

# MAPEFLOOR CPU+/MF

High-performance self-smoothing polyurethane cement mortar from 3 to 6 mm



## DESCRIPTION

**Mapefloor CPU+/MF** is a polyurethane-cement self-smoothing mortar, trowel-applied in 3 to 6 mm thickness, developed by MAPEI's Research Laboratories, antimicrobial and easy to sanitize for the protection of industrial floors, featuring high chemical and mechanical performance and thermal shock resistance up to +80°C, with operating temperatures range from -20°C to +70°C, depending on the thickness.

## TECHNICAL CHARACTERISTICS

**Mapefloor CPU+/MF** provides a protective resin system for industrial floors featuring:

- depending on the thickness applied, resistance to thermal shocks due for example to spillage of hot liquids:
  - 3 mm: -10°C up to +60°C
  - 4 mm: -15°C up to +70°C
  - 6 mm: -25°C up to +80°C;
- fast hardening;
- smooth finishing;
- high chemical resistance against acids, bases, saline solutions, solvents, hydrocarbons in general. For more details, refer to the related chemical resistance table;
- high resistance to impact and abrasion;
- impermeability to liquids in general;
- odourless during application and hardening;
- low VOC content;
- does not allow bacterial growth;
- complies with the requirements according to EN 13813 "Screed material and floor screeds - Screed material - Properties and requirements", which defines the requirements to be applied to materials for screeds used in the construction of internal floors;
- complies with the principles defined in EN 1504-9 ("Products and systems for the protection and repair of concrete structures: definitions, requirements, quality control and evaluation of conformity. General principles for the use of products and systems"), and the minimum requirements required by EN 1504-2, coating (C), according to PI, MC, PR, RC, IR principles ("Surface protection systems for concrete").

## ADVANTAGES

- Fulfills HACCP requirements.
- Complies with all Indoor Air Comfort Gold emission requirements for indoor flooring systems, including AgBB in Germany, M1 in Finland and Afsset in France, BREEM, CAM, Singapore Green Label and Global Green Tag. Classified A+, the best class for the lowest emissions.
- Complies with standards applied in the foodstuffs sector EN 1186, EN 13130 and prCEN/TS 14234, as well as the Decree of Consumer Goods that represent the conversion of European directive 89/109/EEC, 90/128/EEC and 2002/72/EC regarding contact with foodstuffs.
- Hygienic and sanitizable; certified according to ISO 4628-1 Riboflavin test for cleaning validation.
- Resistant to fungi and bacteria, certified according to ISO 846.
- Non-tainting for food.
- Fast return to service.
- Ease for warehousing management; components A, B and **Mapecolor CPU+** are common to whole **Mapecolor CPU+** product range.
- Sustainability: it can contribute to LEED credits. EPD (Environmental Product Declaration) compliant.

## WHERE TO USE

**Mapecolor CPU+/MF** is mainly used to create smooth polyurethane-cement based systems, with a light no-slip property, or as base layer for rough multi-layer systems (**Mapecolor System CPU+/DP**) for industrial floors especially in dry or even occasionally wet, for short periods, production and logistic areas, where a durable, resistant and easy to clean and sanitize surface is required.

**Mapecolor CPU+/MF** is typically used in the chemical and pharmaceutical, textile and tanning industries, canning in general, sugar refineries, dairies, wineries and beverage companies in general, meat and fish processing, production and storage areas of food companies in general, commercial and industrial kitchens, freezing rooms and wherever high mechanical and chemical spillages and contact to hot liquids resistances are requested.

## COLOURS

**Mapecolor CPU+/MF** must be mixed with the specific **Mapecolor CPU+** pigment available in grey, beige, red, green, ochre, blue and orange colour. Please, always refer to the Mapei Technical Service for a detailed assessment of the most suitable system and colour for the specific case. The colour also helps to define the overall performance of the system.

