

# Technical data sheet

## HiPerCem<sup>®</sup> - Refractory



### General information

HiPerCem<sup>®</sup> is Calucem's new Calcium Aluminate Cement (CAC) binder system developed for use in highly sophisticated refractory castables. HiPerCem<sup>®</sup> is a very reactive, white Calcium Aluminate Cement that combines the high content of the reactive Monocalciumaluminate (CA) phase with an optimized particle size distribution and specific surface area. It does not contain any additives.

HiPerCem<sup>®</sup> provides customers increased flexibility for the formulation of advanced refractory castables.

The use of HiPerCem<sup>®</sup> makes it possible to design castable formulations with lower cement content- thus maximizing CO resistance and high temperature performance.

HiPerCem<sup>®</sup> is recommended for:

Castable types:	RCC, MCC, LCC, ULCC
Installation method:	Vibrational Self Flow Gunning

HiPerCem<sup>®</sup> has a shelf-life of approximately twelve (12) months when stored under dry conditions in paper bags or in 1 t big bags in the unopened original packing.

### Production

HiPerCem<sup>®</sup> is produced by fusing selected raw materials in special kilns. After cooling, the clinker is ground using ball mills.

### Technical data

HiPerCem<sup>®</sup> quality is strictly controlled at our production facility. The technical specifications are listed in the tables below. The usual range values are representative production values

### Chemical composition

Main Constituents	Usual Range (%)	Specification Limit (%)
Al <sub>2</sub> O <sub>3</sub>	63.0-65.0	> 62.5
CaO	33.0-35.0	< 35.5
SiO <sub>2</sub>	0.20-0.50	
Fe <sub>2</sub> O <sub>3</sub>	0.05-0.20	
MgO	< 0.50	
TiO <sub>2</sub>	< 0.30	
Na <sub>2</sub> O+K <sub>2</sub> O	< 0.40	
SO <sub>3</sub>	< 0.20	

### Mineralogical composition

Main mineral phase: CA

Minor mineral phases: CA<sub>2</sub>, C<sub>12</sub>A<sub>7</sub>

	Usual Range	Specification Limit
CA (%)	92 - 98	> 90
C <sub>12</sub> A <sub>7</sub> /CA	< 0.02	

### Fineness

	Usual Range	Specification Limit
Blaine (cm <sup>2</sup> /g):	4300-4700	> 4300
Residue 90µm:		< 5.0

### Setting time and compressive strength

The setting time and compressive strength is tested in a Tabular Alumina mortar (10% HiPerCem<sup>®</sup>, 90% Tabular Alumina and 10% water addition), in order to describe the behavior of HiPerCem<sup>®</sup> in refractory mixtures with a workable consistency.

The initial set is the first temperature rise in the exothermic profile, measured by a thermocouple. The final set is determined by the maximum temperature in the exothermic profile.

After setting, strength develops very rapidly. The compressive strength tests are conducted with Tabular Alumina mortar prisms (4 x 4 x 16 cm) which are produced according to modified EN 196-1.

	Tabular Alumina mortar
Initial set	> 160 min
Final set	maximum 350 min after initial set
Compressive Strength 24h	> 20 MPa

### Additional Information (for guidance only)

Bulk density approx.:	0.9 g/cm <sup>3</sup>
Specific gravity:	2.90-3.05 g/cm <sup>3</sup>
Refractoriness in cement approx.:	1560-1580 °C

## **Quality**

Like all other Caluцем products, the production of HiPerCem® is subject to stringent quality control. Constant monitoring of all components ensures a consistent quality. The production plant is certified according to EN ISO 9001 – certificate number CH08/1542 and the Environmental Management System EN ISO 14001 – certificate number CH08/1543.

## **Safety instructions**

The standard safety measures for cement must be followed. You will find further information in our Safety Data Sheet.

All previous Technical Data Sheets are no longer valid.