Product Data Sheet

Reference FC-FONDAG E -BT-GB-KFR-062011

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FONDAG® E

1 General description

FONDAG® E is a dry mixed concrete that enables a calcium aluminate concrete to be made with extremely high performance. It is specially designed for aggressive environments subject to one or more of the following conditions : high temperatures, repeated thermal shocks, abrasion, erosion, mechanical impact, chemical corrosion, etc.. The product is also designed to allow easy placing.

FONDAG® E is particularly adapted to very demanding applications including :

- Areas exposed to heat, thermal shock, abrasion and impact in steel and non-ferrous metallurgical industries
- Industrial floors exposed to intensive use under aggressive conditions : chemical, petrochemical, food industries, etc.
- Hydraulic infrastructures exposed to abrasion, erosion and cavitation : spillways, sills, flushing gates, jetty heads, sluice beds, etc.
- Industrial floors near high voltage installations requiring high electrical resistivity : floors surrounding aluminium furnances
- Areas exposed to projection of extremly low temperature gas or liquid

The outstanding performance of FONDAG® E is due to the combination of a very hard, dense, synthetic calcium aluminate aggregate and a calcium aluminate binder. By contrast to Portland cement concrete, FONDAG® E does not release Portlandite. This improves significantly refractory properties and resistance to chemical corrosion as well as elminating the major cause of efflorescence. Its key benefits are :

- Resistance to both high temperatures (up to 1100°C) and low temperatures (down to -180°C), and repeated thermal shock
- High resistance to abrasion, erosion, wearing and mechanical shock
- Resistance to corrosion by diluted acids (pH > 3.5), sulphates, oils, industrial waste and aggressive water
- High electrical resistivity
- Rapid hardening (return to service within 6-8 hours)
- Adjustable workability and working time with admixtures

2 Specifications

The specification limits 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 the production.

Chemical analysis

Main constituants (%)	Usual range
Al_2O_3	≥ 36
CaO	≤ 41
SiO_2	≤ 8
Fe_2O_3	≤ 18

* Chemical analysis is determined according to the EN 196-2. The product (including aggregates and binder) is milled to powder prior to the analysis.

Sieve analysis

Cumulative passing (%)		
sieve size	usual range	Specification limits
10 mm	95 - 99	≥ 93

Mechanical strength

Compressive strengh (MPa)	
Age	Specification limits
24 h	≥ 40

* Water addition : 10% by weight of FONDAG® E
* 100 mm cube; cured at 20°C and > 90% relative humidity

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3 Additional information

This information is given for guidance only.

- Wet density : 2500 - 2700 kg/m3
- Compressive strength at 8 hours (20°C) : ≥ 30 MPa
- FONDAG® E is subject to the conversion phenomenon. Only its strength after conversion measured according to the Annex A of EN14647 (about 40 MPa with 10% water addition) should be considered for design purposes.
- CNR index : ≤ 0.7
- Mechanical strength after firing at high temperature

	Compressive Strengh (MPa)
110°C	70
800°C	50
1100°C	25

* Test conducted on 100 mm cubes. All samples cured for 24 h at 20°C & >90% relative humidity, then held for 24 h at 110°C. Some samples held for a further 6 h at 800°C or at 1100°C (+ 5°C/s) and then cooled down gradually.

4 Packaging and shelf life

• 25 kg bags (per pallet: 50 bags, 1250 kg) are particularly suitable for small volume mixers, such as a small field drum mixer. A 25 kg bag yields 10 litres of concrete. One pallet of 1250 kg produces 0.50 m3 of concrete.

• 1250 kg remote opening Big-Bags are particularly suitable for large volume mixers, such as truck mixer. One Big-Bag yields 0.50 m3 of concrete.

In common with all cementitious materials, FONDAG® E must be stored in dry conditions, off the ground. In this case, it will retain its properties for at least 12 months.

5 Guidelines for application

For more information, contact Kerneos representantive.

Water addition

The water addition should not exceed 10% of the dry weight of FONDAG® E, i.e. :

• ≤ 2.5 litres of water per 25kg bag

• ≤ 125 litres of water per 1250kg Big-Bag

It is important to respect the above recommended instructions to ensure the nominal properties.

Mixing

• Always use each bag or each Big-Bag entirely to avoid any risk of dry material segregation

• Use clean tools and equipment (no Portland cement build up)

• Prepare fresh potable water for a quantity of 10% by weight of the desired dry FONDAG® E

• Add 90% of the prepared water to the mixer with suitable admixture if necessary

• Add the desired quantity of FONDAG® E to the mixer

• Mix for at least 5 minutes or until mix is completely homogenous

• If necessary, add the remaining water until the desired consistency is achieved and ensure that the mix is homogenious

Placing

FONDAG® E must be placed under vibration in order to obtain a good consolidation.

With the recommended water addition, FONDAG® E has at least a dry to plastic consistency (slump from 40 to 90 mm). This consistency is suitable for vibration. The working time is at least 90 minutes at 20°C. Longer working time can be obtained with suitable retarder.

Curing

To ensure the nominal properties of FONDAG® E, curing practices comparable to those used for normal Portland concrete should be followed in all circumstances, in both cold and hot ambient conditions, to avoid premature drying. The curing method could be:

• Waterproof plastic sheet placed as soon as possible and must be in place prior to the beginning of hardening

• Wet textile or water spray applied as soon as the concrete begins to set

• Sufficient quantity of curing agent applied in accordance with the manufacturer's recommendations, and subject to trial approval.

•Any other appropriate means.

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