

Mapecfloor I 390 EDF

**Two-component,
self-levelling epoxy
formulation used to
form strong, dissipative
coatings**



WHERE TO USE

Mapecfloor I 390 EDF is used to form electrically dissipative coatings on concrete substrates and cementitious screeds, including those exposed to medium to heavy traffic.

Once hardened, **Mapecfloor I 390 EDF** is characterised by a low release of micro-particles and volatile organic compounds (VOC) into the air. Thus it's particularly suitable for coating floors in cleanrooms where a high standard of hygiene is required, the dimensions and amount of suspended micro-particles need to be constantly monitored and the presence of potential biological and physical pollutants that could interfere with the various processes needs to be kept under control.

Mapecfloor I 390 EDF is used in particular to make dissipative coatings in environments like:

- electronic industries;
- chemical and pharmaceutical industries;
- laboratories;
- hospitals and operating theatres;
- automotive and aerospace industries;
- warehouses of flammable substances;
- sterile environments;
- cleanrooms.

TECHNICAL CHARACTERISTICS

Mapecfloor I 390 EDF is a two-component, high solid content, pigmented, epoxy resin-based formulate containing electrically-conductive fillers according to a formulation developed in the MAPEI R&D laboratories.

Mapecfloor I 390 EDF is used to make smooth, self-levelling, waterproof, dissipative coatings with high mechanical strength and good resistance to chemicals.

Mapecfloor I 390 EDF is applied on substrates after treating their surface with **Primer W-AS N**, a special two-component water-based epoxy primer for electrically conductive dissipative coatings.

Mapecfloor I 390 EDF is used to make seamless, self-levelling coatings specific for cleanrooms class ISO 3, concerning particle emissions according to ISO 14644-1, and class -7.9, concerning VOC emissions according to ISO 14644-8. Decontaminable according to ISO 8690/1998 with ¹³⁷Cs and ⁶⁰Co.

Mapecfloor I 390 EDF complies with the principles defined in EN 13813 "Screeds and materials for screeds – Materials for screeds – Properties and requirements", which specifies the requirements for screed materials used in the construction of internal floors.

ADVANTAGES

- Electrically dissipative.
- High mechanical strength and good resistance to chemicals.
- Waterproof.
- Dust proof.

- Ease of cleaning and sanitising (Riboflavin test ISO 4628-1).
- Fulfills ATEX 137.
- Bacteriostatic (ISO 22196).
- System fast to put into service.

COLOURS

Mapefloor I 390 EDF is supplied in various RAL colours. For the full range of colours available please contact the Head Office.

RECOMMENDATIONS

- The substrate's moisture content must be no more than 4% and there must not be capillary rising damp (check by testing it with a sheet of polythene).
- Make sure the film of **Primer W-AS N** has completely hardened before applying **Mapefloor I 390 EDF**.
- Before applying **Mapefloor I 390 EDF**, check the electrical conductivity of the surface of **Primer W-AS N**.
- Do not apply **Mapefloor I 390 EDF** on dusty or crumbly substrates or that have not been prepared as specified and primed.
- Do not apply **Mapefloor I 390 EDF** on substrates with oil or grease stains or dirt in general.
- **Mapefloor I 390 EDF** contains special, electrically-conductive fillers which may produce colour or surface unevenness, but this will have no effect on the final performance of the product.
- Do not dilute **Mapefloor I 390 EDF** with solvent or water.
- Do not mix partial quantities of the components to avoid mixing errors; the product may not harden correctly.
- Do not expose the mixed product to sources of heat.
- Coatings made from **Mapefloor I 390 EDF** may change colour or fade if exposed to sunlight but this has no effect on the performance characteristics of the coating.
- The coating may also change colour if it comes into contact with aggressive chemicals. A change in colour, however, does not mean that it has been damaged by the chemical.
- Remove aggressive chemicals as soon as possible after they come into contact with **Mapefloor I 390 EDF**.
- If rooms where the product is being used need to be warmed up, do not use heaters that burn fossil fuels, otherwise the carbon dioxide and water vapour given off into the air will affect the shine on the finish and ruin its appearance. Use electric heaters only.
- Protect the product from water for at least 24 hours after application.

- Do not apply the product directly on cementitious substrates.
- The temperature of the substrate during the application and hardening must be at least 3°C above the dew-point and the surrounding relative humidity must be max. 80%.
- Use suitable specific cleaning equipment and detergent to clean the coating, depending on the type of dirt or stain to be removed.
- The consumption of **Mapefloor I 390 EDF** must never exceed 2.5 kg/m², otherwise the dissipation properties of the system could be affected.

