

Carbide Lime

One of our available lime products is calcium hydroxide formed as a co-product of acetylene. This lime has an available calcium hydroxide purity of over 90%, as does burned lime from quarries. The impurities of the two limes are nearly the same chemical composition, e.g. calcium carbonate, silica, iron, aluminum, and carbon. The carbon found in lime made from quarried limestone is from coal ash used to calcine (burn) the sized limestone feed. The carbon found in our co-product lime is from coke, which when fused with calcium oxide (burned lime) forms calcium carbide. The calcium carbide is then reacted with pure water to form acetylene gas and calcium hydroxide slurry. The acetylene is removed and sold for welding purposes. The high quality lime slurry is decanted to about 38 to 40 % solids and used for soil stabilization, flue gas scrubbing, and all other manner of uses in which hydrated lime can be applied.

The main difference in co-product lime and commercial hydrated (burned) lime is in the concentration of impurities. The available hydrated lime percent concentration is nearly equal. The co-product hydrated lime has more carbon content which makes the lime slurry appear gray in color. There is also a slight “garlic” odor due to the carbide process, which dissipates, quickly in exposed air. When the co-product dries it appears very white. Burned lime, on the other hand, has a higher concentration of iron and silica than co-product lime. Co-product lime is finer in particle size. These are the main differences.

Chemically, the co-product lime performs the same in soil as commercial burned lime. The limes have identical pH values (12.44 at 25 degrees C) and have the same ability to dissolve iron and alumina in clay to form calcium-aluminate-hydrate (CAH) and calcium-silica-hydrate (CSH), which are the two main components of cement. The formation of these pozzolan components then stabilizes the soil, increases strength and imparts water resistance. This reduces Plasticity Index (PI) and prevents excessive shrink/swell characteristics of the clay. Physically, co-product lime is better, having a very finely divided particle size, 75% minus 325 mesh. Commercial lime is only about 80% passing 200 mesh. A finer particle size means more and faster reactivity.

Today, only the most pure calcium oxide (quicklime) is fused with coke in order to render the highest yield in the manufacture of acetylene. The quality of the resultant hydrated lime is a direct result of the excellent raw materials used.