BUILDING TRUST

PRODUCT DATA SHEET

SikaGrout®-510 CS High Flow

High flow, non-shrink, high rapid strength, versatile (consistency can be adjusted), cementitious grout with sustainability benefits

PRODUCT DESCRIPTION

SikaGrout®-510 CS High Flow is a one-part, cementitious Product achieving rapid strength development, high ultimate strength, high flow and non-shrink properties. By adjusting the water content, different consistencies (liquid, plastic and mortar) can be achieved. Placed grout gives structural support and good vibration resistance.

USES

The Product is used for:

- Precision, high performance, grouting underneath machine bases and bed plates, stanchion bases, structural steelwork, etc.
- Grouting dowel bars between precast concrete units.
- Bedding joints in precast concrete sections.
- Sealing around penetrations.
- Fixing anchor bars and ground anchors.
- Repairing concrete structures and components.
- Void filling.
- Grouting thicknesses between 10 and 100 mm.
- Steel reinforcement anchoring.
- Interior and exterior applications.

CHARACTERISTICS / ADVANTAGES

- Ready to use - just add water.
- Easy to mix and apply.
- High strength.
- Excellent flow characteristics at the maximum permissible water content.
- Non-shrink (shrinkage compensated).
- Non-metallic and 'chloride-free' (<0.05%).
- Low water absorption.
- Durable.
- No segregation or bleeding.
- Low permeability.
- Non-corrosive.
- Resistance to sea water and mild alkali attack.
- High flowability retention.
- Pumpable and pourable.
- Adjustable water content for varying applications.
- Quality assured factory blend.
- Application thickness range 10 mm to 100 mm.
- Uses supplementary cementitious materials (SCMs) for improved sustainability.
- Reaction to fire EuroClass A1.

APPROVALS / STANDARDS

- CE marking and declaration of performance based on EN 1504-3: Products and systems for the protection and repair of concrete structures — Structural and non-structural repair.
- CE marking and declaration of performance based on EN 1504-6: Products and systems for the protection and repair of concrete structures — Anchoring reinforcing steel bar.

PRODUCT INFORMATION

Chemical Base

Cement, selected fillers and aggregates, supplementary cementitious materials (SCMs) and special synergistic additives

Packaging

25kg bags

Appearance / Colour

Grey powder

Shelf Life

9 months

Storage Conditions

Store properly in dry conditions in undamaged and unopened original sealed packaging.

Density

~2150 kg/m³

Maximum Grain Size

D_{max}: ~0.8 mm

Consistency

Adjusting the water content alters the consistency, allowing the Product to achieve the following consistencies:

Consistency	Water Content	Initial Flow
Pourable Mortar	14.4% (3.6 litres per 25kg bag)	100 mm
Flowable / Plastic Mortar	17.2% (4.3 litres per 25kg bag)	270 mm
Fluid / Liquid Grout	19.2% (4.8 litres per 25kg bag)	340 mm

NOTE: Assessment made at +20°C.

Soluble Chloride Ion Content

≤0.01% (EN 1015-17)

Compressive Strength

	Compressive Strength				
Consistency	1 Day	3 Days	7 Days	28 Days	Standard
Mortar (14.4% water)	~45 MPa	~65 MPa	~70 MPa	~75 MPa	EN 12190
Plastic (17.2% water)	~40 MPa	~60 MPa	~65 MPa	~70 MPa	EN 12190
Liquid (19.2% water)	~25 MPa	~40 MPa	~50 MPa	~60 MPa	EN 12190

Modulus of Elasticity in Compression

≥20 GPa (EN 13412)

Pull-Out Resistance

Pull-out (Dry):	Displacement <0.6mm at load of 75 kN (EN 1504-6)	(EN 1881)
Pull-out (Wet):	Displacement <0.6mm at load of 75 kN (EN 1504-6)	

NOTE: Maximum dry load ~131.5 kN; maximum wet load ~140.0 kN.

