

THORHELICAL®

REMEDIAL SOLUTIONS

THE NATURAL CHOICE FROM ROUNDTOWER

MIXING DETAILS

We recommend the following best practice for mixing:

1. Start with an empty mixer
2. Add one part sand
3. Followed by 1 part lime
4. Followed by 1.5 parts sand
5. Mix dry for atleast 5 minutes
6. After 5 minutes slowly add water until the desired consistency is reached. It is very important not to drown the mix by adding too much water.
7. Once the desired consistency is reached, mix for a further 20 minutes.

The mix, to begin with, should appear rather dry but as mixing time increases the render will become much 'fattier'. If too much water is added the risk of shrinkage will increase and the final strength reduced.

Do not use any plasticizers.

If walls are dry damp down with spray mist to reduce the effects of suction.

Sand Selection

Clean sharp well-graded sand should be specified. For exterior work, when mortar joint size permits, the sand should contain a small proportion of 3-4mm grit. Interior plastering is the only occasion when a fine sand needs to be used in order to obtain a smooth surface. However, even then, a fine sharp sand will provide a stronger surface. A sand with a high proportion of fines or silt should always be avoided.

Water

Use clean water. Adjust quantities to give a workability suitable for the application. It is important to use the minimum amount of water necessary so as to reduce shrinkage.

Aftercare

Aftercare is vital when using Lime mortars. Protect against frost, against saturation from driving rain and against fast-drying wind and heat. We recommend the use of Hessian sacking and plastic sheeting for protection.

Application		Roundtower	Typical Mix	Approx Coverage (Per 25k Bag)
Internal Plastering	Backing Coates (10mm)	NHL2	2.5 Sand: 1 Lime	8m ²
	Finishing Coat (3mm)	NHL2	2 Fine Silica sand: 1 Lime	26.5m ²
External Rendering	Coat (10mm)	NHL2	2.5 Sand: 1 Lime	8m ²
		NHL3.5	2.5 Sand: 1 Lime	8m ²
Pointing Rubble Stone		NHL2	2.5 Sand: 1 Lime	10m ²
		NHL3.5	2.5 Sand: 1 Lime	10m ²
Pointing Brickwork		NHL2	2.5 Sand: 1 Lime	16m ²
		NHL3.5	2.5 Sand: 1 Lime	16m ²
Harling/Wet Dash/Roughcast		NHL3.5	2.5 Sand/Aggregate	7.5m ²
Slurry Coats		NHL2	2.5 Sand: 1 Lime	Refer to supplier
		NHL3.5	2.5 Sand: 1 Lime	Refer to supplier
Lime Concrete		NHL5	1.5 Mixed Aggregate: 1 Lime	Refer to supplier

We also recommend the use of NHL's in areas of high exposure (e.g. Marine Conditions)



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ROUNDTOWER NATURAL HYDRALIC LIMES

NHL2	NHL 3.5	NHL 3.5 White	NHL5	Why is this important
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PHYSICAL PROPERTIES

Colour	White (73 Value)	Off-White	White (74 Value)	Pale Buff	Our NHL3.5 White is the most white/brightest Natural Hydraulic Lime available on the market. It is the best material to use where sand colour reproduction is of priority.
Fineness to 90µ	4.50%	5.70%	0.90%	5.80%	The exceptional fineness of Roundtower Natural Hydraulic Lime gives an excellent plasticity and encourages high quality plastering workmanship.
Fineness to 200µ	1.00%	0.80%	0.10%	0.70%	
Expansion (soundness)	0.0mm	0.3mm	0.0%	0.5mm	The near zero expansion of NHL binders and the elasticity of pure NHL mortars are such that joint free construction is possible.
Bulk Density	0.578 kg/dm ³	0.808 kg/dm ³	0.520 kg/dm ³	0.885 kg/dm ³	Binders are bought by weight and used by volume. Bulk density is important in evaluating economy comparisons.
Real Density	2.54 g/cm ³	2.73 g/cm ³	2.58 g/cm ³	2.77 g/cm ³	
Plasticity?Blaine value	14586 cm ² /g	7448 cm ² /g	12990 cm ² /g	9743cm ² /g	The Blaine value establishes the area that a gramme of lime can cover. A high value gives the lime a natural "Fatty", plastic consistency, much loved by the user. A high value also ensures minimal shrinkage and associated cracking.
Free water	0.79%	0.70%	0.66%	0.68%	Free water is the moisture that is not combined with the material. Excessive free water (>2%) can cause a premature hydraulic set. Roundtower's low Free Water content allows for long shelf life under normal enclosed warehouse conditions.

MACHANICAL PROPERTIES

Setting Times	600 min	290 min	1190 min	294 min	Early initial set with slow long term hardening.
Comprehensive Strength 7 days	1 MPa	2 MPa	2.5 MPa	3.3 MPa	Early strength achievement is excellent in fighting frost attack
Comprehensive Strength 28 days	3.5 MPa	4.3 MPa	4.5 MPa	5.5 MPa	If applied properly, NHL mortars will achieve great durability.
Comprehensive Strength 6 months	8 MPa	9 MPa	/	11.5 MPa	
Comprehensive Strength 12 months	9 MPa	11 MPa	/	13.5 MPa	

CHEMICAL AND MINERALOGICAL PROPERTIES

SO ₃ (%)	1.47	1.7	1.47	1.46	Less than 3% has no detrimental effect on Lime or Lime mortars. The minute amounts of SO ₃ present come from the fuel used during calcination and not the raw material.
Free Lime (%)	45	1.25	38	18	workability and self-healing properties.
Potassium (K ₂ O) %	0.60	0.90	0.60	0.90	Presence of Alkalies, Potassium or Sodium, can cause Alkali/Silica reaction. Reacts with the Silicates in cement and sand producing gradual disintegration.
Sodium (Na ₂ O) %	0.08	0.10	0.8	0.10	
Portlandite Ca(OH) ₂ %	58	47	59	42	Recarbonated in CaCO ₃ after set.
Tri/Di calcium silicate (C ₃ S+C ₂ S) %	33	40	31	45	Linked to hydraulicity index of Natural hydraulic Lime.
Tricalcium Aluminate C ₃ A %	2.0	1.47	3.9	5.0	
C ₂ SO ₂ (Gypsum)	0	0	0	0	The presence of Gypsum can cause expansion, efflorescence and failures, especially in marine climates. Roundtower Natural Hydraulic Limes are all suitable for use in marine conditions.
Quicklime (CaO)	0	0	0	0	Unslaked lime will expand when hydrated. Makes products unstable.
Additions (waterproofers, plasticisers, water retainers, pozzolans, air entrainers)	0	0	0	0	Due to absence of setting agents, NHL mortars can be re-worked up to 24 hours. Essential for minimising waste on site.
Active Clay (SiO ₂ +Al ₂ +FeO ₂)	/	/	/	/	The percentage of Active Clay will indicate a mortar's hydraulicity. Roundtower Natural Hydraulic Limes conform to the standard EN-459.
Loss on Ignition %	17	14	17	14	The loss on ignition is the percentage of mass lost after heating at high temperatures. It represents the free water, bound water and carbon dioxide.

Tests are carried out in accordance with EU Norm. EN-459 and under strict laboratory conditions. All mortars tested adhere to the EU test mortar norm of Binder:1.13Aggregate mix. Aggregate used in all tests is EU standard laboratory sand(ISO679).