APPLICATION PROCEDURE

Preparation of the substrate

The surface of concrete floors must be dry, clean and sound and have no crumbling or detached areas. The compressive strength of concrete substrates must be at least 25 N/mm² and their tensile strength must be at least 1.5 N/mm². The substrate must also be strong enough for its final intended use and to withstand the types of loads acting on the floor.

The moisture content in the substrate must be maximum 4% and there must be no capillary rising damp (check by testing it with a sheet of polythene).

The surface of the floor to be treated must be prepared with a suitable mechanical process (e.g. shot-blasting or grinding with a diamond disc) to remove all traces of dirt, cement laitance and crumbling or detached portions, and to make the surface slightly rough and absorbent.

Before applying the products, thoroughly remove all dust on the surface with a vacuum cleaner.

Any cracks, holes or surface irregularities must be repaired and smoothed with fluid epoxy resin **Eporip**, or epoxy mortar **Mapefloor EP19** or tixotropic epoxy resin **Mapefloor JA** or **Mapefloor JA Fast**.

Application of Primer SN

Apply the **Primer SN** mixed with **Quartz 0.5** on the substrate with a straight trowel after it has been prepared as specified. Do not broadcast the surface of the primer with quartz sand. Make sure there are no open pores in the surface of the substrate, otherwise air bubbles could escape and form small craters or pinholes in the self-levelling finishing coat. If there are holes or open pores in the substrate fill them with **Eporip** or **Primer SN** thickened with **Additix PE**. When the **Primer SN** is hardened, sanding the surface and apply by roller a second coat of neat **Primer SN**.

Application of Copper Band and Primer W-AS N

The special, self-adhesive, electrically conductive **Copper Band** strips must be placed on the surface of the hardened **Primer SN**. The number and position of the strips depends on the size and shape of the surface to be coated and the position of any joints, channels, pillars, etc., and, in any

TECHNICAL DATA (typical values)

PRODUCT IDENTITY

	component A	component B
Colour:	coloured	transparent
Consistency:	thick liquid	liquid
Density (g/cm ³):	1.5 ÷ 1.6	1.00
Viscosity at +23°C (Pa·s):	6.5 ÷ 8.5 (# 5 - rpm 20)	0.15 ÷ 0.2 (# 2 - rpm 50)

APPLICATION DATA (at +23°C - 50% R.H.)

Mixing ratio:	comp. A : comp. B = 80 : 20 in weight	
Colour of mix:	coloured	
Consistency of mix:	fluid	
Density of mix (kg/m ³):	1,520	
Viscosity of mix (Pa·s):	1.5 ÷ 2.5 (# 4 - rpm 20)	
Workability time: - at +10°C: - at +20°C: - at +30°C:	approx. 40 mins. approx. 25 mins. approx. 15 mins.	
Waiting time between applying Primer W-AS N and Mapefloor I 390 EDF (the times indicated may vary according to surrounding conditions, such as temperature and relative humidity) Substrate temperature: - +10°C: - +20°C: - +30°C:	min. 26 h 17 h 12 h	max. 7 days 5 days 4 days
Set to foot traffic: - +10°C: - +20°C: - +30°C:	approx. 30 hours approx. 24 hours approx. 16 hours	
Waiting time for light traffic: - +10°C: - +20°C: - +30°C:	approx. 5 days approx. 3 days approx. 16 hours	
Waiting time before ready for maximum loads: - +10°C: - +20°C: - +30°C:	approx. 10 days approx. 7 days approx. 5 days	
Application temperature:	+8°C to +35°C	

FINAL PERFORMANCE (at +23°C - 50% R.H.)

Electrical resistance (EN 1081) (Ohm):	10 ⁶ < R _E < 10 ⁹ <i>these values may vary according to surrounding conditions (temperature and humidity) and the equipment used to take the readings</i>	
Compressive strength after 28 days at +23°C (EN 196-1) (N/mm ²):	approx. 80	
Flexural strength after 28 days at +23°C (EN 196-1) (N/mm ²):	approx. 40	
Abrasion resistance - Taber abrasion meter (CS17 disc - 1,000 revs. - 1,000 g) after 7 days at +23°C (EN ISO 5470-1) (mg):	70	
Abrasion resistance - Taber abrasion meter (CS10 disc - 1,000 revs. - 1,000 g) after 7 days at +23°C (EN ISO 5470-1) (mg):	37	
Shore D hardness after 3 days at +23°C (DIN 53505):	77	

