

Hydrated Lime

Technical data sheet

Hydrated Lime is a quality-assured, non-hydraulic hydrated lime produced to meet the requirements for mortar, render and plaster for conservation, restoration and new build construction. It conforms to the high calcium requirements of BS EN 459-1 classification CL 90-S.

Hydrated Lime is manufactured by calcining a high purity calcium limestone in carefully controlled conditions. This process produces quicklime which is then crushed, hydrated and re-ground to produce the finished fine powder.

Applications

Hydrated Lime can be used for many applications other than building including:

- agricultural/horticultural soil acidity regulator
- soil stabilisation
- water treatment and sewage treatment

Building applications

Hydrated Lime improves the plasticity, cohesiveness and water retention of Portland cement mortars and renders and can be used for a wide range of building applications. As hydrated lime is non-hydraulic, it is not suitable for use in mortars and renders without a Portland cement being present.

Lime putty

The key benefit of Hydrated Lime is its effect of improving the workability and water retention of mortars and renders when used as a lime putty. A lime putty can be produced by adding an excess of Hydrated Lime to clean water in a container, while constantly stirring to form a paste. The paste should be allowed to 'condition' by standing for at least 24 hours before use. It is essential that the paste is not allowed to dry out during this time.

General guide to mortar selection by building application

| Proportions by Volume | Mortar Designation |
|-----------------------------|--------------------|
| Copings | I |
| Retaining walls | I or II |
| Free-standing walls | I, II or III |
| Work below DPC | I, II or III |
| Low rise housing (external) | III |
| Low rise (internal) | III or IV |

General guidance only, please refer to brick or block manufacturer's advice.

Strength

An unnecessarily strong mortar will concentrate the effects of any differential movement between the mortar and the masonry and cracks may appear which could reduce the durability and increase the risk of penetration by rain. A weaker mortar will accommodate some differential movement between the mortar and the masonry and if cracking does appear it will generally be distributed as hairline cracks in joints, thus preserving the integrity of the stone, bricks or blocks themselves. In general mortar should be weaker than the masonry it is used with. The use of Hydrated Lime imparts special properties to mortar of low shrinkage combined with elasticity and allows cracks to heal autogenously by continuing carbonation.

Mortar mix design

Mortars containing Hydrated Lime gain strength by a combination of hydraulic action and carbonation. It is essential to consider the mix proportions of mortars with care. The following mix proportions provide a guide from which a mix can be selected to suit the construction and local environmental conditions. Other factors, such as the type of brick or stone, or the sand being used will affect the final mix selection.

It is strongly recommended that trial mixes are carried out prior to commencement of work to ensure that

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the mix design and material combinations meet the requirements of the specification and method of use.

General guide to mortar selection by building application

| Mortar designation | Cement | Hydrated Lime | Sand | Assumed Mortar Class |
|--------------------|--------|---------------|-------|----------------------|
| I | 1 | 0-¼ | 3 | M12 |
| II | 1 | ½ | 4-4 ½ | M6 |
| III | 1 | 1 | 5-6 | M4 |
| IV | 1 | 2 | 8-9 | M2 |

All the above proportions are by volume.

The sand where possible should comply with appropriate British Standards. The lime can either be the dry hydrate or in the form of putty. The volumes used are the same in each case.

Renders

Choice of suitable mixes for renders follows a similar process to that for masonry mortars. In this case the properties of the substrate must be considered. The choice of sand will also be affected by the kind of finish required with finer sands being necessary for some smooth decorative renders and plasters.

General guide to mortar for renders by substrate type

| Substrate | Mix designation | | | |
|---------------------------|---------------------------------|-------------------|-----------------|-------------------|
| | First and subsequent undercoats | | | Final coat |
| | Severe exposure | moderate exposure | Severe exposure | Moderate exposure |
| Dense strong | II | II | II | IV |
| Mod-erately strong, poous | III | III | II | IV |
| Mod-erately weak, porous | III | IV | II | IV |
| Metal Lathing | I,II | I/II | II | III |

Internal cement-based plastering

Hydrated Lime gives excellent workability and water retention which assists in obtaining high quality finishes. Cement-lime-sand plasters have a greater resistance to deterioration in damp conditions than gypsum based plasters.

Backing coats:

- Most normal applications - designation IV mortar.
- Where a strong finish is to be applied designation III.

Finishing coats:

- Most normal applications - designation III or IV mortar.
- Finishing coats must never be stronger than the backing coats to which they are applied. In damp conditions, do not over-trowel the material to avoid shrinkage cracking.

Mixing

It is essential that the lime is uniformly dispersed. The time of mixing will be controlled by the efficiency of the mixer. The following sequence will be suitable for a tilting-drum mixer. When mixing wear protective goggles and water-proof gloves.

1. Add ¾ of the water required
2. Add half of the sand
3. Add all of the Hydrated lime
4. Mix for 2 to 5 minutes until a uniform colour is achieved
5. Stop the mixer and isolate the drive. Scrape down any material adhering to the back
6. Add all of the cement
7. Add the remainder of the sand
8. Add remaining water needed to obtain a workable consistency
9. Mix for three additional minutes or a total mix time of five minutes

Admixtures and additions

Admixtures and additions are not normally required. If used it is recommended that trial mixes are produced to establish optimum dosage consistent with the required strength and performance for any particular application.

Lime wash

Hydrated Lime may be thinned down using water, with or without the addition of pigments, for making brushable lime washes.

Quality

Hanson Hydrated Lime is CE Marked in accordance with the Constructions Products Regulations. In addition to

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applying a system of factory production control, based on ISO 9001 and defined in BS EN 459-1, independent sampling and testing of the product, known as Assessment and Verification of Constancy of Performance (AVCP) System 2+. A Declaration of Performance (DoP) and CE mark are available on our website.

Availability

Available nationwide in 25 kg bags.

Storage

Hydrated Lime readily absorbs moisture and carbon dioxide. It should therefore be stored in a cool, dry, draught-free building, clear of the ground and away from walls to avoid the possibility of condensation.

Conditions of use

As a general rule, Lime products should be placed within the range of 10°C to 30°C.

- In cold weather, setting times may be extended and strength development delayed.
- Hanson Cement cannot be held responsible for poor workmanship.
- To avoid premature deterioration of the product please follow the correct storage requirements.

Technical support

For further advice please contact our Technical Helpline on 0330 123 2441.

Guidance on mortar and render mixes and their suitability for various locations and conditions is given in the following:

- BS EN 1996-1-1: Eurocode 6 - Design of masonry structures
- BRE Digest 362: Building Mortar
- BSI PD 6678: Guide to the specification of masonry mortar
- BS EN 13914-1: Design, preparation and application of external rendering and internal plastering.

Health and safety

Lime causes skin, eye and respiratory irritation, severe burns and dermatitis. Always wear suitable personal protective equipment (PPE) and refer to the full Material Safety Data Sheet for further information.

Please note: Reference to a Technical Standard number in this leaflet is deemed to include the latest published edition and/or any published amendments issued after the standard's publication, unless a date of issue is quoted in which case reference is to the provisions stated in that edition.