Tensile adhesion strength

≥2.0 N/mm² (EN 1542)

NOTE: Tensile adhesion / bond strength determined on a reference concrete MC (0.40) slab made comprising of aggregates with a maximum size between 8 and 12 mm, with a sandblasted surface and saturated surface dry. SikaGrout®-510 CS High Flow applied at 10 mm.

Reaction to Fire

EuroClass A1 (EN 1504-3)

Freeze Thaw De-Icing Salt Resistance

~3.2 N/mm² (EN 13687-1)

NOTE: Measured bond strength after 50 cycles.

Capillary Absorption

0.09 kg / (m² x $h^{0.5}$) (EN 13057)

Chloride Content

64 mg/kg (tested on mixed, hardened material).
1 m³ of mixed, hardened material therefore contains 137,600 mg of chlorides, or 137.6 g.

Carbonation Resistance	Dk ≤ reference concrete MC(0.45)	(EN 13295)

APPLICATION INFORMATION

Mixing Ratio	Varying consistencies are achievable using the following water contents per 25 kg bag: Pourable Mortar ~3.6 litres Flowable / Plastic Mortar ~4.3 litres Fluid / Liquid Grout ~4.8 litres **NOTE:** The maximum water content shall be 4.8 litres per 25 kg bag.
Yield	25 kg yields ~13.25 litres of grout
Layer Thickness	10 mm minimum / 100 mm maximum
Product Temperature	+5°C minimum / +35°C maximum
Ambient Air Temperature	+5°C minimum / +35°C maximum
Substrate Temperature	+5°C minimum / +35°C maximum
Pot Life	~60 minutes
Initial set time	~260 minutes
Final set time	~290 minutes

VALUE BASE

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

- Do NOT exceed maximum water addition.
- Use only clean, potable water for mixing.
- Do NOT use vibrating pokers.
- If mixing with a drill and paddle:
  - The drill shall be high torque, slow speed (i.e. 200 to 500 rpm) with a suitable grout stirrer.
  - Use a clean, rigid mixing vessel - flexible containers (e.g. 'gorilla tubs') are unsuitable.
  - Add the appropriate quantity of clean, potable water to the mixing vessel first and gradually add the powder to the water, mixing continuously.
  - Keep the mixing head in the material - refrain from lifting in and out, as this will introduce air.
  - Once all powder has been added, mix until homogeneous (i.e. at least 3 minutes).
  - Do NOT try and mix too many bags at a time! Most drills and paddles are only capable of mixing one bag at a time. Large volumes require specialist machinery.
  - Once fully mixed, leave the grout to de-gas for 1 to 2 minutes before use.
- Use only on clean, sound substrates (concrete shall be soaked to saturated surface dry (SSD) condition).
- Avoid application in direct sun and / or strong wind.
- Pour or pump continuously from one side only (keep header boxes / hoppers topped up for the duration of the application).
- Keep exposed surfaces to a minimum.
- Do NOT add additional water during the surface finishing, as this will cause discoloration and / or cracking.
- Protect freshly applied material from freeze-thaw action.
- If applying in cold conditions (i.e. at 0°C to +5°C) the application area should be covered (e.g. use of a heated tent system) to create a micro-climate, which should then be heated to ~+20°C for a minimum of 2 days prior to application. Store the Product, water and equipment in this environment until also at ~+20 °C.
- Following application and if applied in cool conditions, or if cold conditions are expected, the use of insulating blankets or heated curing blankets is recommended for at least 72 hours to protect the fresh grout from cold temperatures and frost.
- To avoid cracking in warm temperatures, keep bags cool and use cold water.
- When the ambient temperature is warm, protect the working area from direct sunlight with temporary shelters or canopies. Do NOT expose equipment, materials or application to direct sunlight.
- When working in warm conditions and if being used, cover hoses with white membranes (or similar) to reflect heat and keep the hoses cool (or, if possible, do NOT use black / dark coloured hoses).

ECOLOGY, HEALTH AND SAFETY

User must read the most recent corresponding Safety Data Sheets (SDS) before using any products. The SDS provides information and advice on the safe handling, storage and disposal of chemical products and contains physical, ecological, toxicological and other safety-related data.

