



## MORCEMREST® REPAIR

High resistance mono-component repair mortar, reinforced with fibre, suitable for thicknesses up to 65 mm.



### DESCRIPTION

R4 high resistance mono-component mortar for thick applications. Formulated with Sulfo-resistant cement, selected aggregates and additives; reinforced with fibres.

### TECHNICAL CHARACTERISTICS

R4 reparation mortar according to EN-1504-3.

### ADVANTAGES AND USES

- High bonding strength to concrete and high elastic modulus.
- High thixotropy. With no risk of coming down from the ceiling.
- Water vapour permeable.
- Good resistance to chlorides.
- Resistant to freeze-thaw cycles
- Joints filling in concrete, prefabricated elements and dilatation joints.
- Retraction shrinkage is compensated to minimise risk of cracking.
- High Resistance to carbonation.
- Weather resistant.
- Restoration of structural elements such as: columns, bridges' beams, treatment plants, tunnels, pillars with a great transfer of load.
- Re-generation of concrete.

### DURABILITY

#### Durability: Carbonation rate and chloride diffusion coefficient.

Tests conducted at the Eduardo Torroja Institute for Construction Science according to UNE EN 12390-10 - Determination of resistance to carbonation of concrete under atmospheric levels of carbon dioxide, yielded a carbonation rate (K) of 0.529 mm/year<sup>0,5</sup> for Morcemrest Repair.

This value can be incorporated into models for estimating the service life of reinforced concrete elements due to corrosion and used to calculate the carbonation depth using the equation:  $P = K * t^{0,5}$ , where "P" is the carbonation depth in mm, "K" is the carbonation rate in mm/year<sup>0,5</sup>, and "t" is time in years.

For example, substituting values into the equation, over 50 years, a section of Morcemrest Repair mortar will carbonate 3.74 mm, and 5.29 mm over 100 years.

Similarly, a 25 mm-thick layer of Morcemrest Repair mortar would take 2,233 years to fully carbonate, far exceeding the expected service life of the structure, even without considering the contribution of potential surface protection renders.

Tests conducted at the Eduardo Torroja Institute for Construction Science according to UNE EN 12390-11 - Determination of chloride resistance, unidirectional diffusion, yielded a non-steady-state chloride diffusion coefficient ( $D_{ns}$ ) =  $2.940 * 10^{-12} m^2/s$  for Morcemrest Repair, which can be incorporated into models for estimating the service life of reinforced concrete elements due to corrosion.

The chloride diffusion coefficient obtained is significantly lower compared to those provided in the Structural Code, Table A12.3.2.b, Annex 12. Similar coefficients to those obtained for Morcemrest Repair can only be found in concretes designed with Type III/B cement and low water-to-cement ratios.

### SUITABLE SUBSTRATES

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## MORCEMREST® REPAIR

- Substrate must be in good condition, clean, free of grease, oil and loose parts (minimum traction strength of 1.5 MPa).
- If necessary, prepare substrate mechanically until leave healthy concrete is reached.
- Absorbent substrates are previously dampened to the point of saturation, avoiding water-logging.
- Apply MORCEMREST J when surface has become matt again .
- If there are reinforcing frames, oxide, greases and oils should be cleaned and bad adhered particles should be removed.
- In case of having oxide frames, use a sandblast or a metallic teeth brush.
- Use IMPLAREST C in order to protect it against corrosion.
- In vertical and horizontal parameter unions expand the joint union up to 10.

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### APPLICATION PROCEDURE

#### Mortar mixing:

- Add 2/3 of total water 4,5-5l into a clean bucket and gradually add the powder while mixing.
- Then add the remaining water and mix for 2 more minutes.
- The pot life of the mixed mortar does not exceed 30 minutes at a temperature of +20°C; therefore do not mix more material than required.

#### Application:

- Apply MORCEMREST REPAIR with a dented trowel or a spray gun.
- In case it is necessary to press it firmly to get good adhesion and compactness .
- MORCEMREST REPAIR can be applied in several layers, being the minimum thickness of 5 mm per layer.
- On vertical surfaces up to 65 mm thickness can be apply without the help of frames. In horizontal surfaces the maximum thickness should be 100 mm.
- In vertical and horizontal parameter unions fill in the complete width of the joint.

