

PLANITOP LSN R4

Sulphate-resistant, low resistivity, fibre-reinforced shrinkage compensated thixotropic mortar for the repair of concrete



WHERE TO USE

Repair of degraded concrete structures or reinforced concrete structures subject to sulphate attack.

Some application examples

- Canal linings, marine and maritime structures, hydraulic works, bridges and tunnels that require resistance to sulphate attack.
- Repair and reconstruction of concrete coverings damaged by corroded reinforcing bars.
- Filling of rigid joints (e.g. between base and column, cracks in floors, joints between walls, etc.).
- Repair of precast structures.

TECHNICAL CHARACTERISTICS

Planitop LSN R4 is a one-component pre-blended thixotropic cement-based mortar composed of sulphate-resistant hydraulic binders, synthetic fibres, select aggregates and special water-retaining admixtures developed in the MAPEI Research Laboratories.

Planitop LSN R4 is also suitable in conjunction with galvanic cathodic protection /sacrificial anodes. When installing **Mapeshield I**, there must be no structural damage to the reinforcement. In such cases, the reinforcement must be integrated or replaced according to calculations carried out by a specialised technician. When the use of **Mapeshield I** is planned, do not apply **Mapefer 1K** or any other type of anti-rust protection on the reinforcement rods.

Planitop LSN R4 meets TMR-Q, Dept Transport and Planning Victoria and Transport for NSW relevant criteria (at time of publishing).

Planitop LSN R4 meets the requirements of AS/NZS 4020-2018. (Eurofins)

RECOMMENDATIONS

- Do not use **Planitop LSN R4** on smooth surfaces: roughen the surface thoroughly and add rebars if necessary.
- Do not use cement or admixtures with **Planitop LSN R4**.
- Do not pour **Planitop LSN R4** into forms (use **Mapefill MC 06** or **Mapegrout Hi-Flow**).
- Do not use **Planitop LSN R4** for anchoring (use **Mapefill SP** or **Mapefill GP AU**).

APPLICATION PROCEDURE

TECHNICAL INFORMATION FOR APPLICATION

Composition of mix:	100 kg of Planitop LSN R4 15 - 16 kg water
Thickness layer:	up to 100 mm on vertical surfaces up to 20 mm on ceilings
Application temperature range:	Surrounding temperature and substrate temperature from +5°C to +35°C
Pot life of mix:	approx. 1 h (at +20°C)
Waiting time between each layer:	max 1-2 h

Preparing the substrate

- Remove deteriorated and loose concrete down to the solid, strong and roughened part of the substrate. Any previous repair work that is no longer thoroughly bonded must also be removed.
- Once prepared, the concrete surface to be repaired must have an uneven texture with at least 5 mm peak roughness (ie CSP 5).
- Abrasive blast the concrete and the reinforcing bars until they are free of dirt, rust, cement laitance, grease, oil, varnish or old paint.
- Saturate the substrate with water until it is saturated-surface-dry (SSD).
- Before repairing with **Planitop LSN R4**, wait until the excess surface water has evaporated (SSD).

Preparing the mortar

- Pour into the mixer the amount of water needed to obtain the consistency required for the application.

Litres of water per 20 kg bag: 3.0 - 3.2 ltrs / 20 kg bag

- Start the mixer and slowly add **Planitop LSN R4** to the water in a continuous flow.
- Mix for 1 to 2 minutes, then check to make sure the mix is well blended. Scrape any unmixed powder from the bottom and the sides of the mixer. Mix again for another 2 to 3 minutes.
- Depending on the amount needed, a mortar mixer or a drill with an agitator attachment may also be used. Mix at low speed to avoid entraining air.

Instructions for the preparation of the mortar to create samples for Lab testing are contained in the TECHNICAL DATA table.

Remember that mixing by hand requires a larger amount of water. This adversely affects several of the mortar's properties, including mechanical strength, shrinkage, water tightness, etc.

Planitop LSN R4 remains workable for approx. 1 hour at +20°C.

The expansion of **Planitop LSN R4** is calculated to compensate for hygrometric shrinkage. For it to be effective, the expansion needs to be restrained by rebars or restraints inserted into the substrate.

