



SUMITOMO CHEMICAL

Creative Hybrid Chemistry
For a Better Tomorrow

Product Databook

- Aluminum Hydroxide*
- Aluminum Oxide - Alumina*
- High Purity Alumina - HPA*
- Activated Alumina / Hydraulic Alumina*



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<Important Notice for Users of this Databook>

- (1) All data in this data book is typical and not guaranteed. The typical properties of all the listed products in this databook are subject to change without prior notice due to continual improvements.
- (2) Applications mentioned in this databook are examples without any guarantee. Fitness for any particular purpose should be verified by customers.
- (3) Please refrain from using products in this databook for medical and food applications.

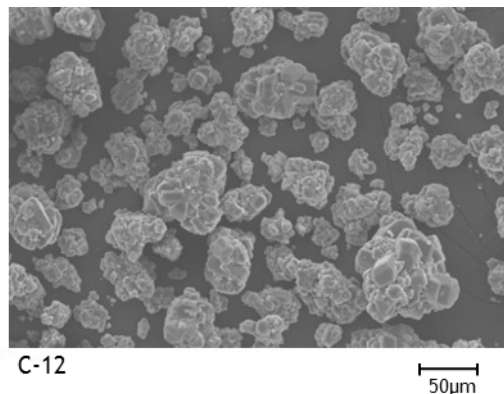
1. Aluminum Hydroxide

Sumitomo Aluminum Hydroxides product portfolio is quite wide to serve diverse industries. Our precipitation process in Bayer Process enables us to fine-tune particle sizes and impurity levels to serve various industries.

Generic Grade

Typical Properties		Product	C-12
Chemical Composition	H2O	[%]	9
	Al(OH)3*	[%]	99.8
	Fe2O3*	[%]	0.01
	SiO2*	[%]	0.01
	Na2O*	[%]	0.18
Loose Bulk Density		[g/cm3]	1.1
Packed Bulk Density		[g/cm3]	1.4
True Specific Gravity			2.42
D50(MT-3300, Laser Diffraction)		[µm]	50
+75µm		[%]	5
Packing	Bulk		Truck, Vessel
	Big Bag		1,000kg
	Paper Bag		25kg

C-12 : Extremely low impurity concentration and small particle size. Excellent reactivity.



C-12

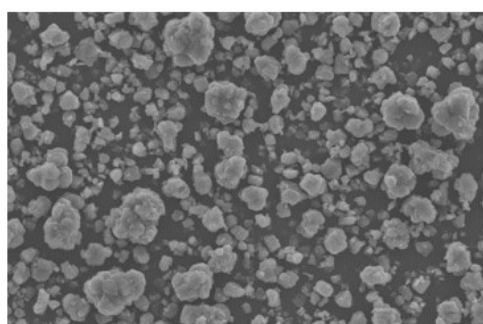
50µm

*Analysis after dried.
Calculated as oxide after analyzing Fe, Si, Na contents.
 $Al(OH)_3 = 100 - (Fe_2O_3 + SiO_2 + Na_2O)$

Fine, Very Fine, Low-Soda

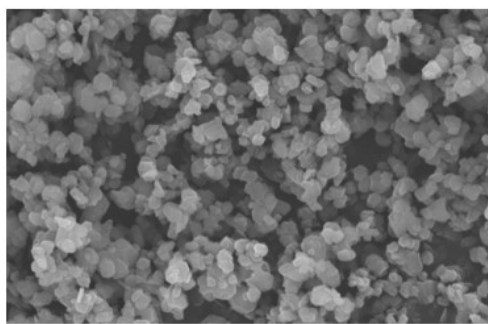
Typical Properties		Product	Fine		Very Fine	Low Soda		
			C-310	C-305	C-301N	CL-310	CL-303	C-302A
Chemical Composition	H2O	[%]	0.05	0.07	0.2	0.04	0.07	0.12
	Al(OH)3*	[%]	99.8	99.8	99.8	99.9	99.9	99.8
	Fe2O3*	[%]	0.01	0.01	0.01	0.01	0.01	0.01
	SiO2*	[%]	0.01	0.01	0.01	0.01	0.01	0.01
	Na2O*	[%]	0.12	0.12	0.2	0.07	0.04	0.11
D50(MT-3300, Laser Diffraction)		[µm]	10	5.5	1.5	12	4	2.4
+45µm		[%]	<0.1	<0.1	<0.1	0.3	<0.1	<0.1
Loose Bulk Density		[g/cm3]	0.7	0.5	0.3	0.7	0.6	0.4
Packed Bulk Density		[g/cm3]	1.3	1.2	0.6	1.3	1.2	0.9
DOA Oil Absorption		[ml/100g]	35	31	54	34	39	39
Whiteness		[%]	-	95	96	92	-	96
BET Specific Surface Area		[m2/g]	1.0	1.5	4	1.1	1.5	2.5
Electric Conductivity**		[µS/cm]	-	-	-	18	20	100
True Specific Gravity			2.42					
Refractive Index			1.57					
Hardness		[Mohs]	3					
Packing	Big Bag		500kg, 1,000kg					
	Paper Bag		25kg					

