### Range of use
- Repair of concrete elements with rough surfaces in areas with static and dynamic loads
- Strengthening concrete load-bearing structures since it has a static effect that can be calculated
- Repair of road construction elements in accordance with ZTV-ING
- Repair of hydraulic structures in accordance with ZTV-W

### Property profile
- Combines corrosion protection, bonding layer, coarse and fine mortar in one product
- A4 mortar according to RL-SIB and class R4 according to DIN EN 1504-3
- Can be applied by hand or sprayed
- Single layers of up to 80 mm in broken out areas
- High resistance to chlorides
- BASt listed

### Characteristic data of the product

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>grey</td>
</tr>
<tr>
<td>Grain</td>
<td>2 mm</td>
</tr>
<tr>
<td>Water requirements</td>
<td>approx. 10.8 %</td>
</tr>
<tr>
<td>External surveillance</td>
<td>QDB and KIWA</td>
</tr>
<tr>
<td>Compressive strength (EN 12190)</td>
<td>after 1 day: ≥ 20 N/mm²</td>
</tr>
<tr>
<td>Flexural tensile strength (EN 12190)</td>
<td>after 7 days: ≥ 45 N/mm²</td>
</tr>
<tr>
<td>Dynamic E-modulus (EN 1542)</td>
<td>≥ 25000 N/mm²</td>
</tr>
<tr>
<td>Adhesion capacity (EN 1542)</td>
<td>≥ 2.0 N/mm²</td>
</tr>
<tr>
<td>Chloride migration coefficient</td>
<td>after 28 days: 1.27 (10^{-12}) m²/s</td>
</tr>
<tr>
<td>Reaction to fire (DIN EN 4102-1)</td>
<td>Class A1</td>
</tr>
<tr>
<td>Reaction to fire (DIN EN 4102-1)</td>
<td></td>
</tr>
<tr>
<td>Chlorides without sea water</td>
<td>XD1 XD2 XD3</td>
</tr>
<tr>
<td>Chlorides from sea water</td>
<td>XS1 XS2 XS3</td>
</tr>
<tr>
<td>Frost attack with/without de-icing salt</td>
<td>XF1 XF2 XF3 XF4</td>
</tr>
<tr>
<td>Chemical attack</td>
<td>XA1 XA2*</td>
</tr>
<tr>
<td>Wear load</td>
<td>XM1 XM2</td>
</tr>
</tbody>
</table>

* Sulphate content of water(\(\text{SO}_4^{2-}\)) ≤ 1500 mg/l

### Moisture class assignment
- WO, WF, WA, WS

The values above represent typical characteristic data of the product and are not to be understood as product specifications.
Certifications

- P 6446-A/11-376, National Test Certificate for repair concretes and mortars for repair works, KIWA Polymer
- Initial test in accordance with DIN EN 1504-3
- 3359/635/11, Fire classification, MPA BS
- P 7718, Durability under alternating water loads, KIWA Polymer
- P 6446, M3 test; PCC concrete repair system, KIWA Polymer
- M 1629, Resistance against chlorides; RWTH Aachen

Possible system products

- Betofix KHB (Art. No. 1087)
- Betofix Spachtel (Art. No. 1008)

Work preparation

Requirements for the substrate
Load-bearing, clean and dust-free.

Preparation
Remove the concrete covering from steel parts and derust the exposed steel surfaces to bright metal (SA 2 ½).
Pre-wet the substrate.

Mixing
Pour water into a clean container and then add the dry mortar.
Mix thoroughly with a mixer for approx. 3 minutes until homogeneous.
Maturing time: approx. 1 minute
Mix again for 1 minute until a consistency proper for working has been achieved.
If necessary, add some water.

Directions

Working conditions
Temperature of material, surroundings and substrate: +5 °C - +30 °C.
Low temperatures lengthen, high temperatures reduce working and setting time.

Working time (+20 °C)
Approx. 60 minutes
After pre-wetting the substrate must still retain some absorption capacity.

Apply a scratch coat with the product.
On areas that are difficult to access, apply a layer of the slightly diluted product as contact grout.
Can be applied in single-layers with a thickness of 5 - 25 mm.
In two layers applied wet-on-wet a thickness of < 50 mm is possible.
Over broken out areas single layers with a thickness of < 80 mm are possible.

Notes on application
If after the repair the concrete cover is < 10 mm, the reinforcement steel must be protected against corrosion with Betofix KHB.
It is not allowed to mix by hand or to prepare only partial quantities.
Initially set mortar cannot be made workable again by adding water or fresh mortar.
Protect the mortar surface for at least 4 days from too fast dehydration, frost and rain.
The surface should be free of cracks hairline cracks/shrinkage cracks are harmless and are not to be faulted since they do not compromise the technical properties of the product.

Notes
Mixing water must be of potable water quality.
May contain traces of pyrite (iron sulphide).
Low in chromate pursuant to Directive 2003/53/CE.
The characteristic data given for this product were determined under labora-tory conditions at 20 °C and 65 % relative humidity

Application rate-dry mortar
Approx. 2.0 kg/m² per mm thick layer or approx. 1.6 kg/dm³

Tools, cleaning
Mixing tool, trowel, smoothing trowel. See the Remmers Machines Manual for information on automatic equipment.
Clean tools with water while the material is still fresh.

Packaging
25 kg paper bag

Storage / Shelf-life
Approx. 12 months stored dry in closed bags

Safety, ecology, disposal
Further information on safety when transporting, storing and handling as well as disposal and ecology is found in the latest Safety Data Sheet.
CE marking

<table>
<thead>
<tr>
<th>CE marking</th>
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</thead>
<tbody>
<tr>
<td>0921</td>
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Remmers GmbH
Bernhard - Remmers - Str.13
D – 49624 Löningen
09
GB1 P1-1
EN 1504-3: 2005

Betofix R4
PCC mortar for structural and non-structural repair of concrete structures

<table>
<thead>
<tr>
<th>Property</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressive strength:</td>
<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>
</tr>
<tr>
<td>Restrained shrinkage / expansion:</td>
<td>≥ 2.0 MPa</td>
</tr>
<tr>
<td>Carbonation resistance:</td>
<td>passed</td>
</tr>
<tr>
<td>Elastic modulus:</td>
<td>≥ 20 GPa</td>
</tr>
<tr>
<td>Thermal compatibility:</td>
<td>≥ 2.0 MPa</td>
</tr>
<tr>
<td>Capillary absorption:</td>
<td>≤ 0.5 kg/(m² • h⁰.⁵)</td>
</tr>
<tr>
<td>Reaction to fire:</td>
<td>class A1</td>
</tr>
</tbody>
</table>

The statements above are compiled from our field of production and according to the latest technological developments and application techniques.

Since application and working are beyond our control, no liability of the producer can be derived from the contents of this information sheet. Any statements made beyond the contents of this information must be confirmed in writing by the producer.

In all cases, our general conditions of sale are valid. With the publication of this Technical Information Sheet all previous editions are no longer valid.

Remmers (UK) Limited
Crawley
United Kingdom
Tel: +44 (0) 1293 594 010
Fax: +44 (0) 1293 594 037
www.remmers.co.uk