



Mapepoxy LR

**Epoxy adhesive
with long open time**



AREA OF USE

Mapepoxy LR is used as force transmission adhesive for

- fresh (unhardened) concrete to hardened concrete
- hardened concrete to hardened concrete
- steel to hardened concrete
- steel to steel

Mapepoxy LR is also suitable to use for anchoring of bolts in drilled holes, and as protective coating on concrete.

Mapepoxy LR differs from **Mapepoxy L** with longer open time and workability.

TECHNICAL CHARACTERISTICS

Mapepoxy LR is a two-component epoxy adhesive based on a pre-filled epoxy resin and a polyamine.

Mapepoxy LR does not contain any benzyl alcohol or other plasticizers that migrate from the product after curing when subjected to normal conditions. Hence product will remain unchanged throughout the lifetime of the construction.

Mapepoxy LR has a very good ability to maintain adhesion to concrete in damp environments compared to other epoxy systems.

Mapepoxy LR has good temperature resistance, but the force transmission properties are reduced between +50

- 70 °C. On cooling the adhesive will regain its original properties.

Mapepoxy LR complies with the principles defined in EN 1504-9 standards ("Products and systems for protecting and repairing concrete structures. Definitions, requirements, quality control and conformity assessment. General principles for the use and application of systems"), and the requirements of EN 1504-4 "Structural bonding".

APPLICATION PROCEDURE

Preparation of the substrate:

Preparation of the concrete

The concrete must be sound, clean and dust-free with a smooth permanent surface. Sand blasting is the best method of surface preparation, but acid washing followed by water-jetting and drying can be used.

Preparation of steel

Steel must be free of rust and other contamination. Sand blasting to SA 2 ½ is the best method, but for small scale work grinding and degreasing can be sufficient.

In general terms the adhesion depends upon the nature of the substrate, the pretreatment and any contamination present. Values which can be used as a basis for calculations will be dependent upon the local conditions and should be evaluated each time.



Mapepoxy LR: Epoxy adhesive. The product complies with specification in EN 1504-4 "Structural bonding"

TECHNICAL DATA (typical values)

PRODUCT DETAILS		Component A	Component B
Color:		grey	black
Appearance:		dense liquid	liquid
Density (g/cm³):		1.675	0.92
Brookfield viscosity at +23°C (mPa*s):		approx. 90 000	approx. 60
APPLICATION DATA			
Mixing ratio:	8:1 component A: component B		
Color of mixture:	grey		
Consistency of the mixture:	dense fluid		
Density of the mixture (kg/m³):	approx. 1 530		
Brookfield viscosity of the mixture (mPa*s):	approx. 8 000		
Application temperature range:	+5°C - 30°C		
	5 °C	20 °C	30 °C
Workability (EN ISO 9514):	310 min.	85 min.	51 min.
Open time (EN 12189):	480 min.	180 min.	120 min.
FINAL PROPERTIES (7 days at + 23 and 50 % R.H)			
Flexural strength (EN 12190):	43.6 N/mm ²		
Final setting time:	7 days		
Performance characteristics for product	Test methods	Requirements according to EN 1504-4 for structural bonding	Product performance
4.3 Structural bonding products for bonded plate reinforcement			
Bond/adhesion strength:	EN 12188	Pull off strength >14 N/mm ² 50 ° > 50 N/mm ² 60 ° > 60 N/mm ² 70 ° > 70 N/mm ²	Pull off strength >15.72 N/mm ² 50 ° > 51.40 N/mm ² 60 ° > 60.99 N/mm ² 70 ° > 70.55 N/mm ²
Shear strength:	EN 12188	> 12 N/mm ²	22.64 N/mm ²
Shrinkage/expansion:	EN 12617-1	< 0.1 %	0 %
Modulus of elasticity:	EN 13412	> 2 000 N/mm ²	5 951 N/mm ²
Coefficient of thermal expansion:	EN 1770	< 100*10 ⁻⁶ per K	53*10 ⁻⁶ per K
Glass transition temperature:	EN 12614	> 40 °C	49.7 °C
Reaction to fire:	EN 13501-1	declared value	B _{fl} -s1
Durability:	EN 13733	pass/fail	pass

