

Technical Data Sheet

ISTRA 50 5.0

General information

ISTRA 50 5.0 is a next generation Calcium Aluminate Cement. It is normal setting, rapid hardening and has high early- and high final strength. ISTRA 50 5.0 has a beige color and is made of special calcium aluminate clinker. Its optimized particle size distribution and mineralogy improves flow and strength in refractory and most demanding building chemistry products like:

- Flooring products
- Technical mortars and tile adhesives
- Regular- and Low Cement Castables
- Insulating Refractory Castables

ISTRA 50 5.0 is tested according of EN 14647 for Calcium Aluminate Cements and has a shelf-life of approx. six (6) months when stored under dry conditions.

Production

ISTRA 50 5.0 is produced by melting selected raw materials (bauxite and limestone) in special kilns. After cooling, the special clinker is ground using ball mills.

Technical data

The following information represents typical values for the quality control carried out in our plant.

Chemical composition (%)

| | |
|--------------------------------|-------|
| SiO ₂ | ≤ 6 |
| Al ₂ O ₃ | 50–55 |
| Fe ₂ O ₃ | ≤ 3,0 |
| CaO | ≤ 40 |
| MgO | ≤ 1,5 |
| SO ₃ | ≤ 0,4 |

Mineralogical composition

ISTRA 50 5.0 contains mainly monocalcium aluminate (CA). This mineral phase is responsible for the high early strength. Fast setting minor phases (C₁₂A₇) are minimized. When mixed with water ISTRA 50 5.0 forms calcium aluminate hydrates as its hydration products.

Mineral phases of ISTRA 50 5.0

| | |
|-----------------------|---|
| main mineral phase: | CA > 60 |
| minor mineral phases: | C ₂ AS, CT, C ₁₂ A ₇ |

Cement technical properties

| | |
|----------------------------------|------------------------------|
| residue on sieve at | 90 μm < 3% |
| fineness (Blaine) approx. | 4100–4700 cm ² /g |
| bulk density approx. | 1 g/cm ³ |
| specific gravity | 3.0–3.1 g/cm ³ |
| refractoriness in cement approx. | 1440 °C |

Setting time and water demand

The testing of the setting time in mortar is conducted to describe the behavior of ISTRA 50 5.0 in mixtures with a workable consistency. A mixture containing CEN-standard sand and using a water/cement ratio of 0.40 is used for testing the mortar based on EN 14647.

| | Mortar |
|---------------------|-----------------------------------|
| Initial set | 2:00 – 5:00 h |
| Final set | maximum 120 min after initial set |
| Water demand | 27 ± 2% |

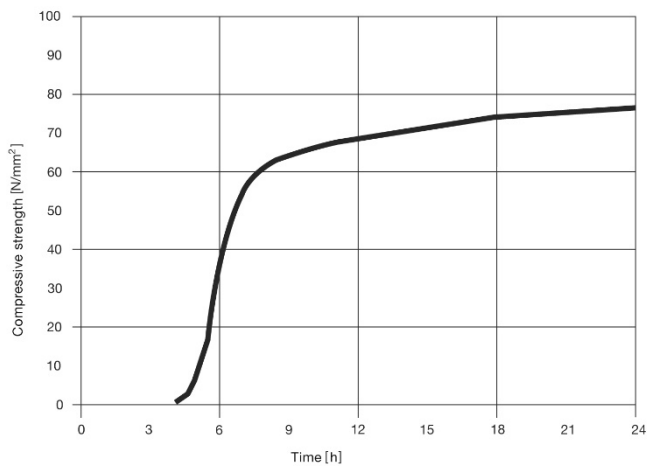
Development of strength

After setting, strength develops very rapidly. ISTRA 50 5.0 is a cement with very high early strength and high compressive strength. After one (1) day, the compressive strength is higher than of high grade Portland cements CEM I 52.5 R after 28 days.

Development of strength [N/mm²]

| Time | 6 h | 1 d |
|-----------------------------|-----|-----|
| Compressive strength | >18 | >60 |

The tests are conducted with mortar prisms 4 x 4 x 16 cm produced according to DIN EN 14647 containing CEN-standard sand and using a water/cement ratio of 0.40.



▶ Refractoriness

After drying out, mortars and concretes made from IS-TRA 50 5.0 slowly emit their hydrate water without destroying the matrix. At high temperatures (> 1000 °C), ceramic bonding occurs between the high alumina cement parts and the refractory aggregates. These ceramic bonds make IS-TRA 50 5.0 an excellent binder in refractory concretes and other refractory mortars or gunning mixes.

▶ Quality

Like all other Calucem products, the production of IS-TRA 50 5.0 is subject to stringent quality control. Constant monitoring of all components ensures a consistent quality. The production plant is certified according to EN ISO 9001:2015 – certificate number HR16/1555 and the Environmental Management System EN ISO 14001:2015 – certificate number HR16/1556

▶ Safety instructions

The normal safety measures for cement must be followed. You will find further information in our safety data sheet.

As of: 08/2018

All previous technical data sheets are no longer valid.