Hicast® 90 Monolithic

Product Data Sheet

Product Description

Hicast 90 is a 93% alumina low cement product designed for extremely rugged applications requiring hot strength and excellent load bearing characteristics. At 190 pcf density, Hicast 90 is comparable to pressed high-alumina brick, with actual hot strengths at intermediate temperatures superior to a 90% alumina brick.

Instructions for using

Casting: Highest strength is obtained with monolithic refractory by using the least amount of clean mixing water that will allow thorough working of material into place by vibration. A mechanical mixer is required for proper placement (paddle type mortar mixers are best suited). After adding the recommended amount of water, wet mix for 5-6 minutes. Place material within 20 minutes after mixing.

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 –48 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 it has taken a firm set and 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	Hicast 90
Region of Manufacture	Americas
Bond type	Hydraulic
Raw material base	Tabular Alumina
Method of installation	Cast
Maximum grain size, mm	6
Maximum service temperature, °C (°F)	1871 (3400)
Net material requirement, kg/m^3 (pcf)	2915 (182)
Water addition, % by weight	
casting by vibrating	4.4-5.0
Packaging in bags, kg (lbs)	25 (55)

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Bulk Density, kg/m^3 (pcf), ASTM C134	
fired 5 hours @ 816°C (1500°F)	2851-3027 (178-189)
Modulus of Rupture, MPa (psi), ASTM C133	
dried 24 hours @ 105°C (220°F)	11.0-16.6 (1600-2400)
fired 5 hours @ 816°C (1500°F)	10.3-14.5 (1500-2100)
Cold Crushing Strength, MPa (psi), ASTM C133	
dried 24 hours @ 105°C (220°F)	69.0-96.6 (10000-14000)
fired 5 hours @ 816°C (1500°F)	75.9-124.1 (11000-18000)
fired 5 hours @ maximum service temperature °C (°F)	89.7-137.9 (13000-20000)
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)	-0.5 to +0.5
Abrasion loss, cm^3, ASTM C704	
fired 5 hours @ 816°C (1500°F)	5 - 8
Chemical Analysis, %, Calcined Basis	
Alumina, Al_2O_3	93
Silica, SiO_2	5.0
Ferric Oxide, Fe_2O_3	0.1
Calcium Oxide, CaO	1.4
Alkali as, K_2O+Na_2O	0.4
Thermal Conductivity, W/m•K (BTU•in/hr•ft^2•°F) , ASTM C417	
260°C (500°F)	4.08 (28.3)
538°C (1000°F)	3.32 (23.0)
816°C (1500°F)	2.89 (20.0)
1093°C (2000°F)	2.67 (18.5)

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 6 months from date of manufacture when properly stored.

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