



# CONCRETE REPAIR SITE HANDBOOK

Hand Placed and Spray Applications

# CONCRETE REPAIR SITE HANDBOOK

Hand Placed and Spray application



Sika® MonoTop® -  
pore sealer/  
smoothing mortars

Sika® MonoTop® -  
repair and profiling  
mortars

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

Sikagard® -  
protective coatings

# CONTENTS

## **BEFORE APPLICATION**

- |          |                    |
|----------|--------------------|
| <b>4</b> | Health and Safety  |
| <b>5</b> | Useful Documents   |
| <b>6</b> | Bag Layout         |
| <b>7</b> | Climate Conditions |
| <b>8</b> | Equipment          |
| <b>9</b> | Do's and Don'ts    |

## **CONCRETE REPAIR PROCEDURE**

- |              |                                      |
|--------------|--------------------------------------|
| <b>10-11</b> | 1 Substrate Preparation              |
| <b>12</b>    | 2 Reinforcement Preparation          |
| <b>13</b>    | 3 Reinforcement Corrosion Protection |
| <b>14</b>    | 4 Bonding Primer                     |
| <b>15</b>    | 5 Repair Application by Hand         |
| <b>16</b>    | 6 Repair Application by Spray        |
| <b>17</b>    | 7 Smoothing Mortar                   |

## **AFTER APPLICATION**

- |           |                       |
|-----------|-----------------------|
| <b>18</b> | Curing Protection     |
| <b>18</b> | Curing Methods        |
| <b>19</b> | Cleaning Tools        |
| <b>19</b> | Environment/Accidents |

## **20 MIXING**

## **21 SIKA REPAIR SYSTEMS**

## **HINTS AND ADVICE**

- |           |                       |
|-----------|-----------------------|
| <b>22</b> | Over Head Application |
| <b>23</b> | Spray Equipment       |

# 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 and tools
- Pot life
- Curing treatment

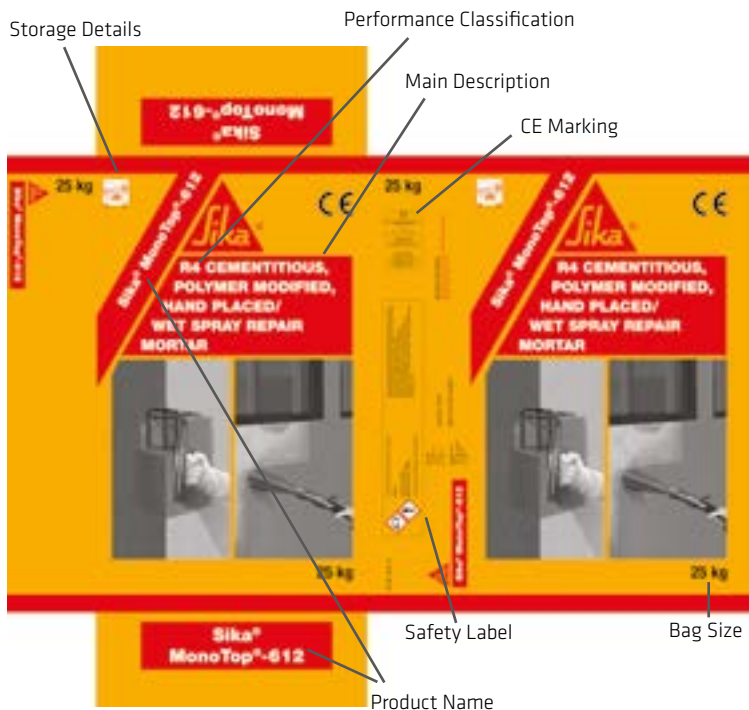


## SAFETY DATA SHEET

- Hazards
- First aid
- Emergency
- Ecology

# BAG LAYOUT

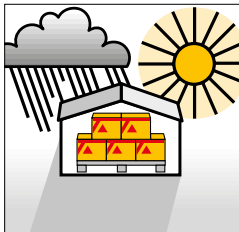
## Example



# CLIMATE CONDITIONS

## 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

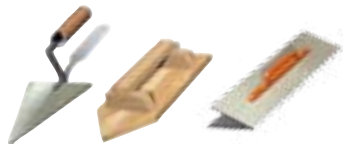
## Hand Tools



Mixing tools



Mixing container



Application tools



Sponge



Brushes



# DO'S AND DON'TS

## DO'S



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

## DON'TS



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 a high pressure water jet, 1100 bar (large area)



**or**

- With a hammer drill (medium area)



**or**

- Hammer and chisel (small patch repairs)



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



### EXTENT OF CONCRETE REMOVAL

- Remove concrete minimum 15mm behind main bars



### CORRECT SUBSTRATE PREPARATION

- Rougher surface (2mm 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 a supervisor immediately if there are any cracks in the substrate.

