Kaolite® 1600, 1800, 1800 Gun

Datasheet Code US: 314-100 SDS: 103 / 153

Product Description

Tri-Mor Kaolite 1600, 1800 and 1800 Gun insulating monolithics reduce both the quantity of heat storage and heat transfer through the lining producing significant savings in furnace fuel consumption. The lower densities of these vermiculite containing Kaolite monolithics reduce the amount of supporting furnace steel work required and provide more insulation capability with a thinner lining. These products can be cast, poured, or gunited.

Kaolite 1600 is a very lightweight, low thermal conductivity vermiculite based monolithic designed for backup insulation applications up to 1600°F (871°C). Kaolite 1600 contains Portland cement which limits use temperature to 1600°F (871°C); however, this makes it an economical product based on cost per cubic foot.

Kaolite 1800 and Kaolite 1800 Gun are very lightweight, low thermal conductivity, vermiculite based monolithics designed for backup insulation applications up to 1800°F (982°C). They contain a calcium-aluminate cement which gives them higher temperature capability. Typical applications would be low-temperature lining for ovens and ductwork lining.

Instructions for Using

Casting

Highest strength is obtained by using the least amount of clean mixing water and working material into place by lightly vibrating. A mechanical mixer is required for proper placement (paddle- type mortar mixers are best suited). Mix for 3 minutes to achieve a ball-in-hand consistency and place material within 30 minutes.

Gunning

Use suitable gunite equipment. To reduce rebound and dust pre-dampen material uniformly with approximately 12 - 24% by weight clean water in mechanical mixer before placing into gun. Add required water at nozzle for effective placement. Suggested air pressure at the nozzle is between 18 and 25 psi (0.12 and 0.17 MPa).

Precautions

Store bagged monolithics in a dry place, off the ground and, when possible with the original shrink wrapping intact. Watertight forms must be used when placing material. All porous surfaces that will come into contact with the material must be waterproofed with a suitable coating or membrane. Cure 24 hours under damp conditions before initial heat-up. Keep freshly placed monolithic warm during cold weather, ideally between 50°F and 80°F (10°C and 27°C).

New monolithic installations must be heated slowly the first time. Freshly placed lightweight monolithics are sometimes prone to a deteriorating condition called alkali hydrolysis when they are kept in a non-dried state for a sustained period of time. Under these conditions, the monolithics should be force dried soon after placement to help retard the possible deterioration.

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Monolithic Product Name	Kaolite 1600		Kaolite 1800		Kaolite 1800 Gun
Material method of installation	cast	gun	cast	gun	gun
Physical Properties					
Temperature use limit, °F	1600	1600	1800	1800	1800
Temperature use limit, °C	871	871	982	982	982
Placement, average lb to place 1 ft^3	25	34	26	33	33
Placement, average kg to place 1 m^3	11	16	12	14	14
Pounds per bag, lb	20	20	20	20	20
Pounds per bag, kg	9	9	9	9	9
Shelf life, months	12	12	12	12	12
Water, %, recommended					
casting by vibrating	140-160	140-160	145-165	145-165	-
pouring	165-180	165-180	170-185	170-185	-
Density, ASTM C 134, pcf					
dried 24 hrs @ 220°F	29-39	33-45	29-39	31-42	28-38
fired @ 1500°F	23-32	27-38	23-31	25-36	25-35
Density, ASTM C 134, kg/m^3					
dried 24 hrs @ 104°C	464-625	529-721	464-625	497-673	449-609
fired @ 816°C	368-513	432-609	368-496	400-577	400-561
Modulus of Rupture, MOR, ASTM C 133, psi					
dried 24 hrs @ 220°F	60-125	70-150	40-70	50-80	50-90
fired 5 hrs @ 1500°F	20-45	30-55	30-50	40-60	55-100
fired 5 hrs @ temperature use limit, °F	25-40	35-50	25-40	40-60	55-100
Modulus of Rupture, MOR, ASTM C 133, MPa					
dried 24 hrs @ 104°C	0.41-0.86	0.48-1.03	0.27-0.48	0.34-0.55	0.34-0.62
fired 5 hrs @ 816°C	0.14-0.31	0.21-0.34	0.21-0.34	0.27-0.41	0.38-0.69
fired 5 hrs @ temperature use limit, °C	0.17-0.27	0.24-0.34	0.17-0.27	0.27-0.41	0.41-0.69
Cold crushing strength, CCS, ASTM C 133, psi					
dried 24 hrs @ 220°F	150-300	175-350	75-150	80-150	90-175
fired 5 hrs @ 1500°F	100-200	120-250	80-150	90-175	95-180
fired 5 hrs @ temperature use limit, °F	70-120	90-160	50-90	70-150	80-175
Cold crushing strength, CCS, ASTM C 133, MPa					
dried 24 hrs @ 104°C	1.03-2.07	1.21-2.41	0.52-1.03	0.55-1.03	0.62-1.21
fired 5 hrs @ 816°C	0.69-1.38	0.83-1.72	0.55-1.03	0.62-1.21	0.66-1.24
fired 5 hrs @ temperature use limit, °C	0.48-0.83	0.62-1.10	0.34-0.62	0.48-1.03	0.55-1.21
Permanent Linear Shrinkage, ASTM C 113, %					
dried 24 hrs @ 220°F (104°C)	0 to -0.3	0 to -0.3	0 to -0.3	0 to -0.3	0 to -0.3
fired 5 hrs @ 1500°F (816°C)	-1.0 to -2.0	-1.0 to -2.0	-1.0 to -1.8	-1.0 to -1.8	-0.8 to -1.8
fired 5 hrs @ temperature use limit, °F (°C)	-1.5 to -2.5	-1.5 to -2.5	-1.5 to -2.5	-1.5 to -2.5	-1.5 to -2.5

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Chemical Analysis, % weight basis after firing					
Alumina, Al_2O_3	9.9	9.9	30	30	27
Silica, SiO_2	31	31	29	29	39
Ferric Oxide, Fe_2O_3	7.4	7.4	9.2	9.2	7.0
Titanium Oxide, TiO_2	1.1	1.1	2	2	1.6
Calcium Oxide, CaO	39	39	18	18	15.5
Magnesium Oxide, MgO	8.2	8.2	8.1	8.1	6.3
Alkalies as Na_2O and K_2O	3.4	3.4	3.1	3.1	3.5
Thermal Conductivity, BTU•in/hr•ft^2, per ASTM C201					
Mean Temperature @ 500°F	0.87	1.03	0.75	0.75	0.74
1000°F	1.02	1.11	0.95	0.95	0.90
1500°F	1.16	1.2	1.15	1.15	1.06
Thermal Conductivity, W/m•K, per ASTM C201					
Mean temperature @ 260°C	0.13	0.15	0.11	0.11	0.11
538°C	0.15	0.16	0.14	0.14	0.13
815°C	0.17	0.17	0.16	0.16	0.15