

TR[®] Block Insulation



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Product Description

TR-19 and TR-19HS Block are asbestos-free insulation products, manufactured from vermiculite granules and high-temperature bonding materials. TR-20 Block is made from diatomaceous silica with a hydraulic binder.

TR-19 Block is an economical, energy saving insulation. It exhibits minimal shrinkage at its 1900°F (1040°C) temperature limit, and will not readily decompose even when exposed directly to flame or cryolite vapor conditions.

TR-19HS Block is a high strength structural insulation material, suitable particularly where mechanical loads are present. This block product has very low shrinkage to its 1900°F (1040°C) operating temperature limit and is resistant to cryolite vapor conditions.

TR-20 Block is a superior, high-temperature insulation for service to 2000°F (1095°C). Long, maintenance-free service and maximum operating efficiency is assured by TR-20's unique combination of low conductivity and high stability. TR-20 is also very low in sulfur and iron, making it highly resistant to attack from atmospheric conditions and greatly reducing the possibility of product contamination.

These TR Block products can be manufactured in special shapes to fit customer specifications, saving money on both installation and energy costs.

TR-19, TR-19 HS, and TR-20 Curved Block Insulation is designed primarily for interior and exterior use on bustle pipes, hot air pipes, stacks and other curved or circular equipment. TR Curved Block insulation are available in standard 6" or 12" widths. Special sizes of blocks curved to a specific radius can also be manufactured.

Features

- Low thermal conductivity
- Block construction 36" x 12"
- Good high temperature strength
- Variety of thicknesses up to 7"
- Resistant to cryolite vapors

Applications

- Side and end wall insulating material in carbon baking pits
- Backup insulation in aluminum pot cells, reheat and pusher furnaces, copper reverberatory furnaces, and oil-fired water tube boilers
- Interior and exterior use on bustle pipes, hot air pipes, stacks and other curved or circular equipment

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Physical Properties

	TR-19	TR-19HS	TR-20
Maximum Service Temperature, °F (°C)	1900 (1040)	1900 (1040)	2000 (1095)
Density, pcf (kg/m ³), ASTM C 303			
@ dried	25 (400)	36 (577)	29 (465)
@ 1900°F (1038°C)	24 (384)	34 (529)	–
@ 2000°F (1093°C)	–	–	30 (481)
Cold Crushing Strength, psi (MPa), ASTM C 165			
dried	175 (1.2)	275 (1.9)	180 (1.2)
fired 24 hours @ use limit	65 (0.5)	–	180 (1.2)
Modulus of Rupture, psi (MPa), ASTM C 203			
@ dried	125 (0.9)	200 (1.4)	135 (0.9)
fired 24 hours @ 1900°F (1038°C)	75 (0.5)	–	145 (1.0)
fired 24 hours @ 2000°F (1093°C)	–	–	216 (1.5)
Porosity, %, ASTM C 493	93	85	91
Specific Heat, Btu/(lb°F) {kJ/(kg•K)}	0.20 (0.8)	0.20 (0.8)	0.24 (1.0)
Linear Shrinkage, %, ASTM C 356			
fired 24 hours @ 1900°F (1038°C)	1.75	2.0	–
fired 24 hours @ 2000°F (1093°C)	–	–	4

Chemical Analysis, %

Silica, SiO ₂	39	39	80
Alumina, Al ₂ O ₃	11.6	11.6	4.3
Calcium oxide, CaO	21.5	21.5	11
Ferric oxide, Fe ₂ O ₃	9.2	9.2	1.6
Titanium oxide, TiO ₂	1.6	1.6	0.2
Magnesium oxide, MgO	12.2	12.2	0.8
Alkalies, as, Na ₂ O & K ₂ O	4.0	4.0	1.5

Thermal Conductivity, BTU•in./hr•ft²•°F (w/m•K) ASTM C 201

Mean temperature			
@ 500°F (260°C)	0.72 (0.11)	1.10 (0.16)	0.68 (0.09)
@ 1000°F (538°C)	0.83 (0.13)	1.16 (0.17)	0.79 (0.11)
@ 1500°F (816°C)	0.99 (0.15)	1.20 (0.17)	0.96 (0.14)
@ 1900°F (1038°C)	1.14 (0.17)	1.35 (0.20)	–
@ 2000°F (1093°C)	–	–	1.16 (0.17)

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 Morgan Thermal Ceramics office to obtain current information.