Mon-Droguiste.Com
39 Bis Rue Du Moulin Rouge
10150 Charmont Sous Barbuise
Tél : +33.(0)3.25.41.04.05
Email : contact@mon-droguiste.com
Web : www.mon-droguiste.com

Global Product Data

Calcined Aluminas for Polishing

Calcined Aluminas for Polishing

Product / Properties Unground	Unit	PG feinst typ.	P 815/816 typ.	A 13 LS typ.	A 13 –325 typ.
Calcination degree		very low	very low	low	low
Primary crystal size	µm	< 0.1	< 1	< 1	< 1
- Al_2O_3 content	%	0	> 70	> 70	> 70
Chemical Analysis					
Na_2O	%	0.5	0.3	0.1	0.1
Fe_2O_3	%	0.03	0.02	0.02	0.02
SiO_2	%	0.03	0.02	0.02	0.02
Particle Size					
> 150 µm / 100 mesh	%			4	
> 71 µm / 200 mesh	%			60	
> 45 µm / 325 mesh	%		0.8	85	6
> 20 µm / 635 mesh	%	< 3			
d10 Cilas / Compacite	µm	0.7	1.2		0.6
d50 Cilas / Compacite	µm	3.4	6	80	4.5
d90 Cilas / Compacite	µm	14	20		28
Specific surface area / BET	m^2/g	45 –80	4 –11	6.5 –15	8 –17
Loose bulk density	g/l	450 –600			650
Oil absorption	%	35 –50	53	52	30
Cutting effect		1	1	2	2
Polishing effect		10	10	7	9

All data are based on test methods, measured with Cilas 1064 and published as typical or rang limits.

produced in North America

produced in Europe

General information:

- Al_2O_3: min. 99%
- specific gravity: 3.98 g/cm^3

Calcined Aluminas for Polishing

Product / Properties Unground	Unit	P 10 typ.	P 6 typ.	P 02 typ.	P 2 typ.	P 2 FR typ.	P 30 typ.	P 2 S typ.	P 730 typ.	P 10 feinst typ.
Calcination degree		low	low	low	low	low	low	low	low	low
Primary crystal size	µm	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
- Al_2O_3 content %		> 70	> 70	> 70	> 70	> 70	> 70	> 70	> 70	> 70
Chemical Analysis										
Na_2O %		0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Fe_2O_3	%	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
SiO_2	%									
Particle Size										
> 200 µm / 65 mesh	%	< 0.1								
> 125 µm / 115 mesh	%		< 5							
> 90 µm / 170 mesh	%			< 1	< 0.5	< 0.5	< 0.1			
> 71 µm / 200 mesh	%							< 0.1		
> 63 µm / 250 mesh	%	25 –50	15 –40	1.0 –15	0.1 –5	< 1.5	0.1 –3	0.1 –3		
> 56 µm / 270 mesh	%								< 0.1	
> 40 µm / 400 mesh	%								< 3	< 0.1
> 20 µm / 635 mesh	%									< 3
d10 Cilas	µm	1.6	1.5	1	0.8	1.2	0.7	0.7	0.6	0.5
d50 Cilas	µm	38	33	16	11	24	8,3	9	3,7	3
d90 Cilas	µm	100	90	48	40	45	36	34	19	14
Specific surface area / BET	m^2/g	9 –17	9 –17	9 –17	9 –17	9 –17	9 –17	9 –17	9 –17	10 –17
Loose bulk density	g/l	700 –1000	700 –1000	640 –740	500 –800	650 –850	500 –800	500 –800	400 –600	350 –550
Oil absorption	%	38 –50	37 –47	36 –46	35 –45	40 –50	30 –40	35 –45	40	30 –40
Cutting effect		2	3	2	2	2	2	2	2	2
Polishing effect		7	8	8	9	9	9	9	9	10

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produced in North America

produced in Europe

General information:

