



ALUMINIUM TRIHYDROXIDE FOR

# FLAME RETARDANT FILLERS

2019



## **GENERAL PROPERTIES**



Aluminium trihydroxide (ATH) is a halogen free flame retardant filler. When heated above temperatures of approximately 200°C, an endothermic reaction will take place, liberating 3 molecules of crystal water and thereby removing energy from the combustion zone.

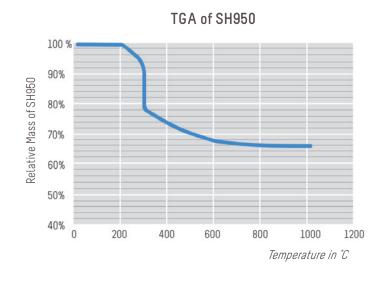
The loss of  $34.6\,\%$  of its weight as water vapour also dilutes combustible gases.

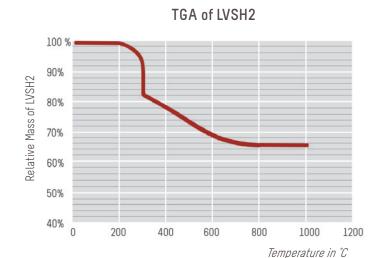
Furthermore, no toxic smoke or decomposition products are formed during this reaction, making ATH an ideal product to comply with regulations.

Alteo ATH grades have well defined particle size, top cut and oil absorption values. These and other relevant characteristics enable you to choose the grade best suited to your application, processing conditions and required filler loads.

| Name                  | Aluminium trihydroxide |
|-----------------------|------------------------|
| Chemical Formula      | Al(OH) <sub>3</sub>    |
| C.A.S.                | 21645-51-2             |
| Loss on Ignition      | 34.6 %                 |
| True Density          | 2.4g/cm <sup>3</sup>   |
| Hardness - Mohs scale | 2.5 - 3.5              |
| Refractive index      | 1.57                   |

## Thermogravimetric analysis (TGA) of Alteo ATH grades







# **FLAME RETARDANT**

# & fillers range

Alteo runs its Bayer plant in Gardanne - France. The plant produces a wide range of hydrates and calcined aluminas thereby securing the availability of controlled feedstock for all possible applications.

As the most widely used mineral in flame retardancy applications, Alteo offers a full range of unground, ground and viscosity improved aluminium trihydroxide fillers that allow high load levels in multiple resin and plastics systems.

#### Typical applications and grades used

|                     |                                     | Ungr  | ound  | Ground |       |       |      | Ground<br>Viscosity optimized grades |      |       | Blends<br>Low viscosity grades |       |         |        |        |
|---------------------|-------------------------------------|-------|-------|--------|-------|-------|------|--------------------------------------|------|-------|--------------------------------|-------|---------|--------|--------|
| Polymer System      | Application                         | SH950 | SH500 | SH300  | SH150 | SH100 | SH80 | SH60                                 | SH30 | LVSH1 | LVSH2                          | LVSH3 | FRAT33M | FRAT66 | FRAT44 |
|                     | SMC                                 |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
|                     | BMC                                 |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
| Polyester Resins    | Gel coat                            |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
|                     | Pultrusion                          |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
|                     | Synthetic marble                    |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
|                     | PVC rigid                           |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
| PVC                 | PVC - Plastisols                    |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
|                     | Flooring                            |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
| Epoxy Resin         | Electronic parts-Casting resins     |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
| <u> гроху пезні</u> | Laminates                           |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
|                     | Foam                                |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
| Poly Urethane       | Rigid                               |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
|                     | Casting resins                      |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
|                     | Pultrusion                          |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
| Acrylic Resins      | Injection moulding                  |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
|                     | Artificial marble                   |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
|                     | Belt conveyors                      |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
| Rubber and latex    | Elastomers                          |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
|                     | Carpet                              |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
| EVA, EVA/PE         | Cables                              |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
|                     | Paint                               |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
| Others              | External Thermal Insulation (ETICS) |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |
|                     | Adhesives-sealants                  |       |       |        |       |       |      |                                      |      |       |                                |       |         |        |        |



# **UNGROUND AND GROUND**

**ATH** 

These are our standard grades, used in a wide variety of applications and polymer systems.

