

Spraycem 301

Spray Applied Cementitious Repair Mortar

Description


A pre-packed single component polymer modified spray applied mortar. Spraycem 301 has been designed for machine applications using the dry-spray process and is particularly suitable on large volume repairs to reinforced concrete structures which have been damaged due to reinforcement corrosion or frost attack. May be utilised for hand-applied patching, using formwork if necessary. Spraycem 301 has been specially formulated to achieve and surpass performance requirements of EN 1504 Part 3 Class R3. Applications include bridges, retaining walls, tunnels, reservoirs, building facades and coastal structures.

Advantages

- Excellent durability & resistance to water, frost & salt attack
- Rapid strength development without the use of accelerators
- Excellent high build characteristics
- Low rebound
- Controlled low water/cement ratio
- Excellent adhesion to correctly prepared substrates
- Only requires addition of clean water
- Formulated using non-reactive aggregates, with reference to alkali-silica reaction
- Complies with BD27/86

Technical Information

Density	2050-2150 Kg/m ³
Yield	84 x 25 Kg units per m ³
Coverage	55 Kg/m ² @ 25 mm thickness
Cement content	>400 Kg/m ³
Bond strength	2-3 MPa, concrete failure
Initial set	Typically 3.5-4.5 hours
Sulphate content	< 3.0 %
Equivalent sodium oxide	0.136 ppm

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Nufins, Kingston House, 3 Walton Road, Pattinson North, District 15, Washington, Tyne & Wear. NE38 8QA 13 0086-CPD-594215	
EN 1504-3 Concrete repair product for structural repair CC Mortar (based on hydraulic cement)	
Compressive strength	Class R3 (>25 MPa)
Chloride ion content	≤0.05 %
Adhesive bond strength	>1.5 MPa
Adhesion after freeze/thaw (50 cycles with salt)	>1.5 MPa
Carbonation resistance	Passes
Elastic modulus	>15 GPa
Dangerous substances	Complies with 5.4

Compressive strengths (MPa) cured and tested at 20°C

24 hours	72 hours	7 days	28 days
10-20	20-30	35-45	55-65

1.8 Litres mixing water used to produce test pieces.



Technical properties of Spraycem 301

Properties	Standard	Performance Requirement	Declared Value
Appearance			Grey Powder
Water addition			Proportioned to give required consistency
Chloride-ion content	EN 1015-17	≤ 0.05 %	≤ 0.05 %
Nominal aggregate size			4 mm
Water/cement ratio		<0.4	0.30
Application thickness min / max			20mm to 150mm
Working time			20-40 minutes
Final set			4-8 hours
Density			2050-2150 kg/m ³
Temperature for application			5°C to 35°C
Modulus of elasticity, in compression	EN 13412	≥ 15 GPa	18 GPa
Flexural strength	BS 6319-3		13 MPa
Tensile strength	BS 6319-7		4.3 MPa
Adhesion - concrete	EN 1542	≥ 1.5 MPa	>2.0 MPa
Adhesion after freeze/thaw (50 cycles with salt)	EN 13687-1	≥ 1.5 MPa	>2.0 MPa
Adhesion after thunder showers (30 cycles)	EN 13687-2	≥ 1.5 MPa	>2.0 MPa
Adhesion after dry cycling (30 cycles)	EN 13687-4	≥ 1.5 MPa	>2.0 MPa
Coefficient of thermal expansion			12 x 10 ⁻⁶ /°C
Skid resistance	EN 13036-4		Class 1
Carbonation resistance	EN 13295	d _k ≤ ref. concrete	Passes
Capillary absorption	EN 13057	≤ 0.5 kg.m ⁻² .h ^{-0.5}	≤ 0.5 kg.m ⁻² .h ^{-0.5}
Cracking tendency	Coutinho ring test		No cracking after 180 days
Carbon dioxide diffusion co-efficiency			u _{2.82} x10 ⁴
Water absorption			0.13 kg/m ³ /h ^{-0.5}
Chloride diffusion coefficient			6.2x10 ⁻¹³ m ² /s ⁻¹

Technical data shown are statistical results and do not correspond to guaranteed minima.

Tolerances are those described in appropriate performance standards.

All testing was conducted at 20°C under laboratory conditions, unless otherwise stated.

Test pieces produced using 1.8 Litres water per 25kg bag.