## 2. REINFORCEMENT PREPARATION

### CLEANING REINFORCEMENT

Remove **ALL**:

- Tie wires
- Mortar/concrete
- Rust/scale
- Other loose material



### REMOVAL TECHNIQUES

#### 1. Steel wire brush or hand/power tools

Technique applicable only in carbonated concrete and under environmental constraints where techniques 2 and 3 cannot be used.

- Reinforcement uniformly cleaned



#### 2. Abrasive blast cleaning techniques

- Reinforcement uniformly cleaned
- If chlorides are present reinforcement should be cleaned with water afterwards



#### 3. High pressure water jetting (1100 bar min)

- Reinforcement uniformly cleaned



Inform a supervisor immediately of any badly damaged reinforcement.

### 3. REINFORCEMENT CORROSION PROTECTION



#### APPLICATION OF CORROSION PROTECTION

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

Allow time for the first coat to harden before applying the second 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.

# 4. BONDING PRIMER

## APPLYING 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.



# 5. 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 the repair mortar firmly into the repair area using a trowel and/or hand

Apply second layer when first layer is dry if application depth exceeds product's maximum layer thickness.



- Profile the surface and finish with a trowel

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

# 6. REPAIR APPLICATION

By Spray

## SURFACE PREPARATION

- Wet the substrate



- Wipe away excess water



small area: with sponge

large area: with air pressure



## APPLICATION TECHNIQUE

- Point nozzle 200mm to 500mm 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 2nd layer is required surface should not be too smooth.





## 7. SMOOTHING MORTAR



### **SURFACE PREPARATION**

- Wet and clean the surface with water (180 bar)



### **SMOOTHING OR LEVELLING MORTAR**

- Apply vertically using toothed trowel
- Apply with trowel approximate 45° to surface

Use different size toothed trowel for required layer thickness.



- When the first layer is hard, apply second layer



- Smooth surface using wooden trowel after product has set



0.25 - 4 hours

# AFTER APPLICATION

## CURING PROTECTION

Protect application from:

- Frost
- Wind\*
- Rain\*
- Sun\*

\* Apply as soon as possible after application to avoid surface cracking/crazing



## CURING METHODS

- Plastic sheeting
- Fabric and water
- Other membranes



- If no subsequent coating is to be applied on the 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

(eg Sika® MonoTop®)

- Add powder to water and mix for three minutes



## TWO COMPONENT SYSTEM

(eg SikaTop®)

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

Do not add extra water.



## THREE COMPONENT SYSTEM

(eg Sika® EpoCem®)

- Shake component A + B separately
- Mix components A + B together
- Add A + B to powder component C and mix for three minutes

Adjust consistency to suit conditions using powder component C. Refer to product data sheet for more information.



# SIKA REPAIR SYSTEMS

PRODUCT	Type	Application		BS EN 1504 Reference
Sika® MonoTop®-612	Repair Mortar	Hand	Wet spray	Part 3 - R4
Sika® MonoTop®-615	Repair Mortar	Hand	Wet spray	Part 3 - R3
Sika® Rapid Repair Mortar	Repair Mortar	Hand		Part 3 - R4
SikaCem®-133 Gunit	Repair Mortar		Dry spray	Part 3 - R4
SikaCem®-133 F Gunit	Repair Mortar with fibres		Dry spray	Part 3 - R4
SikaCrete® CP	Repair Mortar low resistivity		Dry spray	Part 3 - R4
SikaCrete® CP	CP Overlay		Dry spray	Part 3 - R4
Sika® Armorcecrete	Repair Mortar	Flowable		Part 3 - R4
Sika® MonoTop®-610	Bonding Primer and Reinforcement Corrosion Protection	Hand	Spray	Part 7
Sika® Armatec®-110 EpoCem®	Bonding Primer and Reinforcement Corrosion Protection (chlorides)	Hand	Spray	Part 7
Sika® MonoTop®-620	Smoothing Mortar/ Pore Sealer	Hand		Part 2
Sikagard®-720 EpoCem®	Smoothing Mortar/ Pore Sealer	Hand		Part 2

