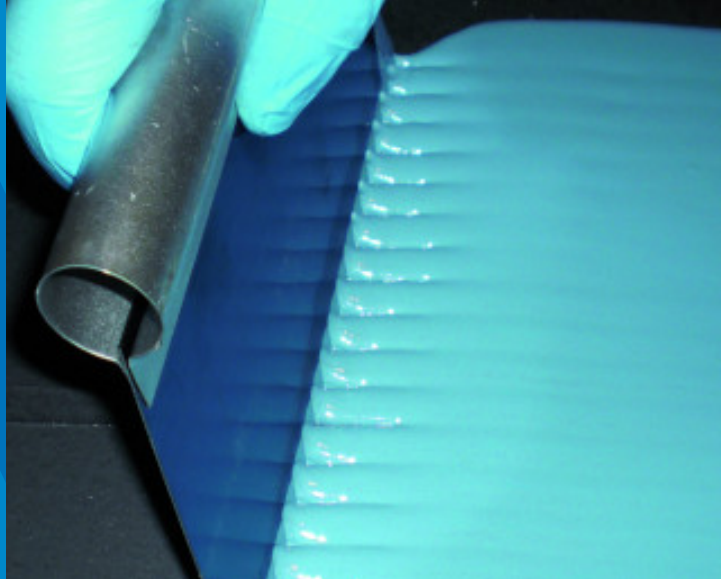


MAPEFLOOR I 390 EDF

Two-component, self-levelling epoxy resin for electrically dissipative systems



DESCRIPTION

Mapecfloor I 390 EDF is a two-component, high solid content, pigmented, epoxy resin-based formulation containing electrically conductive fillers according to a formulation developed in the MAPEI R&D laboratories. It is used to form smooth electrically dissipative resin systems, watertight and with high mechanical and good chemical resistances, on concrete floors and cementitious screeds, including those exposed to medium to heavy traffic.

TECHNICAL CHARACTERISTICS

- Electrically dissipative.
- Good chemical resistances.
- High mechanical strength.
- Impermeable to water and liquids in general.
- Anti dust.

Mapecfloor I 390 EDF is used to make seamless, self-levelling resin systems 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.

Mapecfloor I 390 EDF fulfills the requirements of ISO 8690/1998 with contaminants ¹³⁷Cs and ⁶⁰Co.

Mapecfloor I 390 EDF complies with requirements of EN 13813 "Screed material and floor screeds - Screed material - Properties and requirements", which specifies the requirements for screed materials used in the construction of internal floors.

ADVANTAGES

- Easy to clean and sanitize (Riboflavin test ISO 4628-1).
- Fulfills ATEX 137.
- Does not allow microbial growth according to ISO 22196.
- System fast to put into service.
- Easy to maintain.
- Sustainability: it can contribute to LEED credits. EPD (Environmental Product Declaration) compliant.

WHERE TO USE

Mapefloor I 390 EDF is used to make electrically dissipative systems for floors in areas like:

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

Once hardened, **Mapefloor I 390 EDF** is characterised by a low release of micro-particles and volatile organic compounds (VOC) into the air. Thus, it is particularly suitable for resin systems for 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.

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 moisture content must be no more than 4% and there must not be capillary rising damp.
- **Mapefloor 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 systems. 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 on **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 not affect 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.
- The surface of the system made with **Mapefloor I 390 EDF** may change colour if exposed to UV rays, but this has no effect on the performance characteristics of the coating.
- The surface may also change colour if it comes into contact with aggressive chemicals. A colour change, however, does not mean that it has been damaged by the chemical substance.
- 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 of 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 application and the hardening must be at least 3°C above the dew point and the relative humidity of the air must be max. 80%.
- Use suitable specific cleaning equipment and detergent to clean the resin system, 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 dissipative 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.

The surface of the floor must be prepared with suitable power tools (e.g. shot-blasting or grinding with a diamond disk) 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 product, carefully vacuum off the dust from the surface.

