



Zinc Borate-treated TimberStrand

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1. Product Identification

Product	Manufacturing Location(s)
Zinc Borate-treated TimberStrand®	USA: Chavies, KY; Deerwood, MN.

Synonyms: column, treated sill plate

2. Hazardous Ingredients/Identity Information

Name	CAS#	Percent	Agency	Exposure Limits	Comments
Wood	None	93-95	OSHA OSHA ACGIH ACGIH Recommended ^A Recommended ^A Recommended ^A	PEL-TWA 15 mg/m ³ PEL-TWA 5 mg/m ³ TLV-TWA 0.5 mg/m ³ TLV-TWA 1 mg/m ³ PEL-TWA 5 mg/m ³ PEL-STEL 10 mg/m ³ PEL-TWA 2.5 mg/m ³	Total dust Respirable dust fraction Inhalable, Western red cedar Inhalable, All other species Softwood or hardwood total dust Softwood or hardwood total dust Western red cedar total dust
Resin Solids: ^{B,C} Polymeric Diphenylmethane Diisocyanate (Polymeric MDI) ^D	9016-87-9	4-6	OSHA ACGIH	None None	None
Co-Binder ^B	None	0-2	None	None	None
Borogard [®] ZB Wood Preservative (Zinc borate hydrate) ^E	138265-88-0	< 1	OSHA ACGIH	Zinc borate hydrate as "Nuisance Dust": PEL-TWA 15 mg/m ³ PEL-TWA 5 mg/m ³ TLV-TWA 10 mg/m ³ TLV-TWA 5 mg/m ³	Total dust Respirable dust fraction Inhalable dust fraction Respirable dust fraction
Paraffin wax ^B	8002-74-2	< 1	OSHA ACGIH	PEL-TWA 2 mg/m ³ TLV-TWA 2 mg/m ³	Paraffin wax fume Paraffin wax fume

2. Hazardous Ingredients/Identity Information (cont'd.)

^A Weyerhaeuser recommended exposure limits based on 1989 OSHA PELs. In 1992, the U.S. Court of Appeals for the Eleventh Circuit Court overturned OSHA's 1989 Air Contaminants Rule, which included specific PELs for wood dust established by OSHA at that time. Wood dust is now officially regulated as an organic dust in a category known as "Particulates Not Otherwise Regulated" (PNOR), or Nuisance Dust. However, a number of states have incorporated the OSHA PELs from 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 noncompliance with the 1989 PELs.

^B The VOC content of adhesives and sealants used are equal or less than the current VOC content limits of South Coast Air Quality Management District (SCAQMD) Rule #1168, AND all sealants used as fillers meet or exceed the requirements of the Bay Area Air Quality Management District Regulation 8, Rule 51.

^C This product contains no urea-formaldehyde resins.

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

^E Wood preservative/fungicide. Registered with the U.S. EPA as a pesticide. (EPA registration number is 1624-120).

3. Hazard Identification

Appearance and Odor: TimberStrand[®] consists of layers of laminated solid wood which are glued together with a polymerized diphenylmethane diisocyanate (polymeric MDI) resin. The product has a slightly aromatic/wood odor. The wood component may consist of hardwoods, not including cedar. This product also contains a biocide and insecticide to help prevent decomposition from mold and insect infestation.

Primary Health Hazards: The primary health hazard posed by these products is thought to be due to inhalation of wood dust.

Primary Route(s) of Exposure:

- Ingestion:
- Skin: Dust
- Inhalation: Dust
- Eyes: Dust

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

Signs and Symptoms of Exposure:

Acute Health Hazards: 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 Health Hazards: 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 Listing:

- NTP: Wood dust, *Known to be a Human Carcinogen*
- IARC Monographs: Wood dust, Group 1 – *Carcinogenic to humans*. Polymeric MDI, Group 3 – *Unclassifiable as to carcinogenicity to humans*.
- OSHA Regulated: Not Listed

NTP:

Wood Dust

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."

3. Hazard Identification (cont'd.)

IARC:

Wood Dust

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.

4. Emergency and First-Aid Procedures

Ingestion: Not applicable under normal use.

