



## Benefits of using lime-based mortars

Masonry structures built with lime-based mortars contribute to:

- a healthy indoor environment,
- improved aesthetics,
- longer life of the building,
- ease and low cost of maintenance.

### ● Low water penetration

The unique properties of lime allows for a continuous uniform bond between the mortar and the masonry unit. These properties mean that the masonry is less susceptible to water penetration while allowing breathability and moisture control.



### ● Increased breathability and moisture control

Although lime-based mortars are better at withstanding water penetration, they also allow the moisture trapped in the masonry to evaporate through the mortar which reduces related damage to masonry. In addition, the lower potential for condensation and damp contributes to a healthy indoor environment.



### ● Reduced cracking

Lime-based mortars reduce the risk of major cracks occurring. When cracks do appear, they tend to be in the form of microcracks within the mortar rather than macrocracking or separation from the masonry units. These microcracks are self-healing by the lime in the mortar as moisture movements bring dissolved calcium salts into the microcracks where they react with carbon dioxide to harden and “heal” the crack.



### ● Less efflorescence

Lime-based mortars reduce efflorescence, which are white stains and deposits on masonry and render surfaces. Moisture movement in masonry using these mortars tends to occur through the mortar joints, which lessens efflorescence by reducing evaporation through the bricks. The result is a better, more uniform appearance.



### ● Easier and cheaper building maintenance

Lime-based mortars are easier to remove and replace when necessary. This means easier maintenance on older buildings.



### ● Workability and water retention resulting in optimum material use & productivity

When lime is used in a mortar, it allows the mix to hold a greater amount of water and has a lubricating effect which improves the plasticity of the mortar. Lime-based mortars usually have a longer “spot” life – the mortar remains plastic and useable for a longer time after mixing, increasing productivity. Mortars with these properties are generally appreciated by craftsmen, promoting good workmanship with better joint filling and finishing. This increased productivity can lead to improved economy in use and less waste.



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# LIME IN MORTARS

MASONRY MORTARS, PLASTERS AND RENDERS  
– A PROVEN SUSTAINABLE AND ECONOMICAL SOLUTION



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Lime substances are classified under Regulation (EC) No. 1272/2008 on the classification, labelling and packaging of substances and mixtures (CLP Regulation). Information on the hazards of specific products is available directly from your lime supplier. Before handling, always read the extended Safety Data Sheet (e-SDS) and container labels for safe use, physical and health hazard information. An e-SDS template for lime substances is available and can be downloaded from the EuLA's website [www.eula.eu](http://www.eula.eu)



**Designers, builders and owners** look for only the best performing construction materials to provide long-term, sustainable and economic building solutions. To conform to these criteria, a well-built masonry structure should be: durable, flexible and easy to maintain.



## Challenges

### for building professionals and owners: durability & long-term performance

Lime-based mortar has always been widely used in masonry buildings. Its durability and long term performance are demonstrated by the myriad of historic buildings in our towns and cities.

However, over the last two or three decades, lime has largely been replaced by other materials in mortars. The emphasis here is on the early age compressive strength needed for faster, taller and thinner constructions. This causes a notable increase in problems such as cracking, water penetration and general lack of durability.

These emerging problems with durability have been recognised and researched at European universities and building institutes, which nowadays support the multiple benefits of lime in mortars.

The European Lime Association (EuLA) commissioned an independent institute to provide an exhaustive overview of the internationally available scientific publications relating to mortar functionalities and performance of lime-based mortars. The full study as well as other resource material is available at [www.eula.eu](http://www.eula.eu)

#### The unique properties of lime

Lime is a product derived from limestone in an industrial process. Naturally occurring limestone, which is composed almost exclusively of calcium carbonate, transforms into quicklime, calcium oxide, by applying heat. When slaked with water, quicklime transforms into hydrated lime, which is a dry powder composed of calcium hydroxide. Hydrated lime can be used in a suspension called milk of lime.

Once processed, these products derived from limestone have the unique ability to return to their original chemical form by reacting with carbon dioxide to eventually form calcium carbonate. This process, commonly called "The Lime Cycle" (from limestone to limestone) helps lime to make a continuous uniform bond between mortar and masonry unit. It helps to make the mortar more permeable to vapour, allowing moisture movement, and to give the mortar the necessary flexibility to respond to the various stresses and movements of masonry.



## Lime-based mortars meet the needs of building professionals



**Designers, architects and engineers** all need a reliable product with a predictable performance that meets the requirements of the client.

**The builder and craftsman** need a material which is consistent, easy to use and enables good workmanship with rapid, cost-effective, economic working.

**Building professionals** need to provide owners with long lasting attractive masonry, without cracking, water penetration, or damage due to frost or moisture.



## Lime-based mortars fulfill the criteria for sustainable building



- Full compliance with code requirements (EN 1996).
- Supported by existing mortar standards (EN 998).
- Deliver the flexural strength required for more slender walls.
- Meeting the requirements for appropriate compressive strength.
- Additional benefits in bond quality and durability.
- Addressing masonry behaviour in relation to shear strength and water tightness.

**Sustainability** is supported by the greater durability of masonry with lime containing mortars. In addition, at the end of a building's life, masonry units can potentially be reused by cleaning off the mortar. If the mortar used was a lime-based mortar, which is usually softer than the brick, reuse of the bricks is generally possible. This is not the case with mortars which do not contain sufficient lime, as the mortar is usually too hard and brittle to remove without damaging the brick or block.

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