MAPEI

MapeWrap 31

Medium viscosity epoxy resin for impregnation of MapeWrap with “dry system”

WHERE TO USE

MapeWrap 31 is used for the impregnation of **MapeWrap** fabrics, when concrete, reinforced concrete and masonry elements need repair or strengthening by using the “dry system”.

TECHNICAL CHARACTERISTICS

MapeWrap 31 is a gelatinous, solvent-free, epoxy resin based adhesive specially developed in the MAPEI Research & Development laboratories for the impregnation during application using the “dry system” of **MapeWrap** fabrics.

MapeWrap 31 is made up of two pre-measured components (component A = resin and component B = hardener) that must be mixed together before use. After having mixed the two parts together, **MapeWrap 31** remains workable for approximately 40 minutes at +23°C.
Once hardened, **MapeWrap 31** acquires excellent dielectric properties and high mechanical strength.

MapeWrap 31 responds to 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 for EN 1504-4 (“*Structural bonding*”).

MapeWrap 31 is also part of the composite FRP carbon fibre systems **Mapewrap C UNI-AX 300** + **Mapewrap 31** and **Mapewrap C UNI-AX 600** + **Mapewrap 31**. Said systems have been certified by the American institute ICC-ES (International Code Council Evaluation Service) under various environmental conditions and archieved the report ESR - 3499.

RECOMMENDATIONS

- **MapeWrap 31** must not be used once the hardening reaction has begun.
- Apply **MapeWrap 31** over **MapeWrap 11** or **MapeWrap 12** when they are still wet.

APPLICATION PROCEDURE

Preparing MapeWrap 31

Mix the two components of **MapeWrap 31** together. Pour component B into component A and mix with a slow speed drill fitted with a stirrer until the resin is completely homogeneous. Mix ratio: 4 parts by weight of component A and 1 part by weight of component B. To avoid the risk of accidental ratio errors, use the whole package: if only partial quantities are required, use precision electronic scales to weight at the components.

Applying MapeWrap 31 and placing the MapeWrap fabrics

Apply a uniform first coat of **MapeWrap 31** over the still wet **MapeWrap 11** or **MapeWrap 12**, with a brush or with roller. Immediately apply the **MapeWrap** fabric making sure it is laid without creases. Press it several times using **Roller for MapeWrap** so the

MapeWrap 31

Applying MapeWrap 31 with a roller on the still fresh MapeWrap 11 (or MapeWrap 12)

Applying pressure on the fabric with the Roller for MapeWrap so that MapeWrap 31 can penetrate well into the fabric

adhesive can completely penetrate through the fibres of the fabric.
Apply over the **MapeWrap** fabrics a second coat of **MapeWrap 31**.
Pass over the impregnated fabric with the worm-screw roller **Roller for MapeWrap** in order to completely eliminate any air bubbles formed during the application.

PRECAUTIONS TO BE TAKEN BEFORE APPLICATION

No special precautions need to be taken at temperatures between +5°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.

In winter, if applications need to be carried out outdoors at temperatures below +5°C, it is recommended before repairing or reinforcing with **MapeWrap** fabrics, to warm the substrate at least 24 hours before bonding and prepare adequate insulation systems in order to avoid any risk 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 31** it is recommended to wash the working tools with solvents (ethyl alcohol, toluol, etc.) before the product dries.

CONSUMPTION

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

MapeWrap C (CARBON fabrics)

Type of fabric	Consumption (g/m^2)	Height (cm)	Consumption (g/m)
UNI-AX 300 or UNI-AX HM 300	1000-1100	10 20 40	100-110 200-220 400-440
UNI-AX 600 or UNI-AX HM 600	1500-1550	10 20 40	150-155 300-310 600-620
BI-AX 230	1000-1100	20 40	200-220 400-440
BI-AX 360	1250-1400	20 40	250-280 500-560
QUADRI-AX 380	2000-2100	30 48.5	600-700 970-1020
QUADRI-AX 760	3500-3700	30 48.5	1050-1100 1700-1800

MapeWrap G (GLASS fabrics)

Type of fabric	Consumption (g/m^2)	Height (cm)	Consumption (g/m)
UNI-AX 900	900-1000	30 60	270-300 540-600
QUADRI-AX 1140	1300-1400	30 48.5	390-420 630-680

PACKAGING

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

STORAGE

The product may be stored for 24 months in its original packaging and at temperatures not below +5°C.

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 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.

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.

All relevant references for the product are available upon request and from www.mapei.com

TECHNICAL DATA (typical values)

PRODUCT IDENTITY		
	component A	**component B**
Consistency:	paste	liquid
Colour:	yellow	transparent yellow
Specific gravity (g/cm³):	1.05	1.12
Brookfield viscosity (mPa·s):	17.000 (shaft 5 - rev. 10)	110 (shaft 2 - rev. 100)

APPLICATION DATA (after 7 days at +23°C - 50% R.H.)	
Mix ratio:	component A : component B = 4 : 1
Mix consistency:	gelatinous paste
Colour of mix:	yellow
Specific gravity of the mix (g/cm³):	1.06
Brookfield viscosity (mPa·s):	6,500 (shaft 3 - 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 +5°C to +30°C
Adhesion to concrete (N/mm²):	> 3 (after 7 days - concrete failure)
Tensile strength* (ASTM D 638) (N/mm²):	≥ 40
Tensile strain* (ASTM D 638) (%): **– after 28 days:**	 ≥ 1.6
Compressive strength (ASTM D 695) (N/mm²):	≥ 70
Flexural strength* (ISO 178) (N/mm²):	≥ 70
Modulus of elasticity under compression (ASTM D 695) (N/mm²):	≥ 3,000
Modulus of elasticity in flexion (ISO 178) (N/mm²):	≥ 2,500
Tensile modulus of elasticity* (ASTM D 638) (N/mm²):	≥ 2,600
Glass transition temperature Tg (°C) (ASTM E 1640-09):	≥ 70 (after 3 days at +23°C + 4 days at +60°C)

FINAL PERFORMANCES			
Performance characteristic	**Test method**	**Requirements according to EN 1504-4**	**Performance of product**
BONDED MORTAR OR CONCRETE			
Compressive strength (N/mm²):	EN 12190	≥ 30	> 70
Shear strength (N/mm²):	EN 12615	≥ 6	> 10
Compressive modulus of elasticity (N/mm²):	EN 13412	≥ 2,000	> 3,000
STRENGTHENING USING BONDED PLATE			
Shear strength (N/mm²):	EN 12188	≥ 12	50° > 40 60° > 35 70° > 30
Bond strength: **– pull out (N/mm²):**	EN 12188	≥ 14	> 20
Bond strength: **– inclined shear strength (N/mm²):**	EN 12188	50° ≥ 50 60° ≥ 60 70° ≥ 70	50° > 90 60° > 85 70° > 100

** 5 sample coupons per test series (testing temperature +23°C (+73°F) - 50% H.R.)*

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