Powder Products
Using Sika Materials

Sika Egypt
Technical Department
Concrete Repair & Reinforcement Corrosion Protection

- Grouting (Cement Grout)
- Site batch mortars
- Repair Mortars
- Corrosion Protection & Ready to use mortar
- Concrete Waterproofing & Protection
- Cementitious Flooring
The Procedures for Repairing Concrete

Surface Preparation:
- In Case of cementitious repair for Concrete surface should be saturated dry with water (S.S.D) condition.
- Concrete surfaces should be sound, clean and free from oils, grease or surface contaminants.
- Remove all loosely adhering particles.

Steel Protection and Bonding Agent:
- Steel reinforcement is to be cleaned using steel brush to remove all adhering particles.
- Protect the Steel from corrosion using Sika Steel Protection materials.
- Use a bonding agent to bond the old concrete with the repairing mortar (concrete).
- Could use a material with a combination between both actions.
Using Cement-based Anti-Corrosive Rebar Coating:

Using Sika Top Armatec -108:

- Cement-based, Synthetic modified 2 component coating for corrosion protection. *(Green Color)*

**Mixing**
Fill component (A) (liquid) into a suitable mixing container and add the corresponding quantity of component (B) (powder). Mix together thoroughly for 3 minutes.

**Application**
Apply the first approx. 1 mm thick layer onto the prepared reinforcing steel with a medium-stiff brush. It is unavoidable that Sika Top Armatec® -108 will also be applied onto the surrounding concrete. The second coat is applied in the same way after a waiting time of 2 - 3 hours (at 20°C). Subsequent cement-based mortar repairs can be applied after the same waiting time. The waiting time is approx. 24 hours for synthetic-resin-based mortars. If repairs are to be delayed, the second layer of Sika Top Armatec® -108 to be broadcast with 0.4 - 0.7 mm quartz sand immediately after application and allowed to harden.
3.3 Epoxy-cement mortar

New Generation

Tri component: Epoxy + Cement = Sika EpoCem

Comp. Comp.

A + B C

Advantages of epoxy: Early strength, Chemical resistance
able to be over coated soon

+ Advantages of cement: adhesion to damp surface,
temperature resistance,
Modulus of elasticity, cost

=> Water Industry repairing work mainly
Using Cement-based Epoxy modified Anti-Corrosive Rebar Coating and bonding agent:

Using Sika Top Armatec -110 EpoCem:

- Cement-based epoxy modified three-component anti-corrosive coating and bonding agent.

**Mixing**
Shake component (A) and (B) thoroughly before opening. Pour both liquid components A+B into a suitable mixing vessel and mix for 30 seconds. Add Component (C) slowly while continuing to stir the mixture. Mix mechanically for 3 minutes, minimising addition of DO NOT ADD WATER!

**Application**
As reinforcement corrosion protection:
Apply first layer approx. 1 mm thick, using a medium hard brush or spray gun to the cleaned reinforcement. Apply 2nd layer when the first coat is hard to the finger mail (2 - 3 hrs. at +20°C)

As bonding primer:
Apply using medium hard brush or spry gun to prepared substrate. To achieve good bond. Freshly applied Sika Top Armatec® -110 EpoCem must be protected against contamination and rain until application of the repair mortar.
Repair mortars

Ordinary Repair mortars

One Component, Cement based, multi-purpose patching and repair mortar, incorporating the use of micro-fibers.

- Sika Rep (From 5 to 30 mm thickness)
- Sika Rep Fine (Up to 5 mm thickness)

Mixing
For normal applications add 4.25 - 4.5 litres of water per 25 Kg bag. Mixing should continue for a max 5 minutes after all the contents of the bag are placed in the mix water.

Application
Prime Surface with a slurry of Sika Rep® using a stiff brush. The recommended slurry consists of 5.0 - 5.5 litres of water per 25 Kg of Sika Rep®. While the slurry coat is still damp, apply Sika Rep® to a maximum thickness of 30 mm and compact thoroughly by trowel. For enhanced bonding characteristics use Sika Latex® in the slurry mix or use Sika Top Armatec® -110 Epocem as the bonding medium.
Cracks Repair
Sika Intraplast Z
Expanding Grout Admixture

**Dosage**
2% by weight of cement. (1 kg per 50 kg cement).

**Mixing**
A mixing time of 4 minutes with a W/C ratio of 0.36 - 0.40 has been found to give the best results.
The most effective mixing sequence has proven to be; water, cement and finally the admixture. Cements containing fly ash are unsuitable.

