

What is the difference between Hydrated Lime and Natural Hydraulic Lime (NHL)?

Hydrated lime is readily available at most building supply stores. It is often sold as “Type S” for Special Hydrate as opposed to “Type N” for Normal Hydrate. “Special” means the Type S Hydrated Lime has, after cooking the limestone, (which happens to often be from a Dolomitic limestone deposit), been air-slaked twice through pressure. The Normal hydrate is air-slaked only once through pressure. The three classifications for limestones that are designated by the ASTM to describe the chemistry of the stone is High Calcium, Dolomitic and Magnesian Limes. The majority of what Dolomitic Type S Hydrated Lime is used for is to plasticize and control the setting time of Portland cement mortars now used for modern, new, construction work. Type N Hydrated lime can successfully be slaked with water and used for sheltered internal plaster work however it might be very soft on its own. Type S Hydrated lime can also be used in sheltered internal work and its impurities may make it slightly harder. Altogether however, the addition of Portland cement is expected and is intended for the Type S Hydrated (Sometimes called Type S-A or N-A which just means additionally air-entrained) lime to be used in exterior applications such as laying modern brick, concrete block and making cement stucco. A typical mix for any of those applications is confusingly called a “Type-N” mortar which has nothing to do with Type N “Normal” Hydrated lime.

The “N” in Type N mortar is just a letter assigned in an acronym meant to describe a cement mortar strength. In that acronym Type M is the strongest, Type S- next strongest (again has nothing to do with Type S Hydrated Lime), **Type N Mortar**, Type O and Type K (for the softest cement mortar blend) correspond to strengths of Mortar where every other letter makes up the acronym M A S O N W O R K.

Type N Mortar is in bold letters here to highlight this mix ratio because it has been the standard mix ratio for mortar to lay modern brick, lay concrete block and make cement stucco for all of North America for the longest period (mid-1950- now) of the relatively short history of Portland cement being in existence, (1824-1910 in early forms and 1910-now in modern forms). The Type N mortar ratio is composed of 1 part Type 1 Portland cement, 1 part Type S Hydrated lime and 6 parts sharp, well-graded sand. Take away Portland cement and simple hydrated limes won't hold up well against the elements in exterior building work unless sheltered.

In comes the “Hydraulic” Limes.

Hydraulic Limes are limes that set not only from the carbonation that re-occurs from the cooked stone's exposure to air but they set with water all on their own. Type N mortar or an even “softer” Type O mortar is often incorrectly touted as a “Lime Mortar” suitable to be used as a replacement material for historic mortar reproduction. This was the common wisdom in building repair in previous years when calling out mix remedies (now known to inherently fail pre-maturely) were previously then used in many exterior applications meant to significantly repair historic masonry structures.

There now exists endless sound information that cement-based mortars and synthetically created “Hydraulic Lime” mortars are not the same as high quality Natural Hydraulic Lime mortars in the most critical properties. Cement mortars will not yield the same service-life results for exterior applications, even when the softest Portland cement or “Masonry cement” based Type O mortars are used and placed over the soft bedding mortar on historic masonry structures that need to breathe.

The issue in cost between the two is that it is always so much more expensive to do things three times than to do things correctly, once.

Also see our advice on Hydrated and Synthetic Hydraulic lime.