

LUMNITE®

General information

LUMNITE® is a fused, low purity calcium aluminate (CA) cement typically used in refractory applications where service temperatures do not exceed 1350°C (2500°F). It also may be used in a variety of applications in construction, corrosion resistance and other industries.

LUMNITE® is composed of calcium aluminate phases which have the following characteristics:

- High early strength
- Refractoriness
- High abrasion resistance
- Resistance to biogenic sulfuric acid corrosion

LUMNITE® has a shelf life of approximately six months if stored in a dry environment with small temperature variations. Other environments may shorten or extend the shelf life.

Production

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

Quality

LUMNITE® is tested according to ASTM and other accepted procedures. Quality control data is available for each production lot.

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.

Technical data

The following information represents typical ranges for the chemical and physical properties of LUMNITE® produced at our plant.

Chemical composition, % (ASTM C-114)

SiO ₂	9.0% max
Al ₂ O ₃	44.0% min
Fe ₂ O ₃	9.0% max
CaO	37.0-41.0%
MgO	≤ 1.5%
SO ₃	< 0.4

Mineralogical composition

LUMNITE® contains mainly monocalcium aluminate (CA). This mineral phase is responsible for the high early strength.

When mixed with water, LUMNITE® forms calcium aluminate hydrates as its hydration products.

Mineral phases of LUMNITE®:

Main mineral phase	CA
Minor mineral phases	C ₂ AS, CT, C ₁₂ A ₇

Physical properties:

% retained on 325 mesh	< 25 %
Blaine Fineness (ASTM-204)	320 - 380 m ² /kg
Bulk density	approx. 1.15 g/cm ³
Specific gravity	3.0 - 3.1 g/cm ²
Approximate melting point:	1350°C / 2500°F

Setting time and water demand

The setting time is determined by ASTM C-403 using a test mortar. The strength and water demand are determined by ASTM C-109.

Initial set (hrs:min)	3:30 – 6:00
Final set	Maximum 120 min after initial set

Development of strength

Once setting has begun, strength develops very rapidly. After one day, the compressive strength is typically higher than Type I Portland cements after 28 days.

Typical development of strength versus time

Time	6 hrs	1 day
Compressive Strength (MPa)	-	>45

▶ Resistance against corrosion

High resistance against waste waters in combination with extraordinary abrasion resistance and high resistance against biogenic sulfuric acid corrosion (BSAC) makes LUMNITE® an ideal product for sewer systems and waste water plants. When LUMNITE® is mixed with water, the hydration products of calcium aluminate cement are formed. They are extremely resistant against aggressive, slightly acid waters (pH factor > 3) including water soluble sulfates.

▶ Refractoriness

LUMNITE® can be used in mild to moderate refractory applications, such as artificial fireplace logs and hearths, where temperatures do not exceed 1350 °C (2500 °F). LUMNITE® can be used in gunning mixes, as well as castables. It can be used as a stand-alone cement, or as part of a more complex hydraulic system.

▶ Mixing advice

As with Portland cement, ambient conditions and temperatures of the ingredients will influence the length of time LUMNITE® concretes and mortars will remain plastic and workable. Higher temperatures naturally will reduce this time while lower temperatures will extend it. Many types of mixes using LUMNITE® are extremely sensitive to the characteristics of each ingredient in the mix, and may require substantial lab testing to obtain optimum properties.

▶ Safety instructions

Please refer to our Material Safety Data Sheets for complete information. In general, CALUCEM calcium aluminate cements are not known to contain hazardous or toxic materials.

▶ Important notice

The information and statements herein are believed to be reliable, but are not to be construed as a warranty or representation for which we assume legal responsibility. No warranty, representation or condition of any kind, expressed or implied (including NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE) SHALL APPLY. Having no control over the use of cement, the seller will not guarantee finished work, nor shall the seller be liable for consequential damages.

▶ Note of caution

Dry cement powder is non-hazardous, but will act as an irritant if airborne cement dust is breathed. When mixed with water to make concrete, mortar or grout, skin or eye contact may cause mild to severe irritation. Care should be taken to minimize contact with cement powder or paste, and to avoid breathing any airborne cement dust.

Date: 09/2014 / This supersedes all earlier data sheets.