant levels. The NCI epidemiology study of 26,000 workers found little evidence linking formaldehyde exposure to cancer. Formaldehyde is classified by OSHA and NTP as a probable or potential carcinogen. IARC has classified formaldehyde as carcinogenic to humans. .

Carcinogenicity Listings (Formaldehyde):

- NTP: Reasonably Anticipated to be a Human Carcinogen
- IARC Monographs: Group 1 – Carcinogenic to Humans
- OSHA Regulated: Formaldehyde Gas

IARC - Group 1: Carcinogenic to humans. 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.

4. Emergency and First-Aid Procedures

Ingestion: NAP

Eye Contact: Wash material out with clean running water.

Skin Contact: If skin abraded, seek proper first aid or medical treatment.

Skin Absorption: NAP

Inhalation: Remove to fresh air. If irritation or other symptoms persist, consult a physician.

Note to Physician: None

5. Fire and Explosion Data

Flash Point (Method Used): NAP

Flammable Limits: LFL = Wood dust: 40 grams per cubic meter of air. UFL = NAP

Extinguishing Media: Water spray; carbon dioxide

Autoignition Temperature: 425°– 475°F

Special Firefighting Procedures: Fire fighting procedures for wood products are well known.

Unusual Fire and Explosion Hazards: Medium-density fiberboard is not an explosion hazard. Sawing, sanding, or machining MDF could result in the by-product wood dust. Wood dust may present a strong to severe explosion hazard if a dust cloud contacts an ignition source.

NFPA Rating (Scale 0-4): Health = 0 Fire = 1 Reactivity = 0

6. Accidental Release Measures

Steps to be Taken In Case Material Is Released or Spilled: Not applicable for product in purchased form. Dust generated from sawing, sanding, drilling or routing this product may be vacuumed or shoveled for recovery or disposal. Wood dust clean-up and disposal activities should be accomplished in a manner to minimize creation of airborne dust.

7. Handling and Storage

Precautions to be Taken In Handling and Storage: Provide adequate ventilation to reduce the possible build-up of formaldehyde vapors.

8. Exposure Control Measures, Personal Protection

Engineering Controls: Due to the explosive potential of wood dust when suspended in air, precautions should be taken during sanding, sawing or machining of wood products to prevent sparks or other ignition sources in ventilation equipment. Use of totally enclosed motors is recommended. Provide local exhaust as necessary to meet OSHA requirements for formaldehyde and wood dust exposure.

Personal Protective Equipment:

RESPIRATORY PROTECTION: Wear NIOSH/MSHA approved respirator when the permissible exposure limits to formaldehyde and/or wood dust may be exceeded.

EYE PROTECTION: Recommend goggles or safety glasses as conditions indicate when sawing, sanding or machining wood products.

SKIN PROTECTION: Protective equipment such as gloves and outer garments may be needed to reduce skin contact.

9. Physical/Chemical Properties

Physical Description: A panel product manufactured from ligno-cellulosic fibers combined with a synthetic resin or other suitable binder.

Boiling Point (@ 760 mm Hg):	NAP
Evaporation Rate (Butyl acetate = 1):	NAP
Freezing Point:	AP
Melting Point:	NAP
Molecular Formula:	NAP
Molecular Weight:	NAP
Oil-water distribution coefficient:	NAP
Odor threshold:	NAP
pH:	NAP
Solubility in Water (% by weight):	Insoluble
Specific Gravity (H₂O = 1):	<1
Vapor Density (air = 1; 1 atm):	NAP
Vapor Pressure (mm Hg):	NAP
Viscosity:	NAP
% Volatile by Volume [@ 70°F (21°C)]:	0

10. Stability and Reactivity

Stability: Unstable Stable

Conditions to Avoid: High relative humidity and high temperature increase the rate of emission of formaldehyde from medium-density fiberboard.

Incompatibility (Materials to Avoid): Strong oxidizing agents, strong acids

Hazardous Decomposition or By-Products: Thermal and/or thermal-oxidative decomposition can produce irritating and toxic fumes and gases, including carbon monoxide, aldehydes and organic acids.

Hazardous Polymerization: May occur Will not occur

Sensitivity to Mechanical Impact: NAP

Sensitivity to Static Discharge: NAP

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. NTP and 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 produced mild results; human eye, 1 ppm/6 minutes produced mild results. Toxicity studies: human inhalation TC_{Lo} of 8 ppm reported, but response not specified; human inhalation TC_{Lo} of 17 mg/m³ for 30 minutes produced eye and pulmonary results; human inhalation TC_{Lo} of 300 ug/m³ produced nose and central nervous system results; LC₅₀ (rat, inhalation) = 1,000 mg/m³, 30 minutes; LC₅₀ (mice, inhalation) = 400 mg/m³, 2 hours.

11. Toxicological Information (cont'd.)

Exposure to gaseous formaldehyde 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 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.

Source: *OSHA Regulated Hazardous Substances*, Government Institutes, Inc., February 1990; Registry of Toxic Effects of Chemical Substances (RTECS), National Institute for Occupational Safety and Health (provided by Canadian Centre for Occupational Health and Safety, CCINFO May 1995).

