

High Purity Calcium Hydroxide

Jost Chemical Co. has developed and commercialized a line of extremely pure Calcium salts for applications in human nutrition where extremely low vagrant metal contaminants are required. Jost's advances in manufacturing purification technology were initially targeted to produce ultrapure forms of Calcium Citrate and Calcium Phosphate for infant formula and clinical nutrition products where very low Aluminum levels are required. Over time Jost's proprietary techniques were applied to our manufacturing processes for making Calcium Hydroxide, resulting in the commercialization of an innovative material with unparalleled purity attributes. Jost Calcium Hydroxide has become an attractive alternative to commodity grade Calcium Hydroxide in a variety of chemical manufacturing environments, nutritional formulations and other applications where purity is a must.



BACKGROUND

The commodity forms of Calcium Hydroxide are often referred to as hydrated lime, a common mineral used in large tonnage across applications ranging from waste treatment to chemical manufacturing to human and animal nutrition. Hydrated lime typically contains many naturally occurring vagrant metal

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Calcium Hydroxide Impurity Profile Comparison

| Impurity | FCC | Jost limit | Jost typical | Commodity Calcium Hydroxide* |
|-----------------------------------|-------|------------|--------------|------------------------------|
| Magnesium and Alkali Salts | 4.80% | 4.80% | < 0.8% | 5.00% |
| Arsenic | 3 ppm | 1 ppm | < 0.2 ppm | 1.5 ppm |
| Lead | 2 ppm | 1 ppm | < 0.1 ppm | 0.33 ppm |
| Cadmium | - | 3 ppm | < 0.1 ppm | 0.1 ppm |
| Manganese | - | 10 ppm | < 1 ppm | 29 ppm |
| Aluminum | - | 2 ppm | < 1 ppm | 1500 ppm |
| Silicon | - | n / a | < 50 ppm | 4500 ppm |
| Magnesium | - | n / a | < 200 ppm | 6000 ppm |

**average from several commodity grade hydrate lime samples*

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impurities, including high levels of Magnesium, Aluminum, Silicon, and Manganese. Hydrated lime originates from mined starting materials that can vary in purity from one geological region to another as well as within the confines of a particular deposit. This variance can result in inconsistent levels of vagrant metals. Jost's proprietary manufacturing process both reduces the vagrant metal contaminants found in commodity Calcium Hydroxide and allows Jost to produce consistently pure material. As shown in the "Calcium Hydroxide Impurity Profile Comparison" table, Jost Calcium Hydroxide is orders of magnitude more pure in various metals than commodity grades.

While the USP and FCC have established limits for a number of the impurities cited above, many chemical manufacturing processes and nutritional formulations using Calcium Hydroxide demand an even lower vagrant metal content. Jost tests for a number of additional critical impurities beyond the USP/FCC monographs, as shown in the "Calcium Hydroxide Impurity Profile Comparison" table.



CONCLUSION

Jost Chemical's purified Calcium Hydroxide has quickly become a true "game changer" for engineers and formulators across the range of industries served by Jost. Please contact your Jost representative for additional information on Jost's ultrapure Calcium Hydroxide products for evaluation in your critical process.

Jost Chemical: "It's in the details..."

APPLICATION SUCCESS STORIES

➤ A chemical manufacturer has an application that requires Calcium Hydroxide as a calcium source in the synthesis of a pharmaceutical grade compound. The final product is color sensitive, and high levels of **Iron** and **Manganese** in commodity calcium hydroxides (hydrated lime) had been identified as contributing factors to unacceptable color. The customer determined that Jost's ultra-pure Calcium Hydroxide FCC, Jost Code 2242, contained dramatically low levels of Iron and Manganese, which allowed them to consistently produce an appropriately colored solid phase material upon drying.

➤ The presence of naturally occurring **Silicon** content in commodity calcium hydroxide has been shown to interfere with process chemistry in synthesis operations. While techniques are available to remove silicon impurities from finished products, they are time consuming and costly to implement. Utilization of Jost's ultrapure Calcium Hydroxide in the reaction sequence can prevent the need to remove silica impurities post-reaction, saving customers both time and money.

➤ A manufacturer of specialized protein concentrates used in infant formulas and clinical nutrition products is required to deliver a high purity Calcium complex in its protein products. **Aluminum**, **Manganese**, **Lead** and **Arsenic** levels are of critical concern to nutritionists formulating for these applications. Jost's ultra pure Calcium Hydroxide contains ultra low levels of these metal contaminants and is therefore called upon as the calcium source used in the production of the concentrated protein. In this way, Jost's exceptionally pure Calcium Hydroxide allows for the delivery of calcium into formulated medical foods for the infant and aging populations who are especially sensitive to heavy metal contaminants.