FILLER-WOLLASTONITE SILANE COATED

Introduction

Wollastonite, a metasilicate of calcium ($CaSiO_3$), contains theoretically 48.3% CaO and 51.7% SiO_2 with hardness of 4.5 on Mohs' scale. It occurs as aggregates of bladed or needle-like crystals. Wollastonite is used by several industries as economical filler. The use of Wollastonite depends on the accicularity or the aspect ratio; i.e., ratio between length and width of a crystal. Wollastonite having aspect ratio in the range from 3:1 to 5:1 has little potential for reinforcing applications. A better compatibility between the polymer and the filler is achieved by and size reduction & chemical surface treatment of Wollastonite with Aminosilane coupling agents. By overcoming this majorhurdle, Wollastonite can be suitable for several intresting applications.

Applications

1. Wollastonite In Coatings- Treated Wollastonite is preferred for improved corrosion and blistering resistance in waterborne epoxy primers and anti-corrosive pigments. Treated Wollastonite is used in wide variety of corrosion resistant coatings which are exposed to extreme chemical conditions such as long-term salt spray and humidity and is effective in preventing blistering and flash rusting. Treated Wollastonite is often used as a part replacement for short glass fibers, particularly in unsaturated polyesters.
2. Treated Wollastonite Plastics And Polymers- Treated Wollastonite is typically used for automotive applications because of its low thermal expansion, zero-gap bumpers, painting ability, high flow, mold in color, high stiffness, reduced shrinkage, and improved resistance to UV and petrol. Treated Wollastonite due to its fibrous structure and its size distribution, is widely used in automobile applications where surface treatment plays a major role when looking at dispersing ability, scratch resistance, and mechanical properties.

Benefits

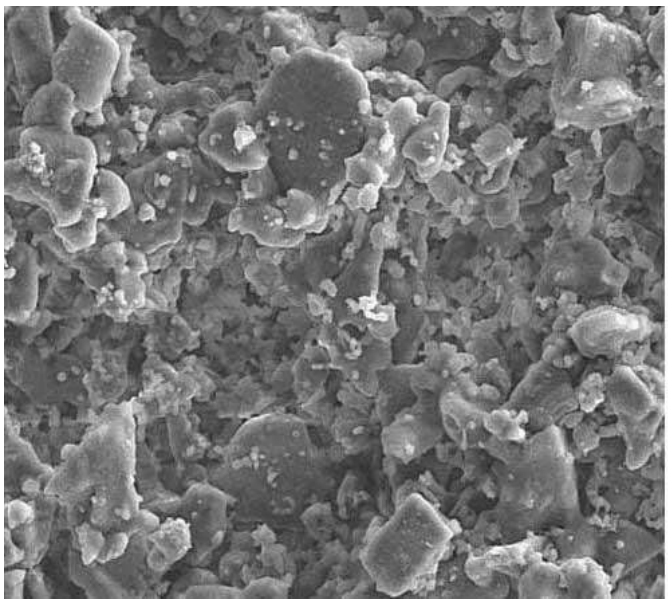
1. Treated Wollastonite shows, improvement in flexural modulus, tear strength, dielectric properties and retention of mechanical properties at elevated temperatures.
2. Treated Wollastonite also shows, high brightness and whiteness, low moisture and oil absorption, low volatile content, inert material with an alkaline pH, weather resistance and moisture absorption.

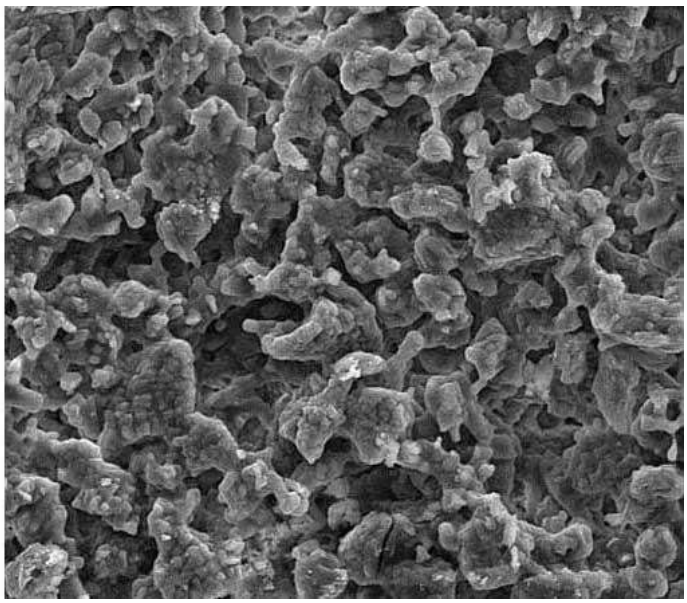
Comparison With Other Accicular Fillers Such As Talc And Mica

Product	Wollastonite	Talc	Dolomite	Mica
Molecular Formula	CaSiO3	Mg3Si4O10(OH)2	CaMg(CO3)2	Al2K2O6Si
Molecular Weight	116.16 g/ mol	379.259 g/mol	184.40 g/ mol	256.239 g/mol
Mohs Hardness	2.8-3.0	1	3.5-4.0	2.5-3.0
Aspect Ratio	20:1	20:1	3:1	50: 1
Melting Point (deg C)	1510-1550	900-1050	2570- 4660	1250-1300
pH (aqueous soln)	8.5-10.5	8.4-9.4	5.5-6.5	7.5-9.5
Refractive Index	1.60-1.65	1.53-1.60	1.65-1.68	1.56 - 1.60

Role Of Silane Coupling Agent-

Freshly milled Wollastonite particles attracts hydroxyl groups (from water), preventing the filler surface from fully coupling with the nonpolar polymer. However, surface treatment of the Wollastonite particles with a silane-based coupling agent improves dispersion and processing as well as impact resistance, surface gloss, dimensional stability, and scratch resistance properties. Silane coupling agents are also said to reduce dust in filler handling and increase filler flow and dispersion during processing





Specifications

Test	Specification	Test Method
Brightness	83.80	
Moisture Content	0.048	
Bulk Density Loose (gm/ ml)	0.56	
Bulk Density Tapped (gm/ ml)	0.95	

Particle Size D50	3.80 Micron	Particle Size Analyser
Calcium Oxide	45.10	
Sio2	49.20	
Fe2o3	0.40	
Al2o3	1.10	
Loss On Ignition	3.60	

Product FDA Status

It is not registered in food contact applications by US FDA.

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