Eye Contact: Wood dust may cause mechanical irritation. Treat dust in eye as foreign object. Flush with water to remove dust particles. Seek medical help if irritation persists.

Skin Contact: Wood dust of certain species can elicit allergic contact dermatitis in sensitized individuals, as well as mechanical irritation resulting in erythema and hives. Seek medical help if rash, irritation or dermatitis persists.

Skin Absorption: Not known to occur under normal use.

Inhalation: Wood dust may cause unpleasant obstruction in the nasal passages, resulting in dryness of nose, dry cough, sneezing and headaches. Zinc borate (which is adhered to the wood dust particles) may irritate the upper respiratory tract (nasal passages and throat) if levels of zinc borate exceed 10.0 mg/m³. However, if airborne wood dust exposures are kept below the TLV of 5.0 mg/m³, no zinc borate effects are expected. If effects are suspected, remove individual to fresh air. Seek medical help if persistent irritation, severe coughing or breathing difficulty occurs.

Note to Physician: None

5. Fire and Explosion Data

Flash Point (Method Used): NAP

Flammable Limits:

LFL = NAP

UFL = NAP

Extinguishing Media: Water spray, carbon dioxide, sand

Autoignition Temperature: Variable [typically 400-500°F (204-260°C)].

Special Firefighting Procedures: None

Unusual Fire and Explosion Hazards: 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 dusts. However, zinc borate, aside from having resistance to decay and insects, is also a fire retardant. Therefore, the explosion and fire hazard may be substantially reduced.

NFPA Rating (Scale 0-4): (wood dust)

Health = 1

Fire = 1

Reactivity = 0

6. Accidental Release Measures

Steps to be Taken In Case Material Is Released or Spilled: Not applicable for products in purchased form. Wood dust generated from sawing, sanding, drilling, or routing of these products may be vacuumed or shoveled for recovery or disposal. Avoid dusty conditions and provide good ventilation. Use NIOSH-approved respirator and goggles where ventilation is not possible and the allowable exposure limits may be exceeded.

7. Handling and Storage

Precautions to be Taken In Handling and Storage: No special handling precautions are required for products in purchased form. Avoid repeated or prolonged breathing of wood dust. Products with 100% MDI adhesive release no formaldehyde and have no measurable uncured isocyanate monomer. Store in well-ventilated, cool, dry place, away from open flame.

8. Exposure Control Measures, Personal Protection

Personal Protective Equipment:

RESPIRATORY PROTECTION – Not applicable for products in purchased form. A NIOSH-approved respirator is recommended when allowable exposure limits may be exceeded.

PROTECTIVE GLOVES – Not required. However, cloth, canvas, or leather gloves are recommended to minimize potential mechanical irritation from handling product.

EYE PROTECTION – Not applicable for product in purchased form. Goggles or safety glasses are recommended when machining these products.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT – Not applicable for product in purchased form. Outer garments may be desirable in extremely dusty areas.

WORK/HYGIENE PRACTICES – Follow good hygienic and housekeeping practices. Clean up areas where wood dust settles to avoid excessive accumulation of this combustible material. Minimize blowdown or other practices that generate high airborne-dust concentrations.

Ventilation:

LOCAL EXHAUST – Provide local exhaust as needed so that exposure limits are met.

MECHANICAL (GENERAL) – Provide general ventilation in processing and storage areas so that exposure limits are met.

SPECIAL – None

OTHER – None

9. Physical/Chemical Properties

Physical Description: TimberStrand[®] consists of layers of laminated solid wood which are glued together with a polymerized MDI resin. The product has a slightly aromatic/wood odor. The wood component may consist of hardwoods, not including cedar. This product also contains a biocide and insecticide to help prevent decomposition from mold and insect infestation.

Boiling Point (@ 760 mm Hg):	NAP
Evaporation Rate (Butyl Acetate = 1):	NAP
Freezing Point:	NAP
Melting Point:	NAP
Molecular Formula:	NAP
Molecular Weight:	NAP
Oil-water Distribution Coefficient:	NAP
Odor Threshold:	NAP
pH:	NAP
Solubility in Water (% by weight):	<0.1
Specific Gravity (H₂O = 1):	Variable; depends on wood species and moisture
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: Avoid open flame. Product may ignite at temperatures in excess of 400°F (204°C).