## RECOMMENDATIONS

- Do not apply **Mapecolor CPU+/MF** on wet substrates or on concrete younger than 7 days.
- Do not dilute **Mapecolor CPU+/MF** with solvents or water.
- Do not apply **Mapecolor CPU+/MF** on dusty or crumbly substrates.
- Do not apply **Mapecolor CPU+/MF** on substrates contaminated by oil, grease, or dirt in general.
- Do not apply **Mapecolor CPU+/MF** on not properly prepared substrates.
- Do not mix partial quantities of the components to prevent mistakes in the mixing ratios which would cause incorrect hardening of the product.
- Do not expose the mixed product to heat sources.
- Do not apply **Mapecolor CPU+/MF** on ceramic substrates or stone materials in general with no appropriate specific preparation of the laying surface.
- **Mapecolor CPU+/MF** exposed to UV lights could lead to noticeable colour changes; this phenomenon does not affect the performance of the coating in any way.
- The colour of **Mapecolor CPU+/MF** can also change in case of contact with certain chemicals; the colour variation itself is not an indication of chemical aggression on the coating.
- Remove as soon as possible any chemicals in contact with **Mapecolor CPU+/MF**.
- For cleaning use suitable equipment and detergents depending on type of dirt to be removed.

- Protect **Mapefloor CPU+/MF** from water for at least 24 hours after the application.

## APPLICATION PROCEDURE

### Substrate characteristics

Substrates must be solid, compact, stable, sound, clean, and properly designed for static and dynamic loads foreseen in the operating conditions. The flatness must be defined by the needs of use. At the time of application, compressive strength of the concrete or cementitious mortar used for the repair must be higher than 25 N/mm<sup>2</sup> and the direct tensile strength at least 1.5 N/mm<sup>2</sup>.

The substrate surface must appear visually dry. There must be no capillary rising damp as well.

In the case of substrate such as ceramic tiles, natural stones, or old resin coatings, they must be perfectly stable and anchored to the substrate, intact, sound, and clean. These substrates require specific preparation methods for the laying surfaces. In the case of old resin coatings, it is recommended to also perform a compatibility test with the new system to be applied.

### Substrate preparation

The surface of the floor must be prepared with specific mechanical equipment such as for example shotblasting or milling machine, to remove all traces of dirt, any contamination for the entire thickness concerned, cement laitance, crumbly or detached parts and make the surface rough and absorbent.

Any defects such as holes, pitting, cracks, etc. must be repaired using, for example, **Primer SN** possibly filled with quartz sand or thixotropic agent like **Additix PE** or with **Mapefloor JA** or **Mapefloor JA Fast** depending on the width and depth of the defects and cracks.

For the reconstruction of heavily degraded areas and joints, the filling of large depressions, repairs, or minimal localized changes to slopes, etc., please contact the Technical Service.

Before proceeding with the application of the material, the surface dust must be carefully vacuumed.

### Anchor grooves

The anchoring grooves on the concrete must be made with a suitable mechanical joint saw. The dimensions (depth and width) must be approximately double the thickness of **Mapefloor CPU+/MF**.

They must be provided along the perimeter of the area, near all the vertical lines such as walls and pillars, around the drainage channels and wells, on the thresholds of the doors, around the feet of the machinery, in general along each free edge and the interruptions of the installation, such as joints that clearly define the end of the working day and the beginning following one.

The maximum distance between parallel grooves must not exceed approximately 15 meters. If it exceeds this measure, it will be necessary to make intermediate cut.

In case concrete has not fully completed its hygrometric shrinkage, it is advisable to make the anchor grooves also along the cracks control joints. It will make possible to seal the joint in case the shrinkage crack appears in the joint (therefore also on **Mapefloor CPU+/MF**) even without removing part of the floor, as the entire area straddling the joint is already well anchored.

### Temperature

To avoid the condensation on the surface, the substrate temperature must be at least 3°C above the dew point. The relative humidity of the air must be lower than 80%. The ambient temperature must be between +10°C and +30°C.

In case of application at temperature above +25°C, store the material in a sheltered spot at a lower temperature. This will allow to get longer pot life and get the application simpler even at high temperatures. In case of temperature below +15°C, store the material in a warmer place (heated room temperature) to avoid the risk of too high viscosity of the mix making the application harder and turning into a potential problem of aesthetics effect.

### Application of the primer

**Mapefloor CPU+/MF** must be applied on a substrate with no surface porosity to prevent pinholes in the hardened product. For such reason a preliminary layer of **Mapefloor CPU+/Primer** must be applied.

