

Product Data Sheet

HyperLime[®] 2

LIMECO[™]

HyperLime[®] 2 is a new, efficient formulated hydraulic lime powder. With class leading low CO₂ footprint, it has a workable, fatty feel with quick set. HyperLime 2 mortars should simply be applied and left to dry, potentially reaching final strengths >2N/mm² within 1-3 months of applying using high ratio mixes such as 1:2.5^{v/v}. Ideal for plastering for New-Build and Renovation as well as general mortar and sheltered render.

HyperLime 2 PowderPutty[™]

- ✓ low in-use bulk density 500kg/m³ (0.5 kg/Litre)
- ✓ carbon footprint is 35kg CO₂ per tonne 1:2.5 mortarⁱ
- ✓ mixes in minutes on site with mortar mixer, cement mixer or powered hand mixers.
- ✓ feels workable, often fatty, in use; similar to putty
- ✓ is quick to set (fig. 1); covered, wet mortar can be reworked up to 24 hours after mixing.
- ✓ no need to keep mortar wet after application for cure
- ✓ strength develops quickly and reliably. 95% of final strength achieved in 28 days (compared to 192 day data)
- ✓ is manufactured using ISO 9001 raw materials.
- ✓ does **not** contain cement, gypsum, chemical/agricultural waste or by-products from power or metal industry.
- ✓ has L*a*b* whiteness >95 with a low RI allowing true mortar colour development based on aggregate.
- ✓ has in-use carbon footprint over 75% smaller than standard OPC mortars and Gypsum plastersⁱⁱ.
- ✓ supplied in 25kg sacks.

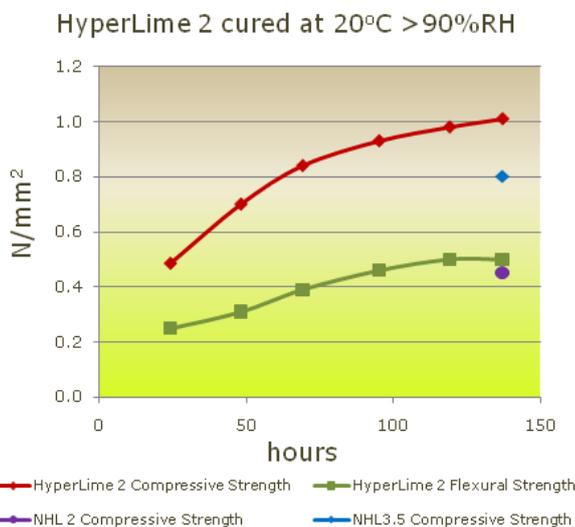


Figure 1. HyperLime 2 cure rate at 20°C, >90% RH in comparison with market leading NHL2 and NHL3.5 products (2000g sharp sand, 282g hydraulic lime, 167g water - 1:2.5 HyperLime 2)

1. HyperLime 2 Indicative Performance Data

HyperLime 2 minimum recommend use level with aggregate is 1:2.5^{v/v} (2 vol HyperLime:5 vol aggregate). Strengths in excess of 2N/mm² are achievable under normal drying conditions (~60% RH or relative humidity); HyperLime 2 does not need to be kept damp for 7 days after applying (fig. 2). Typical flexural strength of HyperLime 2 mortars is ~0.5 N/mm². See website for other mixes.

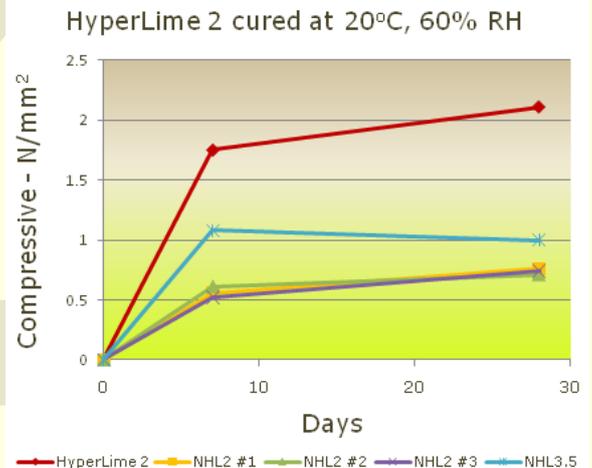


Figure 2. Comparative strength of HyperLime 2 and competitor products cured at ambient RH - 2000g sand, 282g hydraulic lime and 167g water

2. HyperLime 2 Efficiency In-Use

HyperLime 2 has a low bulk density and is very efficient in use. HyperLime 2 can achieve strengths in excess of NHL2 and comparable to NHL3.5 at >90% RH (fig. 3). Under normal drying conditions, HyperLime 2 outperforms NHL2 & 3.5 (fig. 2). In comparison with a basket of NHL2/3.5 products at recommended use levels (typically 1:3) under normal conditions, 1m³ mortar prepared with HyperLime 2 at 1:2.5 can use up to 25% fewer 25kg sacks, compared with NHL2/3.5 at 1:3, to achieve the same strength suitable for M2.5 type (BS 998-2) at 28 days. Performance compares well with high ratio cement mortars and gypsum plasters.

3. HyperLime 2 and water

HyperLime 2 is designed to hold onto water during the first 7 days of cure after application when the critical hydraulic set occurs. Good practice requires continual wetting of other commercial NHLs for 7 days after application to ensure curing however this is eliminated by use of HyperLime 2.

Add just sufficient water to make a continuous mortar or render of required flow when using HyperLime 2. A mix that is dry will not form a ball when squeezed with a gloved hand and crumbles on release; dry mixes are weak. Very wet mixes also lose strength and have potential to crack on drying.

