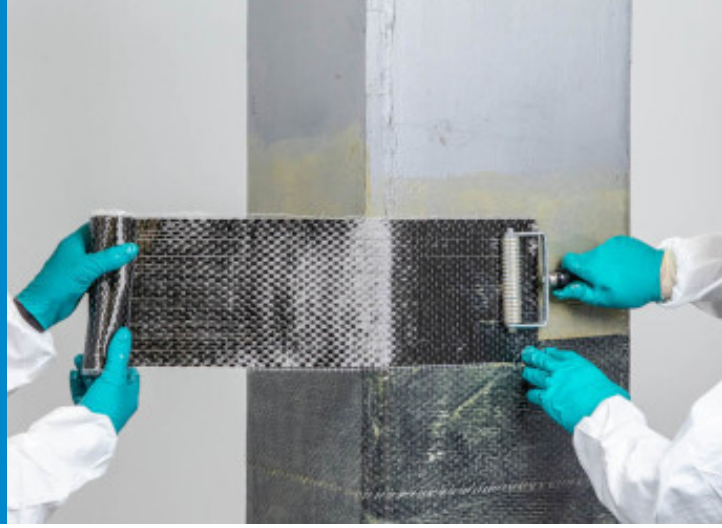
# MAPEWRAP 31

**Two-component, medium-viscosity epoxy adhesive for impregnating MapeWrap fabrics using the “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 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.



*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*

## 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/m²) |
|---|---|
| **UNI-AX 240**<br>**UNI-AX 240 W** | 900-1000 |

| | |
|---|---|
| **UNI-AX 300**<br>**UNI-AX 300 W**<br>**UNI-AX 300 Z**<br>**UNI AX HM 300**<br>**UNI AX HM 300 Z** | 1000-1100 |
| **UNI-AX 400**<br>**UNI-AX 400 W**<br>**UNI AX HM 400** | 1200-1300 |
| **UNI-AX 600**<br>**UNI-AX 600 W**<br>**UNI-AX 600 Z**<br>**UNI AX HM 600**<br>**UNI AX HM 600 Z** | 1500-1600 |
| **BI-AX 230** | 1000-1100 |
| **BI-AX 300 W** | 1050-1150 |
| **BI-AX 360** | 1100-1200 |
| **QUADRI-AX 380**<br>**QUADRI-AX 380 Z** | 1100-1300 |

### MapeWrap G (GLASS fabrics)

| Type of fabric | Consumption (g/m²) |
|---|---|
| **UNI-AX 300** | 850-950 |
| **UNI-AX 900** | 1300-1400 |
| **BI-AX 300** | 850-950 |

### MapeWrap B ( BASALT fabrics)

| Type of fabric | Consumption (g/m²) |
|---|---|
| **UNI-AX 400** | 1550-1650 |
| **UNI-AX 600** | 1950-2050 |

## 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

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:** | paste | liquid |
| **Colour:** | yellow | transparent yellow |
| **Specific gravity:** | 1.05 g/cm³ | 1.12 g/cm³ |
| **Brookfield viscosity:** | 17,000 mPa·s (shaft 5 - rev. 10) | 110 mPa·s (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 |
| **Density of the mix:** | 1.06 g/cm³ |
| **Brookfield viscosity:** | 6,500 mPa·s (shaft 3 - rev. 10) |
| **Workability time:**<br>**– at +10°C:**<br>**– at +23°C:**<br>**– at +30°C:** | <br>60'<br>40'<br>20' |
| **Setting time:**<br>**– at +10°C:**<br>**– at +23°C:**<br>**– at +30°C:** | <br>90'<br>50'<br>30' |
| **Application temperature:** | from +5°C to +30°C |
| **Adhesion to concrete* (EN 1542):** | > 3 (after 7 days - concrete failure) |
| **Tensile strength** (ASTM D 638):** | ≥ 40 N/mm² |
| **Tensile strain** (ASTM D 638):**<br>**– after 28 days:** | <br>≥ 1.6% |
| **Compressive strength (ASTM D 695):** | ≥ 70 N/mm² |
| **Flexural strength** (ISO 178):** | ≥ 70 N/mm² |
| **Modulus of elasticity under compression (ASTM D 695):** | ≥ 3,000 N/mm² |
| **Modulus of elasticity in flexion (ISO 178):** | ≥ 2,500 N/mm² |

| | |
|---|---|
| **Tensile modulus of elasticity** (ASTM D 638):** | ≥ 2,600 N/mm² |
| **Glass transition temperature Tg (ASTM E 1640-09):** | ≥ +70°C (after 3 days at +23°C + 4 days at +60°C) |

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

* With concrete substrates exhibiting higher mechanical performance (higher compressive strength and, consequently, higher tensile strength), adhesion tests with **MapeWrap** products can achieve failure loads exceeding 3.5 MPa.

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

## 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.*

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