FLUECO 100 C SFR

POURABLE PREMIXED FAST HARDENING CEMENT GROUT CONTAINING SYNTHETIC FIBRES, WITH RIGID STEEL FIBER REINFORCEMENT FOR PRECISION ANCHORING AND STRUCTURAL REPAIRS IN AGGRESSIVE ENVIRONMENTS AND AREAS SUBJECTED TO DYNAMIC LOADS

DRACO

REFURBISHMENT and PROTECTION LINE

POURABLE CEMENT MORTARS FOR REPAIRING AND ENLARGING THE SECTION OF CONCRETE STRUCTURES

FLUECO 100 C SFR is a pourable, premixed, quick setting and hardening one-component cementitious grout reinforced with rigid steel fibres for precision anchoring. **FLUECO 100 C SFR** has high early and final mechanical strength, even at low temperatures (-5 °C); it is waterproof, durable in service -even in aggressive environments- and resistant to shocks and dynamic loads. **FLUECO 110 C SFR** has a good resistance to chemical and environmental attacks and is suitable for all exposure classes defined in standard UNI 11104.

BENEFITS

FLUECO 100 C SFR is designed to carry out structural repairs and precision anchoring in short times

The main benefits of using the product are:

- ✓ **Fast strength development: FLUECO 100 C SFR** has a high early mechanical strength, thus permitting the structure to be used after 24 hours (+20 °C).
- ✓ **Resistance to sulphates and chemical and environmental attacks: FLUECO 100 C SFR** has high compactness, low capillary porosity and high resistance to aggressive agents present in the environment like chlorides and sulphates.
- ✓ **Outstanding mechanical strength: FLUECO 100 C SFR** withstands high static and dynamic loads, thus making it ideal for industrial applications.
- ✓ **Impermeable to water and carbon dioxide:** the chemical-physical characteristics of **FLUECO 100 C SFR** make it waterproof, resistant to freeze-thaw cycles and no subject to carbonation.
- ✓ **Applicable thickness 10 to 150 mm:** with its specific formula reinforced with steel fibres can be used in applications requiring grouting thicknesses between 10 and 150 mm without electro-welded mesh, even at low temperatures.
- ✓ **No crazing or plastic shrinkage cracking: FLUECO 100 C SFR** thanks to the use of synthetic fibres that counter cracking FLUECO 100 C SFR develops no craze-cracks or plastic shrinkage cracks.
- ✓ **Restrained expansion: FLUECO 100 C SF** contains materials that provide proper development of expansion even when air cured.
- ✓ **Long durability in service: FLUECO 100 C SFR** has been specially formulated to minimise cracking even with long cure times, thus ensuring the structure a longer service life of and a reduced maintenance.

USES

FLUECO 100 C SFR is ideal for structural repair, maintenance and restoration of damaged concrete and reinforced concrete structures exposed to aggressive environments. **FLUECO 100 C SFR** is especially recommended for:

- ✓ Laying and repair of road and motorway joints
- ✓ Anchoring of railroad sleepers, guides, machinery and equipment in general
- ✓ Repair of industrial and warehouse flooring and pavements of car parks and high-traffic transit areas
- ✓ Installation of covers of manholes and surface water drains, even in highly trafficked areas
- ✓ Grouting underneath industrial turbines, gen-sets and compressors, wire drawing, metal stamping and grinding machines.

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APPLICATION INSTRUCTIONS

SUBSTRATE CLEANING

- **Remove all flaking parts** from concrete in the area to be grouted, including cement laitance, by either mechanical chipping or high-pressure water cleaning being careful not to damage the substrate.
- **Remove spots, efflorescence or soaked-in stains** of oil, grease, paint, lime, dust, dirt etc.
- **Remove previous repair works**, if irreversibly damaged or deteriorated.

SUBSTRATE PREPARATION

- For a good bonding to the substrate **roughen the surface** mechanically by bush hammering, chipping or water jetting (the latter avoids damage to the substrate and is recommended for large areas) until reaching the sound, compact concrete layer. Roughen until reaching an interface roughness of at least 5 mm and make right angle cuts along the perimeter of the area to be treated to a depth of at least 10 mm. Roughening of the surface layer improves bond strength and ensures proper development of expansion.
- **Wet the surface with pressurised water up to saturation.** This prevents the substrate from absorbing water from the mix as this could lead to cracking and reduce adhesion. This operation also removes fragments resulting from roughening of the concrete substrate. Remove all free surface water with compressed air or rags

REBAR PROTECTION

- **Sandblast, waterblast or brush mechanically the reinforcement bars** and remove all loose particles such as rust flakes or loose debris that could lead to corrosion or affect adhesion. Concrete removal from the substrate by hydrodemolition also cleans the bars thoroughly, making sandblasting unnecessary.
- **Protect the reinforcement bars** by re-alkalising them with the corrosion-inhibiting agent **DRACOSTEEL.**

SUPPLEMENTAL REINFORCEMENT

- When for technical-structural reasons the design engineer so specifies, an electro-welded mesh with spacers (at a distance of at least 1 cm from the substrate) and a reinforcement cover of at least 1.5-2 cm can be installed.

PREPARATION

Mix **FLUECO 100 C SFR** using an on-site mortar mixer. Pour the water into the mixer drum in the recommended ratio: 2.75-3 litres of water every 25kg pack of **FLUECO 100 C SFR** (11-12%). Slowly add the powder while mixing for at least 4-5 minutes until a smooth, lump-free consistency is achieved. Make sure that all the product has been properly mixed and there is no powder left on the walls and the bottom of the mixer.

