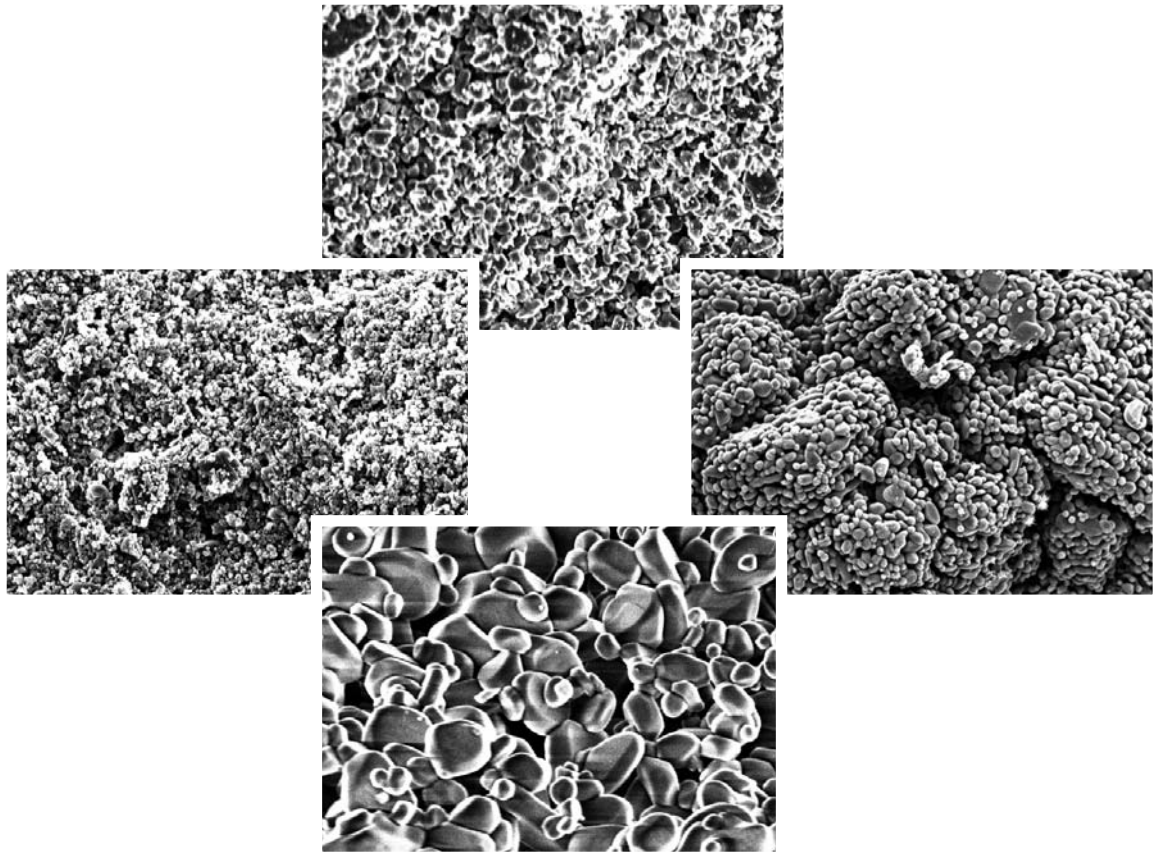




European Regional Product Data

Reactive and Calcined Aluminas for the Ceramic Industry

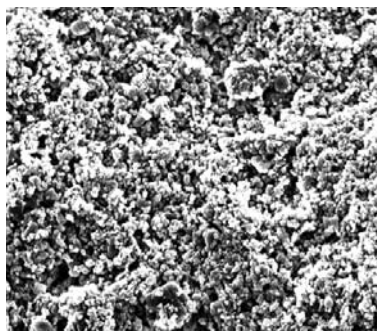




Thermally Reactive Aluminas for Ceramics

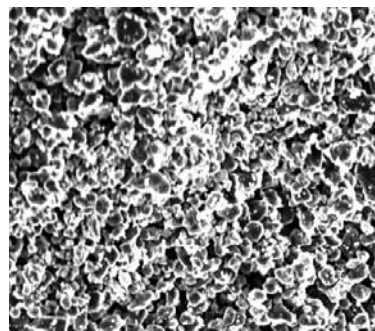
unground					CT 1200					
Properties / method	Unit				typical	Min	Max			
Specific Surface Area / BET	[m ² /g]				1.2	1.0	1.4			
Particle Size / sieve > 63 μm	[%]				75.0	50.0	95.0			
Chemical Analysis										
Al ₂ O ₃ by difference	[%]				99.85					
Na ₂ O	[%]				0.06		0.08			
Fe ₂ O ₃	[%]				0.02		0.03			
SiO ₂	[%]				0.01		0.03			
CaO	[%]				0.01		0.03			
superground		CT 3000 SG			CT 1200 SG			CT 530 SG		
Properties / method	Unit	typical	Min	Max	typical	Min	Max	typical	Min	Max
Specific Surface Area / BET	[m ² /g]	7.5	6.5	8.5	3.1	2.8	4.0	4.9	4.0	5.5
Particle Size / D50 Cilas	[μm]	0.5	0.3	0.6	1.3	1.0	1.5	1.5	1.1	1.8
Particle Size / D90 Cilas	[μm]	2.0		3.0	3.2		3.6	4.6	3.8	5.4
Chemical Analysis										
Na ₂ O	[%]	0.08		0.10	0.06		0.08	0.09		0.10
Fe ₂ O ₃	[%]	0.02		0.03	0.02		0.03	0.02		0.03
SiO ₂	[%]	0.03		0.07	0.05		0.08	0.03		0.07
CaO	[%]	0.02		0.03	0.04		0.05	0.03		0.05
MgO	[%]	0.07	0.05	0.10	0.07	0.05	0.10	0.04	0.02	0.06
Ceramic Properties										
Press Density / 90 MPa	[g/cm ³]	2.25			2.38			2.60		
Fired Density	[g/cm ³]	3.90	3.88		3.92	3.86		3.90	3.86	
Firing Temperature/1h soak time	[°C]		at 1540				at 1670			
Shrinkage	[%]	16.8			15.6			13.0		

The typical product properties are based upon the actual averages from production data.
