MAPEWRAP 21

Two-component, super-fluid epoxy resin for impregnating MapeWrap fabrics using the "damp system"





CE EN 1504-4

IN COMPLIANCE WITH EUROPEAN STANDARD EN 1504-4 MAPEI STRUCTURAL BONDING

WHERE TO USE

Impregnation immediately before placing **MapeWrap** fabrics that need to be applied on concrete, reinforced concrete or masonry elements to repair or strengthen.

TECHNICAL CHARACTERISTICS

MapeWrap 21 is a superfluid solvent-free epoxy resin based product specifically developed in the MAPEI Research & Development laboratories for the impregnation prior to placing **MapeWrap** fabrics.

MapeWrap 21 is made up of two pre-measured components (component A = resin and component B = hardener) that must be mixed together before use. After mixing, **MapeWrap 21** remains workable for approximately 40 minutes at +23°C.

Once hardened, **MapeWrap 21** acquires excellent dielectric properties and high mechanical strength.

MapeWrap 21 complies with the principles defined in EN 1504-9 ("*Products and systems for protecting and repairing concrete structures: definitions, requirements, quality control and conformity evaluation. General principles for the use and application of systems*"), and the minimum requirements for EN 1504-4 ("*Structural bonding*").

RECOMMENDATIONS

- **MapeWrap 21** must not be used once the hardening reaction has begun.
- Apply the impregnated **MapeWrap 21** fabric over the still wet **MapeWrap 11** or **MapeWrap 12**.

APPLICATION PROCEDURE

Preparation of MapeWrap 21

Mix the two components of **MapeWrap 21** together. Pour component B into component A and mix with a slow speed drill fitted with a stirrer until the resin is completely homogeneous.

Mixing ratio: 4 parts by weight of component A and 1 part by weight of component B. Do not use partial quantities to avoid the risk of accidental dosage mistakes, use a the whole package; if only partial quantities are required, use a precision electronic scales to weigh the components.

MAPEI

Impregnation of fabric with MapeWrap 21

The impregnation of the fabric can be carried out either manually or with suitable equipment.

Manual impregnation

Manually impregnate the precut **MapeWrap** fabric to the necessary size and plunge into a rectangular plastic trough filled approximately 1/3 of the total volume with **MapeWrap 21** for several minutes.

Take the fabric from the bowl, leave it to drip for a few seconds and then remove all the excess resin by squeezing it gently with your hands without wringing it to prevent damaging the fibres. Wear rubber gloves when carrying out this operation.

Impregnation by machine

As an alternative to impregnating the fabric manually, simple equipment with a bowl and a series of rollers may be used which makes it easier and safer for the operator to saturate the fabric and remove the excess resin.

This equipment is particularly recommended when a large number of interventions on large surface areas need to be carried out.

Using this system, even distribution of the resin in every part of the fabric is guaranteed. Apply the fabric immediately after impregnating it.

Applying MapeWrap fabric

Apply the fabric impregnated with **MapeWrap 21** over the still fresh **MapeWrap 11** or **MapeWrap 12**, making sure it is laid without crease.

After having flattened the fabric wearing protective rubber waterproof gloves, apply another coat of **MapeWrap 21** by brush or roller. Press it several times using a stiff rubber or metal roller (**Roller for MapeWrap**) so the adhesive can completely penetrate through the fibres of the fabric.

Pass the **Roller for MapeWrap** with a worm screw over the impregnated fabric, in order to completely eliminate any air bubbles formed during the application.



Manual impregnation of MapeWrap fabrics



Impregnation of MapeWrap fabrics by machine



Application of MapeWrap onto the reinforced concrete element

PRECAUTIONS TO BE TAKEN BEFORE APPLICATION

No special precautions need to be taken at temperatures between +10°C and +30°C. In hot weather do not expose the material to direct sunlight and bonding should be carried out during the cooler hours. During the winter, if applications need to be carried out outdoors at temperatures lower than +10°C, it is recommended to warm the substrate at least 24 hours before bonding, before repairing or reinforcing with **MapeWrap** fabrics and arrange for adequate insulation systems in order to avoid any danger of frost. The thermal insulation should be maintained for at least the next 24 hours. Before use, store the product in a heated area.

CLEANING

Due to the strong adhesion of **MapeWrap 21** also on metal, it is recommended to wash the working tools with solvents (ethyl alcohol, toluol) before the product dries.

CONSUMPTION

Consumption depends on the type of fabric (unidirectional, bidirectional and quadri-directional) and the height:

MapeWrap C (CARBON fabrics)

Type of fabric	Consumption (g/m²)
UNI-AX 240 UNI-AX 240 W	900-1000
UNI-AX 300 UNI-AX 300 W UNI-AX 300 Z UNI AX HM 300 UNI AX HM 300 Z	1000-1100
UNI-AX 400 UNI-AX 400 W UNI AX HM 400	1200-1300
UNI-AX 600 UNI-AX 600 W UNI-AX 600 Z UNI AX HM 600 UNI AX HM 600 Z	1400-1500
UNI-AX 1200 UNI-AX 1200 W	2700-2800
BI-AX 230	800-900
BI-AX 300 W	950-1050
BI-AX 360	1100-1200
QUADRI-AX 380 QUADRI-AX 380 Z	800-1000
QUADRI-AX 760	1900-2100

MapeWrap G (GLASS fabrics)

Type of fabric	Consumption (g/m²)
UNI-AX 300	900-1000
UNI-AX 900	1400-1500
BI-AX 300	900-1000

MapeWrap B (BASALT fabrics)

Type of fabric	Consumption (g/m²)
UNI-AX 400	1200-1300
UNI-AX 600	1450-1550

PACKAGING

5 kg units (component A = 4 kg, component B = 1 kg).

STORAGE

MapeWrap 21 can be stored up to 24 months in its original sealed packaging at temperatures not below +10°C.

SAFETY INSTRUCTIONS FOR THE PREPARATION AND APPLICATION

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.

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.

PRODUCT FOR PROFESSIONAL USE.

TECHNICAL DATA (typical values)

PRODUCT IDENTITY	component A	component B
Consistency:	liquid	liquid
Colour:	transparent yellow	transparent yellow
Specific gravity:	1.12 g/cm³	1 g/cm³
Brookfield viscosity:	380 mPa·s (shaft 1 - rev. 5)	50 mPa·s (shaft 1 - rev. 50)

APPLICATION DATA	
Mix ratio:	component A : component B = 4 : 1
Mix consistency:	liquid
Colour of mix:	transparent yellow
Specific gravity of the mix:	1.1 g/cm³
Brookfield viscosity:	300 mPa·s (shaft 1 - rev. 10)
Workability time: **– at +10°C:** **– at +23°C:** **– at +30°C:**	 60’ 40’ 20’
Setting time: **– at +10°C:** **– at +23°C:** **– at +30°C:**	 90’ 50’ 30’
Application temperature:	from +10°C to +30°C
Adhesion to concrete (EN 1542):	> 3 N/mm² (after 7 days at +23°C - concrete failure)
Tensile strength (ASTM D 638):	30 N/mm²
Tensile elongation (ASTM D 638):	1.2%
Compressive strength (ASTM C 579):	65 N/mm²

Flexural strength (ISO 178):	55 N/mm²
Modulus of elasticity under compression (ASTM C 579):	2000 N/mm²
Modulus of elasticity in flexion (ISO 178):	2500 N/mm²

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

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.

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

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