*Analysis after dried.
Calculated as oxide after analyzing Fe, Si, Na contents.
 $Al(OH)_3 = 100 - (Fe_2O_3 + SiO_2 + Na_2O)$



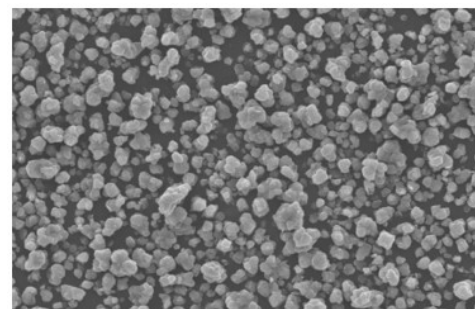
C-305

20µm



C-301N

4µm



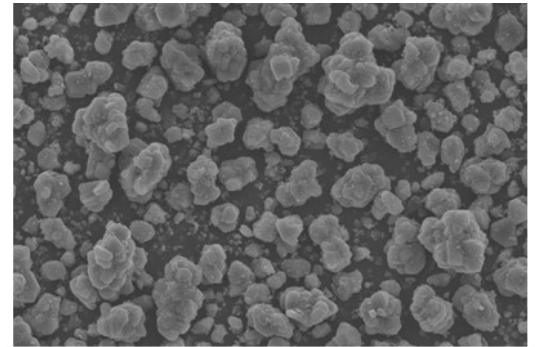
CL-303

20µm

High Whiteness

Typical Properties		Product	CW-375HT	CW-350	CW-308
Chemical Composition	H2O	[%]	0.03	0.03	0.06
	Al(OH)3*	[%]	99.9	99.9	99.8
	Fe2O3*	[%]	0.01	0.01	0.01
	SiO2*	[%]	0.01	0.01	0.01
	Na2O*	[%]	0.07	0.06	0.17
D50(MT-3300, Laser Diffraction)	[µm]	70	43	10	
+45µm	[%]	-	-	<0.1	
Loose Bulk Density	[g/cm3]	1	1.0	0.6	
Packed Bulk Density	[g/cm3]	1.4	1.4	1.3	
DOA Oil Absorption	[ml/100g]	30	29	34	
True Specific Gravity			2.42		
Refractive Index			1.57		
Hardness	[Mohs]		3		
Packing	Big Bag		500kg, 1,000kg		
	Paper Bag		-		25kg

*Analysis after dried.
 Calculated as oxide after analyzing Fe, Si, Na contents.
 $Al(OH)_3 = 100 - (Fe_2O_3 + SiO_2 + Na_2O)$



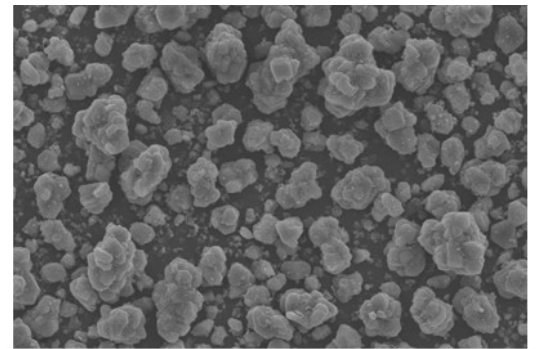
CW-308

20µm

Impart tone and transparency to artificial marbles / plastics when added as a filler.

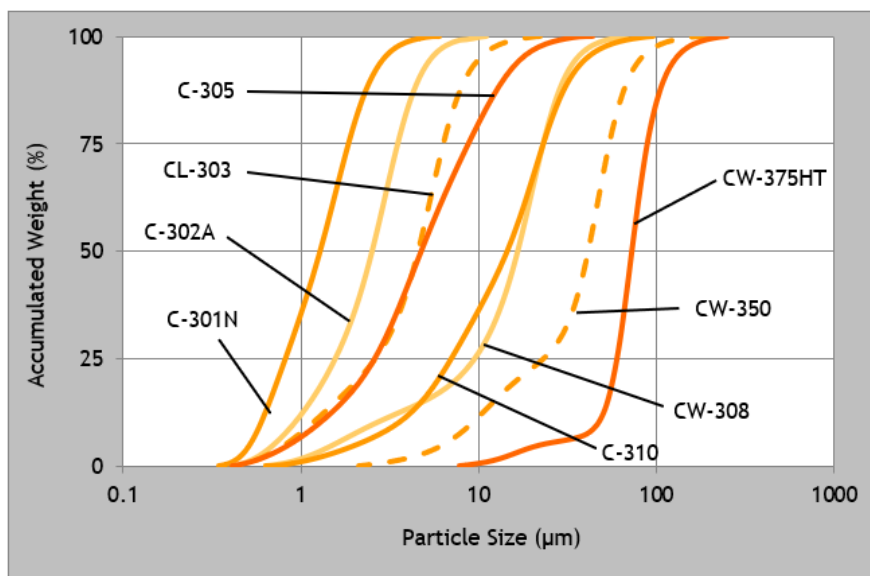
High Whiteness (Surface Treated)