The min-max data show our standard product specification data for these products.



2μm

CT 3000 SG



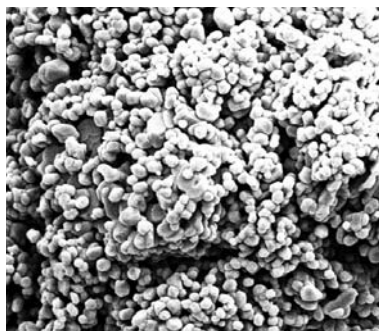
2μm

CT 1200 SG

Calcined Aluminas for Ceramics

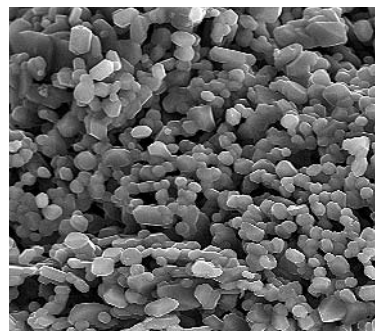
unground		CT 700			CT 800			WRA		
Properties	Unit	typical	Min	Max	typical	Min	Max	typical	Min	Max
Specific Surface Area / BET	[m ² /g]	0.65	0.6	0.8	0.70	0.65	0.85	0.60	0.50	0.70
Particle Size / sieve > 63 µm	[%]	70.0	40.0	80.0	70.0	50.0	95.0	70.0	50.0	95.0
Primary Crystal Size / D50 Cilas Compacité	[µm]	2.0	1.5	2.2	1.9	1.5	2.1	2.3		
Press Density / Compacité	[g/cm ³]	2.30	2.25	2.35	2.30	2.24	2.34			
Chemical Analysis										
Al ₂ O ₃ by difference	[%]	99.7			99.7			99.7		
Na ₂ O	[%]	0.12		0.15	0.12		0.15	0.12		0.15
Fe ₂ O ₃	[%]	0.02		0.03	0.02		0.04	0.02		0.04
SiO ₂	[%]	0.01		0.03	0.01		0.03	0.01		0.03
CaO	[%]	0.03		0.045	0.02		0.06	0.03		0.06
fineground					CT 800 FG			WRA FG		
Properties	Unit				typical	Min	Max	typical	Min	Max
Specific Surface Area / BET	[m ² /g]				0.90	0.70	1.20	0.85	0.60	1.10
Particle Size / D50 Cilas	[µm]				3.5	2.5	5.0	4.0	2.4	5.4
Particle Size / wet sieve > 45 µm	[%]				0.1		3.0	0.5		3.0
SiO ₂	[%]				0.02		0.04	0.02		0.04
superground					CT 800 SG					
Properties	Unit				typical	Min	Max			
Specific Surface Area / BET	[m ² /g]				1.00	0.80	1.50			
Particle Size / D50 Cilas	[µm]				3.4	2.5	4.0			
Particle Size / Cilas > 20 µm	[%]				0.1		1.0			
SiO ₂	[%]				0.02		0.04			

