Kao-Tuff™ FS Monolithic

Product Data Sheet

Product Description

Kao-Tuff FS is a medium-weight, fused silica based monolithic with excellent thermal shock resistance. It is installed by standard vibratory casting techniques.

Instructions for Using

Casting: Highest strength is obtained with a monolithic refractory by using the least amount of clean mixing water which will allow thorough working of material into place by vibrating or rodding. A mechanical mixer is required for proper placement (paddle type mortar mixer best suited). After adding the recommended amount of water to achieve a ball-in-hand consistency, wet mix for 4-6 minutes. Place material within 30 minutes after mixing.

Precautions: Watertight forms must be used when placing material. All porous surfaces that will come in contact with the material must be waterproofed with a suitable coating or membrane. For maximum strength, cure 24 hours in a damp condition before initial heat-up. Keep freshly placed monolithic warm during cold weather, ideally between 16°C and 27°C (60°F and 80°F) until wet curing is complete. New monolithic installations must be heated slowly the first time.

For detailed installation instructions and commissioning schedules, please contact your Morgan Advanced Materials-Thermal Ceramics representative.

Properties	Kao-Tuff FS
Region of Manufacture	Americas
Bond type	Hydraulic
Raw material base	Fused Silica
Method of installation	Vibratory Cast
Maximum grain size, mm	6
Maximum service temperature, °C (°F)	1316 (2400)
Net material requirement, kg/m^3 (pcf)	2019 (126)
Water addition, % by weight	
casting by vibrating	5.5-6.5
Packaging in bags, kg (lbs)	25 (55)

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Properties	Kao-Tuff FS
Bulk Density, kg/m^3 (pcf), ASTM C134	
dried 24 hours @ 105°C (220°F)	1986-2147 (124-134)
fired 5 hours @ 816°C (1500°F)	1938-2098 (121-131)
Modulus of Rupture, MPa (psi), ASTM C133	
dried 24 hours @ 105°C (220°F)	4.8-8.3 (700-1200)
fired 5 hours @ 816°C (1500°F)	4.1-6.9 (600-1000)
Cold Crushing Strength, MPa (psi), ASTM C133	
dried 24 hours @ 105°C (220°F)	41.4-65.5 (6000-9500)
fired 5 hours @ 816°C (1500°F)	34.5-62.1 (5000-9000)
fired 5 hours @ maximum service temperature °C (°F)	41.4-69.0 (6000-10000)
Permanent Linear Change, %, ASTM C113	
dried 24 hours @ 105°C (220°F)	0 to -0.2
fired 5 hours @ 816°C (1500°F)	-0.1 to -0.3
fired 5 hours @ maximum service temperature °C (°F)	-0.2 to -0.5
Abrasion loss, cm^3, ASTM C704	
fired 5 hours @ 816°C (1500°F)	12-22
Chemical Analysis, %, Calcined Basis	
Alumina, Al_2O_3	21
Silica, SiO_2	75
Iron Oxide, Fe_2O_3	0.2
Titania, TiO_2	0.4
Lime, CaO	2.3
Magnesia, MgO	0.1
Alkali as, $Na_2O + K_2O$	0.1
Thermal Conductivity, W.m•K (BTU•in/hr•ft^2•°F) , ASTM C417	
260°C (500°F)	1.21 (8.4)
538°C (1000°F)	1.34 (9.3)
816°C (1500°F)	1.41 (9.8)
1093°C (2000°F)	1.43 (9.9)

Storage and Shelf Life

- Monolithics should be stored in a dry, well-ventilated area and held off the ground on pallets ideally with the original packaging intact. Keep out of rain and damp conditions.
- Normal shelf life is 9 months from date of manufacture when properly stored.

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