

# Hydrated Lime Production in Nigeria; the Feasibility Report

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# Abstracts

Hydrated lime is an organic product that has many beneficial uses. It is a caustic solid substance, white when pure, is obtained by calcining limestone and other forms of calcium carbonates. Pure lime, also called quicklime, is composed basically of Calcium Oxide (CaO). There are two types of hydrated lime. High calcium hydrated lime contains approximately 75 percent calcium oxide. Dolomitic hydrated lime contains approximately 45 percent calcium oxide and 30 percent magnesium oxide. Hydrated lime is very alkaline with a pH of 12.4.

The main differences between hydrated lime & quicklime are their reactivity & their chemical composition. Hydrated lime and quick lime are both calcium compounds. In its hydrated state, calcium is called calcium hydroxide, and in its pure state it is called calcium oxide, or quicklime. Calcium oxide, the "natural" state of calcium that comes out directly from the mine, has a heavy density (65lb/ft<sup>3</sup>) and is more reactive than hydrated lime.

To simplify, hydrated lime is the result of adding water to powdered quick lime, putting it in a kiln or oven, and then hydrating/pulverizing it with water. The resulting lime has a density of 35lb/ft<sup>3</sup>, and is called calcium hydroxide because it has been hydrated.

It is necessary for calcium oxide (quick lime) to be slaked in a controlled environment because it can create heat that reaches up to 120 degrees Fahrenheit. Calcium hydroxide, or hydrated lime, is already neutralized, so it will not undergo oxidation and can be used with water, for water ph control, lime slurry addition, lime slurry mixes, soil rehabilitation and much more.

Hydrated lime is used extensively as an industrial raw material. As a depilatory, it



removes hairs from hides. It is used for fertiliser production (soil conditioning), white wash, mortars, cements, ammonia recovery in gas manufacture, calcium salts, water softening, causticising soda, purification of sugar juices, acceleration for low grade rubber compounds etc.

In petrochemicals, hydrated lime is used as a disinfectant, buffer and neutralising agent. In food industry, it is a food additive and a shell-forming agent in poultry and snail farming. It is also used to produce rayons, calcium hypochlorite bleaches, phosphate chemicals, citric acid, glycerine, polypropylene oxide and for controlling acidity.

In metallurgical industries, hydrated lime finds good and extensive use in the production of non-ferrous metals such as lead, uranium, zinc, silver, copper and gold. In aluminium smelting and production of high-grade steel, hydrated lime also plays an important role as an input.

From the above list it can be seen that the market for hydrated lime is wide, expanding and sustainable and it cuts across industries like building and construction, agriculture, metallurgy, food, chemical and petrochemicals, each of which has high annual demand.

The national demand estimate for hydrated lime in Nigeria is in excess of 100,000 MT per annum and the estimated total supply figure is less than 35,000 MT per annum with most of the demand been met through importation.



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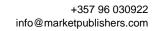
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