**Application**
Add directly to the cement mix water in the mixer.
**Sika Plug** (For Running water repair)

One Component Fast-Setting, Portland-cement Water stopper

**Mixing**

Mix with clean water to obtain desired consistency. Do not over-wet. Do not re-temper.

**Mixing ratio** water : powder is 1:4.

**Application**

Plug minor leaks first working from the edges. Place Sika Plug® firmly into the crack or hole. For large openings, form compound into a carrot shape, and when plug is firm, ram it into cavity. Hold in place with heel of rubber gloved hand. Let go, strike off flush with surface.
**Polymer modified repair mortars.**

is a cement based, polymer modified, *(Always two component)* repair mortar with added polyamide **fibers**.

- Sika Top 121
- Sika Top 122

**Mixing**

- Place the full contents of Comp. (A) in a suitable mixing container. Add Comp. (B) and mix for 3 minutes until a smooth, even consistency is achieved.

**Application**

- Whilst the substrate is still damp work the mortar vigorously into the surface. For large repairs use Sika Top® -121 as a bond-coat. Exposed reinforce steels use **Armatec®** -110. Afterwards apply the repair mortar of Sika Top® -122 by trowel to required profile.
Sika Grouting Systems
Cement Grout
WHAT ARE GROUTS?

Machinery and equipment which have precise tolerances for alignment or require uniform support cannot be placed directly on finished concrete surfaces. Both the concrete surface and the machine base have irregularities which result in alignment difficulties and bearing load concentrations.

*For this reason*, machine bases or soleplates are aligned and leveled by shimming or other means and the resulting space between the machine base and the foundation filled with a *load transfer material*.

The *load-transfer materials* most frequently used are hydraulic cement and epoxy grouts.
The Advantages of the SikaGrout® System

Improved expansion behaviour
  • No shrinkage, no cracks
  • High early strength development
  • High final strength development
  • Different layer thicknesses
  • Excellent flow characteristics
  • Low deformation under load
WHAT ARE CEMENTITIOUS GROUTS?

- A high performance Formulated products.
  - Ready to use.
  - High early and final strength.
    - SikagROUT 200
    - SikagROUT 214
    - SikagROUT 295
    - Sikacrete 114 (Micro-Concrete)
- Non-shrink-OR Shrinkage compensating
WHAT ARE CEMENTITIOUS GROUTS?

**Mixing**
- Prepare the amount of water required to obtain the right consistency (refer to mixing ratio). Pour approx. 2/3 of the mix water into the mixer and gradually add SikagROUT®, this will help to avoid making lumps. Then pour in the rest of the water and let mix for a minimum of 3 minutes from the time the last water was added to the mix.

**Application**
Pour grout immediately after mixing. Ensure that air displaced by the mortar can easily escape; otherwise entrapped air will prevent full contact grouting. Wet porous substrates to saturated surface dry condition. When grouting base plates etc., ensure that a continuous and sufficient head of pressure is maintained to keep the grout flowing.

To make optimum use of the products expansion properties, apply the grout as quickly as possible (within max. 15 minutes).
System Applications:

High Precision Grouting
Specs. For Cement Grout

ASTM-C-1107:

**Sikagout 200** Grade A- single stage of expansion

**Sikagrout 214 & 295** Grade B+C -2 Stage of expansion

**CRD-C-621**. Expansion percent
Specs. For Cement Grout

Min/Max Layer Thickness:

• The minimum application thickness should be ≈ 3 x diameter (Ø) of the maximum aggregate size in mm.

• The maximum application thickness/layer should be approx. ≈ 10 x diameter (Ø) same as above in mm.

if >75 mm- use of clean washed aggregates or use Sikacrete 114
Construction

GROUT VOLUME CHANGE

Micrometer Bridge

ASTM- C1090

CRD-C-621.

Measures height change 1,3,14 & 28 d

Test equipment for grout expansion measurement
Cement Grouting Problems??

Recommendations to minimize the possibility of cracking:

• Foundation should be pre-saturated before grout placement. Flood with water for 12 hours, if time permits. One hour should be the minimum.
• Cut large grout jobs down into smaller pieces. Recommended 1.0-1.2 m max in any direction per application.
• Minimize the surface area of exposed grout.
• Make the grout to be confined.
Cement Grouting Problems??