Buildups of **Planitop LSN R4** without restraints in thicknesses of more than 30 mm should be done only after inserting rebars and roughening the surface of the concrete, taking care to cover the reinforcement with a layer at least 20 mm thick.

Lesser thicknesses can be applied without rebars as long as the substrate has been thoroughly roughened to counter the expansion. The expansion phase ends during the first days of hardening.

Applying the mortar

Planitop LSN R4 may be applied with a putty knife or trowel on vertical surfaces in layers up to 100 mm thick, or on ceilings in layers up to 20 mm thick, without the use of form-work.

It may also be applied using a suitable piston or worm-screw type rendering machine. Do not use a continuous mixing type rendering machine.

For repairing concrete surfaces (e.g. balconies, columns, beams, etc.) we recommend treating the rebars with **Mapofer 1K** after sanding them unless galvanic cathodic protection is to be used. Please refer **Mapeshield I** technical data sheet for further details

When further coats of **Planitop LSN R4** are needed, leave the previous coat rough and wet the surface with water.

PRECAUTIONS TO BE TAKEN DURING AND AFTER APPLICATION

- Only use bags of **Planitop LSN R4** which have been stored on their original pallets.
- In warm weather store the material in a cool place. Use cold water to prepare the mortar.
- In cold weather, store the product in a place which is protected from frost, and use lukewarm water to blend the mortar.

After applying **Planitop LSN R4**, we recommend that it is cured carefully, especially in hot or windy weather, to avoid the water evaporating too quickly and causing the formation of surface cracks due to plastic shrinkage. Curing should begin as soon as possible after placement and finishing the repair. Curing should be in accordance with recommended concrete curing methods.

CLEANING

Mortar that has not yet hardened can be removed from tools with water. After setting, cleaning is very difficult and can only be done mechanically.

CONSUMPTION

18.5 kg/m² per cm of thickness if used pure and 14.5 kg/m² if used mixed with 30% of 6 - 8 mm aggregate.

PACKAGING

20 kg bag.

TECHNICAL DATA (TYPICAL VALUES)

PRODUCT IDENTITY

Consistency:	powder
Colour:	grey
Maximum size of aggregate:	1.5 mm
Chloride ion content: – minimum requirement ≤ 0.05% - according to EN 1015-17:	≤ 0.05%

TECHNICAL INFORMATION FOR THE PREPARATION OF THE PRODUCT

Composition of mix:	100 parts in weight of Planitop LSN R4 with 15.5% of water
Preparation of the mix:	Mixing of the product according to EN 196-1

CHARACTERISTICS OF FRESH MIX (at +20°C - 50% R.H.)

Colour of mix:	grey
Consistency of mix:	thixotropic
Density of mix:	2.200 kg/m ³

FINAL PERFORMANCE

According to curing defined in test methods

Performance characteristic	Test method	Performance of product
Compressive strength:		
- 1 day	AS 1478.2	15 MPa
- 7 days		40 MPa
- 28 days		60 MPa
Flexural strength (28 days):	AS 1012.11	6.5 MPa
Modulus of elasticity in compression:	AS 1012.17	24 GPa
Bond strength to substrates determined by tensile:	AS 1012.24	>1.0 MPa
Drying Shrinkage:	AS 1478.2	<600 µm (after 28 days)
Restrained Expansion	ASTM C878	positive expansion (after 7 days)
Electrical Resistivity (28 days):	T 358	<15,000 Ωcm

NOTES: Preparation of samples: compaction according to EN 196-1.

STORAGE

Planitop LSN R4 may be stored for up to 12 months in its original packaging.

The product is available in special 20 kg bags which must be stored completely protected from exposure to moisture and rain.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

For further and complete information about the safe use of our product please refer to the latest version of our Safety Data Sheet available for download from our website at www.mapei.com.au.

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.

The values declared in the TECHNICAL DATA table (typical values) were obtained in compliance with test methods and curing cycles defined in the technical standards referenced therein. Therefore, please note that the use of test procedures or methods other than those indicated in the table could lead to different values and that, in such cases, any liability of our company is excluded.

Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com.au.

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The most up-to-date TDS can be downloaded from our website www.mapei.com.au

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