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23

**MONOLITHIC
REFRACTORIES**

REFRACTORY CASTABLE



A. Conventional Castable

Use high alumina bauxite, mullite or corundum as aggregate, high alumina cement as binding agent, conventional castable is with high compressive strength and excellent performance.

Aggregate could also be porous materials to get insulating castable

Applications

- Casting an alternative to fireclay and high alumina brick
- Application for cyclone preheater of cement kiln, ceramic kiln, ash coal hoppers coal and incinerators
- Casting at EAF roof core, burner block, nose ring and kiln load

Conventional Castable Product Data

| Type | Cast 13 | Cast 13ES | Cast 15 | Cast 16ES | Cast 17MT | Cast 18 |
|--|-----------|-----------|-----------|-----------|-----------|-----------|
| Maximum Service Temperature (°C) | 1300 | 1300 | 1500 | 1600 | 1700 | 1800 |
| Maximum Grain Size of Aggregates (mm) | 5 | 5 | 5 | 5 | 5 | 5 |
| Approximate Weight Required for Casting (kg/m ³) | 2010-2020 | 2010-2120 | 2200-2210 | 2300-2350 | 2550-2600 | 2700-2730 |
| Approximate Amount of Water Required For Casting (%) | 10-12 | 10-12 | 10-12 | 10-12 | 10 | 10-12 |
| Bulk Density After Drying At 110°C (kg/m ³) | 2050-2070 | 2110-2120 | 2250-2260 | 2350-2400 | 2500-2550 | 2800-2820 |
| Cold Crushing Strength After Drying At 110°C (MPa) | 35-38 | 40-45 | 30-32 | 40-50 | 35-38 | 49-50 |
| Modulus of Rupture After Drying At 110°C (Kg/cm ²) | 60-70 | 70-80 | 70-75 | 70-75 | 70-80 | 100-120 |
| Reheat Test, Permanent Linear Change After Heating At 1260°C (%) | +0.5 | +0.5 | -0.5 | -0.5 | -0.5 | -0.18 |
| SiO ₂ (%) | 57.1 | 47.5 | 45.0 | 33.1 | 6.3 | 0.5 |
| Al ₂ O ₃ (%) | 29.5 | 32.4 | 48.6 | 61.6 | 85.5 | 92.1 |
| Fe ₂ O ₃ (%) | 4.2 | 6.0 | 1.2 | 1.5 | 1.4 | 0.5 |

Insulating Castable Product Data

| Type | CAST 11LW | CAST 13LW |
|--|-----------|-----------|
| Maximum Service Temperature (°C) | 1100 | 1300 |
| Maximum Grain Size Of Aggregates (mm) | 3 | 5 |
| Approximate Weight Required For Casting (kg/m ³) | 800-900 | 1200-1300 |
| Approximate Amount of Water Required For Casting (%) | 40-50 | 35 |
| Bulk Density After Drying At 110°C (kg/m ³) | 900-950 | 1400-1450 |
| Cold Crushing Strength After Drying At 110°C (MPa) | 3-4 | 11-12 |
| Modulus Of Rupture After Drying At 110°C (Kg/cm ²) | 8.0 | 20-25 |
| Reheat Test, Permanent Linear Change After Heating At 1260°C (%) | -0.08 | -0.05 |
| SiO ₂ (%) | 55.0 | 47.1 |
| Al ₂ O ₃ (%) | 15.0 | 40.5 |
| Fe ₂ O ₃ (%) | 6.2 | 1.6 |

B. High Alumina Low Cement Castable

Less cement is added to decrease CaO content inside the castable, alumina powder is applied to increase strength and liquidity.

Low Cement Castable Product Data

| Type | C70 | NEO165 | C82 |
|--|-----------|--------|-----------|
| Maximum Service Temperature (°C) | 1600 | 1650 | 1700 |
| Maximum Grain Size Of Aggregates (mm) | 5 | 5 | 5 |
| Approximate Weight Required For Casting (kg/m ³) | 2400-2430 | 2550 | 2600-2630 |
| Approximate Amount Of Water Required For Casting (%) | 5.0-5.5 | 5.0 | 5.0-5.5 |
| Bulk Density After Drying At 110°C (kg/m ³) | 2430-2440 | 2560 | 2630-2640 |
| Cold Crushing Strength After Drying At 110°C (MPa) | 52-55 | 80-90 | 34-35 |
| Modulus Of Rupture After Drying At 110°C (Kg/cm ²) | 60-65 | 62-65 | 40 |
| Reheat Test, Permanent Linear Change After Heating At 1260°C (%) | -0.05 | -0.15 | -0.40 |
| SiO ₂ (%) | 36.1 | 22.4 | 13.1 |
| Al ₂ O ₃ (%) | 61.2 | 70.1 | 82.5 |
| Fe ₂ O ₃ (%) | 1.2 | 1.3 | 1.2 |
| CaO (%) | - | - | 1.5 |