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2µm

CT 800



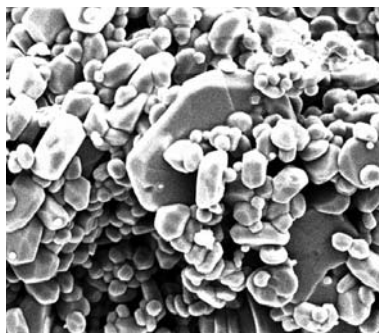
2µm

WRA

Calcined Aluminas for Ceramics

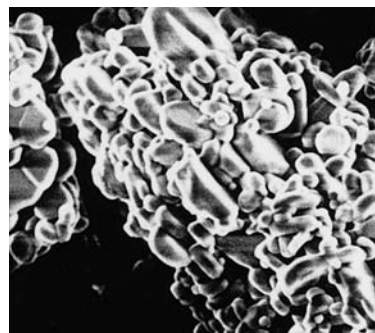
unground		HVA			CT 19		
Properties	Unit	typical	Min	Max	typical	Min	Max
Specific Surface Area / BET	[m ² /g]	0.50	0.40	0.55	0.40	0.20	0.45
Particle Size / sieve > 63 µm	[%]	70.0	50.0	95.0	70.0	50.0	95.0
Primary Crystal Size / D50 Cilas Compacité	[µm]	2.7	2.1	3.0	4.0		
Chemical Analysis							
Al ₂ O ₃ by difference	[%]	99.7		99.8			
Na ₂ O	[%]	0.10		0.15	0.08		0.10
Fe ₂ O ₃	[%]	0.02		0.03	0.02		0.04
SiO ₂	[%]	0.01		0.02	0.01		0.05
CaO	[%]	0.03		0.05	0.03		0.05
fineground		HVA FG			CT 19 FG		
Properties	Unit	typical	Min	Max	typical	Min	Max
Specific Surface Area / BET	[m ² /g]	0.70	0.55	0.85	0.60	0.40	0.80
Particle Size / D50 Cilas	[µm]	4.8	4.0	5.5	5.5	4.0	7.5
Particle Size / wet sieve > 45 µm	[%]	0.6		3.0	1.0		3.0
SiO ₂	[%]	0.02		0.03	0.02		0.05