Alternatively, **Primer SN** fully broadcast with quartz sand **Quartz 0.9** can be used as well but only for fully cured and dry substrates with a humidity content < 4% and when no thermal shocks are expected during the service life of the floor.

In case of rough surface, apply a scratch coat using **Mapefloor CPU+/MF** to even the surface. For further information about preparation, mixing, consumption and application details of **Mapefloor CPU+/Primer** and **Primer SN**, please read the related Technical Data Sheets.

## Product preparation

Shake the packs containing the liquid components A, B and **Mapecolor CPU+** pigment. Pour two packs of component A and two packs of **Mapecolor CPU+** into a clean bucket and mix for a few seconds until a homogeneous mixture is obtained. Then add two packs of component B and mix again with a suitable low-speed electric mixer until completely blended. Then slowly and gradually add one pack of component C, continuing to mix for at least three minutes until a homogeneous mixture is obtained. We recommend the use of specific low-speed mixers. At temperatures lower than +23°C this time could be slightly longer. Only mix whole packs of components A, B, C and **Mapecolor CPU+** to prevent potential mistakes in the mixing ratios which could compromise the entire system.

## Product application

Immediately after mixing, pour all mixed **Mapefloor CPU+/MF** on the floor and spread it evenly to the required thickness with a straight or serrated trowel or a squeegee fitted with thickness rulers. It is advisable to proceed with the installation of the product in such a way as to ensure that the material that has just been poured can be connected to the one already laid when the latter is still fresh and workable. This way the signs of conjunction will be minimized. Immediately after spreading, it is necessary to use a spike roller several times to remove any air trapped during mixing and help the material smoothing. Apply the mix within the useful pot life indicated in the table. The higher the temperature, the lower the pot life; the lower the temperature, the higher the pot life.

## SYSTEMS

**Mapefloor CPU+/MF** can be applied both as a self-smoothing and as the basecoat of the multilayer defined profile system (**Mapefloor System CPU+/DP**). For the whole description of **Mapefloor System CPU+/DP** see the relevant system Technical Data Sheet.

## CONSUMPTION

*As scratch coat 1 mm thickness:*

**Mapefloor CPU+/MF:** approx. 1.7 kg/m<sup>2</sup>

*As self-smoothing layer:*

|                                |                               |
|--------------------------------|-------------------------------|
| <b>Mapefloor CPU+/MF 3 mm:</b> | approx. 5.5 kg/m <sup>2</sup> |
| <b>Mapefloor CPU+/MF 4 mm:</b> | approx. 7 kg/m <sup>2</sup>   |
| <b>Mapefloor CPU+/MF 6 mm:</b> | approx. 10 kg/m <sup>2</sup>  |

The consumption is influenced by the roughness and absorption of the substrate as well as by the environmental and working conditions of the job site.

## TOOLS CLEANING

Equipment used to prepare and apply **Mapefloor CPU+** product range must be cleaned with thinner for polyurethanes immediately after use. Once the product has hardened, it can only be removed mechanically.

## FLOOR CLEANING

The first cleaning after laying **Mapefloor CPU+/MF** must only be carried out after the product has completely hardened. Early washing could lead to the formation of stains/shading due to the surface not yet perfectly closed and still partially absorbent.

For periodic and extraordinary washing, use suitable and specific machines, equipment and detergents for the type of stains and dirt to be removed.

## PACKAGING

**Mapefloor CPU+** Component A: 2 kg pack

**Mapefloor CPU+** Component B: 2.16 kg pack

**Mapefloor CPU+/MF** Component C: 20 kg bag

**Mapecolor CPU+**: 0.23 kg pack.

**Warning:** Product consists of two packs of component A plus two packs of component B plus one sack of component C and two packs of **Mapecolor CPU+**.

## STORAGE

12 months in the original sealed packaging and kept in a dry and sheltered place at temperatures between +10°C and +30°C. Components A and B can be damaged by frost. **Mapefloor CPU+/MF** part C is sensitive to humidity.

## SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Instructions for the safe use of our products can be found on the latest version of the Safety Data Sheet, available from our website [www.mapei.com](http://www.mapei.com).