Main characteristics	Test method	Requirements according to EN 13813 for synthetic resin-based screeds	Performance of product
BCA wear-resistance:	EN 13892-4	≤ 100 µm	AR 0.5
Adhesion strength:	EN 13892-8; 2004	≥ 1.5 N/mm ²	≥ 2.5 N/mm ²
impact strength:	EN ISO 6272	≥ 4 Nm	IR 20
Capillary absorption and water permeability:	EN ISO 1062-3	w < 0.1 kg/m ² ·h ^{0.5}	0.005 kg/m ² ·h ^{0.5}
Resistance to chemicals:	EN 13529	Declared CR value	Shore D reduction < 50% CR1 (Class II) CR4 (Class II) CR5a (Class I) CR10 (Class II- slight loss of shine) CR11 (Class II) CR12 (Class II)
Reaction to fire:	EN 13501-1	A _{1FL} to F _{FL}	B _{FL} -s1

Cleanroom testing (CSM standard)

Performance characteristic	Test method	Test parameters	Classification
Concentration of airborne particles from the material when subjected to friction:	ISO 14644-1	vs. PA6 Normal force: 300 N	ISO Class: 3
Evaluation of volatile organic compound (VOC) emissions at +23°C and +90°C:	ISO 14644-8	From class 0 (high concentration of VOC, equal to 1 g/m ³) to -12 (VOC emissions equal to 10 ⁻¹² g/m ³ or 0.001 ng/m ³).	ISO-ACC _m Class -7.9

case, they must be positioned every 80 m² of surface minimum (a circular area around 5 meters in radius). The strips are laid on the hardened primer near to a wall, a pillar, etc. by applying a 1-1.5 meter long piece on the surface of the floor, and then folding it up along the vertical surface for at least 50 cm. Be very careful when handling the strips of copper and folding them along the wall, otherwise they may be torn or permanently damaged. Once the resin coating has been applied, the free ends of the strips must be connected to earth by a qualified electrician.

Once the copper strips have been positioned, apply a coat of **Primer W-AS N** electrically conductive resin in water emulsion over the entire surface with a roller.

After 24 hours curing and obtained an even matt black finish, the electrical resistance measurement will need to be conducted. The resistance to earth R_E value must be < 3 x 10³ Ω using 10V.

Apply **Mapefloor I 390 EDF** only after having applied and checked the conductivity of **Primer W-AS N**.

Before applying **Mapefloor I 390 EDF**, remove all traces of dust from the surface with a vacuum cleaner.

For further details regarding the preparation and application of **Primer SN** and **Primer W-AS N**, refer to the relative Technical Data Sheets.

Preparation of the product

Stir each component of **Mapefloor I 390 EDF** with an electric mixer and add approximately 10% by weight of **Quartz 0.25** to component A while mixing to form a smooth, well-blended compound.

Pour all the content of component B into the container of component A and mix again with a suitable low-speed electric mixer (300-400 revs/min.) for at least 2 minutes until homogeneous mixture is achieved. Do not overmix the product to avoid entraining too much air into the mixture.

Pour the mixture into a clean container and briefly mix again.

Apply the mixture within the pot life indicated in the data table (referred to a temperature of

+23°C). Higher surrounding temperatures will reduce the pot life of the mixture, while lower temperatures will increase it.

Application of the product

Apply a single layer up to 1.5-2 mm thick of **Mapefloor I 390 EDF** with a notched spreader or rake (with "V" shaped notches) over the entire surface to be treated. Immediately after spreading on the self-levelling product, back-roll with a spike roller to eliminate any air entrained into the product during mixing. It is recommended to pass over the surface with the roller in two perpendicular directions. Back-roll intensively especially in the perpendicular direction to that one assumed by the conductive fibres that are visible on the surface after the application.

When the **Mapefloor I 390 EDF** has hardened, test a reference area of the system to check its dissipative capacity.

The number of checks and measurements of the dissipation capacity of the coating must be proportional to the area to be tested as indicated below:

Size of area	Number of tests
< 10 m ²	1 test per m ²
10 < m ² < 100	10 to 20 tests
> 100 m ²	10 tests every 100 m ²

Cleaning

Clean tools used to prepare and apply **Mapefloor I 390 EDF** with ethanol immediately after use. Once hardened, the product may only be removed using mechanical means.

CONSUMPTION

Max. 2.5 kg/m² of **Mapefloor I 390 EDF**.

PACKAGING

20 kg kit.

– component A: 16 kg;

– component B: 4 kg.

STORAGE

Mapefloor I 390 EDF may be stored for 24 months in its original sealed packaging, in a dry area, at a temperature between +5°C to +30°C. Protect from frost.

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. When the product reacts, it generates considerable heat. After mixing components A and B 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.

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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**All relevant references
for the product are available
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Mapefloor I 390 EDF



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