

<b>Type of product:</b>	Dense low cement content castable (LCC)
<b>Main component (s):</b>	High alumina raw materials / Zirconium
<b>Nature of bond:</b>	Hydraulic
<b>Maximum service temperature:</b>	1.600 °C
<b>Particle size distribution:</b>	0-6 mm
<b>Installation method:</b>	Casting-vibrating
<b>Water addition for mixing:</b>	4,5-6 l/100 kg
<b>Quantity required:</b>	2,60 t/m <sup>3</sup>
<b>State at delivery:</b>	Dry
<b>Packaging:</b>	Waterproof paper bag
<b>Storage life:</b>	6 months (under cover, fresh and dry place)

Properties	Method	Unit	Average values
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### Chemical analysis (calcined Basic)

Al <sub>2</sub> O <sub>3</sub>	FRX	%	55
SiO <sub>2</sub>	FRX	%	32
Fe <sub>2</sub> O <sub>3</sub>	FRX	%	0,9
CaO	FRX	%	1,5
ZrO <sub>2</sub>	FRX	%	7,5

### Physical properties

<b>Bulk density</b>	Dried at 110 °C	UNE EN ISO 1927-6:12	g/cm <sup>3</sup>	2,58
	Fired at 1200 °C		g/cm <sup>3</sup>	2,55
<b>Cold crushing strength</b>	Dried at 110 °C	UNE EN ISO 1927-6:12	MPa	90
	Fired at 800 °C		MPa	130
	Fired at 1200 °C		MPa	140
<b>Thermal conductivity</b>	200 °C	UNE EN-993-15:2005	W/m K	1,73
	600 °C		W/m K	1,68
	1000 °C		W/m K	1,65
<b>Permanent linear change</b>	Fired at 800 °C	UNE EN ISO 1927-6:12	%	-0,15
	Fired at 1200 °C			-0,25
<b>Resistance to abrasion</b>	Fired at 800 °C	ASTM C-704:07	cm <sup>3</sup>	-

Remarks: The test data are mean values, therefore do not represent a guarantee for technical specifications.

## Installation instructions

Dense refractory castables are, usually, hydraulically setting products. They are supplied as dry material and mixed with the corresponding amount of water (potable quality).

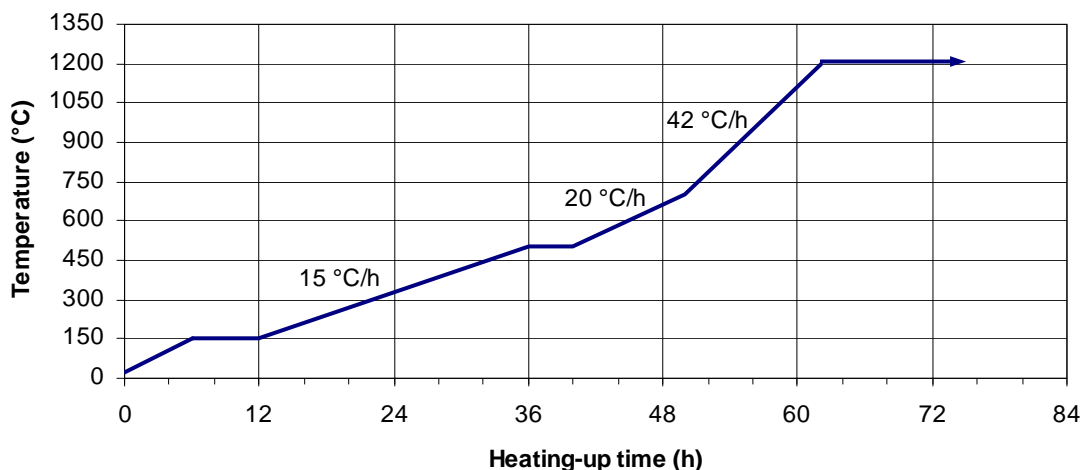
It's recommended mixing with a paddle mixer. The temperature of mixing must be at least 10° C: product, water, ambient. During mixing and low ambient temperatures the setting time retards and requires a longer waiting time; on the other hand, at temperatures above 25° C, setting processes can considerably be accelerated.

When the installation of castable requires a shuttering or it is on an old lining, dehumidification by dry absorbing surfaces must be prevented.

- When the castable is supplied as a 2-component material: to add both according to the indicated ratio and to mix in a dry state for approx. 2 minutes.
  - It's recommended to add first about 80 % of water specified (potable quality). Mix this and then to add slowly more water until the proper consistency for installation is achieved. The highest amount of water specified must not be exceeded
  - The total mixing time after water addition should be approx. 4 minutes. The change of "too dry" to "flow consistency" can occur suddenly, therefore, wait until the end of mixing time and do not force the consistency within a shorter time by adding too much water.
  - The water addition should be the one that castable demands, because an excess of water produces a slower setting and a reduction in mechanical properties; on the other hand, a shortage of water cause worse workability and deficient packing.
  - Thixotropic castables are compacted by means of suitable poker vibrator and/or external vibrator, avoiding air bubbles and cavity formation.
  - The mixed castable is installed without interruption, in panels according to the design and/or local conditions at site.
- S e t t i n g**
- Refractory castables harden at room temperature
  - Heat development during setting can happen due to the binding system, which supports the setting process, and the water loss must be prevented by spraying with water or other method.
  - For MCC and LCC castables, the shuttering can be removed from about 8 hours after the completed vibration. ULCC and NCC require a longer time until removal of shuttering. In the case of suspended linings, remove the shuttering after 24 hours. In any case, check the castable whether it has become hard before removal of shuttering. The setting time increases for low ambient temperatures, therefore, the waiting time is longer.

The total setting/air drying should normally be 24 hours after completed casting, being necessary to place a frost-protection. After drying and/or heating-up according our recommendations can be carried out.

## Initial heating-up schedule



Final temperature: 1200 °C

Total thickness of all no-dried refractory materials: 300 mm

For thickness > 300 mm, to increase 1 h. or to decrease the heating-up ramp 0,4 °C/h between 150 - 500 °C for each additional 10 mm.