When the product reacts, it generates considerable heat. After mixing components A, B and C, we recommend applying the product as soon as possible and to never leave the container unguarded until it is completely empty.

PRODUCT FOR PROFESSIONAL USE.

## TECHNICAL DATA (typical values)

### PRODUCT IDENTITY

|                     | Comp. A                      | Comp. B                      | Comp. C                     | Mapecolor CPU+                               |
|---------------------|------------------------------|------------------------------|-----------------------------|--|
| Colour:             | Milky white                  | Dark brown                   | White grey                  | Grey, beige, red, green, ochre, blue, orange |
| Appearance:         | Liquid                       | Liquid                       | Powder                      | Paste  |
| Density:            | 1-1.05 g/cm <sup>3</sup>     | 1.2 g/cm <sup>3</sup>        | –                           | 1.30-1.60 g/cm <sup>3</sup>                  |
| Bulk density:       | –                            | –                            | 1.80-1.95 g/cm <sup>3</sup> |  |
| Viscosity at +23°C: | 200-600 mPa·s (# 2 - rpm 20) | 100-160 mPa·s (# 1 - rpm 50) | –                           | 5000-9000 mPa·s (# 5 – rpm 20)               |

### APPLICATION DATA

|                             |  |
|-----------------------------|--|
| Mixing ratio:               | 2xA / 2xB / 1xC / 2xMapecolor CPU+: 2x2.0 / 2x2.16 / 1x20 / 2x0.23 |
| Colour of the mix:          | Grey, beige, red, green, ochre, blue, orange                       |
| Consistency of the mix:     | Fluid  |
| Density of the mix:         | 1700 kg/m <sup>3</sup>   |
| Pot life at +23°C:          | 15 min   |
| Temperature of the surface: | From +10°C to +30°C  |

**FINAL PERFORMANCE at +23°C and 50% R.H.**

|   |   |
|---|---|
| Tack free:  | 2-4 h   |
| Ready for traffic at 23°C:  | - Recoating: 12 h<br>- Light traffic: 24 h                      |
| Complete hardening:   | 4-5 days  |
| Shore D hardness after 28 days (DIN 53505):                         | 83  |
| Slip resistance (EN 13036-4):                                       | Class I (wet indoor surfaces)<br>Class II (dry indoor surfaces) |
| Modulus of elasticity by compressive strength (EN 13412):           | 4306 MPa  |
| Coefficient of linear thermal expansion (EN 1770):                  | $5.35 \cdot 10^{-5} \text{ K}^{-1} \alpha_m$                    |
| Determination of characteristics by flexural strength (EN ISO 178): | 4488 MPa  |
| Depth of water penetration under positive pressure (EN 12390-8):    | No penetration (5 bar / 3 days)                                 |
| Adhesion strength (EN 13892-8):                                     | $\geq 2 \text{ N/mm}^2$   |

| Essential characteristics | Test method | Requirements according to EN 13813 for cement screeds | Typical values  |
|---------------------------|-------------|---|---|
| Abrasion resistance BCA:  | EN 13892- 4 | $\leq \text{AR6}$                                     | AR0.5   |
| Compressive strength:     | EN 13892-2  | From C5 to C80  | C50   |
| Flexural strength:        | EN 13892-2  | From F5 to F50  | F15   |
| Permeability to water:    | EN 1062-3   | Declared value  | $w < 0.1 \text{ kg}/(\text{m}^2 \cdot \text{h}^{0.5})$<br>(Class III)   |
| Chemical resistance:      | EN 13529    | CR group number (from 1 to 15 a) and class (1 or 2)   | Shore D reduction < 50%<br>CR9, CR10, lactic acid 10-90 Vol% (class 2, change of colour, clearer)<br>CR11, CR12 (Class 2) |
| Reaction to fire class:   | EN 13501-1  | Declared value  | B <sub>FL</sub> -s1   |