PLASTIC REFRACTORIES

Plastic Refractories is phos-bonded, bauxite, mullite or corundum-based refractories are used as aggregate. Its unsurpassed resistance to acid and neutral as well as basic slags allows it to survive the corrosive environment. The plastic refractories do not require forms during insulation where anchors present except for flat arch constructions

Usually the binder of plastic refractories is liquid aluminium dihydrogen phosphate, the plasticity can be adjusted when are doing the installation. We can also supply the plastic refractories with powder binder, and plastic refractories ready for use (packed in cartons)



Plastic Refractories Product Data

| Item | | CPC65 | CPC75 | CPC80 | CPC90 |
|----------------------------------|--------------------------------|-------|-------|-------|-------|
| Service Temp (°C) | | 1550 | 1600 | 1650 | 1700 |
| Bulk Density (g/m ³) | | 2.4 | 2.5 | 2.6 | 2.8 |
| C.C.S. | 110°C | 30 | 65 | 80 | 85 |
| | 1110°C | 45 | 70 | 90 | 95 |
| | 1500°C | 50 | 90 | 100 | 110 |
| M.O.R. | 110°C | 8 | 9 | 10 | 12 |
| | 1110°C | 9 | 10 | 11 | 13 |
| | 1500°C | 10 | 11 | 12 | 14 |
| Max. Grain Size (mm) | | 5 | 5 | 5 | 5 |
| Chemical Analysis (%) | Al ₂ O ₃ | 65 | 75 | 80 | 90 |
| | Fe ₂ O ₃ | 2.0 | 2.0 | 1.8 | 1.5 |

Mixing Liquid Shall Be Supplied With The Plastic Refractories Powder

REFRACTORY MORTAR

PROPERTIES

For bonding the individual bricks together, protecting the joints from corrosion by slag and other furnace. It helps bricks to be used in acid conditions and suitable for light bonding between insulation bricks. High bonding strength with low shrinkage. It combines high refractoriness with smooth working properties. Available in both ready-to-use wet type and dry type.

APPLICATIONS

Used for laying all types of refractory blocks



Refractory Mortar Product Data

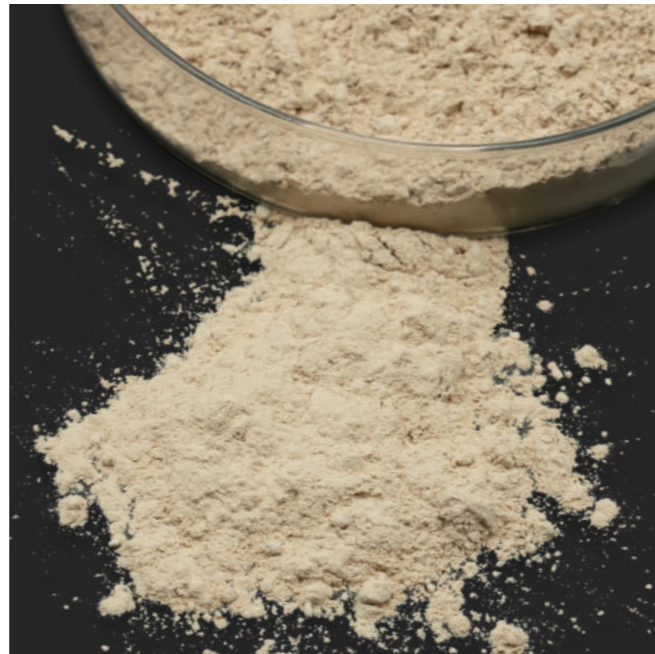
| CLASSIFICATION | MORTAR DATA SHEET | | | |
|--|-------------------------------|---|----------------------------------|--|
| | Mortar 30 HM | Mortar 43 AM | Mortar 70 HM | Mortar 80 PM |
| | HIGH-DUTY HEAT-SETTING MORTAR | SUPER-DUTY AIR-SETTING MORTAR(WET TYPE) | HIGH-ALUMINA HEAT-SETTING MORTAR | INORGANIC PHOSPHATE-BONDED HIGH-ALUMINA MORTAR(WET TYPE) |
| CHEMICAL COMPOSITION: (APPROXIMATE) | | | | |
| SiO ₂ (%) | 59 | 52.4 | 25.2 | 10.1 |
| Al ₂ O ₃ (%) | 32.3 | 43.5 | 70.1 | 80.0 |
| Fe ₂ O ₃ (%) | 1.8 | 1.4 | 1.5 | 1.8 |
| PHYSICAL PROPERTIES | | | | |
| Orton Cone | 30 | 33-34 | 37-38 | 38 |
| Approximate Amount Of Water For Trowelling Consistency | 20-25 | | 18-20 | 220-225 |
| Per 1000 Pcs 9' Standard Brick, Equivalent Thinly Trowelled Joints | 160-180 | 200-210 | 150-200 | |
| Modulus Of Rupture After Drying At 110°C(kg/cm ²) | 20 | 25 | 23 | 45 |