#### Curing:

- Protect from wind, freeze and sun light during the hardening process.
- In order to avoid excessive desiccation it is advisable to cover the surface with humid sackcloth or plastics during the process of curing.
- The curing process is essential

### RECOMMENDATIONS

- Do not add extra water to the mortar other than the recommended amount and do not remix it.
- Do not apply it under 5°C or above 30°C.
- Do not add any cement, sand nor other substances that may alter the proprieties of the material .
- The tools used should be clean with water immediately after being used, in order to avoid the hardening of the material, if not mechanical means will be needed to
- The tools used will be clean with water immediately after being used, in order to remove the products remnants. avoid the hardening of the material, which will need to be remove with mechanical means.
- Please consult with the Technical Department for any application that might not be described in this Technical Data Sheet.
- For all the safety information regarding the use, storage and transportation of the product, please consult our uploaded Safety Data Sheet of the product.
- When applying the repair mortar without a bonding bridge, the foundation of concrete must be rough, clean and well moistened before, but the surface must be free of water at the time of application, that is, the foundation must not be waterlogged. The repair mortar must be applied making it penetrate into the foundation previously prepared and must be compacted avoiding the inclusion of air in order to obtain the required strength, and to protect the reinforcement from corrosion.

### PACKAGING AND STORAGE

MORCEMREST REPAIR served supplied in 25 kg bags. Shelf life: 1 year storage in its original packaging, away from extreme weather conditions and humidity.

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### TECHNICAL DATA

| R4 REQUIREMENTS                                           | DATA OF THE PRODUCT                        |
|-----------------------------------------------------------|--------------------------------------------|
| Appearance                                                | GREY powder                                |
| Density of product in paste form                          | Aprox. 2.0±0.1 gr/cm³                      |
| Granulometry                                              | Dmax 2 mm                                  |
| Thickness by layer                                        | 5 mm min. 65 mm max.                       |
| 28 days Compression resistance                            | >45Mpa                                     |
| Chloride content (EN 1015)                                | ≤ 0,05%                                    |
| Adhesion (EN 1542)                                        | ≥ 2 N/mm²                                  |
| Resistance to carbonation (EN 13295)                      | dk ≤ type MC control concrete(045)         |
| Elasticity module (EN 13412)                              | ≥ 20 GPa                                   |
| Capillary absorption (EN 13057)                           | ≤ 0,5 kg·m <sup>-2</sup> x h <sup>-½</sup> |
| Thermal compatibility part 1                              |                                            |
| (EN 13687-1)                                              | ≥ 2 N/mm²                                  |
| Sudden cooling cycles after high temperatures (50 cycles) |                                            |
| (EN 13687-2)                                              | ≥ 2 N/mm²                                  |
| Thermal compatibility part 4:                             |                                            |
| Thermal cycles in dry areas (50 cycles)                   |                                            |
| (EN 13687-4)                                              | ≥ 2 N/mm²                                  |
| RESISTANCE CURVE                                          |                                            |
| Compression: (EN 12190)                                   |                                            |
| 1 day                                                     | ≥ 20 N/mm²                                 |
| 7 days                                                    | ≥ 35 N/mm²                                 |
| 28 days                                                   | ≥ 45 N/mm                                  |
| Flexotraction: (EN 12190)                                 |                                            |
| 28 days                                                   | ≥ 6 N/mm                                   |
| Pot life time of the paste                                | 20 - 30 minutes                            |
| Mixing water                                              | 4,5 - 5L                                   |
| Paste yield                                               | 2.0 Kg/m²/mm thickness                     |
| Classification according to EN 1504-3:2006                | R4                                         |
| Type                                                      | CC                                         |

Rev. 25\_01 - This revision cancels all previous ones. Please, obtain the latest version from our web site - [www.grupopuma.com](http://www.grupopuma.com) - (+34) 957 76 40 40

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### CE MARK

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
|                                                                                                                                                                                                |                                            |
| GRUPO PUMA SL<br>C) Conrado del Campo nº2 29590 Campanillas (Málaga)<br>17<br>Nº: 215205                                                                                                                                                                                         |                                            |
| En-1504-3<br>MORCEMREST REPAIR                                                                                                                                                                                                                                                   |                                            |
| Structural restoration of the concrete product with CC mortar.<br>For vertical applications without being framed. It allows up to 5 to 65mm of thickness density in vertical surfaces and up to 100 mm in horizontal thickness densities.<br>(Polymerized hydraulic cement base) |                                            |
| Compression resistance                                                                                                                                                                                                                                                           | Class R4                                   |
| Chloride ions content                                                                                                                                                                                                                                                            | ≤ 0.05%                                    |
| Adhesion                                                                                                                                                                                                                                                                         | ≥2Mpa                                      |
| Resistance to carbonation                                                                                                                                                                                                                                                        | Pasa                                       |
| Elasticity module                                                                                                                                                                                                                                                                | ≥ 20GPa                                    |
| Thermal compatibility part 1                                                                                                                                                                                                                                                     | ≥ 2 MPa                                    |
| Capillary absorption                                                                                                                                                                                                                                                             | ≤ 0.5 Kg.m <sup>-2</sup> h <sup>-0.5</sup> |
| Fire reaction                                                                                                                                                                                                                                                                    | A1                                         |

### LEGAL DISCLAIMER

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