

## Nucem H.B. Mortar

### Lightweight Cementitious Mortar

#### Description

A pre-packed polymer modified, fibre reinforced cementitious mortar designed for the restoration of spalled and damaged concrete where formwork can not be utilised. This durable high build repair system affords maximum protection to embedded reinforcement and can be installed to a thickness of up to 100mm in a single application on vertical surfaces. Independently tested by Taywood Engineering Limited and complies with highways standards Series 5700, BD27/86 clause 6 and DMRB CS 462. Nucem H.B. Mortar has been specially formulated to achieve and surpass the performance requirements of EN 1504 Part 3 Class R3.


#### Advantages

- Pack contains everything required including gauging liquid
- Guaranteed low water/cement ratio
- Excellent adhesion to dense concrete & steel etc.
- Chloride free & low chromate (CR VI <2ppm)
- Aggregate is non-Alkali Silica reactive in accordance with ASTM C289
- Excellent workability & finishing properties
- Good resistance to water, frost & salt permeation
- Suitable for sections from 10mm upwards
- Based on shrinkage compensated Portland Cements
- Complies with DMRB CS 462 & EN 1504-3

#### Applications

- Structural repair of concrete damaged by corrosion, impact or fire
- Repairs to spalled columns, beams & soffits
- Waterproof pointing mortar
- Waterproof render to concrete, brickwork & 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 23 0086-CPR-774186	
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

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.

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, consideration should be given to replacement.



## Technical properties of Nucem H.B. Mortar

Properties	Standard	Performance Requirements	Nucem H.B. Mortar Declared Value	Typical Concrete (30 MPa) Declared Value
Appearance			Grey Powder & White Liquid	
Chloride-ion Content	EN 1015-17	≤0.05 %	≤0.05 %	
Minimum layer thickness Maximum layer thickness - vertical - inverted			10 mm 50 mm* - 100 mm 50 mm	
Working time @ 20°C			30-45 minutes	
Initial set			2-4 hours	
Final set			4-6 hours	
Application temperature			5°C to 30°C	
Density			1450 kg/m <sup>3</sup>	2250-2400 kg/m <sup>3</sup>
Compressive strength @ 20°C	EN 12190	≥25 MPa	16 MPa @ 24 hours 30 MPa @ 7 days 40 MPa @ 28 days	21-32 MPa @ 7 days 30-40 MPa @ 28 days
Flexural strength	BS 6319-3		6.4 MPa	3-6 MPa
Modulus of elasticity, in flexure	BS 6319-3		11.5 GPa	
Modulus of elasticity, in compression	EN 13412	≥15 GPa	>15 GPa	
Indirect tensile strength	BS 1881-117		3.95 MPa	2.5-3.5 MPa
Direct tensile strength	BS 6319-7		4.22 MPa	
Adhesion to concrete	EN 1542	≥1.5 MPa	≥2.0 MPa	
Adhesion after: freeze/thaw thunder/shower dry cycling	EN 13687-1 EN13687 -2 EN 13687 -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 @ 20 mm			350 mm	
Sorptivity			0.01 mm min <sup>-1/2</sup>	0.15 mm min <sup>-1/2</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/°C	EN 1770		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	EN 13295	d <sub>k</sub> ≤ ref. Concrete	Passes	
Capillary absorption	EN 13057	≤0.5 kg/m <sup>2</sup> .h <sup>0.5</sup>	≤0.5 kg/m <sup>2</sup> .h <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.

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

\*For sections greater than 50mm please contact Nufins technical department.

## Priming

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.

## Mixing

Nucem H.B. Mortar should be mixed mechanically with the gauging liquid provided, in a forced action mixer. Prior to mixing, wet out the mixer drum and discard water. Repeat regularly at breaks and meal times.

Pour 3/4 of the gauging liquid into the rotating mixer drum then gradually add the entire powder contents. Add sufficient of the remaining gauging liquid, to achieve the desired consistency. **Do not overmix.** It is permissible to omit a small quantity of gauging liquid if a stiffer mix is required. Mixing time is 2 - 3 minutes till the product is thoroughly mixed.

## Application Instructions

Apply Nucem H.B. Mortar whilst the primer remains tacky. If the primer dries before application of mortar, the substrate should be re-primed.

Depending on the location to be repaired, material should be applied by hand or trowel, ensuring that thorough good compaction is achieved onto the primed substrate and around the reinforcement. Finish surfaces as required with a plastic or steel float.

Nucem H.B. Mortar may require build-up in layers and in this case it is recommended to heavily score the intermediate layer surface, producing a physical key and leaving to harden, then re-priming in order to ensure maximum adhesion. The final layer surface should be finished as required with a plastic or steel float.

## 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. Nucem H.B. Mortar should be protected from rapid drying out, using normal methods of curing such as taped down polythene sheeting, and wet hessian if required, in line with good concreting practise. A 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.

## Overcoating

Nucem H.B. Mortar is extremely durable and provides excellent protection to embedded 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 20kg packs (yield approximately 14 litres).

Nucem Primer is available in 1kg and 5kg units (coverage 3 - 5m<sup>2</sup> 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

Mortar should not be installed in temperature below 5°C unless measures have been taken 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.

## 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.