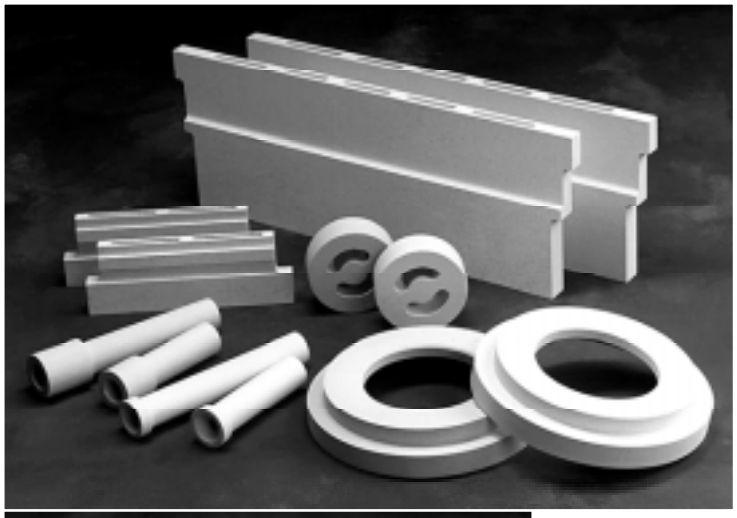
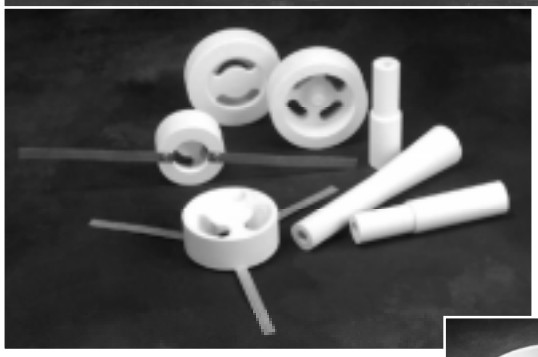
BNZ Materials, Inc.

Marinite® C, A and A^{HP}

Refractory Products

Inorganic board insulation to convey and form aluminum





Marinite C, A and A^{HP} are strong, machinable, non-asbestos inorganic board insulations for conveying, containing, handling and forming molten aluminum and other non-ferrous metals. Marinite A and A^{HP} can be used in aluminum contact applications up to approximately 1500°F (816°C).

Made of fibers, micro silica and a hydrothermally-produced inorganic binder, they are ideal materials for conveying and controlling the flow of aluminum.

Manufactured for greater life and improved machining characteristics. High heat treatment removes excess water, and minimizes shrinkage that would normally occur in service.

The current family of Marinite aluminum contact boards provides the reliability and quality needed in your most critical service applications. This outstanding performance continues to be synonymous with the Marinite trademark for over 50 years.

CERTIFIED ISO9002 QUALITY SYSTEM

Refractory Products

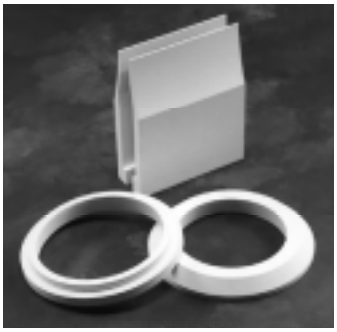
Inorganic board insulation to convey and form aluminum

Marinite Aluminum Contact Boards

Advantages

These unique board materials have many outstanding advantages. Metals do not adhere to them, even when they cool and solidify, so skull can be easily removed. They require no foundry facing wash, and do not lead to contamination of the metals. Molten metals are conveyed with less heat loss, so stay at a more uniform temperature, and therefore can be handled at a lower temperature.

Because they have a low heat capacity, preheating isn't required. They are crack- and shock-resistant, and offer cost-efficiency through a long service life.



Marinite C

Advantages and Uses

Marinite C was the first non-asbestos aluminum contact board developed and produced in our Billerica, MA plant. It is widely used for launders and trough linings, spouts, floats, stoppers, dams, baffles and basins. Even with more advanced, recently-developed aluminum contact board formulas, many companies prefer the attributes of Marinite C and continue to use it in their operations.

Marinite A

Advantages and Uses

Marinite A, which is our hardest board, was developed as a replacement for MetALform and as direct competition to N-14 (L-14) and B-3 (M1) boards. Its improved characteristics include higher strength, which equates to better machinability, and greater toughness for more resistance to physical abuse. Marinite A also has significantly reduced shrinkage, so it is an extremely low shrinkage board at molten aluminum temperatures.

