



Refractory Products

**Non-asbestos, non-ceramic fiber,
calcium silicate**

Marinite 2200 is a new high density millboard insulation developed to meet today's more stringent safety and hygiene regulations. It can be handled, die-cut, drilled and sawed with significantly lower risk due to human exposure than competitive products containing ceramic or mineral fiber. The high temperature millboard is rated at 2200°F (1200°C), and offers low thermal conductivity, high temperature stability, uniform density and excellent resistance to thermal shock and chemical attack.

Applications

Industries such as aluminum, glass, steel, appliance, aerospace, automotive and petrochemical use Marinite 2200 for heat processing, fire protection and electrical resistance applications:

- Lehr rolls
- Insulating barriers in appliances
- High temperature gaskets and seals
- Fire protection
- Personnel protection
- Efficient refractory backup
- Furnace hot face linings

Performance Advantages

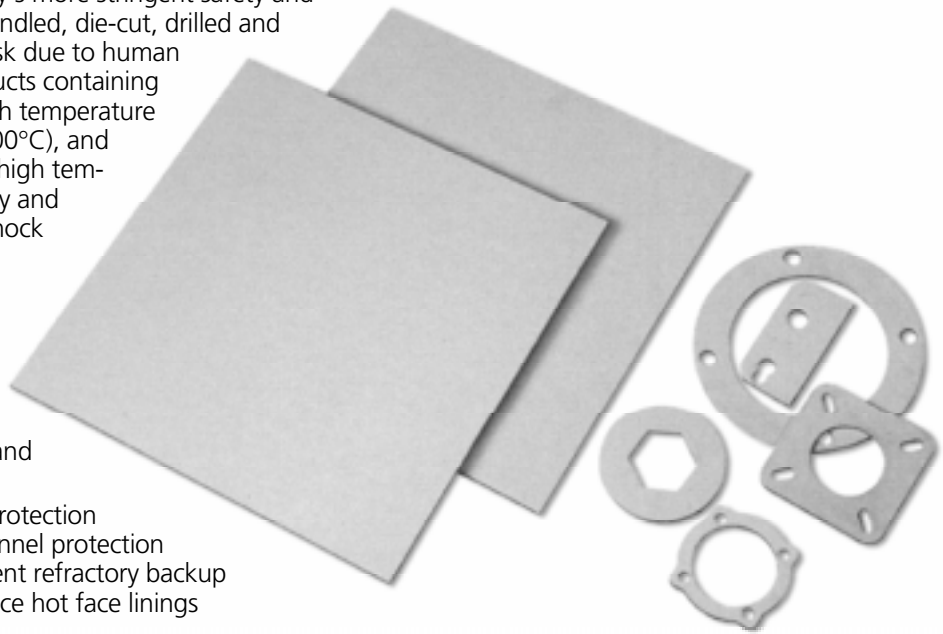
When compared with other competitive ceramic fiber containing products, Marinite 2200 has distinct advantages:

- IARC Group 3 health classification
- Lowest dimensional shrinkage at 1832°F (1000°C) of any product
- Highest tensile strength — both transverse and longitudinal
- Higher compressive strengths and recovery after loading
- Excellent thermal conductivity
- Easy handling and machinability

Health Care

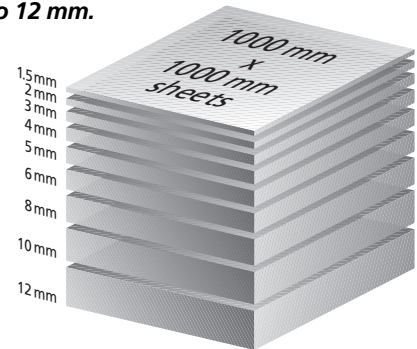
Marinite 2200 contains no asbestos and no ceramic fibers. All its components are classified as IARC Group 3 agents. This classification is only given if the material is not classifiable as to its carcinogenicity to humans. Presently, all non-asbestos millboards that are made of ceramic fiber rated at 2200°F (1200°C) — glass wool, rock wool or slag wool — are classified by IARC as Group 2B. A Group 2B rating means the agents of concern are possibly carcinogenic to humans.