CALCIUM ALUMINATE CEMENT

LONG KETER is supplying a comprehensive range of Calcium Aluminate Cement

Feature

- Rapid-hardening, high strength
- High refractoriness, high service temperature
- Good resistance to corrosion, high wear resistance
- High thermal shock stability
- Low thermal conductivity, low linear shrinkage
- Good integrity with furnace lining, easy operation,
- Allow direct contact of fire, suitable for various atmosphere



■ Calcium Aluminate Cement Product Data

| Category | | CA50 | | |
|--|--------------------------------|-------|-------|-------|
| Product Grade | | A600 | A700 | A900 |
| Chemical Composition (%) | SiO ₂ | ≤8.0 | ≤7.5 | ≤6.0 |
| | Al ₂ O ₃ | ≥50.0 | ≥51.0 | ≥53.5 |
| | Fe ₂ O ₃ | ≤2.5 | ≤2.5 | ≤2.5 |
| | R ₂ O | ≤0.4 | ≤0.4 | ≤0.4 |
| | CaO | - | - | - |
| | MgO | - | - | - |
| 325M Residue On Sieve (%) | | ≤15 | ≤12 | ≤8 |
| Specific Surface Area/BET (m ² /kg) | | ≥300 | ≥320 | ≥350 |
| Initial Setting Time (min) | | ≥45 | ≥60 | ≥90 |
| Final Setting Time (h) | | ≤6 | ≤6 | ≤6 |
| Flexural Strength (MPa) | 1d | 6 | 6.5 | 8.0 |
| | 3d | 7 | 7.5 | 10.0 |
| Compressive Strength (MPa) | 1d | 45 | 55 | 72 |
| | 3d | 55 | 65 | 82 |

PURE CALCIUM ALUMINATE BINDER FOR REFRACTORY

- As with all hydraulic binders, Pure Calcium Aluminate Binder must be stored in dry conditions, off the ground. In this case, it will retain its properties for at least 12 months. In many instances, experience has demonstrated that properties are retained for more
- Calcium Aluminate cement is designed to be used at high temperature and harsh environment, is a pure calcium aluminate binder with an alumina content of approximately 70%-79%. It has outstanding performance during hydration and after exposure to high temperatures.



■ Pure Calcium Aluminate Binder For Refractory Product Data

| Category | LKTPC 71 | LKTPC 72 | LKTPC 80 | |
|--|----------|----------|----------|------|
| Al ₂ O ₃ (%) | > 68.5 | > 68 | > 79 | |
| CaO (%) | < 31 | < 12 | < 19.5 | |
| MgO (%) | < 0.5 | > 18 | < 0.5 | |
| SiO ₂ (%) | < 0.8 | < 1 | < 0.35 | |
| Fe ₂ O ₃ (%) | < 0.4 | < 0.5 | < 0.2 | |
| TiO ₂ (%) | < 0.4 | < 0.4 | < 0.3 | |
| K ₂ O+Na ₂ O (%) | < 0.5 | < 0.5 | < 0.7 | |
| Blaine Specific Surface (cm ² /g) | > 4000 | > 3500 | > 8000 | |
| Density (g/cm ³) | 2.9-3.05 | 2.95-3.1 | 3.2-3.3 | |
| Initial Set (min) | > 150 | > 140 | > 35 | |
| Final Set (min) | < 300 | < 500 | < 150 | |
| Compressive strength (MPa) | | | | |
| | 6h | > 20 | - | > 5 |
| | 24h | > 35 | > 10 | > 25 |



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