Performance characteristics for product	Test methods	Requirements according to EN 1504-4 for structural bonding	Product performance
4.4 Structural bonding products for bonded mortar or concrete			
Bond/adhesion strength:	EN 12636	pass/fail	pass (Concrete fail 5.23 N/mm ²)
Shear strength:	EN 12615	> 6 N/mm ²	12.83 N/mm ² (concrete to concrete) 11,68 N/mm ² (fresh concrete)
Compressive strength:	EN 12190	> 30 N/mm ²	99.3 N/mm ²
Shrinkage/expansion:	EN 12617-1	< 0.1 %	0 %
Sensitivity to water:	EN 12636	pass/fail	pass (concrete fail 5.23 N/mm ²)
Modulus of elasticity:	EN 13412	> 2 000 N/mm ²	5 951 N/mm ²
Coefficient of thermal expansion:	EN 1770	< 100*10 ⁻⁶ per K	53*10 ⁻⁶ per K
Glass transition temperature:	EN 12614	> 40 °C	49,7 °C
Reaction to fire:	EN 13501-1	declared value	B _{fl} -s1
Durability:	EN 13733	pass/fail	pass

The air and substrate's temperature should be at least + 5 °C during product application and curing, unless otherwise stated.

Preparation of the product:

Components A and B should have a temperature of +15 °C or more when mixed together. Comp. B is poured into comp. A and mixed with a drill whisk at slow speed for approximately 3 minutes until the product is completely homogenous.

The product must not be thinned!

Application of the product :

Bonding of fresh (unhardened) concrete to hardened concrete or steel

Mapepoxy LR can be applied with a brush, or a squeegee on flat surfaces. For larger surfaces and places with reinforcement a funnel sprayer can be used. Take special notice to use **Mapepoxy LR** within its workability (depends on temperature).

The fresh concrete or mortar must be applied within the adhesives open time (depends on temperature). If the open time cannot be met, the adhesive should be broadcast with sand, and a new layer of adhesive applied.

Use as low w/c ratio in the concrete as possible. Cover with plastic sheeting or use a curing membrane immediately after placement.

Bonding with **Mapepoxy LR** can be done at all temperatures where it is reasonable to pour conventional concrete or mortar, without the addition of frost inhibiting admixtures. However, make sure the temperature is above 0 °C on the surface during application.

Reliable results are obtained on a dry surface, but some moisture can be tolerated.

Bonding of steel or hardened concrete to hardened concrete

Mapepoxy LR can be applied with a brush, or a squeegee on flat surfaces. For larger surfaces a funnel sprayer can be used. Take special notice to use **Mapepoxy LR** within its workability (depends on temperature).

The steel or concrete must be applied within the adhesives open time (depends on temperature). If the open time cannot be met, the adhesive should be broadcast with sand, and a new layer of adhesive applied.

For this area of application **Mapepoxy LR** is only suitable for horizontal surfaces. For vertical surfaces, or if a thicker adhesive joint is needed, use **Adesilex PG 1** or **Adesilex PG 2**.

Fastening of bolts

Mapepoxy LR can be used for fastening of bolts in drilled holes. After drilling, the hole should be cleaned, and **Mapepoxy LR** is poured into the hole e.g. with a funnel. Then place the bolt, and fix it until the mortar is sufficiently cured. If the annulus around the bolt is larger than 5 mm use **Mapepoxy L-Mörtel**.

The drilling holes should be dry during installation, even if sufficient results can be obtained when the surface is damp. All excess water must be removed.

Coating

Mapepoxy LR can be used as a coating on concrete or steel e.g. to ensure adequate

reinforcement coverage where this is too low. Apply **Mapepoxy LR** using a brush, trowel or funnel sprayer. Normally at least 2 coats are applied with sand dressing in between. The coating can be built up to a thickness of several millimeters.

CLEANING

Tools and equipment must be washed immediately after use with **Spesialtynner**, ethanol or other cleaning agent suited for epoxy. Once hardened the product may only be removed mechanically.

CONSUMPTION

Used as adhesive: 0.5 – 1.5 kg/m²

Consumption varies with the evenness of the surface, temperature and method of application.

PACKAGING

1.25 kg kit: Component A = 1.1 kg, component B = 0.15 kg.

4.5 kg kit: Component A = 4.0 kg, component B = 0.5 kg.

STORAGE

Properties for use are not changed for a period of 24 months when stored between + 5 and + 30 °C in unopened original packaging.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Instructions for the safe use of our products can be found on the latest version of the SDS available from our website www.mapei.no

PRODUCT FOR PROFESSIONAL USE.

NOTE

Although the technical details and recommendations contained in this product datasheet 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.no

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