Any cracks, holes or surface irregularities must be repaired and smoothed with **Primer SN**, filled, if necessary, with quartz sand or made thixotropic with the addition of **Additix PE**, **Mapecfloor JA** or **Mapecfloor JA Fast**.

Select the most suitable product depending on the width and depth of cracks. Use **Mapecfloor EP P19**, pre-dosed epoxy mortar, to reintegrate any badly damaged areas or joints, fill hollows in the surface and repair or carry out localised modifications to slope.

Application of Primer SN

Apply **Primer SN** mixed with **Quartz 0.5** on the substrate with a straight trowel or rake after it has been prepared accordingly. 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 could escape and form small craters or pinholes in the self-levelling finishing layer. If holes or open pores are still detected on the substrate, skim the surface again with **Primer SN**. When the **Primer SN** has hardened, sand the surface and apply a further coat of **Primer SN** by roller.

Application of Copper Band and Primer W-AS N

The special, self-adhesive, electrically-conductive **Copper Band** strips must be placed on **Primer SN**, once hardened. The number and position of the strips depend on the shape of surface to be coated and the position of any joints, channels, pillars, etc. and, in any 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 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 the earth by a qualified electrician.

Once the copper strips have been positioned, apply on the entire surface an even coat by roller of **Primer W-AS N**, electrically conductive resin in water emulsion, over the entire surface of the epoxy formulation.

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 $<3 \times 10^3 \Omega$ at 10 V.

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

Before applying **Mapecfloor 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 relevant Technical Data Sheets.

Preparation of the product

Stir components A and B of **Mapecfloor I 390 EDF** electric mixer (300-400 revs/min.). While still stirring, add approximately 10% by weight of **Quartz 0.25** to the component A then mix to form a well-blended compound. Pour all the content of component B into the container of component A and mix for at least 2 minutes until a 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. 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 **Mapecfloor I 390 EDF** with a notched spreader or rake (with "V" shaped notches) over the entire surface to be treated.

Immediately after spreading the self-levelling product, back-roll with a spiked 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 conductive property 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 can only be removed mechanically.

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 can be stored for 24 months in its original sealed packaging, in a dry place at a temperature between +5°C and +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 never leaving the container unattended until it is completely empty.

PRODUCT FOR PROFESSIONAL USE.

TECHNICAL DATA (typical values)

PRODUCT IDENTITY

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

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

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

Waiting time before setting to light traffic:	
- at +10°C:	approx. 5 days
- at +20°C:	approx. 3 days
- at +30°C:	approx. 16 hours
Waiting time before ready for maximum loads:	
- at +10°C:	approx. 10 days
- at +20°C:	approx. 7 days
- at +30°C:	approx. 5 days
Application temperature:	from +8°C to +35°C

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

Electrical resistance (EN 1081):	$10^6 < R_E < 10^9$ these values may vary according to surrounding conditions (temperature and humidity) and the equipment used to take the readings
Compressive strength after 7 days at +23°C (EN 196-1):	approx. 80 N/mm ²
Flexural strength after 7 days at +23°C (EN 196-1):	approx. 40 N/mm ²
Abrasion resistance - Taber abrader (CS17 wheel- 1000 revs. - 1000 g) after 7 days at +23°C (EN ISO 5470-1):	70 mg
Abrasion resistance - Taber abrader (CS10 wheel - 1000 revs. - 1000 g) after 7 days at +23°C (EN ISO 5470-1):	37 mg
Shore D hardness after 3 days at +23°C (DIN 53505):	77

