



Thermal Ceramics vacuum formed products are a rigid self-supporting fiber insulation manufactured from a slurry consisting of Kaowool ceramic fibers and binders. Thermal Ceramics products have the capability to withstand chemical attack. Exceptions include hydrofluoric acid, phosphoric acid, and strong alkalis. A small amount of combustible binder will burn out at approximately 300°F. Additional hardness and strength can be achieved with post treatments.

Kaowool PM is manufactured to close tolerances with an excellent surface finish. Kaowool PM has a good thermal conductivity and can easily be die-cut.

Kaowool M is a low cost general duty insulation product available in a variety of sizes and thicknesses. Kaowool M is a rigid self-supporting product that can be produced in different strength ranges to fit individual applications.

Kaowool S is a higher strength product with good non-ferrous molten metal resistance.

Kaowool HD is a low cost high strength product recommended for tough mechanical stress areas. Also, very good for back-up behind dense refractories.

Kaowool HS is a high strength product recommended for tough mechanical stress areas. Also, very good for back-up behind dense refractories.

Kaowool HS45 is designed for a temperature rating of 2400°F (1316°C) with very high compressive and flexural strengths. Each board is machined to a thickness tolerance $+1/4 - 1/16$ " (3.125 - 1.5625 mm). Kaowool HS45 is non-wetting to molten aluminum metal and exhibits good resistance to chemical attack.

Features

- Excellent thermal conductivity
- Excellent strength and thermal stability at elevated temperatures
- Capability to withstand chemical attack
- Board capabilities are 48 x 36 x 1/4 to 3" (120 x 90 x 0.625 to 7.5 cm) with the exception of PM Board which can be made 1/8" (3.125 cm) thick

Applications

- Appliance and heat processing insulation
- Back up in steel ladle and torpedo cars
- Backup insulation to dense refractories
- Combustion chamber construction
- Expansion joint material
- Flue and chimney linings
- Furnace, kiln, and oven hot face linings
- General molten metal contact
- Glass coffin walls
- Glass regenerator insulation
- Glass tank side, end wall and port neck
- Glass tank wall and port neck insulation
- Heat shields
- High temperature gaskets and seals
- High mechanical stress areas
- Kiln furniture
- Trough linings in contact with aluminum

Kaowool Low Temperature Boards

Product Information

Physical Properties	Kaowool PM	Kaowool M	Kaowool S	Kaowool HD	Kaowool HS	Kaowool HS-45
Color	white	beige	brown	beige	beige	white
Density, pcf (kg/m^3)	16 (256)	17 (272)	20 (320)	26 (416)	28 (448)	42 (673)
Max. Temperature Rating, °F (°C)	2300 (1260)	2300 (1260)	2300 (1260)	2400 (1316)	2300 (1260)	2400 (1316)
Continuous Temperature Use Limit, °F (°C)	2150 (1177)	2000 (1093)	2000 (1093)	2300 (1260)	2200 (1204)	2400 (1316)
Melting Point, °F (°C)	3200 (1760)	3200 (1760)	3200 (1760)	3200 (1760)	3200 (1760)	2800 (1538)
Modulus of Rupture, psi (Mpa)	200 - 250 (1.38 - 1.72)	100 - 130 (0.68 - 0.89)	150 - 180 (1.03 - 1.24)	150 - 175 (1.03 - 1.20)	230 - 260 (1.58 - 1.79)	450 - 550 (3.10 - 3.79)
Compressive Strength, psi (Mpa)						
@ 5% deformation	20 - 30 (0.13 - 0.20)	20 - 30 (0.13 - 0.20)	30 - 50 (0.20 - 0.34)	50 - 70 (0.34 - 0.48)	60 - 80 (0.41 - 0.55)	200 - 250 (1.37 - 1.72)
@ 10% deformation	30 - 40 (0.20 - 0.27)	30 - 40 (0.20 - 0.27)	50 - 60 (0.34 - 0.41)	70 - 90 (0.48 - 0.62)	80 - 100 (0.55 - 0.68)	250 - 300 (1.72 - 2.06)
Linear Shrinkage, %, 24 hours						
@ 1500°F (816°C)	0.2	1.2	1.0	0.1	0.8	0.5
@ 1800°F (982°C)	1.9	2.2	2.0	1.4	1.9	0.7
@ 2000°F (1093°C)	2.4	2.8	2.3	2.5	2.1	0.4
@ 2200°F (1204°C)	3.4	—	—	2.8	0.2	0.6
@ 2400°F (1316°C)	—	—	—	—	+0.3	+0.8
Chemical Analysis, % Weight basis after firing						
Alumina, Al ₂ O ₃	44	42	46	41	18	55
Silica, SiO ₂	56	56	53	53	81	35
Calcium Oxide, CaO	—	—	—	5	—	8
Other	<1	2	—	—	—	2
Loss of Ignition	4 - 7	4 - 7	5 - 8	5 - 8	5 - 8	5 - 8
Organic Material	3 - 6	3 - 6	4 - 7	4 - 7	4 - 7	4 - 7
Thermal Conductivity BTU•in/hrs•ft²•°F (w/m•k)						
Mean temperature						
@ 500°F (260°C)	0.40 (0.05)	0.47 (0.06)	0.59 (0.08)	0.57 (0.08)	0.68 (0.10)	1.02 (0.15)
@ 1000°F (538°C)	0.59 (0.08)	0.71 (0.10)	0.80 (0.11)	0.80 (0.11)	0.84 (0.12)	0.96 (0.14)
@ 1500°F (816°C)	0.87 (0.12)	1.04 (0.15)	1.12 (0.16)	1.13 (0.16)	1.12 (0.16)	1.16 (0.17)
@ 2000°F (1093°C)	1.27 (0.18)	1.52 (0.22)	1.58 (0.23)	1.60 (0.23)	1.58 (0.23)	1.72 (0.24)

Chemical Properties

Caution should be exercised during initial heating. Adequate ventilation should be provided to avoid potential flash ignition of the binder out-gassing or avoid air entry while at elevated temperature.

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.

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