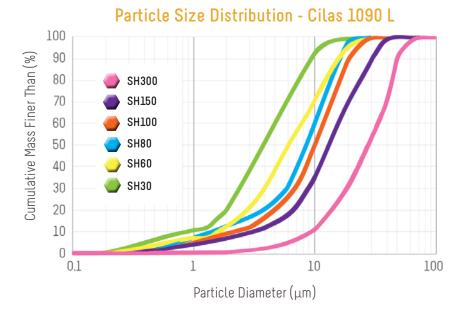
Standard grades have a low fines content and a very well defined topcut.

Available as unground and as ground grade from 25 to 4 microns.

|                                     |         | Ungrou | nd ATH |       |       | Groun |      |      |      |
|-------------------------------------|---------|--------|--------|-------|-------|-------|------|------|------|
|                                     |         | SH500  | SH950  | SH300 | SH150 | SH100 | SH80 | SH60 | SH30 |
| Physical properties                 | Unit    |        |        |       |       |       |      |      |      |
| Particle Size Distribution (Cilas)  |         |        |        |       |       |       |      |      |      |
| D50                                 | μm      | 55     | 95     | 25    | 14    | 11    | 8.5  | 6    | 4    |
| < 2 μm                              | %       |        |        | 3     | 3     | 4     | 9    | 15   | 17   |
| < 12 μm                             | %       |        |        |       |       |       |      |      | 92   |
| < 32 μm                             | %       |        |        |       |       | 98    | 100  | 99   |      |
| < 45 μm                             | %       |        |        |       | 99    |       |      |      |      |
| < 63 μm                             | %       |        |        | 95    |       |       |      |      |      |
|                                     |         |        |        |       |       |       |      |      |      |
| Oil Absorption (oleic acid)         | ml/100g | 22     | 20     | 22    | 25    | 27    | 31   | 29   | 30   |
|                                     |         |        |        |       |       |       |      |      |      |
| Specific Surface Area B.E.T         | m²/g    | 0.2    | 0.15   | 1     | 1.2   | 1.5   | 3.0  | 5    | 9.5  |
| Moisture Content                    | %       | 0.1    | 0.05   | 0.15  | 0.15  | 0.20  | 0.3  | 0.5  | 0.9  |
| Loss On Ignition (100-1000°C)       | %       | 34.6   | 34.6   | 34.6  | 34.6  | 34.6  | 34.6 | 34.6 | 34.6 |
| Chemical analysis                   |         |        |        |       |       |       |      |      |      |
| Al(OH) <sub>3</sub> - by difference | %       | 99.7   | 99.7   | 99.7  | 99.7  | 99.7  | 99.7 | 99.7 | 99.7 |
| Na <sub>2</sub> O total             | ppm     | 2300   | 1600   | 1600  | 2300  | 2300  | 2300 | 2300 | 2300 |
| CaO                                 | ppm     | 100    | 100    | 100   | 100   | 100   | 100  | 100  | 135  |
| SiO <sub>2</sub>                    | ppm     | 55     | 40     | 45    | 60    | 60    | 60   | 65   | 70   |
| Fe <sub>2</sub> O <sub>3</sub>      | ppm     | 65     | 70     | 70    | 65    | 65    | 65   | 80   | 95   |

Typical data







# VISCOSITY IMPROVED

## **GRADES**

Responding to market needs, especially in resin based systems, Alteo has developed 2 ranges of improved and low viscosity grade hydrates. This enables our customers to increase loading levels that are necessary to meet evermore demanding legal requirements.