In addition, Marinite 2200 is designed to emit less particulates during fabrication than competitive products. All organic components found in Marinite 2200 are of natural origin. Thus, toxic fumes are not released with the first heating of Marinite 2200, as there may be with materials containing synthetic resins. Marinite 2200 is an environmentally friendly product.



Standard Sizes

Machined shapes are easily fabricated from 1000 mm square boards (39.4" x 39.4") that range in thickness from 1.5 mm to 12 mm.



Marinite 2200

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Standard Sizes

Width x Length:	in.	39.4 x 39.4
	mm	1000 x 1000
Thickness:	in. (~1/16 to ~1/2)	0.059; 0.079; 0.118; 0.157; 0.197; 0.236; 0.315; 0.394; 0.472
	mm	1.5, 2, 3, 4, 5, 6, 8, 10, 12

Dimensional Tolerances

Length and Width, in. (mm)	±0.2 (±5)
% Thickness	±10
Squareness (max. difference between diagonals), in. (mm)	±0.4 (±10)

Typical Data

Properties

Density, within ±10%, pcf (kg/m ³)	70 (1100)
Moisture Content, (normal), % of dry weight	< 3
Modulus of Rupture, Flexural strength, psi (kg/cm ²)	1000 (70)
Compressive Strength, (ASTM F 36 K)	
% Compression at 1000 psi (70 kg/cm ²)	7
% Recovery	50
Tensile Strength, Parallel to face of sheet, psi (kg/cm ²)	
Longitudinal	710 (50)
Transversal	570 (40)
Classification Temperature, °F (°C)	2200 (1200)
Product Melting Point, °F (°C)	>2460 >(1350)
Thermal Conductivity, Btu-in/ft ² , hr, °F (W/m ² K)	
752°F (400°C)	0.83 (0.12)
Linear Shrinkage, %, for 24 hr. @	
1800°F (1000°C)	1
2200°F (1200°C)	2.7
Dielectric Strength, @ RH 50% and 73°F (23°C), volts/mil (kv/mm)	61 (2.4)
Volume Resistivity, ohm-cm	7 x 10 ¹²

The physical and chemical properties of BNZ's Marinite 2200 represent typical average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice.

Warranty

BNZ Materials warrants that its products are manufactured in accordance with its applicable material specifications and are free from defects in workmanship and materials using BNZ's specifications as a standard. Every claim under this warranty shall be deemed waived unless in writing and received by BNZ within thirty (30) days of the date the defect was discovered and within one (1) year of the date of the shipment of the product.

BNZ MAKES NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, IN FACT OR IN LAW, INCLUDING WITHOUT LIMITATION, THE WARRANTY OF MERCHANTABILITY OR THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, OTHER THAN THE LIMITED WARRANTY SET FORTH ABOVE.



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Marinite®

Plant Location

Billerica

400 Iron Horse Park

North Billerica, MA 01862

Phone: (978) 663-3401

(800) 888-0061

FAX: (978) 663-2735

Insulating Fire Brick

Plant Location

Zelienople

191 Front Street

Zelienople, PA 16063

Phone: (412) 452-8650

(800) 955-8650

FAX: (412) 452-1346

BNZ Materials manufactures and is a worldwide supplier of a range of specialty industrial insulations. Our calcium silicate insulation has been manufactured continuously at Billerica, Massachusetts for over 50 years. Prior product identification was under the Johns-Manville trademark.

In addition to our calcium silicate product line, BNZ also manufactures Insulating Fire Brick and refractory specialties at the world's most advanced IFB plant located in Zelienople, PA. Over sixteen types of IFB are available for use in applications from 2000°F to 3200°F to meet the specific needs of a variety of industries.

Contact BNZ for more information on these products and their applications.



Limitation of Liability

It is expressly understood and agreed that the limit of BNZ's liability shall be the resupply of a like quantity of non-defective product and that BNZ shall have no such liability except where the damage or claim results solely from breach of BNZ's warranty.

IT IS ALSO AGREED THAT BNZ SHALL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, OR OTHER DAMAGES FOR ANY ALLEGED NEGLIGENCE, BREACH OF WARRANTY, STRICT LIABILITY, OR ANY OTHER THEORY, OTHER THAN THE LIMITED LIABILITY SET FORTH ABOVE.