12. Ecological Information

No information available at this time.

13. Disposal Considerations

Waste Disposal Method: Incinerate or landfill in accordance with local, state, and federal regulations.

This product is not considered hazardous waste under federal hazardous waste regulations 40 CFR 261. Please be advised, however, state and local requirements for waste disposal may be different than federal regulations. Dry land disposal is acceptable in most states if disposed of or discarded in its purchased form. It is, however, the user's responsibility to determine at the time of disposal whether the product meets EPA RCRA criteria for hazardous waste.

14. Transport Information

Not regulated as a hazardous material by the U.S. Department of Transportation.

15. Regulatory Information

TSCA: This product complies with TSCA inventory requirements.

CERCLA: NAP

DSL: NAP

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

STATE RIGHT-TO-KNOW:

Minnesota: Minnesota Statutes, 1984, Section 144.495 and 325F.181 require that all particleboard and medium-density fiberboard used in newly constructed housing units or sold to the public as building materials in Minnesota meet the HUD Formaldehyde Emission Standard for Particleboard, 24 CFR Sections 3280.308 and 3280.406. Furniture and furnishings not normally permanently affixed to a housing unit are not considered "building materials" and are excluded.

New Jersey: Under certain conditions, this product may release free formaldehyde vapor at concentrations at or above 0.1 parts per million (ppm) but less than 0.5 ppm. Formaldehyde is a substance which appears on New Jersey's *Environmental Hazardous Substance List*.

15. Regulatory Information (cont'd.)

Pennsylvania: Under certain conditions, this product may release free formaldehyde vapor at concentrations at or above 0.1 parts per million (ppm) but less than 0.5 ppm. Wood dust may be generated by sawing, sanding or machining this product. Formaldehyde and wood dust are substances which appear on Pennsylvania's *Appendix A – Hazardous Substance Lists*.

California: California's Safe Drinking Water and Toxic Enforcement Act of 1986 (Initiative Measure, Proposition 65): Title 22 California Code of Regulations requires that a clear and reasonable warning be given before exposure to chemicals listed by the State as causing cancer or reproductive toxicity. Formaldehyde is on California's list of chemicals known to the State to cause cancer. Wood dust is on California's list of substances known to the State to cause cancer. See required warning at the end of this document.

SARA 313 Information: None

SARA 311/312 Hazard Category: NAP

FDA: NAP

WHMIS Classification: This product is not considered a controlled product.

16. Additional Information

Date Prepared: 9/20/87

Date Revised: 12/21/2010

Prepared By: Flakeboard America Limited

Flakeboard MSDS available on: www.flakeboard.com

User's Responsibility: The information contained in this Material Safety Data Sheet is based on the experience of occupational health and safety professionals and comes from sources believed to be accurate or otherwise technically correct. It is the user's responsibility to determine if the product is suitable for its proposed application(s) and to follow necessary safety precautions. The user has the responsibility to make sure that this sheet is the most up-to-date issue.

Definition of Common Terms:

ACGIH	=	American Conference of Governmental Industrial Hygienists
C	=	Ceiling Limit
CAS#	=	Chemical Abstracts System Number
DOT	=	U. S. Department of Transportation
DSL	=	Domestic Substance List
EC50	=	Effective concentration that inhibits the endpoint to 50% of control population
EPA	=	U.S. Environmental Protection Agency
IARC	=	International Agency for Research on Cancer
IATA	=	International Air Transport Association
IMDG	=	International Maritime Dangerous Goods
LCLo	=	Lowest concentration in air resulting in death
LC50	=	Concentration in air resulting in death to 50% of experimental animals
LDLo	=	Lowest dose resulting in death
LD50	=	Administered dose resulting in death to 50% of experimental animals
LEL	=	Lower Explosive Limit
LFL	=	Lower Flammable Limit
MSHA	=	Mining Safety and Health Administration
NAP	=	Not Applicable
NAV	=	Not Available
NIOSH	=	National Institute for Occupational Safety and Health
NPRI	=	Canadian National Pollution Release Inventory
NTP	=	National Toxicology Program
OSHA	=	Occupational Safety and Health Administration

16. Additional Information (cont'd.)

PEL	=	Permissible Exposure Limit
RCRA	=	Resource Conservation and Recovery Act
STEL	=	Short-Term Exposure Limit (15 minutes)
TCLo	=	Lowest concentration in air resulting in a toxic effect
TDG	=	Canadian Transportation of Dangerous Goods
TDLo	=	Lowest dose resulting in a toxic effect
TLV	=	Threshold Limit Value
TSCA	=	Toxic Substance Control Act
TWA	=	Time-Weighted Average (8 hours)
UFL	=	Upper Flammable Limit
WHMIS	=	Workplace Hazardous Materials Information System

CALIFORNIA PROPOSITION 65 NOTIFICATION REQUIREMENT

WARNING

Drilling, sawing or machining wood products generates wood dust, a substance known to the State of California to cause cancer. Avoid inhaling wood dust or use a dust mask or other safeguards for personal protection.

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