Typical Properties		Product	CW-350B	CWL-325J	CW-308B
Chemical Composition	H2O	[%]	0.03	0.05	0.05
	Al(OH)3*	[%]	99.9	99.7	99.7
	Fe2O3*	[%]	0.01	0.01	0.01
	SiO2*	[%]	0.04	0.15	0.12
	Na2O*	[%]	0.05	0.07	0.15
D50(MT-3300, Laser Diffraction)	[µm]	51	20	10	
DOA Oil Absorption	[ml/100g]	28	22	32	
True Specific Gravity			2.42		
Refractive Index			1.57		
Hardness	[Mohs]		3		
Packing	Big Bag		500kg, 1,000kg		
	Paper Bag		-		25kg



CW-308

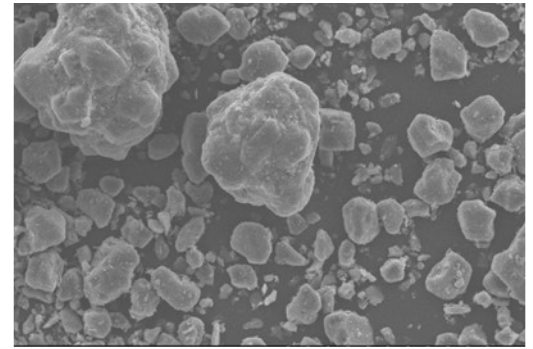
20µm



Low Viscosity

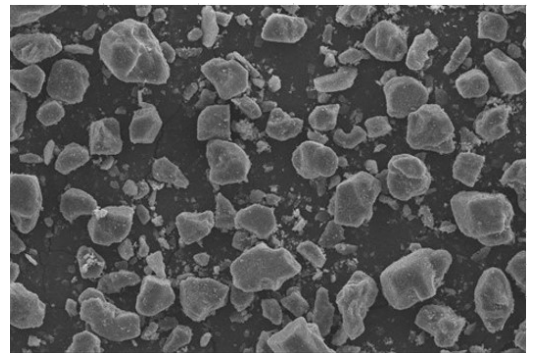
Typical Properties		Product	CW-325LV	CW-320LV	CW-310LV
Chemical Composition	H2O	[%]	0.04	0.04	0.05
	Al(OH)3*	[%]	99.9	99.9	99.9
	Fe2O3*	[%]	0.01	0.01	0.01
	SiO2*	[%]	0.00	0.00	0.00
	Na2O*	[%]	0.07	0.08	0.06
D50(MT-3300, Laser Diffraction)	[µm]	21	17	10	
+45µm	[%]	-	-	-	
BET Specific Surface Area	[m2/g]	0.8	1.1	1.7	
Electric Conductivity	[µS/cm]	20	20	20	
Loose Bulk Density	[g/cm3]	1.0	0.8	0.7	
Packed Bulk Density	[g/cm3]	1.4	1.5	1.4	
DOA Oil Absorption	[ml/100g]	24	27	28	
True Specific Gravity			2.42		
Refractive Index			1.57		
Hardness	[Mohs]		3		
Packing	Big Bag		1,000kg		
	Paper Bag		25kg		

*Analysis after dried.
 Calculated as oxide after analyzing Fe, Si, Na contents.
 $Al(OH)_3 = 100 - (Fe_2O_3 + SiO_2 + Na_2O)$