**ESSENTIAL CHARACTERISTICS FOR CE MARKING ACCORDING TO EN 1504-2 – TAB. ZA.1d; ZA.1e; ZA.1f; ZA 1g (coating C, principles PI-MC-PR-RC-IR)**

| Essential characteristics   | Test method     | Requirements  | Typical values                                       |
|---|-----------------|---|--|
| Abrasion resistance (TABER test):<br>Note: testing methods for flooring systems according to EN 13813 are also acceptable | EN ISO 5470-1   | Loss in weight less than 3000 mg with an H22 abrasive wheel /1,000 cycles /1,000 g load   | <3000 mg   |
| Permeability to CO <sub>2</sub> :   | EN 1062-6       | $S_D > 50 \text{ m}$  | >50 m  |
| Permeability to water vapour:   | EN ISO 7783-1-2 | Class I: $S_D < 5 \text{ m}$ (permeable to water vapour)<br>Class II: $5 \text{ m} < S_D < 50 \text{ m}$<br>Class III: $S_D > 50 \text{ m}$ (impermeable to water vapour) | Class II   |
| Capillary absorption and permeability to water:   | EN 1062-3       | $w < 0,1 \text{ kg}/\text{m}^2 \cdot \text{h}^{0,5}$  | $w < 0,1 \text{ kg}/\text{m}^2 \cdot \text{h}^{0,5}$ |
| Resistance to thermal shock (1x):   | EN 13687-5      | Rigid systems with traffic $\geq 2 \text{ N}/\text{mm}^2$   | $\geq 2 \text{ N}/\text{mm}^2$                       |

|   |               |  |  |
|---|---------------|--|--|
| Resistance to severe chemical attack<br>– Class I: 3 days with no pressure:<br>– Class II: 28 days with no pressure:<br>– Class III: 28 days with pressure:<br>We recommend using test liquids for the 20 classes indicated in EN 13529, which cover all types of the most-commonly used chemical agents. Other test liquids may be agreed upon between those interested in the tests | EN 13529      | Reduction of hardness less than 50% when measured according to the Buchholz method (EN ISO 2815) or the Shore method (EN ISO 868), 24 hours after removing the coating material from immersion in the test liquid  | Shore D reduction < 50%<br>Groups 9, 10, lactic acid 10-90 Vol % (Class II, change of colour, clearer)<br>Groups 11, 12 (Class II) |
| Impact resistance:  | EN ISO 6272-1 | No cracks or delamination after loading<br>Class I: ≥ 4 Nm<br>Class II: ≥ 10 Nm<br>Class III: ≥ 20 Nm  | Class II   |
| Direct tensile adherence test:  | EN 1542       | Average (N/mm <sup>2</sup> )<br>Crack-bridging or flexible systems<br>without traffic: ≥ 0.8 (0.5) <sup>b)</sup><br>with traffic: ≥ 1.5 (1.0) <sup>b)</sup><br>Rigid systems <sup>c)</sup><br>without traffic: ≥ 1.0 (0.7) <sup>b)</sup><br>with traffic : ≥ 2.0 (1.5) <sup>b)</sup> | ≥ 2 N/mm <sup>2</sup>  |
| Reaction to fire class:   | EN 13501-1    | Euroclasses  | B <sub>FL</sub> -s1  |

## Indoor Air Comfort GOLD – VOC Emission

French VOC Regulation  
(Decree of March /April 2011 modified in February 2012)



French CMR components  
(Regulation of April/May 2009)

Pass

Italian CAM Edilizia  
(DM23.06.2022 n.256, GURI n.183 06/08/2022)

Pass

AgBB  
(Regulation AgBB/DIBt)

Pass

Belgian Regulation  
(Royal decree of May 2014)

Pass

Indoor Air Comfort  
(Indoor Air Comfort 8.0 of June 2022)

Pass

Indoor Air Comfort GOLD  
(Indoor Air Comfort GOLD 8.0 of June 2022)

Pass

## 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](http://www.mapei.com)

## LEGAL NOTICE

The contents of this Technical Data Sheet (“TDS”) may be copied into another project-related document, but the resulting document shall not supplement or replace requirements per the TDS in

force at the time of the MAPEI product installation.

The most up-to-date TDS can be downloaded from our website [www.mapei.com](http://www.mapei.com).

ANY ALTERATION TO THE WORDING OR REQUIREMENTS CONTAINED OR DERIVED FROM THIS TDS EXCLUDES THE RESPONSIBILITY OF MAPEI.

All relevant references for the product are available upon request and from [www.mapei.com](http://www.mapei.com)

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