HOT WEATHER PRECAUTIONS

- Store FLUECO 100 C SFR in the shade.
- Use cool water.
- Grout in the early morning and stop when the sun's rays are strongest. It is recommended to start work late in the afternoon after wetting the substrate continuously for at least 6 hours.
- To get the most out of FLUECO 100 C SFR ensure proper curing by applying PROBETON CURING N by spray or by brush.

COLD WEATHER PRECAUTIONS

- Store FLUECO 100 C SFR in a heated environment, where possible.
- Use warm water.
- Do not apply the product if temperature is below -5 °C.
- Start work in the later hours of the morning.
- Ensure the substrate is not frozen.
- Prepare the substrate as indicated, then saturate with hot water continuously for at least 6 hours before applying FLUECO 100 C SFR. Remove any excess water from the surface

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APPLICATION

FLUECO 100 C SFR shall be applied by pouring. Place the grout on clean, roughened and water-saturated surfaces only, as described in the previous paragraph. Pour slowly and continuously to allow the grout to flow properly. Gently vibrate for proper compaction. After application, spread **FLUECO 100 C SFR** using a straight edge.

CURING

To ensure proper curing of the product even in dry weather or where surfaces are exposed to direct sun or wind, we recommend using the curing membrane PROBETON CURING N.

PACKAGING AND STORAGE

FLUECO 100 C SFR is packed in 25kg bags.

The product has a shelf life of 12 months if kept in a sheltered, dry place in its original packaging.

PRODUCT CHARACTERISTICS

APPEARANCE	Powder
COLOUR	grey
MAXIMUM AGGREGATE SIZE	2.5 mm
CHLORIDE ION CONTENT (≤ 0.05%)	≤ 0,05 %
PACKAGING	25kg bag

APPLICATION SPECIFICATIONS

COLOUR OF THE MIX	Grey
MIXING WATER	2.75 ÷ 3 l every 25kg bag (11-12%)
BULK DENSITY OF THE MIX	2400 kg/m^3
pH OF THE MIX	> 12
WORKABILITY - UNI EN 13395-1	210-220 mm
APPLICATION TEMPERATURE	-5°C ÷ +35°C
POT LIFE OF THE MIX	approx. 15-30 minutes (20°C and 50% RH)
COMPLETE HARDENING	approx. 28 days at +20 °C
APPLICATION THICKNESS	10-150 mm
CONSUMPTION	c. 20 kg/m^2 per cm of thickness

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PRODUCT PERFORMANCE

PERFORMANCE ITEM	TEST METHOD	REQUIREMENTS AS PER EN 1504-3 FOR CLASS R4 MORTARS	PRODUCT PERFORMANCE				
				-5°C	0°C	5°C	20°C
COMPRESSIVE STRENGH (MPa)	EN 12190	≥ 45 (after 28 days)	3 hours	>8	>15	>15	>25
			4 hours	>12	>20	>20	>35
			8 hours	>20	>30	>30	>40
			1day	>50	>55	>55	>60
			7days	>65	>65	>65	>70
			28days	>75	>75	>75	>85
FLEXURAL STRENGTH	EN 196/1	None	>15 MPa at 1 day >18 MPa at 7 days >24 MPa at 28 days				
MODULUS OF ELASTICITY IN COMPRESSION	EN 13412	≥ 20 GPa (after 28 days)	30 ± 2 GPa				
BOND STRENGTH TO CONCRETE (MC 0.40 concrete, water/cement ratio = 0.40 as per EN 1766)	EN 1542	≥ 2 MPa (after 28 days)	> 2 MPa				
RESISTANCE TO CRACKING	Ring test method	Crack-free after 180 days	Meets specification				
RESISTANCE TO CARBONATION – ACCELERATED METHOD	EN 13295	Carbonation depth ≤ reference concrete (type MC 0.45, water/cement ratio = 0.45) as per UNI 1766	Meets specification				
WATER IMPERMEABILITY -depth of penetration	EN 12390/8	None	< 5mm				
CAPILLARY WATER ABSORPTION	EN 13057	≤ 0,5 $kg/m^2 \cdot h^{0,5}$	< 0,35 $kg/m^2 \cdot h^{0,5}$				
THERMAL COMPATIBILITY measured as adhesion strength as per EN 1542 (MPa) – Reference concrete MC 0.4 as per UNI EN 1766:			> 2 MPa				
- freeze-thaw cycles with de-icing salts	EN 13687/1	≥ 2 MPa (after 50 cycles)					
- thunder-shower	EN 13687/2	≥ 2 MPa (after 30 cycles)					
- dry cycles	EN 13687/4	≥ 2 MPa (after 30 cycles)					
TOUGHNESS INDEX	ASTM C 1018-97	None	1st Cracking: > 20 kn I_{20} > 20				
SLIP BEHAVIOUR OF REINFORCEMENT	RILEM- CEB-FIP RC6-78	None	> 25 MPa				
TEST METHOD FOR METALLIC FIBRE CONCRETE - Measuring the flexural tensile strength (limit of proportionality (LOP), residual)	EN 14651	None	fR,1k = 6,9 MPa fR,2k = 8,5 MPa fR,3k = 7,6 MPa fR,4k = 6,5 MPa				
REACTION TO FIRE	EN 13501-1	Euroclass A1	A1				

NOTE: The performances indicated are obtained with a 210-220 mm consistency according to UNI EN 13395-1.

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