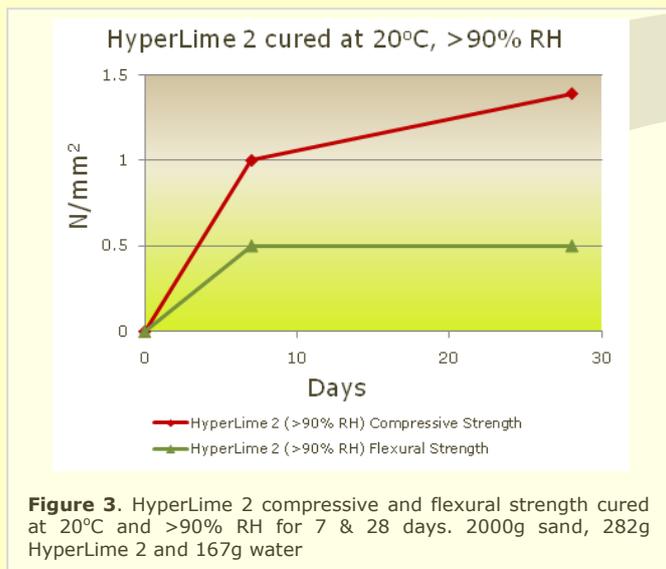


Figure 3. HyperLime 2 compressive and flexural strength cured at 20°C and >90% RH for 7 & 28 days. 2000g sand, 282g HyperLime 2 and 167g water

4. HyperLime 2 and EN459:2010

UKAS accredited testing of HyperLime 2 under EN459 conditions showed its 28 day compressive strength to be 2.5 N/mm². Tests at BRE University of Bath, comparing HyperLime 2 to a leading NHL3.5 to flow table value of 170cm showed both had 28 day compressive strength of 2.1 N/mm².

5. HyperLime 2, Workability and Adhesion

The term "fat" describes a mortar that feels buttery or luxurious in use, adhering well to substrates; a term normally applied to mortars prepared using lime putties. HyperLime 2 has been evaluated by several independent leading lime users/masons/plasterers who describe its unique feel as fatty and very workable, making it an ideal choice for plastering or rendering. This is not observed with other hydraulic lime products on the market. Our trademark PowderPutty™ is used to reflect this. When applying to any surface, ensure the substrate is damp for best adhesion performance.

6. HyperLime 2 and Aggregate Selection

Good sharp sand is used to generate HyperLime 2 data. The choice of aggregate is critical to achieve good strength for HyperLime 2. The use of monogranular sands with void levels >35% is not recommended. The use of a well graded sharp sand with void levels of <35% will give best results.

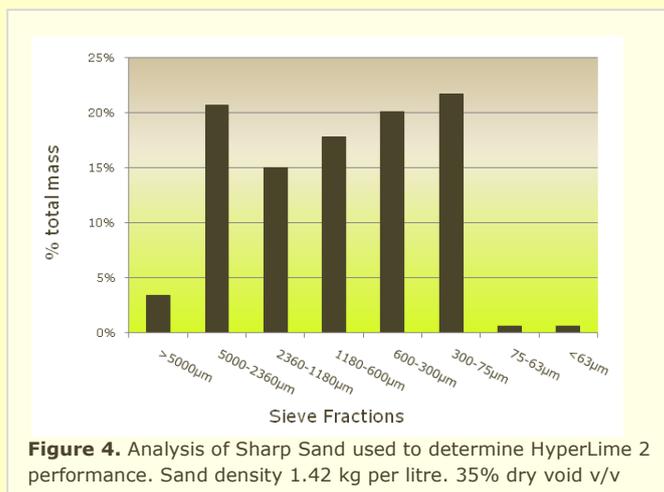


Figure 4. Analysis of Sharp Sand used to determine HyperLime 2 performance. Sand density 1.42 kg per litre. 35% dry void v/v

7. Composition and other performance data

HyperLime 2 EN459 and other Data		
	EN 459 Spec	Typical HyperLime 2 Data
Bulk Density	n/a	0.50 g/mL
Vapour Permeability (1:1 mix)	n/a	>0.5 g ^(air) .m ² .hr.mmHg
Heavy Metals inc. Cr (VI)	n/a	< 3ppm (w/w)
Crystalline SiO ₂	n/a	none detectable
Available Lime	≥40 to <80%	90
Initial Set	>1hr	12
Final Set	≤40hr	24
Compressive Strength at 28 days	≥2 to ≤7 N/mm ²	2.5
Sulphate as SO ₃	<3%	0.25
Soundness	<2mm	0.01
Fineness (+200µm)	≤5%	1
Fineness (+90µm)	≤15%	8
Free Water Content	≤2 %	0.6
Penetration	>10 to <50mm	4
Air Content	≤25%	<5
Sack Shelf Life	-	12 months

8. Further Information

HyperLime 2 should be used between +5°C and +30°C. After application, protect from strong sunlight, wind, rain and especially frost to ensure best performance. It is not recommended to use when freezing temperatures are possible within ~2weeks. For further information regarding alternative HyperLime 2 mix strengths and data, aggregate choice, samples and safety information, contact Limeco Ltd.

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ⁱ 1 year after application to allow cure. HyperLime products carbonate at around 4mm per month

ⁱⁱ Contribution of Working Group III to the fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), 2007, B.Metz, O.R.Davidson, P.R.Bosch, R Dave, L.A.Meyer, Chapter 7.