Incompatibility (Materials to Avoid): Avoid contact with oxidizing agents.

Hazardous Decomposition or By-Products: Thermal decomposition products include carbon monoxide, carbon dioxide, aliphatic aldehydes, resin acids, terpenes, polycyclic aromatic hydrocarbons, hydrogen chloride, ethyl sulfide, diethyl sulfide, and nitrogen oxides.

Hazardous Polymerization: May occur Will not occur

Sensitivity to Mechanical Impact: NAP

Sensitivity to Static Discharge: NAP

11. Toxicological Information

Toxicity Data: None available for product in purchased form. Individual component information is listed below if available.

Components:

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). 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. Source: *OSHA Regulated Hazardous Substances*, Government Institutes, Inc., February 1990.

Zinc borate hydrate

Acute Toxicity:

Ingestion – Low acute oral toxicity; LD50 in rats is greater than 10,000 mg/kg of body weight.

Skin/dermal – Low acute dermal toxicity; LD50 in rabbits is greater than 10,000 mg/kg of body weight. Borogard® ZB is poorly absorbed through intact skin.

Inhalation – No experimental test data.

Skin irritation – Non-irritant.

Eye irritation – Draize test in rabbits produced mild eye irritation effects. Many years of occupational exposure to Borogard® ZB indicates no adverse effects on human eyes. Therefore, Borogard® ZB is not considered to be a human eye irritant in normal industrial use.

Sensitization – Borogard® ZB is not a skin sensitizer.

Note: Borogard® ZB (zinc borate) can decompose, under biological conditions, to form zinc hydroxide and boric acid.

Reproductive/Developmental Toxicity: No experimental test data. However, animal feeding studies with boric acid and sodium tetraborate in rat, mouse and dog, at high doses, have demonstrated effects on fertility and testes. Studies with boric acid in the rat, mouse and rabbit, at high doses, demonstrate developmental effects on the fetus, including fetal weight loss and minor skeletal variations. The doses administered were many times in excess of those to which humans would normally be exposed. Animal studies have also demonstrated developmental toxicity due to excess zinc levels, including increased fetal resorption and reduced fetal weight. However, zinc is essential for the normal fetal development.

Carcinogenicity/Mutagenicity: No experimental test data. Carcinogenicity and mutagenicity tests were negative for boric acid. Limited epidemiology studies have shown no relationship between cancer in humans and occupational exposure to zinc compounds.

11. Toxicological Information (cont'd.)

Human Data: A recent epidemiology study under the conditions of normal occupational exposure to borate dusts indicated no effect on fertility. Source: U.S. Borax Inc. Material Safety Data Sheet for Borogard® ZB, Revision Date: May 2000.

Target Organs: None for product in purchased form.

12. Ecological Information

Environmental Toxicity: None available for product in purchased form. Individual component information is listed below if available.

Zinc borate hydrate

Boron is an essential micronutrient for healthy growth of plants; however, it can be harmful to boron-sensitive plants in high quantities. Care should be taken to minimize the amount of Borogard® ZB released to the environment.

Invertebrate Toxicity: Daphnids (*Daphnia magna* straus) – 48-hr LC50: 76 mg/L Borogard® ZB

Fish Toxicity: Freshwater rainbow trout (s. *Gairdneri*) – 96-hr LC50: 2.4 mg/L Borogard® ZB Bluegill (*Lepomis macrochirus*) – 96-hr LC50: >335 mg/L Borogard® ZB. Source: U.S. Borax Inc. Material Safety Data Sheet for Borogard® ZB, Revision Date: May 2000

Environmental Fate: None available for product in purchased form. Individual component information is listed below if available.

Zinc borate hydrate

Both boron and zinc occur naturally in seawater at average concentrations of 5 mg/L boron and 8 microgram/L zinc and at lower concentrations, generally, in fresh water. Borogard® ZB (zinc borate) can decompose, under certain environmental conditions, to form sparingly water-soluble zinc hydroxide and water-soluble boric acid.

