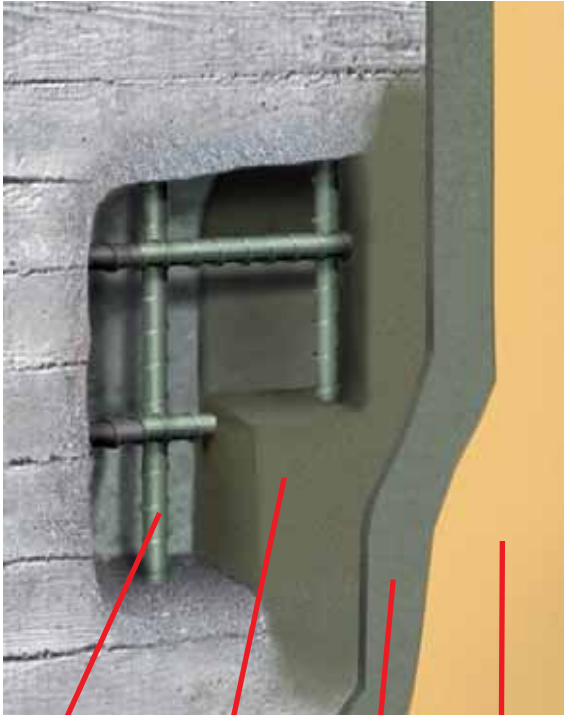




# SITE HANDBOOK

## **Repair of Concrete Structures - Patch Repair and Spray Applications**

A simple step by step guide to preparing and applying Sika Concrete Repair Systems



Sika® MonoTop®/  
SikaTop® Armatec®-  
reinforcement  
corrosion protection

Sika® MonoTop® -  
repair and profiling  
mortar

Sika® MonoTop®-  
pore sealer  
and smoothing  
mortar

Sikagard®-  
protective  
coating layer

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## Concrete Repair Procedure

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## **Health and Safety**



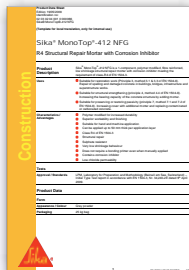
# **Work Safely!**

## Useful Documents



### Method Statement

- Sika® MonoTop® Systems
- Detailed step by step guide to concrete repair



### Product Data Sheet

- Product uses
- Substrate quality
- Substrate preparation
- Mixing Ratio
- Application conditions & tools
- Pot life
- Curing treatment



### Material Safety Data Sheet

- Hazards
- First Aid
- Emergency
- Ecology

## Bag Layout

Example: Sika® MonoTop®-412 N

Storage Details

Safety Label

Main Description

Performance Classification

Application Information

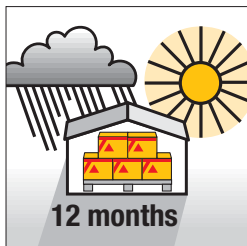


Product Characteristics

CE Marking

Pot Life

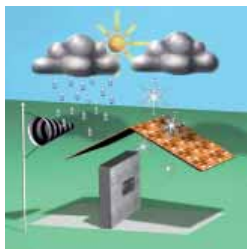
## Climate Conditions



### Storage

Product storage:

- Dry, cool conditions
- Undamaged original packaging



### Application

Protect area from:

- Direct sunlight
- Wind
- Rain
- Frost



### Temperature

Check acceptable limits:

- Ambient temperature
- Substrate temperature

## Equipment

### Hand tools



- Mixing tools



- Mixing bowl



- Application tools



- Sponge



- Brushes





## Do and Do Not!

### DO



Use only clean potable water



Make sure tools are clean and well maintained



Remove only concrete as instructed by supervising officer or qualified engineer



Consult product data sheet before starting

### DO NOT



Do not contaminate mixture with other chemicals



Do not mix powders from different products



Do not add more water than recommended



Do not mix and apply the product in direct sunlight

## 1. Substrate Preparation



### Surface Preparation

- Mark defective concrete



### Concrete Removal

- Using high pressure water jet, 1100 bar (large area)



or

- With hammer drill (medium area)

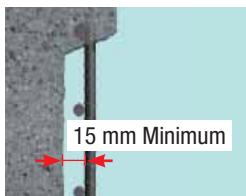


or

- Hammer and chisel (small patch repairs)

- ▼ Remove tire wires, nails etc.
  - Remove only defective concrete as instructed.
- Do not reduce structural integrity.

