# Sika® Rapid Repair Mortar

## R4 Fast Setting Cementitious Repair Mortar

### Product Description

Sika® Rapid Repair Mortar is a one component fast setting cementitious repair mortar, meeting the requirements of Class R4 of BS EN 1504-3.

### Uses
- For repairing all types of structures
- Horizontal and vertical repairs
- Hand applied repairs
- Floor slabs and car park decks
- For exterior and interior use
- In place of R1, R2 & R3 mortars

### Characteristics / Advantages
- Pre-bagged for quality
- Just add water
- High early strength
- Rapid setting
- Contains no chloride admixtures
- Non corrosive to steel
- Can be overcoated

### Tests

**Approval / Standards**

Conforms to the requirements of BS EN 1504-3 R4 Classification

### Product Data

**Form**

**Appearance /Colours**  Grey powder

**Packaging**  25 kg bag

**Storage**

**Storage Conditions/ Shell-Life**  6 months from date of production if stored properly in original unopened, sealed and undamaged packaging in dry and cool conditions.
**Technical Data**

<table>
<thead>
<tr>
<th>Chemical Base</th>
<th>Portland cement, selected aggregates and additives.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>Fresh mortar density: ~ 2.10 kg/l</td>
</tr>
<tr>
<td>Layer Thickness</td>
<td>8.0 mm min. / 30 mm max.</td>
</tr>
</tbody>
</table>

**Mechanical / Physical Properties**

| Compressive Strength          | ~ 10 N/mm² (2 hrs)                                |
|                               | ~ 50 N/mm² (1 day)                                |
|                               | ~ 60 N/mm² (7 days)                               |
|                               | ~ 70 N/mm² (28 days)                              |

**CE Requirements**

<table>
<thead>
<tr>
<th>Requirements as per BS EN 1504-3 Class R4</th>
<th>Results</th>
<th>Requirements (R4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressive Strength</td>
<td>~ 70 N/mm² (MPa)</td>
<td>&gt; 45 N/mm² (MPa)</td>
</tr>
<tr>
<td>Chloride Ion Content</td>
<td>&lt; 0.007%</td>
<td>&lt; 0.05%</td>
</tr>
<tr>
<td>Adhesive Bond</td>
<td>~ 2.5 N/mm² (MPa)</td>
<td>&gt; 2.0 N/mm² (MPa)</td>
</tr>
<tr>
<td>Restrained Shrinkage/Expansion</td>
<td>~ 2.5 N/mm² (MPa)</td>
<td>&gt; 2.0 N/mm² (MPa)</td>
</tr>
<tr>
<td>Carbonation Resistance</td>
<td>NPD</td>
<td>Not required if coated</td>
</tr>
<tr>
<td>Elastic Modulus</td>
<td>~ 30.0 kN/mm² (GPa)</td>
<td>≥ 20 kN/mm² (GPa)</td>
</tr>
<tr>
<td>Capillary Absorption</td>
<td>NPD</td>
<td>&lt; 0.5 kg.m².h⁰⁰⁵</td>
</tr>
</tbody>
</table>

**System Information**

<table>
<thead>
<tr>
<th>System Structure</th>
<th>Bonding primer and reinforcement coating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sika® MonoTop-610:</td>
<td></td>
</tr>
<tr>
<td>SikaTop® Armtec 110 Epocem®:</td>
<td></td>
</tr>
<tr>
<td>Sika® FerroGard®-903:</td>
<td>Corrosion inhibitor</td>
</tr>
</tbody>
</table>

Sika® Rapid Repair Mortar 2/6
**Application Details**

**Consumption**

This depends on the substrate roughness and thickness of layer applied. As a guide, ~ 2.10 kg/m²/mm.

**Substrate Quality**

_Cement_

The concrete shall be free from dust, loose material, surface contamination and materials which reduce bond or prevent suction or wetting by repair materials.

_Steel reinforcement_

Rust, scale, mortar, concrete, dust and other loose and deleterious material which reduces bond or contributes to corrosion shall be removed to a minimum standard of SA2½.

Reference should also be made to BS EN1504-10:2003 for specific requirements.

**Substrate Preparation / Bonding Primer / Reinforcement Coating**

_Cement_

Delaminated, weak, damaged and deteriorated concrete and where necessary sound concrete shall be removed by suitable mechanical or very high pressure waterblasting [up to 110 mPa (16500 psi)] techniques.

Tying wire fragments, nails and other metal debris embedded in the concrete should be removed where possible.

The edges where concrete is removed should be cut at a minimum angle of 90° to avoid undercutting and a maximum angle of 135° to reduce the possibility of debonding with the top surface of the adjacent sound concrete and should be roughened sufficiently to provide a mechanical key between the original material and Sika® Rapid Repair Mortar.

Ensure sufficient concrete is removed from around reinforcement to allow coating and compaction of the repair material.

_Steel reinforcement_

Surfaces should be prepared using abrasive blast cleaning techniques or high pressure waterblasting [up to 60 mPa (9000 psi)] techniques.

Where exposed reinforcement is contaminated with chloride or other material which may cause corrosion, the reinforcement shall be cleaned by low pressure waterblasting [up to 18 mPa (2700 psi)].