Soil mobility: Zinc borate is sparingly soluble in water and may be leachable through normal soil.

Source: U.S. Borax Inc. Material Safety Data Sheet for Borogard® ZB, Revision Date: May 2000

13. Disposal Considerations

Waste Disposal Method: If disposed of or discarded in its purchased form, incineration is preferable.

Dry land disposal is acceptable in most states. It is, however, the user's responsibility to determine at the time of disposal whether your product meets RCRA criteria for hazardous waste. Follow applicable federal, state, and local regulations.

14. Transport Information

Mode: (Air, Land, water)

DOT classification

Zinc borate is regulated as a hazardous material by the U.S. Department of Transportation (DOT) if transported in quantities greater than 1000 pounds (454 kilograms) in one package. Since the amount of zinc borate in the product does not exceed this quantity, the U.S. DOT does not consider the product to be a hazardous material. Therefore, as shipped, this product is not regulated by the U.S. Department of Transportation.

TDG classification

Zinc borate is regulated as a hazardous substance under Canadian Transportation of Dangerous Goods (TDG) regulation. However, as shipped the amount of zinc borate in this product falls below the regulated limit of 110 lbs. (50 kg), the product would not be considered a hazardous material.

Proper Shipping Name:	NAP
Hazard Class:	NAP
UN/NA ID Number:	NAP
Packing Group:	NAP
Information Reported for Product/Size:	NAP

15. Regulatory Information

TSCA: The following ingredients are on the TSCA inventory:

Polymeric Diphenylmethane Diisocyanate (Polymeric MDI), CAS# 9016-87-9

Paraffin wax (CAS# 8002-74-2)

Soybean Oil (CAS# 8001-22-7, contained in Co-Binder ingredient)

CERCLA: NAP

DSL: The following ingredients are on the Canadian Domestic Substance List (DSL) inventory:

Polymeric Diphenylmethane Diisocyanate (Polymeric MDI), (CAS# 9016-87-9)

Paraffin wax (CAS# 8002-74-2)

Soybean Oil (CAS# 8001-22-7)

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.

STATE RIGHT-TO-KNOW:

California Prop 65 – Not listed.

New Jersey – Not listed.

Pennsylvania – When cut or otherwise machined, the product may emit wood dust. Wood dust, Paraffin wax (CAS# 8002-74-2) and Soybean oil (CAS#8001-22-7) appear on Pennsylvania's *Appendix A – Hazardous Substance Lists*.

Minnesota – Minnesota Statutes, 1984, Section 144.495 and 325F.181 do not apply to this product as Zinc Borate-treated TimberStrand® does not contain formaldehyde.

SARA 313 Information: To the best of our knowledge, this product contains no chemical subject to SARA Title III Section 313 supplier notification requirements.

SARA 311/312 Hazard Category: This product has been reviewed according to the EPA "Hazard Categories" promulgated under SARA Title III Sections 311 and 312 and is considered, under applicable definitions, to meet the following categories:

An immediate (acute) health hazard:	Yes
A delayed (chronic) health hazard	Yes
A fire hazard	No
A reactivity hazard	No
A sudden release hazard	No

FDA: NAP

WHMIS Classification: Not a controlled product

16. Additional Information

Date Prepared: 09/21/00

Date Revised: 10/10/2005

Prepared By: Weyerhaeuser Company, Corporate Environment, Health & Safety

Weyerhaeuser MSDS available on: <http://www.weyerhaeuser.com/environment/msds/default.asp>

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 MSDS is the most up-to-date issue.

16. Additional Information (cont'd.)

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
LC50	=	Concentration in air resulting in death to 50% of experimental animals
LCLo	=	Lowest concentration in air resulting in death
LD50	=	Administered dose resulting in death to 50% of experimental animals
LDLo	=	Lowest dose resulting in death
LEL	=	Lower Explosive Limit
LFL	=	Lower Flammable Limit
MSHA	=	Mine 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
PEL	=	Permissible Exposure Limit
RCRA	=	Resource Conservation and Recovery Act
STEL	=	Short-Term Exposure Limit (15 minutes)
STP	=	Standard Temperature and Pressure
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