

MAPEFILL MC 06

Dual shrinkage-compensated, super flow micro-concrete



WHERE TO USE

For re-profiling of deteriorated concrete structures, and grouting of concrete structures in thicknesses ranging from 50 mm to 250 mm.

Some application examples

- Structural reinstatement of reinforced concrete beams and pillars.
- Re-profiling spalled marine structures e.g. piers and jetties, after surface preparations.
- Restoring the lower flanges of pre-stressed concrete beams of viaducts.
- Reinstatement of floor beams and slabs after the scarification of deteriorated areas.
- Restoring concrete floors for industrial facilities and transport infrastructure.
- Enlargement of structural sections e.g. of beams and columns.
- Grouting of machine baseplates, bridge bearings.
- Anchoring of posts and columns.

TECHNICAL CHARACTERISTICS

Mapefill MC 06 is a ready-mixed powder composed of high-strength cement, selected aggregates and special additives with an expansive agent prepared according to a formula developed in MAPEI research laboratories.

Mapefill MC 06, once mixed with water, becomes a fluid mortar, suitable for pouring into formwork without separation of the aggregates even when forming great thicknesses.

Mapefill MC 06, once cured, has the following qualities:

- very high compressive strength;
- modulus of elasticity and coefficients of thermal expansions and permeability to water vapour similar to those of high quality concrete;
- waterproof;
- high adhesion to the old concrete which has been prepared before-hand, and to reinforcing rods especially if they have been treated with **Mapefer 1K** corrosion-inhibiting mortar;
- high resistance to wear due to abrasion.

Mapefill MC 06 is recommended for filling voids up to 250 mm in a single placing.

RECOMMENDATIONS

- Do not use **Mapefill MC 06** on smooth concrete surfaces; roughen them well and insert reinforcing rods if needed.
- Do not use **Mapefill MC 06** for precision grouting, use **Mapefill SP**.
- Do not use **Mapefill MC 06** for applications by spray or trowel, use **Mapegrout Thixotropic**.
- Do not add cement or additives to **Mapefill MC 06**.
- Do not add water after the mix has begun to set.
- Do not use **Mapefill MC 06** taken from damaged or opened bags.

APPLICATION PROCEDURE

Preparing the substrate

- Remove degraded and loose concrete until the substrate is solid, resistant and rough. Any previous restoration work which is not soundly bonded should also be removed.
- Clean the concrete and reinforcing rods to remove all dirt, rust, cement laitance, grease, oil and previously applied paints.
- Soak the substrate with water until it is saturated. Allow the excess water to drain away and make sure there is no standing water when placing the mix. If necessary, use compressed air to facilitate the removal of free water.

Preparing the mortar

Pour 3.3-3.5 litres of water into a mortar mixer. Start the mixer and slowly and continuously pour in the **Mapefill MC 06**. Mix for 1-2 minutes, scraping any unmixed powder off the sides of the mixer and remix for another 2-3 minutes until the mix is fluid and free from lumps.

Depending on the quantity being prepared, **Mapefill MC 06** may also be mixed in a clean container with a drilling machine and a stirrer attachment.

Avoid stirring an excess of air into the mix.

The expansion of **Mapefill MC 06** has been calculated to compensate for hygrometric shrinkage. In order to be effective, the forces of expansion must be countered with firm and grout-tight formwork restraints. The expansion phase is completed during the first days of curing.

Applying the mortar

To facilitate the expulsion of air, pour **Mapefill MC 06** continuously into the moulds.

Water from the mixed **Mapefill MC 06** must not be absorbed by the formwork, which should be pre-treated with a form-release oil (e.g. MAPEI's DMA 1800 MY form release agent). Do not vibrate the mortar. Make sure that all parts of the void or gap have been filled. If necessary, use sticks or rods to move the mortar into difficult or congested areas.

Precautions to be observed during application and curing

In hot weather, it is advisable to prevent the material from being exposed to the sun and to use cold water for preparing the mix. When the temperature is low, the water used for the mix should be around 20°C.

