

ADDING VALUE THROUGH MINERALS

ALUMINO SILICATE

Alumino silicate products are highly siliceous volcanic glass, containing from 2 to 5 percent combined water. When rapidly heated to the proper temperature, the vaporisation of the water and the simultaneous softening of the glass, causes the alumino silicate to suddenly expand, or "pop" into lightweight cellular particles. The control of this expansion and milling technology results in engineered products suitable for specific functions. In rubber these can be used to reduce plate out effects and improve extrusion characteristics.

CALCIUM CARBONATE

Calcium carbonates are usually composed of the crystalline mineral, calcite, which occurs in the form of chalk, marble or limestone. Chalk is fine textured and varies in hardness and colour from deposit to deposit. Most often it originated as the shells of microscopic sea organisms. Marble deposits are limestones changed by crystallisation under conditions of extreme heat and pressure. In some cases, this natural process yields white marble of exceptional brightness and purity, such as the famous deposits at Carrara, Italy.

Fine ground calcium carbonate is used in a wide range of polymer applications as an extender, to improve rheological properties of the compounds. Some fine products are treated with a stearate coating to ease handling and improve dispersion.

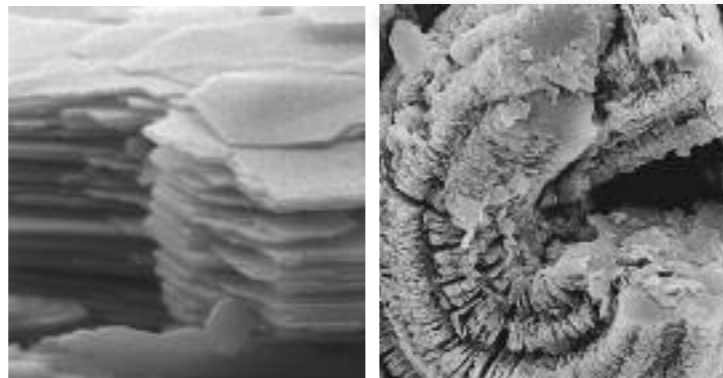
CALCINED KAOLIN

Calcined kaolin is an anhydrous aluminium silicate produced by heating natural china clay to high temperatures in a kiln. This calcination process gives an increase in hardness and alters the morphology of the kaolin particles. When calcination occurs at around 700°C, the dehydroxylation of the kaolin is complete forming a partially crystalline metakaolin. Fully calcined products with an amorphous structure are formed above 980°C.

Fully calcined kaolin can be treated with functionalised silane to give a particle surface capable of chemically coupling with the polymer. Filler dispersion is also improved. Due to the reduced surface activity, calcined kaolins give good reinforcement and permanent set properties, maintaining very good processability.

DIATOMACEOUS EARTH

World Minerals, a member of the Imerys Group, is the world's leading supplier of diatomite, with extensive worldwide reserves. Diatomite is available as natural, calcined or flux calcined products. The key to the wide use of diatomite as a



functional additive is its unique combination of physical properties, including: high porosity, thermal and chemical stability, unique particle structure/high surface area, low specific gravity, low interaction with other additives and whiteness.

The structure of this material allows it to offer a level of reinforcement and other functional properties such as improved compression set etc.

HYDROUS KAOLIN

Kaolin is a hydrated aluminium silicate crystalline mineral formed over many millions of years by the hydrothermal decomposition of granite rocks.

Kaolin is characterised by its fine particle size, platy or lamellar particle shape and chemical inertness. This combination of platy shape and fine particle size results in improved processability, improved reinforcement, tensile strength, abrasion and tear strength. Imerys kaolins can be a cost effective replacement for more expensive components.

SYNTHETIC SILICATES

World Minerals manufactures a line of synthetic silicates, produced by the hydrothermal reaction of diatomite, hydrated lime and water. Through careful and deliberate control of the processing conditions, the chemical and physical properties can be altered to meet some of the most exacting demands in industry.

Available in a wide range of grades and compositions, our synthetic silicate products provide exceptional performance and cost benefits as absorbent and inert carriers, conditioners, anti-caking agents etc.

Please consult our Technical Manager for further product information and advice.

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