

Preparing Natural Hydraulic Lime Mortar

A practical field guide to mixing, dosing, sand selection, consumption tables and protection of freshly applied Saint-Astier® NHL mortars.

Mixing technique

Dosage & reworking

Sand selection

Weather protection

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A complete guide for NHL mortar preparation

Correct preparation is essential to obtain the workability, strength, vapour permeability and durability expected from a Natural Hydraulic Lime mortar.

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Mixing NHL mortar

The order in which materials are introduced, and the time spent mixing, directly determine the quality and workability of the finished mortar.

01

Small mixers

- Add half of the required sand to the drum.
- Add all of the lime.
- Mix until the colour is uniform, approximately 2 minutes.
- Add the remaining sand and mix again for 1 to 2 minutes.
- Add water slowly while mixing until the required plasticity is achieved.
- Allow approximately 5 to 8 minutes of total mixing time.

02

Larger mixers

- Introduce equal parts of the required sand.
- Add an equal part of lime.
- Add more sand in equal parts.
- Dry mix for a few minutes until homogeneous.
- Continue mixing while slowly adding water.
- Mix until the mortar becomes workable, generally 5 to 8 minutes.

Expert tip: NHL mortar should be closer to a dough-like texture than a slurry. Longer mixing improves workability; adding excess water reduces performance and may increase shrinkage.

Using lime putty with NHL mortar

A small amount of lime putty may be added to improve immediate workability and reduce mixing time. Do not exceed 10% of the NHL binder weight.

- Always incorporate lime putty before adding water.
- Do not add lime putty late in the mix, as this may produce an excessively wet mortar.
- Do not use lime putty with NHL 2.
- Remember that lime putty can reduce the final mortar strength.

Dosage & reworking

Use standard buckets, always levelled. Mortar ratios should be agreed with the supplier or specifier according to the masonry, exposure and expected performance.

Class II

2 N/mm²

Recommended binder:

NHL 2

Best suited to sensitive historic masonry and softer substrates.

Class III

3.5 N/mm²

Recommended binder:

NHL 3.5

Suitable for general pointing, bedding and many traditional masonry applications.

Class IV

≥ 5 N/mm²

Recommended binder:

NHL 5

Designed for exposed situations, denser masonry and stronger mortar requirements.

Reworking: Saint-Astier® NHL mortars can be reworked for up to 24 hours after initial preparation. Keep the mortar covered overnight and add as little additional water as possible when re-mixing.

All about sands for NHL mortars

Sand selection is one of the most important variables in lime mortar design. The wrong sand can affect strength, vapour permeability, workability and durability.

01

Cleanliness

Sand should be free from clay and silt. Very fine particles may require wet sieve analysis, as dry sieving may not reveal clay coatings.

02

Well-graded structure

A good mortar sand should contain several particle-size grades. Mono-granular sands reduce workability and compromise the void structure.

03

Vapour permeability

The void structure of the sand directly influences vapour permeability. Sharp, well-graded sands help maintain the breathable nature of lime mortars.

04

Colour and fines

Mortar colour is mainly determined by the fines in the sand. Avoid sands coloured by clay, as they can alter the effective binder ratio.

Important: Improve workability through longer mixing time, not by adding more water. Fine sands usually require more water and may reduce strength, increase shrinkage and encourage lime leaching.

Application	Maximum particle size	Fines content
General masonry / bedding	Approximately 1/3 of joint height	About 20% of mass
Render - stipple, base and rough coats	3 mm down to 0.075 mm	Maximum 15%
Render - smooth finishing coat	2.36 mm down to 0.075 mm	Maximum 25%
Fine / ashlar work	Fine, well-graded sand	Maximum 25%
Interior smooth plastering	Fine, well-graded sand	Maximum 25%

Consumption tables

NHL products are purchased by weight but mixed by volume. Always confirm densities and ratios with the supplier or project specification.

