

## What is Magnesia? - Industrial Minerals Association - North America

Magnesia is a term used to describe various products from magnesium-rich sources. Magnesium makes up two percent of the earth's crust and is the eighth most plentiful element. It also is the third most abundant element found in sea water. The two most important magnesium minerals are magnesite ( $\text{MgCO}_3$ ) and brucite ( $\text{Mg}(\text{OH})_2$ ). Magnesite is the most common source of magnesia and serves many important industrial applications. Magnesia either is produced from magnesite ore or extracted from seawater or brines as magnesium hydroxide.

The term "magnesite" literally refers only to the naturally occurring mineral, however common usage has been to apply it to the end products as well.

The two most commercially important magnesia products are dead-burned magnesia and caustic-calcined magnesia.

Dead-burned magnesia, also known as refractory magnesia, is produced from the heating of magnesite or magnesium hydroxide and is the primary component in refractory materials. The refractory industry is the greatest consumer of magnesium compounds, overall. Refractory materials are nonmetallic substances which are extremely heat resistant and are of great industrial value as the linings in furnaces, kilns and reactors. The steel industry, for instance, is the largest user of refractory magnesia.

Caustic-calcined magnesia (or light-burned magnesia) retains its reactivity and is an essential component in a number of agricultural, environmental, construction and industrial applications.

In agricultural applications, magnesia promotes both plant and livestock health. In fact, magnesium is an essential mineral for both. In plants, magnesium is vital for photosynthesis. In animals, magnesium is required to prevent an often fatal disorder known as hypomagnesia, or grass tetany.

Magnesia plays a vital role in environmental protection. It is used to treat industrial wastewater by removing silica and precipitating heavy metals. It is used to reduce air pollution by stripping sulfur dioxide from industrial air emissions. Its absorbent properties are used to cleanup hazardous chemical spills. And it often is used to render metal-bearing wastes nonhazardous.

In construction, the caustic-calcined product is used to make magnesium oxychloride and oxysulfate cements. These cements are widely used in the flooring industry.

Other industrial applications include use by the oil drilling industry in drilling muds, and by the rubber industry as a vulcanizing agent.

Finally, magnesia is used in comforting consumer products such as milk of magnesia and Epsom salts.