It is used for basic parts such as floats, spouts, stopper pins, distribution boxes, dams, baffles, filter boxes, launders, troughs, head boxes, plus more sophisticated parts such as transition plates, hot top rings (especially large diameter) and as the working lining in low energy aluminum die cast holding furnaces.

Marinite A^{HP}

Uses

Marinite A^{HP} is our high performance offering meant to compete directly against N-17 (L-101) in transition plates, hot top rings, tips, snouts, filter boxes, head boxes, headers, floats and spouts. Also in the metal handling and containing systems of many casting machines.

Design Advantages

Marinite A^{HP} was specifically designed for enhanced toughness and crack resistance. The key to this strategy is the incorporation of high strength graphite fibers. This graphite reinforcement system provides significant load carrying capacity after the typical calcium silicate fracture occurs. This beneficial characteristic is vividly displayed during modulus of rupture testing.

This patented Marinite A^{HP} utilizes these very specific graphite fibers along with other special raw materials to create a calcium silicate with lower shrinkage, less oil absorption, and less outgassing when in contact with molten non-ferrous metals. It also has excellent non-wetting characteristics.

Due to these modern advances in calcium silicate science and fiber technology, Marinite A^{HP} exhibits excellent machinability due to improved toughness and strength.

Notes:

Even after heat treatment, these boards may regain a small amount of moisture from the atmosphere. For this reason,they should be kept in a warm, dry area prior to use.

When casting begins, a slight bubbling usually occurs, but it is of short duration. It can happen even though the boards have been oven dried prior to casting. This is due to the expansion of air in the surface pores of the material when the hot molten metal comes in contact with it, plus chemical reactions that evolve gasses.

Technical Assistance

BNZ Materials, Inc. and its fabricators are eager to work with you on your specific applications.

Typical Data

Properties	Marinite C	Marinite A	Marinite A^{HP}
Density, pcf (kg/m^3)	54 (865)	65 (1041)	65 (1041)
Modulus of Rupture, psi (kg/cm^2)			
1½" (38.1 mm) thick or less	900 (63)	1400 (98)	1200 (84)
2" (50.8 mm) thick	800 (56)	1200 (84)	1000 (70)
Soaking Heat Changes			
@ 1350°F (732°C) for 24 hrs			
Shrinkage, %			
Length or Width	2.3	0.1	0.2
Thickness	9.4	0.8	0.9
Moisture Content, (as received), %	2.5	2.5	2.5
Total Weight Loss, @ 1350°F (732°C), %	5.8	4.5	4.5
Pandux			
Durometer Hardness	70	74	65
Screw Holding Strength, (normal), lb, (kg)			
⅞" penetration	220 (100)	240 (109)	250 (113)
Compressive Strength, psi, (kg/cm^2)			
@ 5% deformation	1600 (112)	2400 (169)	2000 (141)
@ ultimate load	2200 (155)	3000 (211)	2800 (197)
Thermal Conductivity, per ASTM C 177			
Mean temperature, Btu-in/ft^2, hr, °F			
400°F	0.99	—	—
600°F	1.00	—	—
800°F	1.03	1.92	1.47
1000°F	1.06	1.95	1.52
1100°F	—	1.99	1.55
To convert Btu-in/ft^2, hr, °F to kcal-m^2, hr, °C, multiply by 0.124.			
Mean temperature, W/m°K			
200°C	.106	—	—
300°C	.107	—	—
400°C	.110	.276	.210
500°C	.113	.280	.217
600°C	—	.287	.224
Size			
Furnished untrimmed, nominal (+⅝", -⅛") (+15.9 mm, -3.2 mm)			
4' x 8' (1219 x 2438 mm)	●	●	●
4' x 4' (1219 x 1219 mm)	●	●	●
2' x 4' (610 x 1219 mm)	●	●	●
Thicknesses			
½" (12.7 mm)	○	●	●
¾" (19.1 mm)	○	●	●
1" (25.4 mm)	●	●	●
1¼" (31.8 mm)	○	●	●
1½" (38.1 mm)	●	●	●
1¾" (44.5 mm)	○	●	●
2" (50.8 mm)	●	●	●
3" (76.2 mm)	○	●	●

Note: The physical and chemical properties of BNZ's Marinite C, A and A^{HP} represent 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.

● – Available ○ – Not Available

BILLERICA 50 Quality Boards For More Than 50 Years

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 JM 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.

BNZ

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CS85,™ Marinite® & Transite® Plant Location

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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

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.

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.