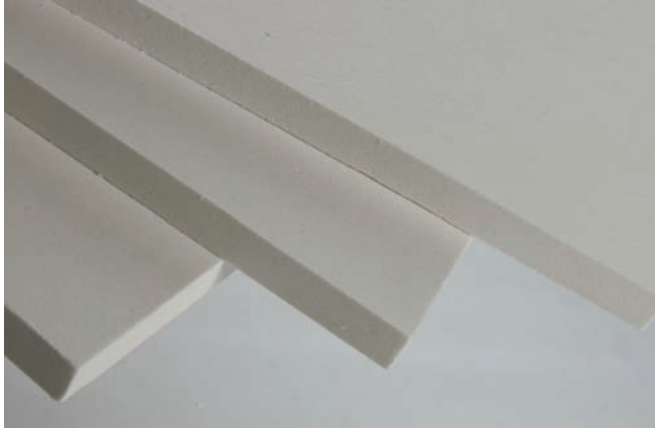


## Kaowool® Millboards



### Product Description

Thermal Ceramics Kaowool Millboard products are processed from a slurry consisting of Kaowool ceramic fibers, fillers and binders. The fiber raw material is Kaolin, a naturally occurring high-purity alumina-silica fireclay. Kaowool Millboard products are strong, thin, durable ceramic fiber based boards having a variety of high-temperature applications. Although these products were formulated and designed to replace asbestos millboard, their potential use extends into more conventional refractory fiber applications. Their use should be considered whenever there is a need for a thin, durable board with excellent insulating characteristics.

Kaowool Millboard Grade 830 was specifically designed for use in the iron and steel industry as a molten contact product. It has proven to be excellent for use as a one shot casting mold liner for both stools and ingot molds because of the unique combination of organic and inorganic binders. This 40 pcf (641 kg/m<sup>3</sup>), 0.16" (4 mm) product produces an exceptionally smooth surface finish on cast metal pieces when compared to those surfaces produced by sand casting or cast using other board products.

Kaowool 1401 Millboard is a strong, thin, dense board product with excellent compression resistance and insulating characteristics. It is produced from Kaowool ceramic fibers, clay, inert fillers, and a small amount of both organic and inorganic binders for increased handling strength. It maintains its integrity throughout a wide temperature range and is easily fabricated and die cut.

### Features

- Asbestos replacement millboard
- Thin durable insulation and gasketing
- Thickness tolerance of  $\pm \frac{1}{32}$ " (0.8 mm)
- Easy to saw or die cut
- Excellent backup insulation
- 2000°F to 2700°F (1093°C to 1482°C) use limits

### Applications

- High-temperature gaskets (all grades)
- High-temperature roll covering (grade 822)
- Fire protection (grade 822)
- Thermal barrier (grades 822 and 1401)
- Backup insulation (grades 822 and 1401)
- One-shot casting mold liner for stools and ingot molds (grade 830)
- Molten metal contact applications in the iron and steel industries (grade 830)
- Molten metal contact applications in the non-ferrous industries (grade 830)
- Heat and flame shields (grade 1401)
- Parting media (grade 1401)

## Kaowool® Millboards

### Physical Properties

	Grade 822	Grade 830	1401
Color	white	tan	white
Density, pcf (kg/m <sup>3</sup> )	55 (881)	40 (641)	35 - 40 (560 - 641)
Continuous Temperature Use Limit, °F (°C)	2000 (1093)	2000 (1093)	2000 (1093)
Maximum Temperature Rating, °F (°C)	2300 (1260)	2700 (1482) (one time)	2300 (1260)
Melting Point, °F (°C)	3200 (1760)	3200 (1760)	3200 (1760)
Modulus of Rupture, psi (Mpa)	650 - 750 (4.48 - 5.17)	400 - 500 (2.76 - 3.45)	650 - 750 (4.48 - 5.17)
Compressive Strength, psi (Mpa)			
@ 5% deformation	50 - 75 (0.34 - 0.51)	-	10 - 20 (0.06 - 0.14)
@ 10% deformation	100 - 125 (0.69 - 0.86)	-	55 - 70 (0.38 - 0.48)
@ 15% deformation	250 - 300 (1.72 - 2.06)	-	175 - 200 (1.20 - 1.38)
Loss on ignition, L.O.I., weight %			
@ 1000°F (538°C)	5 - 7	12 - 15	9 - 11

### Chemical Analysis, % Weight after firing

	Grade 822	Grade 830	1401
Alumina, Al <sub>2</sub> O <sub>3</sub>	35	35	36
Silica, SiO <sub>2</sub>	63	65	60
Other	2	-	4
Organic material	4 - 6	11 - 14	-
Moisture content, (max)	0.5	0.5	0.5

### Thermal Conductivity, Btu•in./hr•ft<sup>2</sup>•°F (W/m•K), ASTM C 201

mean temperature	Grade 822	Grade 830	1401
@ 500°F (260°C)	0.80 (0.11)	0.53 (0.08)	0.61 (0.08)
@ 1000°F (538°C)	0.89 (0.13)	0.71 (0.10)	0.81 (0.12)
@ 1500°F (816°C)	0.98 (0.14)	0.91 (0.13)	1.04 (0.15)
@ 2000°F (1093°C)	1.08 (0.16)	1.15 (0.16)	1.33 (0.19)

### Chemical Properties

Kaowool Millboard provides excellent resistance to chemical attack. Exceptions include hydrofluoric acid, phosphoric acid, and strong alkalis. A small amount of combustible organic binder will burn out at approximately 300°F (149°C). **Caution should be exercised during the initial heating. Adequate ventilation should be provided to avoid potential flash ignition of the binder out-gassing and to avoid air entry while at elevated temperature.**

### Standard Sizes

Grade	Thickness in (mm)	Sheet Size in (cm)	Sq. Ft/Sheet (Sq. M/Sheet)	Weight/Sheet lbs (kg)
822	⅜ (3.18)	27½ x 27½ (70 x 70)	5.25 (0.49)	3 (1.4)
	⅝ (3.18)	55 x 55 (140 x 140)	21 (1.95)	12 (5.5)
	¾ (6.35)	55 x 55 (140 x 140)	21 (1.95)	24 (10.9)
830	0.160 (4.06)	55 x 55 (140 x 140)	21 (1.95)	11 (5.0)
1401	⅙ (1.59)	55 x 55 (140 x 140)	21 (1.95)	4 (1.8)
	⅛ (3.18)	55 x 55 (140 x 140)	21 (1.95)	8 (3.6)
	⅜ (4.76)	55 x 55 (140 x 140)	21 (1.95)	12.5 (5.7)
	¼ (6.35)	55 x 55 (140 x 140)	21 (1.95)	16.5 (7.5)
	⅝ (9.53)	55 x 55 (140 x 140)	21 (1.95)	25 (11.4)
	½ (12.70)	55 x 55 (140 x 140)	21 (1.95)	33 (15.0)

Special sizes and configurations are available upon request.

The values given herein are 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. Therefore, the data contained herein should not be used for specification purposes. Check with your Thermal Ceramics office to obtain current information.