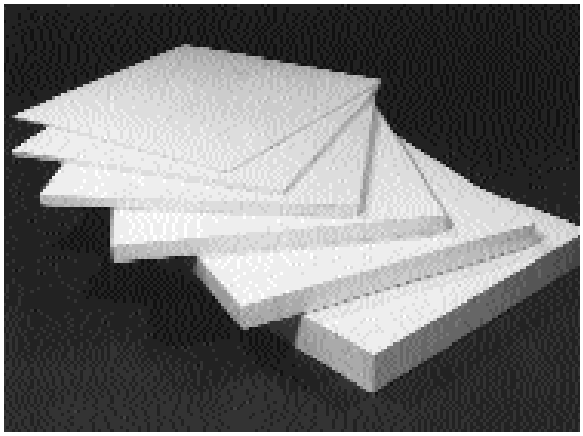
Thermal Ceramics

Kaowool® Low Temperature Boards

Product Information



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 alkalies. 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 +¼ - 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
Nominal density, pcf *(kg/m³)*	15 *(240)*	17 *(272)*	20 *(320)*	26 *(416)*	28 *(448)*	42 *(673)*
Maximum temperature rating,°F *(°C)*	2300 *(1260)*	2300 *(1260)*	2300 *(1260)*	2400 *(1316)*	2300 *(1260)*	2400 *(1316)*
Continuous use limit, °F *(°C)*	2100 *(1149)*	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)*	175 - 250 *(1.20 - 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	15-25 *(0.10 - 0.17)*	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	25 - 40 *(0.17 - 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						
Alumina, Al_2O_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.

Data are average results of tests conducted under standard procedures and are subject to variation.

Data contained in this brochure are intended as a guide only. For specifications and estimating purposes, contact your nearest Thermal Ceramics representative.

Thermal Ceramics Marketing Offices
Thermal Ceramics Americas
T: (706) 796 4200 F: (706) 796 4398
Thermal Ceramics Asia Pacific
T: +65 273 1826 F: +65 2730165
Thermal Ceramics Europe
T: +44 (0) 151 334 4030
F: +44 (0) 151 334 1684

North America Sales Offices
Canada
T: (905) 335 3414 F: (905) 335 5145
United States Southeastern Region
T: (800) 338 9284 F: (706) 796 4324
United States Midwest Region
T: (888) 649 2442 F: (630) 527 0285

United States Eastern Region
T: (877) 787 3385 F: (330) 995 2908
United States Western Region
T: (800) 990 5264 F: (714) 521 4662
Mexico
T: +52 (5) 576 6622
F: +52 (5) 576 1706

South America Sales Offices
Argentina
T: +54 (1) 14373 4439
F: +54 (1) 14372 3331
Brazil
T: +55 (21) 2418 1366
F: +55 (21) 2418 1205

Chile
T: +56 (2) 854 1064 F: +56 (2) 854 1952
Colombia
T: +56 (222) 82935 F: +56 (222) 82803
Guatemala
T: +50 (2) 4733 295 F: +50 (2) 4730 601
Venezuela
T & F: +58 241 858 2192/858 9562

Website: www.thermalceramics.com