## 2. Substrate Preparation



### Extent of Concrete Removal

- Remove concrete minimum 15 mm behind main bars



### Correct Substrate Preparation

- Roughen surface (2 mm minimum)
- Cut sides minimum 90° to avoid undercutting and maximum 135° to reduce debonding around edges
- Substrate shall be sound with no loose material



Inform supervisor immediately if there are any cracks in the substrate

## 3. Preparing Reinforcement



### Cleaning Reinforcement

Remove all:

- Tie wires
- Mortar / Concrete
- Rust
- Other loose material



### Removal Techniques

- Use steel wire brush

or

- Abrasive blast cleaning techniques



or

- High pressure water jetting  
(1100 bar minimum)



- ▼ Inform supervisor immediately of any badly damaged reinforcement

## 4. Reinforcement Corrosion Protection



### Application of Corrosion Protection (if specified)

- Apply two 1 mm thick layers (total 2 mm minimum)



Allow time for the 1st coat to harden before applying 2nd coat.  
Allow application to dry before applying repair mortar.



### Application Techniques

- Hopper spray for large applications

or

- Brush for small applications
- Inspect bars after to ensure full coverage



Use two brushes simultaneously to ensure full application behind bars

## 5. Bonding Primer



### Apply bonding primer (if specified)

- Wet the substrate



- Wipe away excess water



small area: with sponge



large area: with air pressure



### Application Technique

- For small patches brush firmly onto surface



- For large areas spray on with hopper gun



Point gun at different angles on the surface to ensure even application behind the bars

## 6a Repair Application by hand



### Surface Preparation (if bonding primer not applied)

- Wet the substrate



- Wipe away excess water



small area: with sponge

large area: with air pressure



### Application Technique

- Press firmly the repair mortar into the repair area using a trowel



Apply 2<sup>nd</sup> layer when 1<sup>st</sup> layer is dry if application depth exceeds product's max. layer thickness

- Profile surface and finish with trowel



Finish surface with wooden or PVC trowel for best results.  
Do not spray additional water over the surface!



## 6b Wet Spray Application



### Surface Preparation

- Wet the substrate



- Wipe away excess water



small area: with sponge



large area: with air pressure



### Application Technique

- Point nozzle 200 mm to 500 mm from surface



- Finish with PVC or wooden trowel



Make sure voids are filled behind bars.

Point spray nozzle at different angles to the surface.

If 2<sup>nd</sup> layer is required surface shall not be too smooth.



## 7. Smoothing Mortar



### Surface Preparation

- Wet and clean surface with water (180 bar)



### Smoothing or Levelling Mortar

- Apply vertically using toothed trowel
- Apply with trowel approx. 45° to surface



Use different size toothed trowel for required layer thickness



- When the 1<sup>st</sup> layer is hard, apply 2<sup>nd</sup> layer



- Smooth surface using wooden trowel after product has set



0,25 - 4 hrs.

## 8. After Application



### Curing Protection

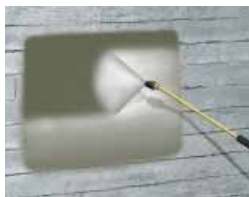
Protect application from:

- Frost
- Wind
- Rain
- Sun



### Curing Methods

- Plastic sheeting
- Jute and water
- Other membranes



- If no subsequent coating is to be applied on surface an approved curing agent could be used

## Additional Information



### Cleaning Tools

- Clean with water

Hardened material can only be removed mechanically



### Environment

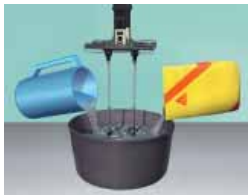
- Dispose of waste responsibly
- Separate recycling materials



### Accidents

- Seek immediate medical attention in the event of an injury

## Mixing



### One component System (e.g. Sika® MonoTop®)

- Add powder to water and mix for 3 minutes



### Two component System (e.g. Sika Top®)

- Shake component A thoroughly and pour into clean container
- Add in powder component C and mix for 3 minutes

**!** Do not add extra water.



### Three component System (e.g. Sika® EpoCem®)

- Shake component A + B separately
- Mix components A + B together



- Add (A + B) to powder component C and mix for 3 minutes



Adjust consistency to suit conditions using powder-component C.  
Refer to Product Data Sheet for more information.