- Avoid the grout works in high temperature by working very early in the morning or late at night.
- Also increase mixing capacity to place grout quicker. Use cold water for mixing.
- If base plate is hot, cool it with water to grouting.
- Apply the curing methods as soon as possible after pouring.
- And try to protect from exposure to direct sunlight.
- In addition the grout should be stored in a cool location, out of direct sunlight 24 hours before use.
Methods of Repair:

**Sika Solution:**

Large repair thickness in horizontal concrete

**Bonding Agent:**

- Using Sika Latex.
- Sika Top 121 (Polymer Modified Patching and Adhesive Mortar).
- Sika Top Armatec -110 EpoCem.

**Repair Mortar:**

- Sika Top 122 (Fiber Reinforced Polymer Modified Repair Mortar)
- Sika Rep (Multi-Purpose Patching and Repair Mortar)
Methods of Repair:

**Sika Solution:**

Large repair thickness with Steel Corrosion

**Steel Protection:**

- Sika Top Armatec -108
- Sika Top Armatec-110 EpoCem.

**Bonding Agent:**

- Using Sika Latex.
- Sika Top 121 (Polymer Modified Patching and Adhesive Mortar).
- Sika Top Armatec -110 EpoCem.

**Repair Mortar:**

- Sika Top 122 (Fiber Reinforced Polymer Modified Repair Mortar)
- Sika Rep (Multi-Purpose Patching and Repair Mortar)
- Repair mortar with Sika Latex.
Methods of Repair:

**Sika Solution:**

- Large *vertical* repair thickness with Steel Corrosion

**Steel Protection:**

- Sika Top Armatec -108
- Sika Top Armatec-110 EpoCem.

**Bonding Agent: (Optional)**

- Using Sika Latex
- Sikadur 32

**Repair Mortar:**

- Sika grout 200/214
- Sika Crete 114
Methods of Repair:

Sika Solution:

Large Vertical repair thickness with Steel Corrosion

Steel Protection:

• Sika Top Armatec -108
• Sika Top Armatec-110 EpoCem.

Bonding Agent: (Optional)

• Using Sika Latex.
• Sikadur 32

Repair Mortar:

• Sika Grout 200/214
• Sikacrete 114
Sika Tile Adhesive & Tile Grout
Sika Cermam & Sika Lasqa & Sika Lasqa WP is a single component, ready to use tiling adhesive mortar combining cement with selected grades of silica sand and several admixtures. Only requires addition of water.

**Mixing**
Use 5 litres water to 25 kg powder.
Mix well with a hand trowel. For large volume mixing, a slow speed drill is recommended.

**Application**
Apply with ‘V’ notched trowels for small tiles.
Apply with square notched trowels for bigger tiles

Fix Tiles
Sika Tile Grout® is a fine powder, which requires only the addition of water to produce a smooth paste that is suitable for grouting ceramic tiles and similar applications. It contains selected hydraulic binders, organic binder, waterproofing materials, and inert hard aggregates. It is supplied in powder form in six standard colors.

**Mixing**
Add 4 kg of Sika Tile Grout® to 1.00 – 1.20 litre of clean water in a clean vessel and mix until a homogenous, smooth, easy to be applied, free from lumps paste is achieved, in case of 25 kg add 6.25 – 7.5 litre of clean water. Allow to stand for 5 minutes.

**Application**
Apply Sika Tile Grout® to the space between ceramic tiles using a sponge, or piece of soft cloth. Work the paste in to the joints and around the edges. Remove surplus grout from the face of the tile using dry cloth. When the grout is completed, polish tiles with dry cloth.
**Sika Seal 105 & (BR)**
A cement based, polymer modified, 2 component, multi-purpose water proofing slurry. Sika Seal® -105 combines the crystallization action (pore block) and the water proofing capability of polymer. It Consists of special fillers, cement and polymer.

**Sika Top Seal 107 & (BR)**
A cement based 2 component polymer modified SBR waterproofing slurry. It is applied to concrete and mortar structures to prevent water infiltration.
Sika Seal 105 (BR) & Sika Top Seal 107 (BR)

Mixing
The consistency of the mix can be altered by reducing the amount of component (A) (liquid) to be used. Under normal circumstances, when the full quantities of both components are mixed together, a slurry consistency will result. For a trowelable consistency use only 90% of component (A) (approx. 4.5 kg) Mix in a clean container by slowly adding the powder component to the liquid component and stirring with slow speed mixer.