Once poured, **Mapefill MC 06** must be cured very carefully. The surface of the mortar exposed to air must be protected against the rapid evaporation of water, particularly in warm and windy environments, to prevent plastic shrinkage surface cracks. Spray water onto the surface during the first 24 hours of curing or apply a suitable curing agent e.g. Mapecure SP.

The protection of concrete structures enlarged or repaired with **Mapefill MC 06** may be enhanced with **Mapelastich Guard**, **Colorite** or **Elastocolor** coating systems, or with **Mapecoat SZ MY** in submerged marine environments.

Cleaning

Before hardening, the mortar can be cleaned from tools with water. After setting, cleaning is difficult and it can only be removed mechanically.

CONSUMPTION

20 kg/m² per cm of thickness.

PACKAGING

25 kg bags.

STORAGE

9 months in its original, unopened packaging in a dry place

TECHNICAL DATA (typical values)

PRODUCT IDENTITY

Strength class according to EN 1504-3:2005

R4

Type:	CC
Consistency:	powder
Colour:	grey
Maximum aggregate size:	6
Bulk density (kg/m³):	1,300
Dry solids content (%):	100
Chloride ions content: - requirements ≤ 0.05% according to EN 1015-17 (%)	≤ 0.05
APPLICATION DATA	
Colour of mix:	grey
Mixing ratio:	3.3 – 3.5 litres water per 25 kg bag
Consistency of the mix:	fluid
Density of the mix (kg/m³):	~ 2,290
pH of the mix:	> 12
Application temperature range (oC):	from +5 to +35
Potlife of the mix (mins):	approximately 60
Thickness per application (mm):	min. 50 to max. 250

PRODUCT PERFORMANCE (13.5% mixing water)					
Performance characteristic	Test method	Minimum requirements according to EN 1504-3 for R4 class mortar	Product performance		
Workability, flow diameter (mm):	EN 13395-1	declared value	280		
Workability (mins after mixing): - Flow after 30" (cm) - Maximum flow (cm)	EN 13395-2	declared value	<table border="1"> <tr> <td>5' 46 49 6</td> <td>60' 42 49</td> </tr> </table>	5' 46 49 6	60' 42 49
5' 46 49 6	60' 42 49				
Compressive strength (MPa):	EN 12190	≥ 45 (after 28 days)	25, after 1 day 55, after 7 days 75, after 28 days		
Flexural strength (MPa):	EN 196/1	not required	6, after 1 day 8, after 8 days 9, after 28 days		
Modulus of elasticity in compression (GPa):	EN 13412	≥ 20	31, after 28 days		
Bond strength to concrete (MC 0.40 type substrate water/cement ratio = 0.40) according to EN 1766 (MPa):	EN 1542	≥ 2	> 2, after 28 days		
Capillary absorption (kg/m² .h^{0.5}):	EN 13057	≤ 0.5	0.09		
Thermal compatibility measured as bonding according to EN 1542, freeze-thaw cycles with deicing salts (MPa):	EN 13687-1	≥ 2 (after 50 cycles)	> 2		
Resistance to accelerated carbonation:	EN 13295	depth of carbonation ≤ reference concrete (MC 0.45 type with water/cement ratio = 0.45) according to UNI 1766	passed		
Rapid chloride permeability (coulombs):	ASTM 1202	not required	<1,000		
Water absorption test (%):	BS 1881: Part 122	not required	1.7		
Volume expansion (%):	ASTM C940	not required	1.1		
Reaction to fire:	EN 13501-1	Euroclass	A1		

SAFETY INSTRUCTIONS FOR THE PREPARATION AND APPLICATION

Mapefill MC 06 contains cement that when in contact with sweat or other body fluids causes irritant alkaline reactions and allergic reactions to those predisposed. During use, wear protective gloves and goggles and take the usual precautions for handling chemicals. If the product comes in contact with the eyes or skin, wash immediately with plenty of water and seek medical attention. For further and complete information about the safe use of our product please refer to the latest version of our Material Safety Data Sheet.
PRODUCT FOR PROFESSIONAL USE.

WARNING

Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application; for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application. In every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

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