# Sika Repair Systems

| Product                    | Type  | Application       | Description                |
|----------------------------|---|-------------------|----------------------------|
| Sika® MonoTop®-412 N       | Repair Mortar   | Hand<br>wet spray | R4 CC Normal Setting       |
| Sika® MonoTop®-412 S       |   |                   | R4 CC Slow Setting         |
| Sika® MonoTop®-412 NFG     | Repair Mortar   | Hand<br>wet spray | R4 PCC Normal Setting      |
| Sika® MonoTop®-412 SFG     |   |                   | R4 PCC Slow Setting        |
| Sika® MonoTop®-352 N       | Repair Mortar   | Hand<br>wet spray | R3 CC Normal Setting       |
| Sika® MonoTop®-352 S       |   |                   | R3 PCC Slow Setting        |
| Sika® MonoTop®-352 NFG     | Repair Mortar   | Hand<br>wet spray | R3 CC Normal Setting       |
| Sika® MonoTop®-352 SFG     |   |                   | R3 PCC Slow Setting        |
| Sika® MonoTop®-211 RFG     | Repair Mortar   | Hand<br>wet spray | R2 PCC fast setting        |
| Sika® MonoTop®-211 FG      |   |                   | Normal use                 |
| Sika® MonoTop®-910 N       | Bonding primer and reinforcement corrosion protection | Hand<br>wet spray | Normal use                 |
| Sika® Armatec®-110 EpoCem® | Bonding primer and reinforcement corrosion protection | Hand<br>wet spray | Demanding use              |
| Sika® MonoTop®-723 N       | Smoothing Mortar                                      | Hand<br>wet spray | R3 PCC cementitious mortar |
| Sikagard®-720 EpoCem®      | Pore Sealer   | Hand<br>wet spray | R4 Epoxy cement            |

## Hints and Advice - Overhead Application



- Apply mortar tightly behind reinforcement until bars are covered.



- Press firmly to ensure pores in concrete substrate are filled.



- From same end apply second layer in same direction as first.
- Repeat layers until void is filled



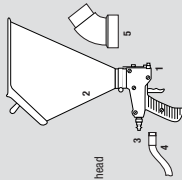
- Smooth surface using wooden trowel

# Hints and Advice - Wet Spray Equipment

Hopper Gun



- Hopper content: 6 ltr
- Weight (empty): 1.5 kg
- Air requirement: 220 l/min
- Required air pressure: 2 to 3 bar
- Adjustable aperture



- 1 Gun with adjustable aperture
- 2 Hopper
- 3 Quick disconnect
- 4 Hose  $\varnothing$  13 mm, 10 m long
- 5 45° Adaptor for application over head (Independent air compressor is needed)

Mortar Pump for "Wet" Spray Application, e.g. Putzmeister S5 EVTM with Mixer TM 100

- Process: Wet spray application
- Conveying volume: 0.4 – 2.4 m<sup>3</sup>/h
- Conveying distance: horizontal up to 70 m
- Pump pressure: max. 25 bar
- Dimensions: L×W×H (mm): 2290×680×1150
- Motor: 400 V/50 Hz
- Capacity of the vessel: 100 ltr
- Weight: 400 kg (inkl. Mixer)



- 1 Nozzle for mortar  $\varnothing$  1 to 8 mm
- 2 Nozzle for finishing coat  $\varnothing$  0.5 to 1.0 mm

The information contained herein and any other advice 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. The information only applies to the application(s) and product(s) expressly referred to herein and is based on laboratory tests which do not replace practical tests. In case of changes in the parameters of the application, such as changes in substrates etc., or in case of a different application, consult Sika's Technical Service prior to using Sika products. The information contained herein does not relieve the user of the products from testing them for the intended application and purpose. 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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