

TECH

Gypsum is the least expensive yet most useful mineral on the planet that can be used to make high quality building materials.

Gypsum is a widely available and abundant natural mineral that is used by Castagra to produce industrial coatings and building materials. There are thousands of square miles of naturally occurring gypsum in the US and throughout the world, often right at the surface. For instance, the White Sands National Monument in New Mexico is a series of about 300 square miles of gypsum dunes, enough to keep the global construction industry supplied with drywall for hundreds of years. Millions of tons are also produced each year by the coal-fired power generation industry as a by product of the smokestack sulphur scrubbers.

Gypsum has some peculiar properties that enhance its usefulness for making commercial products. It is a dihydrate with the chemical formula $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ which means that every dry gypsum molecule has trapped within itself, two loosely attached molecules of water that can be driven off simply by heating it up beyond the boiling point of water. This makes it an excellent active, non-toxic fire retardant. Gypsum is also a soft mineral which means that it can be cut, machined and processed using normal tools and equipment without excessive wear. It is naturally white, making products composed of it easily colored to virtually any desired color. This is in contrast to starting with dark colored materials which cannot easily be made into lighter colors.

There is a widely held belief that products made from gypsum tend to be rigid or inflexible and also unable to withstand getting wet. This is true in the case of drywall and most other gypsum products which are made from the re-crystallization of dehydrated gypsum. About 75% of all gypsum used in the world is made into the drywall, which is, in fact, rigid and unable to withstand getting wet. However, Castagra has developed the



technological means to overcome this by bonding highly water resistant natural oils directly with the water molecules in the gypsum such that these components become “fixed” into a polymer matrix and unable to become wet or soggy. Castagra also has developed technology to make end products either rigid or flexible enough to be rolled up or curved into shape without cracking or crumbling, as desired.

Castagra has made great strides in developing proprietary technology that takes advantage of the unique properties of widely available gypsum, enabling the production of a wide range of useful products for industrial and commercial applications.

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