

## Nucem H.B. Mortar

### Lightweight Cementitious Mortar

#### Description

A prepacked polymer modified, fibre reinforced lightweight cementitious based mortar designed for the restoration of spalled and damaged concrete where formwork cannot be utilised. A durable system which affords maximum protection to embedded reinforcement. Can be applied to a thickness of up to 50mm in a single application on a vertical surface. Independently tested by Taywood Engineering Limited and complies with the DTp specification BD27/86 clause 6. Nucem H.B. Mortar has been specially formulated to achieve and surpass the performance requirements of EN1504 Part 3 Class R3.

#### Advantages

- Pack contains everything required including gauging liquid.
- Guaranteed low water/cement ratio.
- Excellent adhesion to dense concrete and steel etc.
- Contains no chlorides.
- Aggregate is non-Alkali Silica reactive in accordance with ASTM C289.
- Excellent workability and finishing properties.
- Good resistance to water, frost and salt permeation.
- Can be laid in sections from 10mm upwards.
- Based on shrinkage compensated Portland Cements.
- Low chromate (CR VI <2ppm).

#### Applications

- Repair of concrete damaged by reinforcement corrosion or fire damage.
- Repairs to spalled columns, beams and soffits.
- Waterproof pointing mortar.
- Waterproof render to concrete, brickwork and blockwork.

Cement content	>400 kg/m <sup>3</sup>
Water/cement ratio	0.32
Maximum aggregate size	2 mm
Non-reactive aggregates with regard to Alkali-silica reaction, complying with the requirements of DTp Clause 1704.	

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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 PCC Mortar (based on polymer modified 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

#### Surface Preparation

Substrate must be clean and sound, hence all grease, oil, paint, plaster and laitance must be removed. Grit blasting, steam cleaning or water jetting are the preferred methods. If surface has been contaminated with moss or lichen then the surface should be treated with Nufins *Fungicidal Wash*.

Mechanically remove any damaged concrete and expose reinforcement around its full circumference and beyond its corrosion length. Break out to achieve a sound surface, minimum depth 10mm, the edge of the repair must be recessed to avoid feather edging.

All rust and scale should be removed from any exposed steel preferably by blast cleaning. If the reinforcement bar has corroded reducing the bar diameter, then consideration should be given to replacing it.



## Technical properties of Nu cem H.B. Mortar.

Properties	Standard	Performance Requirements	Declared Value Nu cem HB Mortar	Declared Value Typical Concrete (30 MPa)
Appearance			Grey Powder & White Liquid	
Chloride-ion Content	EN1015-17	≤ 0.05%	≤ 0.05%	
Minimum Layer Thickness Maximum Layer Thickness			10mm 50mm*	
Working time			30-45 Minutes	
Initial Set			2-4 Hours	
Final Set			4-6 Hours	
Temperature for application			5°C to 30°C	
Density			1450 kg/m <sup>3</sup>	2250-2400 kg/m <sup>3</sup>
Compressive strength	EN12190	> 25 MPa	16 MPa @ 24 Hrs 30 MPa @ 7 Days 40 MPa @ 28 Days	21-32 MPa @ 7 Days 30-40 MPa @ 28 Days
Flexural strength	BS6319-3		6.4 MPa	3-6 MPa
Modulus of elasticity, in flexure	BS6319-3		11.5 GPa	
Modulus of elasticity, in compression	EN13412	≥ 15 GPa	> 15 GPa	
Indirect tensile strength	BS1881-117		3.95 MPa	2.5-3.5 MPa
Direct tensile strength	BS6319-7		4.22 MPa	
Adhesion to concrete	EN1542	≥ 1.5 MPa	≥ 2.0 MPa	
Adhesion after: freeze/thaw thunder/shower Dry cycling	EN13687-1 EN13687 -2 EN13687 -4	≥ 1.5 MPa ≥ 1.5 MPa ≥ 1.5 MPa	≥ 1.5 MPa ≥ 1.5 MPa ≥ 1.5 MPa	
CO <sub>2</sub> Diffusion coefficient			2.1 x 10 <sup>-5</sup> cm <sup>2</sup> /sec	3.7 x 10 <sup>-4</sup> cm <sup>2</sup> /sec
u value			7100	400
R value			140 m	8 m
Sc @ 20mm			350 mm	
Sorptivity			0.01 mm min <sup>-½</sup>	0.15 mm min <sup>-½</sup>
Cl-Diffusion coefficient			1 x 10 <sup>-10</sup> cm <sup>2</sup> /sec	8 x 10 <sup>-9</sup> cm <sup>2</sup> /sec
Coefficient of thermal expansion	EN1770		7.8 x 10 <sup>-6</sup>	6-12 x 10 <sup>-6</sup>
Water permeability coefficient	28 days		1.7 x 10 <sup>-13</sup> m/sec	1 x 10 <sup>-10</sup> m/sec
Carbonation resistance	EN13295	d <sub>k</sub> ≤ ref. Concrete	Passes	
Capillary absorption	EN13057	≤ 0.5 kg/m <sup>2</sup> /Hr <sup>0.5</sup>	≤ 0.5 kg/m <sup>2</sup> /Hr <sup>0.5</sup>	
Cracking tendency	Coutinho ring		No crack after 180 days	

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

Tolerances are those described in appropriate performance standards.

\*- When rendered over large area. For sections greater than 50mm please contact Nufins technical department.

## Priming

Nucem Primer is prepared by adding the contents of the base to the hardener container and mixing thoroughly.

Usable life 2 - 3 hours.

The prepared surface and cleaned reinforcement steel should be coated with the Nucem Primer using a stiff brush ensuring it is thoroughly worked into the surface. When using Nucem Primer it is not necessary to saturate the substrate with water as it may be applied to either dry or damp surfaces. Whilst the primer is still tacky, normally within 3 hours, apply Nucem H.B. Mortar.

Coverage of Nucem Primer is 3 - 5 m<sup>2</sup> per pack.

## Mixing

The use of a force action pan mixer such as a Creteangle or Daines will ensure thorough mixing. Add approximately "two thirds" of the gauging liquid to the mixer then add the powder component. Add sufficient of the remaining gauging liquid until the desired consistency is achieved. Do not over mix.

## Application Instructions

Whilst the primer is still tacky apply the mixed Nucem H.B. Mortar. If the primer dries before application of the Nucem H.B. Mortar the area should be re-primed. Depending on the area to be repaired, material should be placed either with a gloved hand or trowel ensuring material is thoroughly compacted on to the primed substrate and around the reinforcement.

Nucem H.B. Mortar may require building up in layers and the final layer should be finished with either a wood or steel float. When building up in layers it is preferable to "score" the surface to produce a physical key and to re-prime to ensure maximum adhesion.

## Curing

Nucem H.B. Mortar should be protected from rapid drying out by using normal methods of curing and precautions taken to avoid frost damage. UV degradable resin based curing agents should not be used if the surface is to receive subsequent treatments.

## Over coating

Nucem H.B. Mortar is extremely durable and provides excellent protection to the embedded steel reinforcement. However, areas which have not been repaired will benefit from the application of a protective decorative coating, such as *Covercrete*.

## Packaging

Nucem H.B. Mortar is available in 20 kg packs (yield 14 litres approximately).

Nucem Primer is available in 0.5 kg and 1.0 kg units (coverage 3 - 5 m<sup>2</sup> per kg).

## Storage

Nucem H.B. Mortar has a shelf life of 6 months, when stored unopened at moderate temperatures. 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

Application should not be carried out when the temperature is below 5°C.

## 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.