

SECAR® 51

1 Description

SECAR® 51 is a hydraulic binder, with an alumina content of approximately 50%.

The principal components of SECAR® 51 are calcium aluminates, which make it an ideal binder for refractory applications. SECAR® 51 is particularly rich in monocalcium aluminate which imparts excellent mechanical properties to mortars and concretes. The low iron oxide content of SECAR® 51 when combined with appropriate aggregates produces concretes well suited to withstand severe working conditions related to the presence of carbon monoxide or other reducing atmospheres.

The rheological properties of SECAR® 51 are well adapted for all types of placing methods, particularly for casting and gunning. It is recommended for applications where rapid hardening properties and excellent mechanical performance are required.

SECAR® 51 does not contain any additives, its use is recommended for refractory premixes.

SECAR® 51 is produced and controlled within a quality management system that is certified according to ISO 9001.

2 Specifications

The specification limits indicated are determined with an acceptable quality level (AQL) of 2.5% as defined in the sampling standard ISO 3951.

The usual range represents typical values of our production.

Chemical composition

Principal components (%)

| | Usual range | Specification limit |
|--------------------------------------|-------------|---------------------|
| Al ₂ O ₃ | 50.8 - 54.2 | > 50.0 |
| CaO | 35.9 - 38.9 | < 40.0 |
| SiO ₂ | 4.0 - 5.5 | < 6.0 |
| Fe ₂ O ₃ | 1.5 - 2.5 | < 2.8 |
| MgO | < 1.0 | - |
| TiO ₂ | < 4.0 | - |
| K ₂ O + Na ₂ O | < 0.5 | - |

- The chemical characteristics of SECAR® 51 have been determined according to the following standard: BS EN 196-2: Methods of testing cement; Chemical Analysis of Cement.

Fineness

| | Usual range | Specification limit |
|--|-------------|---------------------|
| Blaine specific surface (cm ² /g) | 3750 - 4250 | > 3700 |
| Residue at 90 µm (%) | - | < 5 |

- The specific surface area has been determined according to the standard: EN-196-6: Method of testing cement; Fineness Determination.

Workability

The workability of SECAR® 51 has been determined by measuring the flow properties using the ASTM C230 flow table. The test is carried out using a standard siliceous sand mortar.

| | Specification limit |
|-----------------------|---------------------|
| Flow after 30 min (%) | > 30 |

- Composition and preparation of the sand mortar is determined by standard EN 196-1 except: cement 500 g, sand 1350 g, water 200 g (W/C = 0.4).
- Tested after 30 minutes with 25 shocks in a conical ASTM mould, d₁ (diameter of base) = 100 mm. % of flow = d₂ (mm) - d₁(mm).

Setting time

| | Usual range | Specification limit |
|--------------------|-------------|---------------------|
| Initial set (min.) | 190 - 270 | > 150 |
| Final set (min.) | 210 - 300 | < 330 |

- Composition and preparation of the sand mortar is determined by standard EN 196-1 except: cement 500g, sand 1350g, water 200g (W/C = 0.4).
- Setting time measurement according to NF P15-431: Vicat apparatus standard EN 196-3 but using a 1000g test weight; temperature 20°C; samples immersed in water or cured at > 90% relative humidity.
- Final setting time measured in accordance with NF P 15-330: the Vicat needle no longer penetrates the mortar.

Mechanical resistance

| Compressive strength (MPa) | | |
|----------------------------|-------------|---------------------|
| Age | Usual range | Specification limit |
| 6 h | 20 - 55 | > 15 |
| 24 h | 55 - 85 | > 50 |

- Composition and preparation of the sand mortar according to EN 196-1 except: cement 500g, sand 1350g, water 200g (W/C = 0.4).
- Test conditions according to EN 196-1; test prisms 40 x 40 x 160 mm; temperature 20°C; prisms cured for 24 hours at > 90% relative humidity, followed by immersion in water.

3 Additional information

This information is given for guidance only.

Mineralogical composition

- Principal phase*: CA
- Secondary phase*: $C_{12}A_7$, C_2AS , CT

* C=CaO, A= Al_2O_3 , S= SiO_2 , T= TiO_2

Other physical characteristics

- Pyrometric cone equivalent: 1430 - 1450°C
- Bulk density: 900 - 1000 kg/m³
- Specific gravity: 2.95 - 3.05 g/cm³

4 Storage and shelf life

As with all hydraulic binders, SECAR® 51 must be stored in dry conditions, off the ground. In this case, it will retain its properties for at least 6 months. In many instances, experience has demonstrated that properties are retained for more than one year.

Kerneos warrants that the product complies with the specifications stated herein to the exclusion of any other warranty, express or implied. Kerneos makes no representation or warranty of any kind, either expressed or implied, as to the suitability or fitness for a particular purpose or use of the product. The warranty shall be limited to the replacement of the non-conforming products or, at Kerneos option, the refund of the purchase price. Any technical advice, recommendations or information are given based on Kerneos current knowledge and experience of the products and are deemed to be accurate. However, Kerneos undertakes no liability or responsibility of any kind with respect thereof. Users are invited to check that they have the latest version of this document.