SUBSTRATE QUALITY

Concrete, Mortar and Stone:
Surfaces must be sound, clean, free from ice, oils, grease, standing water and any loose or friable particles and any other surface contaminants. The concrete 'pull-off' bond (tensile adhesion) strength should be >1.0 N/mm².
Steel and Iron:
Clean, free from oil or grease, rust and scale, etc.

SUBSTRATE PREPARATION

Substrate Preparation:
The substrate should be prepared by suitable mechanical preparation techniques such as high pressure water jetting, breakers, blastcleaning, scabblers, etc. The concrete substrates should be pre-soaked with clean water continuously for 2 to 6 hours to ensure a saturated surface dry (SSD) condition throughout the operation. Immediately before pouring the grout, remove all excess or standing water from within any formwork, cavities or pockets.
Shutter / Formwork:
All formwork should be of adequate strength, treated with release agent and sealed to prevent leakage. Sealing can be achieved by using Sikaflex® -11FC+ sealant beneath or around formwork and between joints. Ensure formwork includes outlets for extraction of the pre-soaking water. A header box / hopper should be constructed on one side of the formwork so that a grout head of 150 - 200 mm can be maintained during the grouting operation.

MIXING

Measure the appropriate amount of clean, potable water (if necessary, warm water to achieve a temperature between +15 and +20°C) to achieve the desired grout consistency given in the aforementioned table and pour into a clean, suitable mixing vessel for each complete unit of SikaGrout®-510 CS High Flow to be used. Flexible mixing vessels (e.g. 'gorilla tubs') are unsuitable - rigid vessels shall be used. Slowly add the powder to the water whilst continually mixing. Mechanical mixing should be carried out using either a high torque, slow speed (i.e. 200 to 500 rpm) drill with an appropriate grout stirrer, or a grout mixer set on slow speed for small mixes. The use of a drill and paddle (in most circumstances) is only suitable for mixing one bag at a time. For larger mixes, use forced action type mixers (NOT concrete tumble mixers which do NOT apply sufficient shear, NOR high speed or colloidal mixers, as these may cause thixotropy, leading to loss of flow). This Product is NOT suitable for mixing by hand. If using a drill and paddle, keep the mixing head in the material - refrain from lifting in and out, as this will introduce air. It is of utmost importance that the Product is mixed thoroughly to the desired consistency (i.e. for at least 3 minutes). Fresh grout (particularly at the highest water level) should be allowed to stand until the air entrapped by mixing has been released before application (typically 1 to 2 minutes).

APPLICATION

Immediately after mixing, and after the Product has been allowed to de-gas (which typically takes between 1 and 2 minutes), pour the mixed grout from one side of the formwork through the header box / hopper, ensuring continuous grout flow during the complete grouting operation to avoid trapping air. Keep header boxes / hoppers topped up for the duration of the application. Continue until the grout appears at the opposite side of the grouting area to the header box / hopper. Use steel banding or chains to assist flow where necessary. Do NOT disturb once grouting has been completed. For large volume placement, grout mixers and pumps are recommended (e.g. Putzmeister SP11 TMR).

CURING TREATMENT

After the grout has initially hardened, remove formwork and trim edges while concrete is ‘green’. Placed grout, which is exposed, should be cured in accordance with good concrete practice. Protect the fresh material from premature drying using an approved curing method (e.g. curing compound such as Sikafloor® ProSeal, moist geotextile membrane, hessian, polythene sheet, under water, etc.). In cold weather, apply insulating blankets or heated curing blankets to protect the Product and maintain a satisfactory constant temperature.

CLEANING OF TOOLS

Clean all tools and application equipment with water immediately after use. Hardened / cured material can only be mechanically removed.

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.

SIKA LIMITED
Watchmead
Welwyn Garden City
Hertfordshire, AL7 1BQ
Tel: 01707 394444
Web: www.sika.co.uk
Twitter: @SikaLimited