Essential characteristics	Test method	Requirements according to EN 13813 for synthetic resin-based screeds	Typical values
BCA wear resistance:	EN 13892-4	$\leq 100 \mu\text{m}$	AR 0.5
Bond strength:	EN 13892-8	$\geq 1.5 \text{ N/mm}^2$	$\geq \text{B2.5 N/mm}^2$
Impact strength:	EN ISO 6272	$\geq 4 \text{ Nm}$	IR 20
Capillary absorption and water permeability:	EN ISO 1062-3	$w < 0.1 \text{ kg/m}^2 \cdot \text{h}^{0.5}$	$w < 0.1 \text{ kg/m}^2 \cdot \text{h}^{0.5}$
Chemical resistance:	EN 13529	Declared CR value	Shore D reduction < 50% CR1 (Class 2) CR4 (Class 2) CR5a (Class 1) CR10 (Class 2- slight loss of gloss) CR11 (Class 2) CR12 (Class 2)
Reaction to fire:	EN 13501-1	from A _{1FL} to F _{FL}	B _{FL} -s1

Cleanroom testing (CSM standard)

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

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.

Please refer to the current version of the technical data sheet, available from our website www.mapei.com 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. www.mapei.com. ANY ALTERATION TO THE WORDING OR REQUIREMENTS CONTAINED OR DERIVED FROM THIS TDS EXCLUDES THE RESPONSIBILITY OF MAPEI.

TECHNICAL SPECIFICATIONS

Supply and installation of smooth electrically dissipative, self-levelling resin system, waterproof, with high mechanical strength and good chemical resistances, by application of two-component epoxy resin with special electroconductive fillers (such as **Mapefloor I 390 AS** by Mapei S.p.A.). The application must be done on substrate which have already been prepared by means of suitable mechanical method, primed with two-component, fillerized epoxy resin (such as **Primer SN** by Mapei S.p.A.) followed by the placing of the specific copper stripes for the connection to the earthing points (such as **Copper Band** by Mapei S.p.A.). Once the primer has hardened, apply by roller a suitable two-component water-based electroconductive epoxy primer (such as **Primer W-AS N** by MAPEI S.p.A. The self-levelling layer of resin must be applied only after checking the electrical conductivity of the hardened film of conductive primer.

The product must have the following characteristics:

Density of mix	1,520 kg/m ³
Viscosity of mix	1.5-2.5 Pa·s (# 4 - rpm 20)
Electrical resistivity (EN 1081)	10 ⁶ < R _E < 10 ⁹ Ohm

These values may vary according to surrounding conditions (temperature and humidity) and the equipment used to take the readings.

Compressive strength after 7 days at +23°C (EN 196-1)	approx. 80 N/mm ²
Flexural strength after 7 days at +23°C (EN 196-1)	approx. 40 N/mm ²
Abrasion resistance - Taber test (CS17 wheel - 1,000 revs. - 1,000 g) after 7 days at +23°C (EN ISO 5470-1)	70 mg

Abrasion resistance - Taber test (CS10 wheel – 1,000 revs. – 1,000 g) after 7 days at +23°C (EN ISO 5470-1)	37 mg
Shore D hardness after 3 days at +23°C (ISO 5470)	77
BCA wear resistance (EN 13892-4)	$\leq 0.5 \mu\text{m}$
Bond strength (EN 13892-8)	$\geq 2.5 \text{ N/mm}^2$
Impact resistance (EN ISO 6272)	20 Nm
Reaction to fire (EN 13501-1)	B _{FL-s1}
Concentration of airborne particles from the material when subjected to friction (ISO 14644-1)	ISO class: 3
Evaluation of volatile organic compound (VOC) emissions at +23°C and +90°C (ISO 14644-8)	ISO-ACC _m Class -7.9
Riboflavin test (ISO 4628-1)	good
Does not allow microbial growth (ISO 22196)	excellent
Chemical resistance (ISO 2812-1/ISO 4628-1, VDI 2083-17)	very good
Chemical resistance (EN 13529)	shore D reduction < 50% CR1 (class 2) CR4 (class 2) CR5a (class 1) CR10 (class 2 - slight loss of gloss) CR11 (class 2) CR12 (class 2)
Fulfills ATEX 137 requirements	
Fulfills ISO 8690 / DIN 25415 requirements with contaminants ¹³⁷ Cs and ⁶⁰ Co	
Contributes to obtaining LEED credits, EPD (Environmental Product Declaration) compliant	

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