Benefits of using lime-based mortars

Low water penetration
The unique properties of lime allow for a continuous unbroken 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 to the ease of condensation and drying which contributes to a healthier 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 time in the mortar as moisture movements bring dissolved calcium salts into the microcracks where they react with carbon dioxide to harden and "heal" the cracks.

Less efflorescence
Lime-based mortars reduce efflorescence, which are white stains and deposits on masonry and render surfaces. Moisture movement in masonry using lime mortar tends to occur through the mortar joints, which limits efflorescence by reducing evaporation through the blocks. 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 a lubricating effect which improves the plasticity of the mortar. Lime-based mortars usually have a longer "spot" life – the mortar remains plastic and usable 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.

Masonry structures built with lime-based mortars contribute to:
- a healthy indoor environment,
- improved aesthetics,
- longer life of the building,
- ease and lower cost of maintenance.

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

www.eula.eu

Lime substances are classified under Regulation (EC) No. 1272/2008 on the classification, labeling and packaging of substances and mixtures. The use of specific products is subject to the terms and conditions of supply, which the supplier determines. Always contact the selected supplier before handling, always read the supplied safety data sheets (SDS) and container labels for safety instructions. The supplier is responsible for the use of our substances in end-users and can be downloaded from the EuLA's website www.eula.eu.
Lime in mortars – masonry mortars, plasters and renders – a proven sustainable and economical solution

www.eula.eu

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 to three decades, lime has largely been replaced by other materials in mortars. The emphasis has been on the early-age compression 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 source material is available at 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 lime back to limestone, helps to make a continuous uniform bond between mortar and masonry unit. It helps to make the mortar more permeable to moisture, allowing moisture movement, and to give the mortar the necessary flexibility to respond to the various stresses and movements of masonry.

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.

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.

Lime-based mortars meet the needs of building professionals

• 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.

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

The builder and craftsmen 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.

Designers, builders and owners look for only the best performing construction materials to provide long-term, sustainable and economic building solutions.