Binder	Average density	Mix 1:2	Mix 1:2.5	Mix 1:3
NHL 5	700 kg/m ³	350 kg	280 kg	240 kg
NHL 3.5	610 kg/m ³	305 kg	244 kg	203 kg
NHL 2	560 kg/m ³	280 kg	224 kg	186 kg
Lime putty	1,350 kg/m ³	675 kg	540 kg	450 kg
OPC / White cement	1,450 kg/m ³	725 kg	580 kg	483 kg

Field reminder: Because Saint-Astier® NHL has a low bulk density, weight-for-weight it can produce significantly more mortar than ordinary Portland cement.

Protecting NHL mortars

Freshly applied NHL mortar is at its most vulnerable between application and full cure. Protection is a fundamental requirement, not an optional step.

Rapid drying

Direct sun, heat and strong wind may inhibit hydration and carbonation, leading to shrinkage or friability.

Remedy: use fine-mesh debris netting and mist lightly in hot or windy conditions.

Insufficient drying

Excessive rainfall, low temperatures or persistent damp can slow the initial set and leave mortars vulnerable to frost.

Remedy: protect wall heads, manage drainage and use scaffold sheeting when needed.

Freeze-thaw risk

Water expands when freezing. If the pore structure is saturated, the mortar may not be able to accommodate this expansion.

Remedy: cover with hessian and tarpaulins, and provide supplementary heating if necessary.

Wind chill

Wind can significantly reduce the effective surface temperature of fresh mortar, increasing frost risk.

Remedy: use scaffold sheeting on the windward face and record min/max temperatures daily.

Wind-chill reference

Wind speed	+5°C	0°C	-5°C
7 km/h	+2°C	-2°C	-7°C
14 km/h	-1°C	-7°C	-12°C
21 km/h	-4°C	-10°C	-16°C
36 km/h	-10°C	-15°C	-23°C
50 km/h	-12°C	-17°C	-26°C
64 km/h	-13°C	-19°C	-28°C

Frequently asked questions

Answers to common on-site questions about preparing and using Saint-Astier® Natural Hydraulic Lime mortars.

What is the difference between NHL 2, NHL 3.5 and NHL 5?

The number indicates the minimum compressive strength at 28 days in N/mm². NHL 2 is the softest and is often used for sensitive historic masonry. NHL 5 is more hydraulic and is suited to more exposed situations.

Can NHL mortar be reworked the following day?

Yes. Saint-Astier® NHL mortars can be reworked for up to 24 hours. Keep the mortar covered overnight and add as little water as possible when re-mixing.

Why is my mortar too wet or not workable?

Excess water is a common cause. Check the sand grading, as fine sands absorb more water. Improve workability through longer mixing rather than adding water.

Which sand should be used for an exterior base coat render?

Use a sharp, well-graded sand from 3 mm down to 0.075 mm, with less than 15% fines between 0.075 and 0.150 mm. Avoid clay-contaminated or mono-granular sands.

When can protection be removed?

Protection should remain until the cured mortar reaches approximately 8% moisture content. Use a calibrated moisture meter rather than relying on visual appearance.

Can NHL mortars be used in winter?

Yes, with suitable precautions. Use scaffold sheeting, monitor wind-chill and provide heating if required. Do not apply if frost is forecast within 48 hours unless proper protection is in place.

Does lime putty improve NHL mortar performance?

Lime putty can improve immediate workability and shorten mixing time, but it may reduce final strength. Do not exceed 10% of NHL binder weight, and do not use it with NHL 2.

Why should clay-coloured sands be avoided?

Clay can behave as a binder and alter the effective binder-to-aggregate ratio. This can make the mortar unpredictable and potentially too rich.

Need support with Natural Hydraulic Lime specifications?

Saint-Astier® provides technical documentation and field guidance for professionals working with Natural Hydraulic Lime mortars, renders and masonry applications.

Contact the team

Technical documentation

This guide is provided for general information only. Specifications should always be project-specific and issued by the relevant specifier. Site conditions, substrate type, exposure, sand grading and workmanship must be assessed before application.