- Al_2O_3: min. 99%
- specific gravity: 3.98 g/cm^3

Calcined Aluminas for Polishing

Product / Properties Unground	Unit	WRA typ.	P 66 M typ.	WRA FG typ.	PSG 100 typ.	PSG 125 typ.	PSG 150 typ.	PSG 300 typ.
Calcination degree		medium high	medium high	medium high	high	high	high	high
Primary crystal size	µm	2.5	2.5	2.5	3	3	3	3
- Al_2O_3 content %		99	99	99	99	99	99	99
Chemical Analysis								
Na_2O %		0.12	0.2	0.12	0.15	0.15	0.15	0.15
Fe_2O_3	%	0.02	0.02	0.02	0.03	0.03	0.03	0.03
SiO_2	%	0.01	0.02	0.02				
Particle Size								
> 200 µm / 65 mesh	%	< 5			< 1			
> 125 µm / 115 mesh	%		< 5			< 4	< 0.1	
> 63 µm / 250 mesh	%	50 –95	< 15		50 –95	30 –60	< 3	
> 45 µm / 325 mesh	%			< 3				
> 40 µm / 325 mesh	%							< 3
d10 Cilas / Compacite	µm		0.3	0.4		17	0.2	0.6
d50 Cilas / Compacite	µm	70	5	4	86	65	5	4.9
d90 Cilas / Compacite	µm		40	14		100	26	17
Specific surface area / BET	m^2/g	0.5 –0.7	0.6 –1.5	0.6 –1.1	0.4 –0.55	0.4 –0.55	0.4 –0.6	0.55 –0.75
Loose bulk density	g/l	700 –1100	600 –850	600 –900	800 –1050	800 –1050	700 –950	550 –900
Oil absorption	%	40 –60	14 –25	12 –25	41 –54	35 –50	12 –25	12 –22
Cutting effect		6	4	4	9	8	7	6
Polishing effect		3	4	5	3	3	3	4

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produced in North America

produced in Europe

General information:

- Al_2O_3: min. 99%
- specific gravity: 3.98 g/cm^3

Calcined Aluminas for Polishing

Product / Properties Unground	Unit	A 2 typ.	A 267 typ.	A 2 –325 typ.	A 2–325 CR typ.	A 35 –325 typ.
Calcination degree		high	high	high	high	very high
Primary crystal size	µm	3	3	2.5	2.5	2.5
- Al_2O_3 content %		99	99	99	99	99
Chemical Analysis						
Na_2O %		0.25	0.25	0.25	0.25	0.11
Fe_2O_3	%	0.02	0.02	0.02	0.02	0.02
SiO_2	%	0.02	0.02	0.021	0.03	0.02
Particle Size						
> 150 µm / 100 mesh	%	3				
> 71 µm / 200 mesh	%	58				
> 45 µm / 325 mesh	%	83	20 –40	< 5	< 1	< 5
d10 Cilas	µm	40	4	0.6	0.4	0.9
d50 Cilas	µm	73	20	6	5	5.6
d90 Cilas	µm	90	42	14	12	17
Specific surface area / BET	m^2/g	< 0.8	0.5 –1.5	< 1.1	< 1.1	< 1.1
Loose bulk density	g/l	825	875	925	950	925
Oil absorption	%	50	50	20	15	20
Cutting effect		9	8	7	6	7
Polishing effect		3	3	3	4	3

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produced in North America

produced in Europe

General information:

