

## 1 General Characteristics

All calcium aluminate cements possess the general properties of **good refractoriness** and **high early strength** when used alone as the principal hydraulic binder. The latter property is often used in combination with other minerals such as calcium sulfate and/or Portland cement to produce high early strengths and/or shrinkage compensation through the formation of ettringite.

Composed mainly of calcium aluminates, SECAR<sup>®</sup> 51 can be used as the primary binder or in combination with other reactive minerals.

Using SECAR<sup>®</sup> 51 as a refractory cement normally finds it as the primary binder in mortars and concretes exposed to refractory temperatures. SECAR<sup>®</sup> 51 is preferred by many for medium duty refractory concretes due to a low iron oxide content of approximately 2.5%.

For construction product formulators SECAR<sup>®</sup> 51 can be used in combination with other reactive minerals to form the binder in many formulations such as self-leveling floor products, fast setting patch materials, non shrink grouts and tile installation products.

SECAR<sup>®</sup> 51 additions to Portland cement will accelerate the initial set from hours to minutes depending on the type and mill of manufactured Portland cement.

SECAR<sup>®</sup> 51 is recommended for applications requiring rapid hardening properties, resistance to abrasion and mechanical shock, resistance to chemical attack and exposure to intermediate temperatures.

Calcium aluminate cements do not release Calcium Hydroxide as a hydration product when used as the sole hydraulic compound in a formulation. This

imparts good refractoriness, chemical resistance and eliminates the major cause of efflorescence.

As a binder, SECAR<sup>®</sup> 51 reacts with most organic and mineral additives to achieve exceptional flow with high early compressive strength.

SECAR<sup>®</sup> 51 is a light gray color and is the calcium aluminate cement closest in color to grey Portland cement. Colorimetry data is available on request.

SECAR<sup>®</sup> 51 does not contain any additives.

SECAR<sup>®</sup> 51 does not contain crystalline silica.

## 2 Specifications

SECAR<sup>®</sup> 51 produced and distributed in North America adheres to the following specifications:

Chemical constituents (% by XRF chemistry)			
Al <sub>2</sub> O <sub>3</sub>	CaO	SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>
≥ 50.0	≤ 40.0	≤ 6.0	≤ 3.0

- Blaine fineness: 3700-4400 cm<sup>2</sup>/g (ASTM C204)
- Residue at 90 microns (+170 mesh): < 5%

### Physical Properties (using EN-196 sand mortar)

- Flow at 30 min: ≥ 40% (ASTM C1437)
- Vicat Initial Set: ≥ 160 min.
- Vicat Final Set: ≤ 330 min

*Modified ASTM C191 - Needle weight is 1000g, needle diameter is 1.16 mm, samples immersed in water.*

- Compressive strength (ASTM C349)
  - 6 hr ≥ 725 psi (5.0 MPa)
  - 24 hr ≥ 9425 psi (65.0 MPa)

For detailed test procedures, please contact a Kerneos Technical or Quality Manager.

### 3 Additional Physical properties

- Bulk density: 1.07 – 1.26 g/cm<sup>3</sup> (66.8 – 78.9 lb/ft<sup>3</sup>)
- Specific gravity: approx. 3.04
- Pyrometric cone equivalent - ASTM C24 on neat cement paste: 14-15 (≈ 2570° F or 1410° C)

Minor constituents (% by XRF Chemistry)			
TiO <sub>2</sub>	MgO	SO <sub>3</sub>	K <sub>2</sub> O+Na <sub>2</sub> O
< 4.0	< 1.0	< 0.4	< 0.5

### Mineralogy

- Principal mineralogical phase:  
calcium aluminate CA
  - Secondary phases:  
C<sub>2</sub>AS
- C = CaO      A = Al<sub>2</sub>O<sub>3</sub>      S = SiO<sub>2</sub>      F = Fe<sub>2</sub>O<sub>3</sub>

### 4 Packaging & Shelf Life

SECAR<sup>®</sup> 51 is available palletized in 94 lb bags or 3000 lb. super sacks. It is also available in bulk semi-tanker or rail car.

SECAR<sup>®</sup> 51 packaging is designed to protect it from humidity. However, as with all hydraulic binders, it is recommended that SECAR<sup>®</sup> 51 not be placed outdoors or in direct contact with the ground. When correctly stored in dry conditions, the properties of SECAR<sup>®</sup> 51 will remain within specification limit for at least 6 months. In most cases, its properties will be retained for over a year.

#### KERNEOS LIMITED WARRANTY

Kerneos warrants that this product, at the time of shipment, conforms to the Specifications set forth in section 2 of this Product Data Sheet. All other information provided in this Product Data Sheet is for guidance only. ALL OTHER WARRANTIES, INCLUDING WITHOUT LIMITATION THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXCLUDED. Kerneos' sole obligation and the sole and exclusive remedy under this limited warranty shall be the replacement of any nonconforming product, or, at Kerneos' option, the refund of the purchase price. No warranty is given for any technical advice or recommendations provided by Kerneos. Buyer waives all claims under this limited warranty unless it has given written notice of nonconformity within 30 days of delivery.