Application
While the surface is still damp (no standing water) apply the first coat and leave to harden (2-6 hours). For slurry consistency, apply with a hard-plastic bristled brush or broom. For trowelable mortars, use a notched trowel. After the second coat has been applied, finish by rubbing down with a soft dry sponge.
Cement based coating System

- First coat: Sika Seal 105 or Sika Top Seal 107
- Second coat: Sika Seal 105 or Sika Top Seal 107
Cementitous Flooring

Sika Egypt
Technical Department
02 Basic systems overview / cementitious systems

Dry shake hardener – cementitious
- Chapdur Premix
- Sikafloor-1 Metaltop
- Síkafloor-2 Syntop
- Síkafloor-3 Quartztop

Surface hardener - Curing agents
- Antisol 90
- Sikafloor-Curehard 24
- Sikafloor-ProSeal
Principles of Cementitious Flooring
Dryshake Hardeners

- Increased abrasion resistance
- Increased durability
- Better aesthetics
- Less dust
- Lower whole life cost
Types of Surface Hardeners

Dry Shake Hardeners (Cement / Aggregate Mix):

▲ Metallic Type: (Sikafloor-1 Metaltop)

Naturally sourced, crushed and graded metal alloy aggregates mixed with cement, pigments and additives

▲ Synthetic mineral Type: (Sikafloor-2 Syntop)

Graded aggregates of furnace slag mixed with cement, pigments and additives

▲ Natural Mineral Type: (Chapdur Premix)

Quartz aggregates with well defined granular consistency, cement, pigments and additives
Dry Shake Concrete Hardeners

▲ Metallic Type:
Naturally source of crushed and graded ferro alloy aggregates mixed with cement, pigment and additives

Sikafloor® - 1 MetalTop

Performance criteria:
▲ extreme abrasion resistance
▲ impact resistance
▲ non – staining !!
▲ slip resistance
▲ conductive floor (BS 2050)
▲ easy cleaning
Dry Shake Concrete Hardeners

▲ Synthetic mineral Type:
Graded aggregates of furnace slag, emory or silicon carbide, mixed with cement, pigment and additives

Sikafloor® - 2 SynTop

Performance criteria:  ▲ very high abrasion resistance
▲ impact resistance
▲ slip resistance
▲ easy cleaning
Dry Shake Concrete Hardeners

▲ Natural mineral Type:
Quartz aggregates with well defined granular consistency, mixed with cement, pigments and additives

Sikafloor® - Chapdur Premix

Performance criteria:
▲ high abrasion resistance
▲ impact resistance
▲ slip resistance
▲ easy cleaning
Local Dry Shake floor hardener:

1. Sikafloor 1 Metal Top.
2. Sika Chapdur Premix
Characteristics /Advantages

• Highest wear resistance rating.
• Excellent impact resistance.
• Non staining.
• Cost effective, long life floor.
• Maintenance free.
• Slip resistant surface possible.
• Dust proof.
• Anti-static performance possible.
• Available in a wide range of colors.

Consumption:

~7 Kg/m² for 2.5 to 3.0 mm thickness

Sikafloor® - 1 MetalTop
Sika Chapdur® Premix is a ready-to-use mixture of cement, pigments, additives and hard aggregate of mineral origin. The particles have been specially selected for their shape, grading, high physical quality and mechanical performance. 

**Premix Consumption:**

4~6 Kg/m² for 2.0 to 3.0 mm thickness
Commercial Positioning Sikafloor® Dryshakes Cementitious flooring

- **Sikafloor® –2 SynTop®**
  - Mid range performance
- **Sikafloor® –1 MetalTop®**
  - High performance
- **Sikafloor® Chapdur Premix**
  - Basic performance

Street fighter concept: recognised, different, local, inexpensive
Sikaflow® dry shake floor hardeners should be applied once the surface bleed water has disappeared.

It means when finger pressure is applied to the surface, the imprint that remains is no deeper than 3-5 mm.
Sikafloor® dry shake floor hardeners must be applied once the surface bleed water has disappeared and when pressure on the surface with a wooden float a definite (bas-relief) imprint remains with no irregularities on its surface.
Sikafloor® dry shake floor hardeners can be manually sprinkled onto the concrete screed in two stages or mechanically spread by machine in one application!
Application

Floating of the surface after sprinkling / spreading the Sikafloor® dry shake floor hardener with a skim float (groove trowel)
Once the concrete has hardened sufficiently, finishing can be carried out using a power float and/or manually using a metallic float to achieve a smooth and even finish.
Hardener Incorporated

applied in two “shakes” at right angles for consistency
Burnished Concrete

glossy polished appearance ideal for Sikafloor® CureHard -24
Cure and Seal immediately after the final power floating of the Sikafloor® dry shake floor hardener, with Sikafloor® ProSeal products (water or solvent based).
Curing / Sealing