#### Particle Size Distribution - Cilas 1090 L 100 90 LVSH1 Cumulative Mass Finer Than (%) 80 LVSH2 70 60 LVSH3 50 40 30 10 0 0.1 100 Particle Diameter (µm)

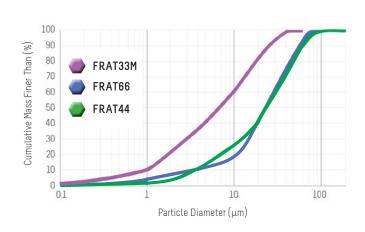
| LVSH2 |  |
|-------|--|

#### **Viscosity Optimized Grades** LVSH1 LVSH2 LVSH3 Physical properties Unit Particle Size Distribution (Cilas) 15 D50 11 8.5 7 $< 2 \mu m$ 98 94 < 32 $\mu m$ < 45 $\mu m$ 96 Oil Absorption (oleic acid) 25 22 20 m²/g Specific Surface Area B.E.T 2.2 Moisture Content 0.35 0.3 0.2 Loss On Ignition (100-1000°C) 34.6 34.6 34.6 Chemical analysis Al(OH)<sub>3</sub> - by difference 99.7 99.7 99.7 Na<sub>a</sub>O total 2300 2300 2300 CaO 100 100 100 SiO, ppm 70 70 70 Fe<sub>2</sub>O<sub>3</sub> 70 70 70

Typical data

#### FRAT33M

#### Particle Size Distribution - Cilas 1090 L



|         | Low Viscosity Grades                 |                |  |  |  |  |
|---------|--------------------------------------|----------------|--|--|--|--|
|         | FRAT33M                              | FRAT66         | FRAT44   |  |  |  |
| Unit    |                                      |                |  |  |  |  |
|         |                                      |                |  |  |  |  |
| μm      | 7.5                                  | 20             | 22   |  |  |  |
| %       | 99                                   |                |  |  |  |  |
| %       |                                      | 100            | 98   |  |  |  |
|         |                                      |                |  |  |  |  |
| ml/100g | 18                                   | 18             | 16   |  |  |  |
|         |                                      |                |  |  |  |  |
| m²/g    | 3.4                                  | 2.5            | 1.5  |  |  |  |
| %       | 0.3                                  | 0.2            | 0.2  |  |  |  |
| %       | 34.6                                 | 34.6           | 34.6   |  |  |  |
|         |                                      |                |  |  |  |  |
| %       | 99.7                                 | 99.7           | 99.7   |  |  |  |
| ppm     | 2300                                 | 2300           | 2300   |  |  |  |
| ppm     | 100                                  | 100            | 100  |  |  |  |
| ppm     | 70                                   | 70             | 70   |  |  |  |
| ppm     | 70                                   | 70             | 70   |  |  |  |
|         | μm %  ml/100g  m²/g % %  ppm ppm ppm | FRAT33M   Unit | FRAT33M   FRAT66   Unit   FRAT33M   FRAT66   FRAT66 |  |  |  |

Typical data

#### ALTEO R&D

For Alteo, innovation and application R&D are major parts of its growth strategy.

Alteo enhances its R&D capabilities through its application laboratory: the installation of state-of-the-art equipment, the recruitment of technical experts and collaborations with key partners and university laboratories.

Alteo constantly strives for the **best specialty** alumina-based solution to your ambitions.

Contact our R&D team now at www.alteo-alumina.com/contact



### **CUSTOMER CARE COMMITMENT**

To meet your highest expectations, our Customer Care team will always strive to ensure a **first class** service.

Our commitment is to provide **full support** from your first call to the delivery of our products; with technical assistance, packing solutions and short lead times.

### **ALTEO AT A GLANCE**

- A world leading fully-integrated supplier of specialty aluminas with a capacity of more than 600 000 tonnes of alumina based products (hydrates and calcined aluminas).
- Global sales network with 4 regional hubs, 17 offices and local warehouses around the world.
- Development centre in France.
- Leading raw material supplier to the following industrial markets: Ceramics, Refractories, Specialty Glass, Polishing, Flame retardants, Fillers and Coatings.

