

Edifice Hydraulic Lime meets the requirements of the newly approved ASTM C1707 Standard Specification for Pozzolonic Hydraulic Lime. The specification was written to ensure what was old could be used as new. Pozzolans can be combined with building lime to achieve the expected workability of a lime-based mortar and the hardening properties provided by a pozzolan. Being able to blend two well characterized materials into one mortar material ensures superior performance.

What is a Pozzolan?

A pozzolan is a material when in the presence of alkali hydroxide (in this case calcium hydroxide) and water will react to form cementitious calcium silicate hydrate and or calcium aluminate. Pozzolans may be naturally occurring, formed by modifying naturally occurring minerals or as a by-product of industrial process. Common to all these materials is their basic chemistry of high silica and alumina and their high reactivity in the presence of calcium hydroxide.

One of the most abundant pozzolan is volcanic ash. The Romans are well known for having used volcanic ash, especially for use in aqueducts. The Romans also used crushed, low temperature fired, as a pozzolan. The heating of the clay modified the clay structure enough to make it reactive. Meta-kaolin, which is now a fairly common pozzolan is a heat treated clay, similar to that of the Roman crushed clay tiles. The use of industrial by-products as pozzolans appears to have started in the Industrial Revolution (mid 1800's). Slag from steel manufacturing and ash from foundries can be found in mortars of this age. Ash from coal fired electrical plants is currently a large source of pozzolans.

Not every pozzolan is can be used with building lime to create PHL. The suitable pozzolan must:

- be low in sodium and potassium reduce the risk of efflorescence,
- must have enough pozzolanicity to provide a set within 48 hours of mixing,
- must provide consistent strength gain and stability over time,
- not reduce water retention below 75%
- not contribute to any risk of expansion due to deleterious components.

What is a Building Lime

A building lime is a hydrate (dry powder) or putty (wet) which meets the requirements of ASTM C206 (Standard Specification for Finishing Hydrated Lime (plaster), C207 (Standard Specification for Hydrated Lime for Masonry Purposes) and C1489 Standard Specification for Lime Putty for Structural Purposes). These requirements include:

- compositional purity >95% active hydroxide
- high water retention (>85%)
- high Emley plasticity (>200 Emley units)
- limited coarse particle size
- no expansion due to incomplete hydration or other impurities

American (ASTM) and Canadian (CSA) have long recognized that these properties as being critical to ensuring the performance of building lime. ASTM C7 Lime Committee is celebrating its 100th Anniversary in 2012.

What is the difference between Pozzolonic Hydraulic Lime (PHL) and Hydrated Hydraulic Lime (HHL)?

PHL proves for the blending of high performance hydrated building lime with pozzolans to create a mortar material. HHL results from the calcination (burning) of a limestone of similar composition to that used to produce Portland cement. It is calcined to just short of melting temperature. This forms calcium silicates and free lime (calcium oxide) and some unburned limestone remains. The material is ground and the free lime is hydrated. But unlike a building lime the resulting hydrated lime does not meet the stringent ASTM requirements for a building lime. In fact it cannot be directly tested as a building lime.