

The sacks of lime are usually opened and dumped into the mixing kettle. Considerable dust (as high as 34,890,240 particles less than ten microns per cubic foot in one sample) is produced by this operation. The average dust produced is 4,733,305 particles per cubic foot and the average exposure per batch is about five minutes. The number of batches made per week varies from one to twenty-five. No respirators are worn by men dumping hydrated lime at any of the points where it is used with the exception of Baton Rouge where the wearing of the MSA "Comfo" respirator is required. About 85% of the dust particles in samples taken while dumping lime in mixing kettles are slightly angular, slightly opaque, crystalline, in appearance under the Konimeter microscope, and five microns or less in size; 15% are rounded, semi-opaque, with a metallic greyish color, ten microns or over. There are also a countless number of very small particles.

Only a small quantity of Hydrated Lime is used in the treatment of boiler feedwater. About 70 pounds of lime is mixed per batch and about six batches are made every day (24 hours). The mixing is done by one man on each shift. Although the exposure is very short, the men at Ingleside Refinery wear Willson "Dust-tite" respirators while dumping lime. The average dust produced during this operation is only 657,024 particles, ten microns or less, per cubic foot. This low dust concentration is the result of a spray of water from a two inch pipe across the hatch of the mixing tank just below the opening while sacks are being dumped. Consequently, the material is wet almost as soon as the lime is introduced. About 95% of the dust particles in samples taken while the lime was being dumped into the mixing tank were semi-angular crystalline in appearance, and from five microns or less in size, and 5% were round opaque, two microns or less in size.

2. Lump Quicklime: Used to "soften" boiler feedwater. The lime used for this purpose is Oyster Shell Lump Quicklime (97% CaO). It comes in fifty pound paper-lined burlap bags, and eight bags are usually used per batch. One batch is made per shift. The dumping and mixing requires about ten minutes per batch, and the man doing this work is protected by rubber type goggles, but no respirator. The average dust produced by handling the bags of lump Oyster Shell Quicklime is 2,605,440 particles per cubic foot. The average dust produced while dumping the bags of lump Oyster Shell Quicklime into the mixing tank is 294,528 particles, less than ten microns, per cubic foot. The handling and dumping of this Oyster Shell Quicklime produces less dust than is produced by the hydrated lime usually used. About 95% of the dust particles in samples taken during the dumping of Oyster Shell Quicklime into the mixing kettle appear slightly angular, crystalline under the Konimeter microscope, and are five microns or less in size; 2% are round, semi-opaque, over ten microns in size; and 3% are black opaque scale-like, five microns or less in size.

What Physiological Effect is Produced by Lime Dust? According to the International Labor Office (Occupation and Health, Vol. II, 1934) particles of lime mix with the sweat of workmen handling it and irritate the uncovered pores of the skin; lesions of the mucous membranes are also set up. We are told that:

"The action of quicklime is due partly to its avidity for water (dehydration), to the heat given off in its reaction with water, and partly to the peculiar causticity of the alkaline oxides or alkaline earths. Quicklime exerts essentially a local action (on the skin and mucous membranes) irritating and caustic, which is naturally less marked in the case of slaked lime. Milk of lime is a feeble caustic acting only on the mucous membranes. The dilute lyes are only caustic to the skin after prolonged action and especially when they are warm.