THE R.J. MARSHALL COMPANY

Alumina Trihydrate (ATH)

Fire Retardant & Smoke Suppressant Additives

R.J. Marshall offers one of the most complete lines of Alumina Trihydrate available in the market today.

By combining our technical capabilities and our multiple processing locations, R.J. Marshall is able to consistently control particle size distributions while offering a wide range of Alumina Trihydrate products.

"We seek to make our customers successful"

"We seek to make our customers successful"

The R.J. Marshall Company was founded by Richard J. and Joan E. Marshall in May of 1978 seeking to make customers successful. Originally conceived as a manufacturer representative company, R.J. Marshall sold commodity grade industrial raw materials. Soon, they found a way to offer a solution to the inconsistent quality of materials drawn from individual mines: a better way to achieve the best possible properties from batch to batch. This kind of consistency and quality has been the hallmark of the R.J. Marshall reputation. Now, The R.J. Marshall Company operates 5 manufacturing plants in North America with a sales and distribution location in Belgium and sells processed flame retardant fillers worldwide.

Alumina Trihydrate (Bayer) ATH $Al_2O_3 \cdot 3H_2O$

General Characteristics

Chemical Formula	$Al_2O_3 \cdot 3H_2O$ or $Al(OH)_3$
Specific Gravity	2.42
Decomposition Temp.	428°F (220°C)
Refractive Index	1.57
Mohs' Hardness	2.5 - 3.5
Appearance	Crystalline Powder
Color	Off White / Tan

Typical Chemical Compositions

$Al_2O_3 \cdot 3H_2O$	99.5%
L.O.I (1000°C)	34.5%
SiO_2	0.010%
Fe_2O_3	0.006%
Na_2O (total)	0.30%
Free moisture	0.3% Max

The R.J. Marshall Company processes and ships Alumina Trihydrate from three processing locations in the United States.

Valley Springs, CA
(near Sacramento)
AH Series

Erie, MI (near Toledo, OH)
A-200 Series
Maxfil Series

Alpine, AL (near Birmingham)
A-200 Series
AH Series
Maxfil Series

- High white, chemical grade ATH also available.

What is Alumina Trihydrate?

Alumina Trihydrate ($Al_2O_3 \cdot 3H_2O$) is the most widely used flame retardant in the world due to its versatility and low cost. Available in different particle sizes, it can be used in a wide range of polymers at processing temperatures below 220°C. ATH is non-toxic, halogen-free, chemically inert, and has low abrasiveness. Additional benefits are arc and track resistance in plastics exposed to electrical arcing, acid resistance, and smoke suppression. At about 220°C, ATH begins to decompose endothermically releasing approximately 35% of its weight as water vapor.

$$Al_2O_3 \cdot 3H_2O + HEAT \text{ ------> } Al_2O_3 + 3\,H_2O$$

Alumina Trihydrate acts as heat sink thereby retarding pyrolysis and reducing the burning rate. The water vapor released has an added effect of diluting combustion gases and toxic fumes.

ATH Quick Reference Chart

Median Particle Size, Microns*	+325 Mesh (%)	Description	Applications
ATH			
A245 / AH170	80	90	Coarse Unground ATH	Synthetic Rubber, SMC, Glass
AH255	42	45	Coarse Ground ATH	Composites
AH270	24	30	Coarse Ground ATH	Latex, Foam, Neoprene
AH280	20	20	Ground ATH	Mass Transit, Carpet Backing
AH290	16	10	Ground ATH	Yarn, Mills, SMC
AH330	13	3	Ground ATH	Electronics, Glassware, Spray Up
AH430	9	1	Ground ATH	BMC, FRP, Pultrusion
A212	12	17	Ground ATH	SMC, BMC
A210	10	9	Ground ATH	SMC, BMC
A208	8	3	Ground ATH	BMC, Carpet Backing, Rubber
A206	6	1	Ground ATH	Pultrusion, BMC
A204	4	trace	Fine Ground ATH	Vinyl, SMC, PVC, Pultrusion
A202	2	trace	Fine Ground ATH	Adhesives, Sealants, Electrical, PVC
Maximized ATH (Maxfil)			
MX200	45	62	High Loading ATH	Highly Filled Resin System
MX100	10	14	High Loading ATH	Highly Filled Resin System
MX104	4.5	0.5	High Loading ATH	Highly Filled Resin System
ATH (H-TEC)			
HT1000	1.4	0.01	Fine ATH	Wire/Cable (Insulation/Sheathing), PVC/NBR Foam

