BUILDING TRUST

PRODUCT DATA SHEET

SikaCem® FLC 100

(formerly MasterRoc® FLC 100)

A powdered admixture for the production of non-shrink, high strength grouts for posttensioned cables and fixing anchors or bolts in concrete or rock

DESCRIPTION

SikaCem® FLC 100 is a chloride free admixture in powder form. It is added at the rate of 6% by weight of cement to produce a flowable, pumpable, non-shrink, non-segregating, impermeable grout, providing high strength and high bond to steel. The most important property SikaCem® FLC 100 imparts to grout is the ability to protect cables against corrosion from aggressive agents and stress.

Inadequate protection against corrosion offered by normal grouts is due to:

a) Excessive capillary microporosity due to high water/cement ratio. Using SikaCem® FLC 100 the water/cement ratio is reduced to 0.3

b) High macroporosity caused by bleed water collecting under strands and in the upper part of the sheath. When bleed water evaporates and is reabsorbed by the cement paste, voids form thus providing easy access for corrosive substances. European recommendations on prestressed concrete (FIP) prescribe that the volume of bleed water must not exceed 0.5%. With the use of SikaCem® FLC 100, the volume of bleed water is considerably lower: it ranges from 0 to a maximum of 2% depending upon the type of cement used.

c) Shrinkage of cement paste and consequent cracking. With normal cement grouts final shrinkage varies from 2 to 3mm. SikaCem® FLC 100 allows not only shrinkage to be eliminated completely, but also slight expansion to occur during setting and hardening.

USES

The production of non-shrink, high strength grouts for posttensioned cables and fixing anchors or bolts in concrete or rock.

The main properties of grouts containing 6% of SikaCem® FLC 100, can be summed up as follows:

- Very high flowability (as measured by the Flow Cone Test) without bleed water or with a very low amount of it. The pumpability of the grout is assured for at least two hours at + 20°C.
- High mix water retention. This very important property imparts high cohesion to the very flowable mix. Under vacuum, of 600 mm Hg, over 90% of the water is retained by the SikaCem® FLC 100. Inadequate water retention would allow water to separate from solid components when the grout is forced through strands of tendons.

CHARACTERISTICS / ADVANTAGES

- Absence of shrinkage, and expansion ranging from 200 to 800 µm/m depending upon the type of cement used.
- Initial setting time in excess of 3 hours at +30°C.
- High early and ultimate strengths: depending on the type of Portland cement used, Compressive strength - (EN 196 PT 1) can range from:

15 to 26 N/mm² at 1 day
50 to 70 N/mm² at 28 days

Slightly lower values are obtained if pozzolanic or slag cements are used.

- High bond to steel: after 7 days the value is in excess of 15 N/mm².

Owing to its high flowability, a cement grout made with 6% by weight of SikaCem® FLC 100 assures the complete filling of sheaths, especially among the strands of cables. This ensures maximum protection of steel against corrosion caused by aggressive agents. As this high flowability is obtained with a low water / cement ratio, the hardened cement paste is dense, compact, impermeable and, therefore, highly durable. On the other hand, the high cohesion and fluidity of the fresh mix, together with freedom from shrinkage, prevents the formation of voids which are often responsible for the penetration of aggressive agents.

PRODUCT INFORMATION

Packaging	SikaCem® FLC 100 is supplied in 500kg bags.
Shelf Life	12 months from date of manufacture. Failure to comply with the recommended storage conditions may result in premature deterioration of the product or packaging. For specific storage advice consult the Sika Technical Services Department.
Storage Conditions	Store out of direct sunlight, clear of the ground on pallets protected from rainfall. Avoid excessive compaction. Do not use if the bag is damaged or has been opened for more than 1 month.

TECHNICAL INFORMATION

Specific Advice	MIXING INSTRUCTIONS: Introduce approximately 25 litres of water per 100kg of cement into the mixer. Start the mixer and **add SikaCem® FLC 100 (6% by the weight of cement)** followed by the cement. Mix for 3 minutes until a plastic and homogeneous mixture is obtained. Add approximately 7 litres of water and mix for a further 2 minutes until the grout is flowable, without lumps and the flow cone empties in approximately 20 seconds. If a high-speed mixer is used (about 1500 r.p.m.) the total mixing time can be reduced from 5 to 3 minutes. The amount of mixing water necessary by weight of cement and SikaCem® FLC 100 is approximately 34% but can range from a minimum of 30% to a maximum of 38% depending upon the cement used. Finely ground cement usually requires a higher amount of water. The grout thus obtained can generally be pumped for at least 2 hours, unless the cement used shows a rapid or false set.

APPLICATION INFORMATION

Yield

Approximately 68 litres of highly flowable grout are obtained by mixing:
100 kg of cement,
6 kg of SikaCem® FLC 100
and 34 litres of water.

TYPICAL EXAMPLES OF PROPERTIES OF CEMENT PASTES CONTAINING 6 kg's OF SikaCem® FLC 100**:**

Type of cement OPC ASTM C-150 Type 1

Water (% by weight of cement) 34.5%

Flow-Cone test (EN 445) Initial = 15 s / 30min = 17 s

Bleed water (EN 445) less than 2% (by volume)

Expansion (at 3 hours) 0 - 2%

Setting times Initial > 3 hours / Final < 10 hours

BASIS OF PRODUCT DATA

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

LIMITATIONS

The temperature of walls and spaces where the grout is to be pumped should be between +5 and +40°C for optimum results. If the temperature is outside this range, consult your Sika representative.

SikaCem® FLC 100 is a chloride free product, which is especially important in the case of cables. However, chlorides can be introduced into a mix if brackish water or special types of cement are used. Therefore, the use of drinkable water (generally containing less than 40 mg/l of chloride) and chloride-free cements (Cl lower than 0.06% by weight of cement) is recommended. Though all Portland, pozzolanic or slag cements may be employed, the use of Portland cement Type I and, preferably, Type III, is recommended in cold weather.

ECOLOGY HEALTH AND SAFETY

As with all chemical products, care should be taken during use and storage to avoid contact with the eyes, mouth, skin and foodstuffs (which can also be tainted with vapour until product fully cured or dried). Treat splashes to eyes and skin immediately. If accidentally ingested, seek immediate medical attention. Keep away from children and animals. Reseal containers after use.
For detailed information, please consult the product Saftey Data Sheet (SDS).

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

LEGAL NOTES

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

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