_Bonding primer_

On a well prepared and roughened substrate a bonding primer is generally not required.

When a bonding primer is not required pre-wet the surface. The surface should not be allowed to dry before application of the concrete repair mortar. The surface should achieve a dark matt appearance without glistening and surface pores and pits should not contain water.

When a bonding primer is necessary apply Sika® MonoTop-610 or SikaTop® Armatec-110 EpoCem® (Refer to the relevant Product Data Sheets).

Site adhesion values - Structural Repair 1.2-1.5 mPa

Non Structural repairs minimum value 0.7 mPa

_Reinforcement coating_

Where a reinforcement coating is required as a barrier apply to the whole exposed circumference two coats of Sika® MonoTop-610 or SikaTop® Armatec 110 EpoCem®. (Refer to the relevant Product Data Sheet).

Reference should also be made to BS EN1504-10:2003 for specific requirements.
### Application Conditions / Limitations

<table>
<thead>
<tr>
<th>Substrate Temperature</th>
<th>+5°C min. / +25°C max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Temperature</td>
<td>+5°C min. / +25°C max.</td>
</tr>
</tbody>
</table>

### Application Instructions

#### Mixing

- **Mixing**
  - Sika® Rapid Repair Mortar can be mixed with a slow speed (< 500 rpm) electric drill mixer or forced action mixer.
  - In small quantities only, product can also be mixed by hand.
  - Pour the water in the correct proportion into a suitable mixing container. While stirring slowly, add the powder to the water. Mix thoroughly for at least 3 minutes to the required consistency.
  - When mixed, the product may be bulked out with dry, dust free aggregates (30% by wt of 3-6 mm granite chippings) and remixed to a uniform consistency.

#### Application Method / Tools

- **If a bonding primer has been used apply repair mortar “wet on wet”.**
  - The repair mortar shall be worked into the prepared pre-wetted substrate between the minimum and maximum layer thicknesses and shall be compacted without inclusion of entrapped air pockets using a trowel or gloved hand.
  - Where layers are to be built up to prevent sagging or slumping, each layer should be allowed to stiffen before applying subsequent layers “wet on wet”. When layers cannot be applied “wet on wet”, or if more than 24 hours between layers apply a bonding primer of Sika® MonoTop-610 or SikaTop® Armatec-110 EpoCem® and apply repair mortar “wet on wet”.
  - Finishing should be done to the required surface texture as soon as mortar has started to stiffen.
  - Reference shall be made to BS EN1504-10:2003 for specific requirements.

#### Cleaning of Tools

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

#### Potlife

- ~ 15-20 minutes (at +20°C)

#### Notes on Application / Limitations

- Refer to recommendations provided in BS EN 1504-10.
  - Avoid application in direct sun and/or strong wind and/or rain.
  - Do not add water over recommended dosage.
  - Large/deep repairs may be subject to shrinkage and cracking. This may be minimised by limiting repair volumes and reducing layer thicknesses.
  - Apply only to sound, prepared substrates.
  - Do not add additional water during the surface finishing as this will cause discoloration and cracking.
  - Protect freshly applied material from freezing.
### Curing Details

**Curing Treatment**

It is essential to cure the repair mortar immediately after application for a minimum of 3 days to ensure full cement hydration and to minimise cracking. Use polythene sheeting taped down at the edges or other approved method.

Curing compounds shall not be used when they adversely affect subsequently applied products and systems.

Reference shall also be made to BS EN1504-10:2003 for specific requirements.

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**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.

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**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.

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**Health and Safety Information**

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Material Safety Data Sheet containing physical, ecological, toxicological and other safety-related data.

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**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.
CE Labelling

The harmonised European standard EN 1504-3 “Products and systems for the protection and repair of concrete structures – Definitions, requirements, quality control and evaluation of conformity – Part 3 Structural and non-structural repair” specifies the identification, performance (including durability) and safety of products and systems to be used to repair concrete surfaces (either building or civil engineering structures).

Non-structural repair fall under this specification – they need to be CE-labelled as per Annex ZA.2, table ZA.2 conformity 2+ and fulfil the requirements of the given mandate of the EU Construction Products Directive (89/106/CE).

<table>
<thead>
<tr>
<th>Product</th>
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<td>Class R4</td>
</tr>
<tr>
<td>Chloride ion Content</td>
<td>≤ 0.05%</td>
</tr>
<tr>
<td>Adhesive Bond</td>
<td>≥ 2.0 MPa</td>
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<td>NPD</td>
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<tr>
<td>Elastic Modulus</td>
<td>≥ 20 GPa</td>
</tr>
<tr>
<td>Capillary Absorption</td>
<td>NPD</td>
</tr>
<tr>
<td>Dangerous Substances</td>
<td>Complies with 5.4</td>
</tr>
<tr>
<td>Reaction to Fire</td>
<td>Class A1</td>
</tr>
</tbody>
</table>

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08
0086 CPD - 541325
BS EN 1504 -3

Concrete Repair Product for Structural Repair
CC Mortar (based on hydraulic cement)