Surface Preparation

Preparation shall leave clean, sound exposed surfaces, free from all contamination, oil, grease, dirt, loose particles, debris and dust.

Saw-cut the perimeter of damaged or spalled areas, forming good shoulders and break out defective concrete to the required depth, using mechanical equipment or high pressure water-jet to expose sound concrete. Minimum repair thickness should be 10mm.

Remove damaged concrete and where spalling has been caused by corrosion, the reinforcement must be exposed. Reinforcement should be cleaned beyond its corrosion length and around its full circumference, enabling mortar to be compacted behind it. All rust and scale should be removed from any exposed steel preferably by grit-blasting. If reinforcement has corroded, reducing bar diameter and volume, then consideration should be given to replacement.

Exposed steel bars should be firmly secured to avoid movement during the application process as this will affect the mortar compaction, build and bond.

Priming

Spraycem 301 is normally applied to prepared concrete, which has been thoroughly saturated with clean water immediately before application. Nucem Primer may be utilised as a bonding agent between concrete and Spraycem 301 where additional protection is required when existing concrete contains chlorides.

Immediately following preparation and cleaning, Nucem Primer should be applied to protect reinforcement.

Nucem Primer is mixed by adding the contents of the base to the hardener container and mixing mechanically till a homogenous consistency is achieved. Usable life 2-3 hours.

Prepared concrete and cleaned reinforcement should be coated with Nucem Primer using a stiff brush, ensuring it is thoroughly worked into the surface. Nucem Primer may be applied to either dry or damp surfaces; we recommend that surfaces are damp, to assist spread. Spraycem 301 should then be applied immediately wet on wet.

Spray Application

Empty the contents of the Spraycem 301 directly into the mixing hopper of the dry-spray machine. The quantity of clean water addition is approx 1.8 litres per 25kg bag; this should be calibrated and controlled by the nozzle-man. Too little water will increase rebound and dust emission, too much and material will slump.

If sagging occurs during the installation to vertical or overhead surfaces, Spraycem 301 should be completely removed and re-applied at a reduced thickness onto correctly prepared substrates.

Finishing

Spraycem 301 is finished by striking off with a straight edge and closing with a steel float. Wood/plastic floats or damp sponges may be used to achieve the desired surface texture. The completed surface should not be overworked.

Cleaning

Mixing equipment and tools should be cleaned regularly through the day to avoid product build up, using clean water.

Curing

Curing should be employed immediately after finishing, as work progresses. Spraycem 301 should be protected from rapid drying out, using normal methods of curing such as securely taped down polythene sheeting, and wet hessian if required, in line with good concreting practise. UV degradable resin based curing membrane such as *Chemcure R90* may be used, but this must be fully removed by mechanical equipment if the surface is going to receive subsequent treatments.

Packaging

Spraycem 301 is available in 25kg packs (yield approximately 12 Litres)

Nucem Primerr is available in 1kg & 5kg units (coverage 3 - 5 m² per kg)

Storage

The shelf life is 6 months when stored unopened in dry, normal conditions and away from direct sunlight. Protect from frost.

Health & Safety

Product Safety Data Sheets (SDS) are available from Nufins. SDS sheets are provided to help customers satisfy their safe handling, use and disposal needs as well as assist with any conformance requirements made locally by health and safety regulations.

SDS are continually updated to provide the latest information to our customers. We therefore recommend contacting our head office to obtain the most recent and accurate SDS before handling and using any product.

Limitations

Normal precautions for winter working with cementitious materials should be adopted. Mortar should not be installed in temperature below 5°C unless measures have been undertaken to protect materials in storage and prior to use. It is recommended that materials are stored above 10°C. In addition, materials should not be installed in temperatures of 3°C or below on a falling scale, without frost protection measures.

Protect installed material from adverse weather and frost. If it is necessary, the work area should be tented and heated during and after placement. Please contact Nufins technical department for further advice.

At ambient temperatures above 35°C the material should be stored in the shade.

Disclaimer

The information contained herein is to the best of our knowledge true and accurate and is given in good faith but without warranty. The user will be deemed to have satisfied themselves independently as to the suitability of our products for their own particular purpose. In no event shall Nufins be liable for consequential or incidental damages.

Users must always refer to the most recent issue of the Technical Datasheets, copies of which will be supplied on request.

Technical Support

Through our technical department and laboratories we can offer a comprehensive service to specifiers and contractors. Technical contacts are available to provide further information and arrange demonstrations.