# HINTS AND ADVICE

## Over Head Application

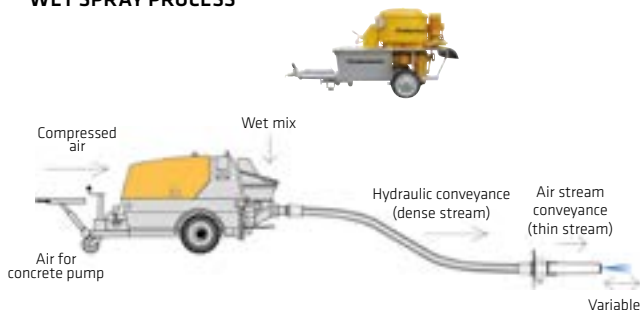
- Apply mortar tightly behind reinforcement until bars are covered
- Press firmly to ensure pores in concrete substrate are filled
- From same end apply second layer in same direction as first
- Repeat layers until void is filled
- Smooth surface using wooden trowel



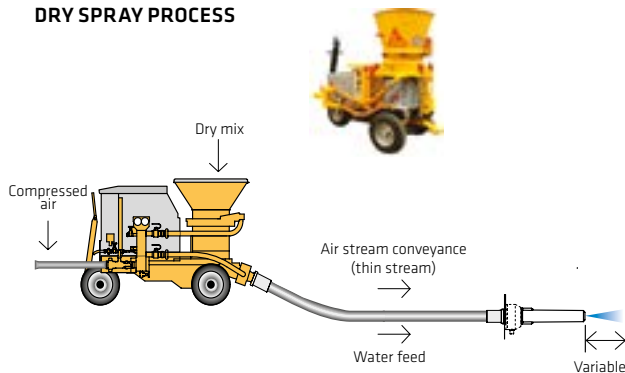
# HINTS AND ADVICE

## Spray Equipment

### WET SPRAY PROCESS



### DRY SPRAY PROCESS



# SIKA FULL RANGE SOLUTIONS FOR CONSTRUCTION:



WATERPROOFING



CONCRETE



REFURBISHMENT



MERCHANT



SEALING AND BONDING



FLOORING



ROOFING



INDUSTRY

## FOR MORE INFORMATION:



### WHO WE ARE

Sika Limited and Sika Ireland Limited are part of the global Sika Group, specialising in the manufacture and supply of chemical based products for construction and industry. Sika is a world-leader in its field with subsidiaries in 90 countries around the world and manufactures in over 160 factories. With approximately 17,000 employees Sika generates annual sales of CHF 5.6 billion (£3.9bn). We are also committed to providing quality, service, safety and environmental care.

In the UK and Ireland, we provide market-leading solutions for concrete, waterproofing, roofing, flooring, refurbishment, sealing & bonding, and industry, and have manufacturing sites in Welwyn Garden City, Preston, Leeds and Dublin with more than 700 employees and a turnover of more than £190 million.

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 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 proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users should always refer to the most recent issue of the Product Data Sheet for the product concerned, copies of which will be supplied on request.



FM 12504



EMS 45308



OHS 585274

### SIKA LIMITED

Head Office  
Watchmead, Welwyn Garden City  
Hertfordshire, AL7 1BQ  
United Kingdom

### Contact

Phone +44 1707 394444  
Fax +44 1707 329129  
E-Mail [enquiries@uk.sika.com](mailto:enquiries@uk.sika.com)  
[www.sika.co.uk](http://www.sika.co.uk)

### SIKA IRELAND LIMITED

Sika House  
Ballymun Industrial Estate  
Ballymun, Dublin 11  
Ireland

### Contact

Phone +353 1 862 0709  
Fax +353 1 862 0707  
E-Mail [info@ie.sika.com](mailto:info@ie.sika.com)  
[www.sika.ie](http://www.sika.ie)

BUILDING TRUST