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2µm

HVA



2µm

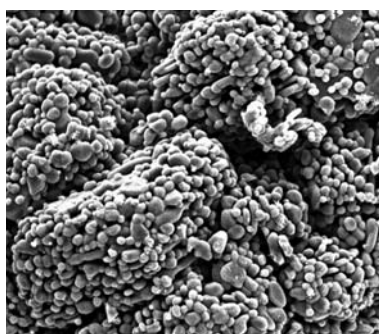
CT 19



Low Soda Aluminas for Ceramics

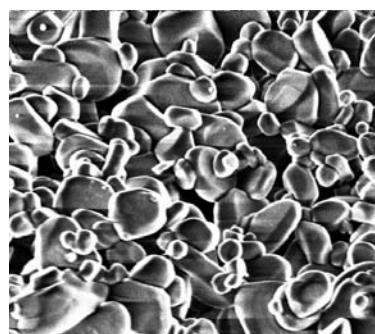
unground		CL 2500			CL 3000			CL 4400			CL 5000		
Properties	Unit	typical	Min	Max	typical	Min	Max	typical	Min	Max	typical	Min	Max
Specific Surface Area/BET	[m ² /g]	0.95	0.85	1.00	0.60	0.55	0.70	0.35	0.25	0.40	0.30	0.20	0.35
Particle Size/sieve > 63 μm	[%]	80.0	50.0	95.0	80.0	50.0	95.0	80.0	50.0	95.0	70.0	50.0	95.0
Primary Crystal Size / D50 Cilas Compacité	[μm]	1.7	1.3	2.2	2.2	1.8	2.6	4.1	2.6	4.6	4.3	2.9	5.1
Press Density/Compacité	[g/cm ³]	2.22	2.18	2.24	2.28	2.27	2.31	2.36	2.32	2.42	2.38	2.35	2.42
Chemical Analysis													
Al ₂ O ₃ by difference	[%]	99.8			99.8			99.8			99.8		
Na ₂ O	[%]	0.06		0.08	0.05		0.08	0.06		0.10	0.06		0.10
Fe ₂ O ₃	[%]	0.02		0.03	0.02		0.03	0.02		0.03	0.02		0.03
SiO ₂	[%]	0.01		0.03	0.01		0.03	0.02		0.05	0.02		0.05
CaO	[%]	0.01		0.03	0.01		0.03	0.03		0.05	0.01		0.03
B ₂ O ₃	[%]	0.01		0.02	0.01		0.03	0.03		0.07	0.01		0.04
fineground					CL 3000 FG			CL 4400 FG					
Properties	Unit				typical	Min	Max	typical	Min	Max			
Specific Surface Area/BET	[m ² /g]				0.90	0.75	1.20	0.60	0.40	0.65			
Particle Size/D50 Cilas	[μm]				4.2	3.6	4.8	5.2	3.8	7.7			
Particle Size/wet sieve>45μm	[%]				0.5		3.0	1.8		3.0			
SiO ₂	[%]				0.01		0.03	0.02		0.05			
superground		CL 2500 SG			CL 3000 SG								
Properties	Unit	typical	Min	Max	typical	Min	Max						
Specific Surface Area/BET	[m ² /g]	1.2	0.9	1.6	1.00	0.80	1.15						
Particle Size / D50 Cilas	[μm]	3.5	3.3	3.8	4.0	3.2	4.6						
Particle Size/wet sieve >20 μm	[%]	2.0	0	3.0	0.1		3.0						
SiO ₂	[%]	0.02	0	0.04	0.02		0.04						

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2μm



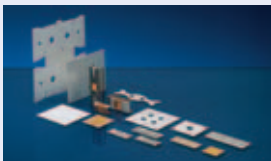

CL 2500



2μm

CL 5000



Field of Application	Ceramic Properties	Alumina Grades and Key Properties
Advanced and Wear Resistant Ceramics		
parts with > 99% Al ₂ O ₃		CT 3000 SG, CT 1200 SG
parts with 85 – 99% Al ₂ O ₃		CT 800, WRA, CL 2500
	<ul style="list-style-type: none"> • Uniform, dense ceramic matrix • Defined surface properties • Excellent wear and abrasion resistance 	<ul style="list-style-type: none"> • Fine controlled particle size distribution • High thermal reactivity • Good grindability • High chemical purity 99.8 – 99.9% Al₂O₃
Electrical Insulators		
90 – 98% Al ₂ O ₃ Spark Plugs		CL 3000, CL 5000, CT 700
High Tension Insulators		HVA FG, CT 19 FG
	<ul style="list-style-type: none"> • High dielectric strength • High mechanical strength • High thermal conductivity 	<ul style="list-style-type: none"> • Consistent shrinkage • Very low Na₂O • Good machining properties • Alpha-alumina
Electronic Components / Substrates		
99.5% Al ₂ O ₃ Ceramics		CT 3000 SG, CT 1200 SG
70 – 99% Al ₂ O ₃ Ceramics		CL 2500, CL 3000, CL 5000
	<ul style="list-style-type: none"> • High electrical resistance • Uniform dense ceramic matrix • High mechanical strength 	<ul style="list-style-type: none"> • Very low Na₂O < 0.06% • Consistent shrinkage • High thermal reactivity
Porous Ceramic & Catalyst Carriers		
High Alumina Ceramics		CL 3000 FG
Aluminosilicate Ceramics		HVA FG, CT 19 FG
	<ul style="list-style-type: none"> • Defined pore structure • Good mechanical and impact strength 	<ul style="list-style-type: none"> • Defined particle size distribution • Good ceramic reactivity • Consistent shrinkage



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