

ATH

Aluminium Trihydrate

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Ground aluminium trihydrate

Aluminium trihydrate (ATH), also known as aluminium trihydroxide or alumina trihydrate, is derived from bauxite ore. This natural ore is refined to a fine white powder via the Bayer process. After washing and drying it is used as the feedstock for a wide range of alumina chemicals.



Applications

ATH is a very white halogen free flame retardant filler used in a number of applications utilising the different benefits the product provides.

Plastics and rubber

ATH is compatible with a wide range of polymer types including thermoplastics, thermosets and elastomers and is used in a diverse range of applications like glass reinforced plastic (GRP), rubber carpet backing and latex flexible foams. ATH enhances the fire resistance properties of the final polymer product.

Solid Surfacing

ATH's superior whiteness makes it a preferred choice for manufacturers of solid surfacing and synthetic marble. Solid surfacing filled with alumina hydrate machines easily which is particularly beneficial when producing seamless surfacing.

Surface coatings

In waterborne and solvent based paints ATH extends TiO_2 enabling a reduction of paint production costs and provides flame retardancy to the coating. The weathering resistance provided by ATH means it performs well in exterior coatings. ATH also controls gloss in coatings making it suitable for a variety of applications including powder and roof coatings.

Special properties

The raw material used for the ATH products is from a high purity source.

Flame retardant mechanism

ATH decomposes when exposed to heat yielding aluminium oxide and water by the following reaction:



The decomposition starts at 180°C and is endothermic with a heat change of ~1050J/g. A total loss of 34.7% of the original weight is observed. When incorporated into organic materials such as plastics, textiles and wood, ATH acts a flame retardant by taking heat away

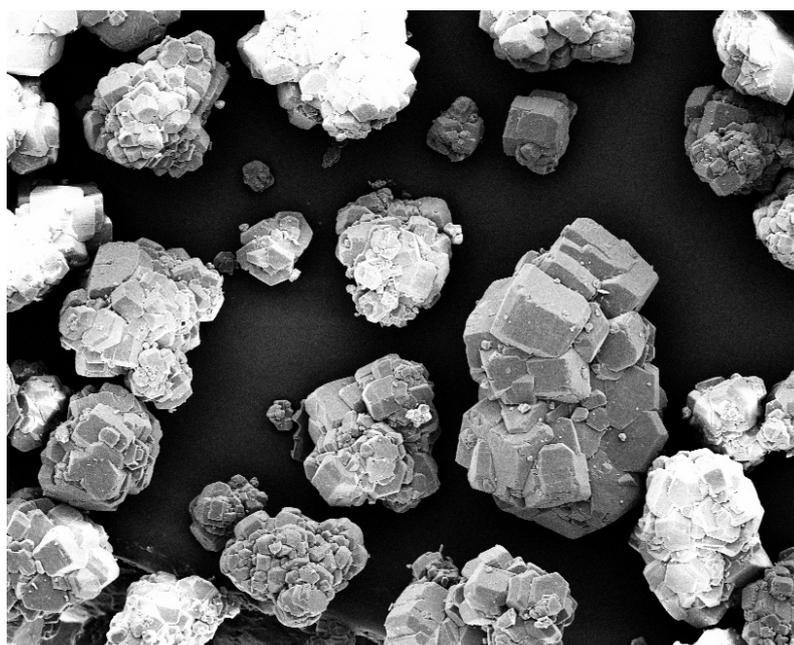
from the flame front. In addition the creation of water vapour near the surface of the polymer leads to oxygen depletion and reduces the burning rate of the gases. ATH also promotes the formation of a char which prevents heat being returned back to the polymer.

Smoke Suppression

Smoke is the main cause of death in fire situations; one of the main advantages of using ATH in flame retardant formulations is to reduce smoke output. A solid phase reaction occurs whereby the high surface area aluminium oxide formed from the decomposition of ATH, absorbs the combustion products responsible for the formation of soot particles.

Physical properties

Specific gravity	2.4
Moh's hardness	3
Loose bulk density	0.55 - 1.05 kg/litre
pH (20% w/v slurry)	9
Refractive index	1.6
% moisture at 105°C/1hr	0.1-0.4



ATH particles under the SEM microscope

Standard grades

The typical properties of the ATH grades within the product range are as follows:

	Median particle size	Screen residue		Specific surface area BET	Brightness minimum
	<i>D</i> (0.5) μm	retained on	(%)	(m^2/g)	L^*
M6B	6.5	32 μm	0.05	3.2	99.0
M8B	8	45 μm	0.01	2.4	99.0
M10B	9.5	45 μm	0.08	1.6	98
M15B	11.5	63 μm	0.6	1.1	98
M20B	13	90 μm	0.2	0.9	97.5
M25B	23	90 μm	0.8	0.8	97.5
B302*	25	45 μm	60	0.8	97.5

* low viscosity grade

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Value driven

We are proud and passionate about what we do – this is reflected in our values Committed, Innovative and Responsible.

Our promise

In line with our vision, we promise to deliver Mineral Solutions for Our World. 'Mineral Solutions' meaning we together with you identify or develop the right service and product for your application and operations.

For 'Our World' our focus will be on selected applications where we have developed extensive expertise and where we can use our mineral technology and processing skills to generate more customer value. 'Our World' also meaning that we accept responsibility for the environment and our surrounding societies and that we therefore operate with a clear sustainability focus.