* Sedigraph using micromeritics model 5120

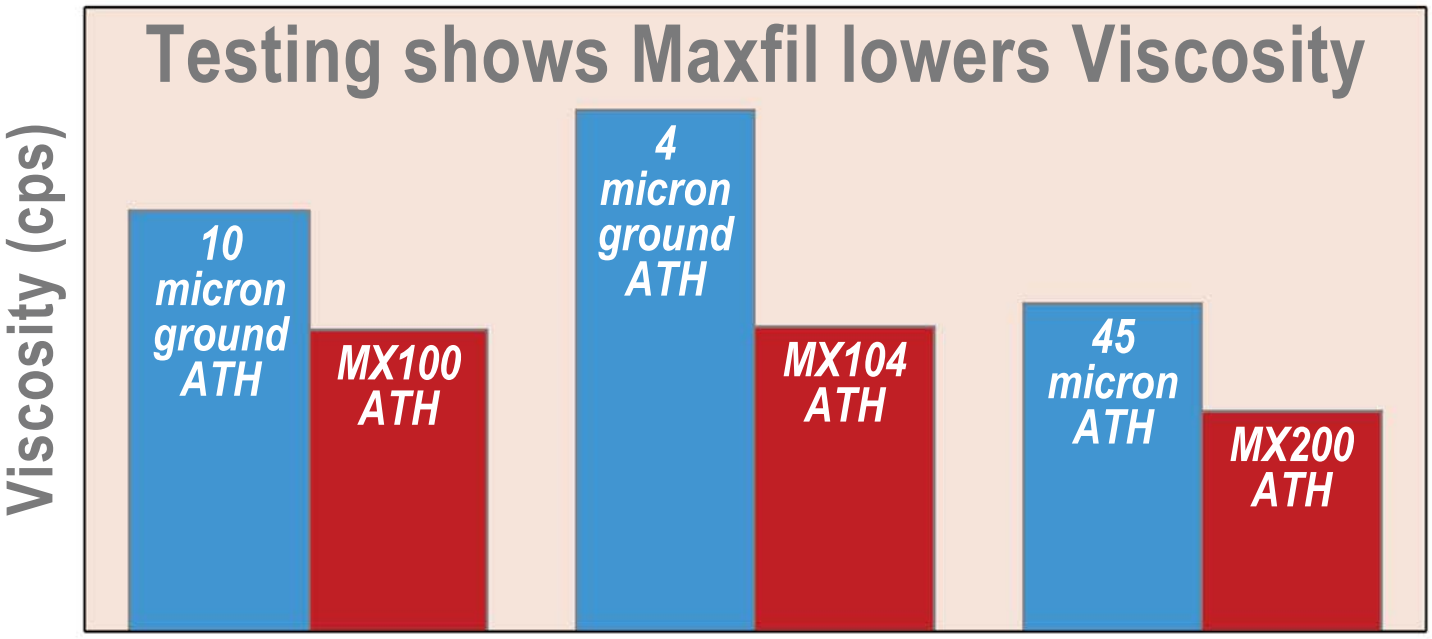
THIS WAY TO MAXFIL™

Maximized Alumina Trihydrate

MAXFIL™ is a series of engineered alumina trihydrate (ATH) flame retardant fillers created for maximum filler loadings, extremely low viscosities, increased flame retardance and decreased formulation costs.

Using Maxfil MX100, MX104 or MX200 can achieve better glass wet-out, help reduce shrinkage and warpage, while also increasing the ability to achieve UL 94-VO, UL94 5VA and ASTM E84 Class 1 flame & smoke ratings.

Typical Physical Properties	MX100	MX104	MX200
Packed Bulk Density (lb/ft^3)	69	46	78
Loose Bulk Density (lb/ft^3)	57	40	58.5
Oil Absorption (ml/100g)	35	37.5	32.5
Median Particle Size (um)	10	4.5	45
+100 mesh (%)	0	0	4
+200 mesh (%)	0.7	0	50
+325 mesh (%)	14	0.5	62



MX100

Testing shows MX100 results in a 28% decrease in viscosity over a 10 micron ground ATH.

Designed for use in highly filled resin systems requiring a 10 micron ATH. MX100 particle size distribution is tightly controlled to achieve high filler loadings and at the same time keep the working viscosities of the compound low.

MX104

Testing shows MX104 results in a 42% decrease in viscosity over a 4 micron ground ATH.

A 4.5 micron engineered ATH, MX104, allows for higher filler loadings and lower resin requirements than can be achieved with typical ATH grades. MX104 will lower production cost and increase flame retardance & smoke suppression.

MX200

Testing shows MX200 results in a 32% decrease in viscosity over a 45 micron ATH.

A coarser blend than MX100 & MX104 at 45 microns, MX200 is designed for the manufacturer who wants to minimize cost and maximize filler loadings. The particle size distribution is engineered to achieve very high filler loadings and very low viscosities.

THE R.J. MARSHALL COMPANY

800-338-7900 phone • 248-948-6460 fax • 888-514-8600 customer care
salesinfo@rjmarshall.com • www.Rjmarshall.com

All statements, technical information and recommendations are based on tests we believe to be reliable, the accuracy or completeness is not guaranteed, and the following is made in place of all warranties, expressed or implied. Our only obligation is to replace product proved to be defective. We shall not be liable for any injury, loss or damage, direct or indirect, from using or not being able to use the product. Before using, customer must determine the suitability of the product for the intended use and customer assumes the responsibility. These statements may not be changed except by an agreement signed by an officer of The R.J. Marshall Company.

August 2016