Applied by fine mist spray or roller

▲ **Sikafloor® - ProSeal:**
a clear acrylic resin polymer

curing efficiency acc. ASTM C309, hardening, improvement of abrasion resistance according to ASTM D4060 and sealing, improvement in cleaning and maintenance

Sikafloor® - ColourSeal has been removed from the Corporate range.
Joints - Cutting

Dry cut the joints with a diamond disc cutter, during the first few hours after the concrete has been laid.
Control Joint Construction

Fig. 11-27. Contraction joints provide for horizontal movement in the plane of a slab or wall and induce controlled cracking caused by drying and thermal shrinkage.
Expansion joints - Sealing

The joint should be filled with a sealing material or mastic, allowing:

▲ Joint movement up to 25 %
▲ Resistance to water pressure
▲ Resistance to light chemical spillage
▲ Resistance to wheeled traffic

Sikaflex® 1-A
Expansion joints - Sealing

Sikaflex® 1-A supported by a SikaRod joint base.

Sikaflex® 1-A

Sika® Rod
Cementitious Flooring Screeds
Sika® Level range
Sikafloor®-Top 111®
Sikafloor® Level -25
Types of Levelling screeds

Cement based screeds:
A combination of one or more types of hydraulic binders, plus aggregates in a very well defined sieve curve and admixtures, mixed with water.

How they work:

▲ The addition of water at the optimal dosage, makes a mortar which is easily placed, workable, crack free and designed to achieve optimal performance requirements, whether mechanical strengths, abrasion resistance.

▲ Can achieve a self levelling, and/or self smoothing surface or a trowelable consistency depending on the formulation.
Purpose of underlayment screeds are:

- Provide flat and smooth surface for the traffic wearing surface
  - Wood-floor
  - Tiles
  - Carpet
  - Resilient floors
    - PVC, Linoleum
    - PU screeds
      (comfort floors)
Underlayment levelling screeds

Before and after underlayment application
Construction

Application of Sika Level range Or Sika Top 111
Floor repair and levelling....

...the minimum and maximum
Levelling thickness $d_{\text{min}} = 2 \text{ mm}$, $d_{\text{max}} = 10 \text{ mm}$
Levelling thickness $d_{\text{min}} = 10 \text{ mm}$, $d_{\text{max}} = 30 \text{ mm}$ (with added aggregate)

for Sikafloor®-Level -100
Floor repair and levelling....

...the minimum and maximum

Levelling thickness $d_{\text{min}} = 0.5 \text{ mm}$, $d_{\text{max}} = 10 \text{ mm}$

Levelling thickness $d_{\text{min}} = 10 \text{ mm}$, $d_{\text{max}} = 20 \text{ mm}$ (with added aggregate)

for Sikafloor®-Level -200
Floor repair and levelling....

...the minimum and maximum

Levelling thickness $d_{\text{min}} = 0.5 \text{ mm}$, $d_{\text{max}} = 15 \text{ mm}$

Levelling thickness $d_{\text{min}} = 15 \text{ mm}$, $d_{\text{max}} = 30 \text{ mm}$ (with added aggregate)

for **Sikafloor®-Level -300**
...the minimum and maximum
Levelling thickness $d_{\text{min}} = 5 \text{ mm}$, $d_{\text{max}} = 25 \text{ mm}$

for **Sikafloor®-Level -25**
02 Basic systems overview / cementitious systems

Pump screeds – cementitious

- Sikafloor-Level 25
The Pump:
The Pump:
The Pump:
The Flow check:

Level, non absorbent surfaces are imperative
Sikafloor® -Level -25

The Application:

By Pump:
Place on the primed surface!
Sikafloor® -Level -25

The Application:
By Pump:
spread the material by trowel or pin screed rake to the required thickness.
Polymer Modified Cementations Flooring:

**Sika Top 111/1-3:**
A 2 component cement based polymer modified levelling, surfacing and grouting mortar. Two aggregate sizes, depending upon application.

Type 3.0 mm. for a layer from 0.8 cm. to 3.0 cm.
Type 1.2 mm. for a layer from 0.4 cm. to 1.2 cm.

**Uses:**
- Concrete roads.
- Parking areas.
- Swimming pools.
- Posts for guardrails, signs and crash barriers.
- Lamp standards.
- Pillars and buttresses.
- Foundation slabs and supports.
Polymer Modified Cementitious Flooring

Sika Top 111/1-3

Consumption 2.3 kg/mm
I hope You got the information you need from this Presentation

Sika Egypt .......Your Partner at work