

COMMON USES FOR MAGNESIUM OXIDE

SOURCE :

http://en.wikipedia.org/wiki/Magnesium_oxide#Applications

Metal	Uses
Magnesium oxide	<p>A <u>refractory material</u> is one that is physically and chemically stable at high temperatures. "By far the largest consumer of magnesia worldwide is the refractory industry, which consumed about 56% of the magnesia in the United States in 2004, the remaining 44% being used in agricultural, chemical, construction, environmental, and other industrial applications."</p> <p>Cement</p> <p>MgO is one of the raw materials for making <u>Portland cement</u> in <u>dry process plants</u>. If too much MgO is added, the cement may become expansive. ^[clarification needed] Production of MgO-based cement using <u>serpentinite</u> and waste <u>Carbon dioxide</u> (CO₂) (as opposed to conventional <u>CaO</u>-based cement using <u>fossil fuels</u>) may reduce <u>anthropogenic</u> emissions of CO₂.</p> <p>Desiccant</p> <p>MgO is a relatively poor <u>desiccant</u>, but because it neutralizes sulfur oxide acids created by oxidation of Kraft-processed papers, it is used by many libraries for preserving books.</p> <p>Medical</p> <p>In medicine, magnesium oxide is used for relief of heartburn and sore stomach, as an antacid, magnesium supplement, and as a short-term laxative. It is also used to improve symptoms of indigestion. Side effects of magnesium oxide may include nausea and cramping. In quantities sufficient to obtain a laxative effect, side effects of long-term use include enteroliths resulting in bowel obstruction.</p>

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Magnesium oxide	<p>Other</p> <ul style="list-style-type: none"> • MgO is used as an insulator in industrial cables, as a basic refractory material for crucibles and as a principal fireproofing ingredient in construction materials. As a construction material, magnesium oxide wallboards have several attractive characteristics: fire resistance, moisture resistance, mold and mildew resistance, and strength. • It is used as a reference white color in colorimetry, owing to its good diffusing and reflectivity properties. It may be smoked onto the surface of an opaque material to form an integrating sphere. • It is used extensively in heating as a component of tubular construction heating elements. There are several mesh sizes available and most commonly used ones are 40 and 80 mesh per the American Foundry Society. The extensive use is due to its high dielectric strength and average thermal conductivity. MgO is usually crushed and compacted with minimal air gaps or voids. The electrical heating industry also experimented with aluminium oxide, but it is not used anymore. • MgO doping has been shown to effectively inhibit grain growth in ceramics and improve their fracture toughness by transforming the mechanism of crack growth at nano scale.

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Magnesium oxide	<ul style="list-style-type: none"> • Pressed MgO is used as an optical material. It is transparent from 0.3 to 7 μm. The <u>refractive index</u> is 1.72 at 1 μm and the <u>Abbe number</u> is 53.58. It is sometimes known by the <u>Eastman Kodak</u> trademarked name Irtran-5, although this designation is obsolete. Crystalline pure MgO is available commercially and has a small use in infrared optics. • MgO is packed around <u>transuranic waste</u> at the <u>Waste Isolation Pilot Plant</u>, to control the solubility of radio nuclides. • An aerosolized solution of MgO is used in library science and collections management for the <u>de acidification</u> of at-risk paper items. In this process, the alkalinity of MgO (and similar compounds) neutralizes the relatively high acidity characteristic of low-quality paper, thus slowing the rate of deterioration. • MgO is also used as a protective coating in <u>plasma displays</u>. • Magnesium oxide is used as an oxide barrier in spin-tunneling devices. Owing to the crystalline structure of its thin films, which can be deposited by <u>magnetron sputtering</u>, for example, it shows characteristics superior to those of the commonly used amorphous Al_2O_3. In particular, <u>spin polarization</u> of about 85% has been achieved with MgO versus 40–60% with aluminium oxide. The value of <u>tunnel magneto resistance</u> is also significantly higher for MgO (600% at room temperature and 1100% at 4.2 K) than Al_2O_3 (ca. 70% at room temperature). MgO is thermally stable up to about 700 K, vs. 600 K for Al_2O_3.