

# Crystal characterization of Almatris Tabular Alumina

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Almatris is a global leader in the development, manufacture, and supply of premium specialty alumina products. With nearly 1000 employees worldwide, the company's products are used in a wide range of industries, including steel production, cement production, non-ferrous metal production, plastics, paper, ceramics, carpet manufacturing, and electronics industries. Almatris serves customers globally out of nine production facilities located strategically around the world.



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## **Almatris Tabular Alumina**

Almatris tabular alumina is a pure sintered  $\alpha$ -alumina material that has been fully densified by rapid sintering without the use of sintering aids at temperatures in excess of 1800 °C. Tabular alumina has characteristic large, well developed hexagonal tablet shaped  $\alpha$ -alumina crystals of up to 200  $\mu\text{m}$  length. The excellent thermal volume stability and thermal shock characteristics of tabular alumina can be attributed to its specific microstructure: low open porosity and large crystals with closed spherical pores, which are entrapped upon re-crystallization during rapid sintering. Tabular alumina has extremely high refractoriness, high mechanical strength and abrasion resistance, very good chemical purity, excellent dielectric properties, and good resistance against corrosion.

Tabular alumina is the aggregate of choice in unshaped and shaped high performance refractories. It is used in a variety of industries such as steel, foundry, cement, petrochemical, ceramic, and waste incineration. Other common applications include its use in electrical insulators, kiln furniture, and as a catalyst support. Ground tabular is an excellent product to be used as filler in epoxy or resin systems where high dielectric strength, thermal conductivity, or abrasion is desired.

### Phenom™ Electron Microscope

Whereas crystal growth can be seen by the naked eye or a small magnifying glass most of the pores can only be seen using magnifications of 1000x – 3000x. Scanning electron microscope (SEM) pictures are ideal for investigating the amount and size of the pores. A SEM is also excellent for measuring the crystal sizes on samples which can be used as reference during production.

The Phenom™ high-resolution personal electron microscope is particularly suitable for making the SEM pictures for our applications. It is also used for the investigation of fine milled calcined and reactive alumina products which represent another important product line in the Almatiss' portfolio.

The Phenom is small in size and fits easily on an average desk so it won't take up much laboratory space. It is also very easy to use. It takes less than an hour for training the laboratory personnel in using the microscope so it can be used almost immediately after installation.



**SEM picture of tabular alumina – there are almost no open pores present. The crystal size and boundaries can easily be seen here.**