- Al_2O_3: min. 99%
- specific gravity: 3.98 g/cm^3

Calcined Aluminas for Polishing

Product / Properties Unground	Unit	CT 19 typ.	PBC typ.	PB typ.	P 20 typ.	P 25 typ.	Gilox 63 typ.	Gilox 125 typ.	A 10 5 µm typ.	A 10 –325 typ.
Calcination degree		very high	very high	very high	very high	very high	very high	very high	very high	very high
Primary crystal size	µm	4.5	4.5	4.5		22	15	12	5	5
- Al_2O_3 content %		99	99	99	99	99	99	99	99	99
Chemical Analysis										
Na_2O %		0.06	0.1	0.1	0.35	0.35	0.35	0.35	0.08	0.08
Fe_2O_3	%	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02
SiO_2	%	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04
Particle Size										
> 150 µm / 100 mesh	%	<10	< 5	< 3					1	
> 125 µm / 115 mesh	%							< 1		
> 71 µm / 200 mesh	%								57	
> 63 µm / 250 mesh	%	50 –95	40 –90	40 –90	50 –80	55 –90	0.1 –3	5 –12		
> 45 µm / 325 mesh	%								87	< 5
d10 Cilas	µm				4*	5*	2.5		50	1.2
d50 Cilas	µm	65	68	65	18*	25*	17	21.5	82	8.3
d90 Cilas	µm				55*	70*	45		130	20
Specific surface area / BET	m^2/g	0.2 –0.45	0.3 –0.45	0.3 –0.45	0.15	0.15	0.2		0.2 –0.6	0.4 –0.9
Loose bulk density	g/l	750 –1050	800 –1100	750 –1050	600 –1100	600 –1100			950	800
Oil absorption	%	40 –50	40 –46	37 –44	20 –60	25 –65	10 –25	15 –30	35	15
Cutting effect		8	8	8	9	9	8	8	8	7
Polishing effect		2	3	3	1	1	1	1	2	3

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produced in North America

produced in Europe

General information:

- Al_2O_3: min. 99%
- specific gravity: 3.98 g/cm^3

* desagglomerated

Calcined Aluminas for Polishing

What are polishing aluminas?

Our polishing aluminas are grades of a specially produced oxide. As inorganic products, they have one important advantage over natural materials used for polishing: their physical properties and chemical compositions are constant regardless of the pressure or temperature experienced during use. Aluminum oxide is the most widely used polishing medium. In general, polishing compounds contain approximately 50% alumina. The aluminum oxide is in the form of an agglomerate that consists of numerous primary crystals. The size of these crystals depends on the degree of calcination: as a general rule, the higher the calcination temperature, the larger the primary crystals. Certain grades with larger crystals can be used for grinding and lapping while some with small primary crystals simply equalize and smooth the surface being treated, without removing significant amounts of material. The primary crystals of polishing aluminas are extremely hard. On the Mohs scale the aluminas rate one degree below diamond.

What are the properties of polishing aluminas?

Polishing aluminas are used in many different applications and industrial processes. They give excellent results in lapping and grinding situations. They are successfully used in various lapping processes as precision lapping, final lapping, surface abrasion (hydro abrasion) and polishing (buffing, hydro lapping, barrel polishing resp. tumbling). They can also be used successfully in grinding processes where a certain amount of cutting always takes place leaving a rough surface. Typical applications are in honing, super finishing, fettling and polishing (using polishing wheels). The main benefits of polishing aluminas are:

- Crushing properties of the agglomerates and primary crystals
- Hardness of the primary crystals
- Shape of the grains in the damaged and the undamaged crystals
- Wide range of working temperature, high melting point and excellent resistance to thermal shock
- Workability and oil absorption
- Homogeneity of the powder low in impurities, hard particles

The balance of cutting and polishing effects, together with the oil absorption rate, indicates where each grade of polishing alumina can be used most effectively. The cutting effect is indicated on a scale of 1 to 10, where 1 represents a low cut and 10 represents a very high degree of abrasion. The polishing effect is classified in the same way, with the scale number 1 indicating a highly reflective surface finish and scale number 10 indicating a lustrous finish achieved by fine, soft aluminas.

How are they applied?

Polishing aluminas are used alone or as an ingredient of a polishing compound. These compounds are effectively a mixture of a polishing medium with a binder, usually oil or wax.The ratio of binder to a polishing medium varies according to the intended application but is usually in the region of 50% polishing medium, 50% binder.The most common forms in which Almatis polishing aluminas are applied are:

- As is, without any additives
- As a suspension in water or oil
- Mixed with water or oil emulsions
- Mixed with a creamy paste
- Mixed with a solid paste to form a polishing bar

They can be applied manually or in automatic polishing processes, such as airless processes or barrel finishing. Other applications are household cleaners, car cleaners, stone polishes, brake linings and vibro-finishing.