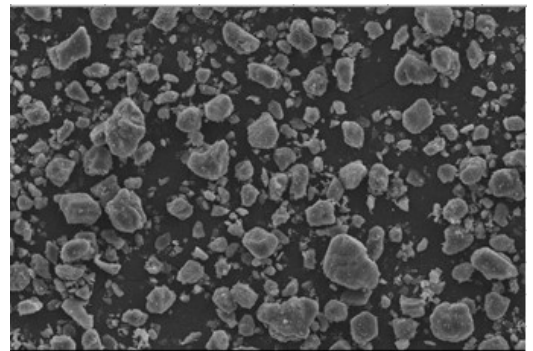
CW-325LV

40µm



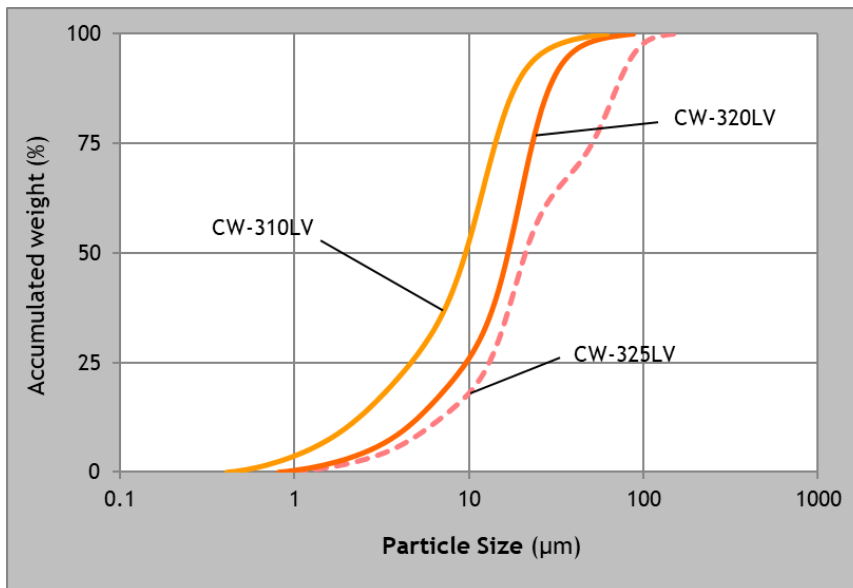
CW-320LV

40µm



CW-310LV

40µm



Click the movie to learn viscosity performance difference between each product.

<Test Conditions>

Observed the compound's behavior 100 seconds while pressing with 50g weight.

Aluminum Hydroxide: 60vol%

Resin: Silicone

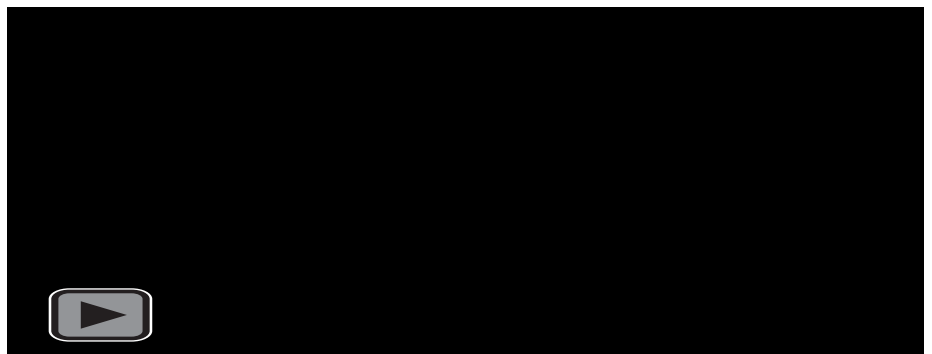
Compound Volume: 1.5g

Weight: 50g

<Movie Operating Conditions>

PC only.

Download this PDF file necessary.



2. Aluminum Oxide - Alumina

Sumitomo Chemical's Calcined Aluminas are produced in various levels of calcination level/soda content and supplied in both unground and ground shapes to satisfy diverse customer requirements.

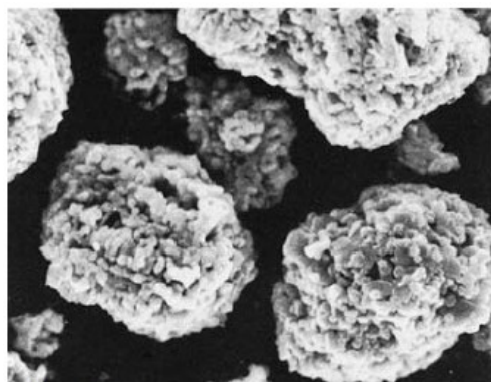
Normal Soda / Unground

Typical Properties		Product	A-21	A-26	A-210
Chemical Composition	H ₂ O	[%]	0.04	0.1	0.04
	L.O.I	[%]	0.05	0.1	0.05
	Fe ₂ O ₃	[%]	0.02	0.02	0.02
	SiO ₂	[%]	0.01	0.01	0.02
	Na ₂ O	[%]	0.21	0.21	0.27
	Al ₂ O ₃	[%]	99.7	99.7	99.6
Specific Gravity		[-]	3.95	3.90	3.95
D50 (MT-3300, Laser Diffraction)		[μm]	50	50	95
α Crystal Size		[μm]	2~4	<1	2~4
Bulk Density	Green	[g/cm ³]	0.7	0.9	0.9
	Packed	[g/cm ³]	1.2	1.2	1.2
Packing	Big Bag		1,000kg		
	Paper Bag		25kg		

A-21 : High calcined. Used for initial buffing stages of stainless steel.

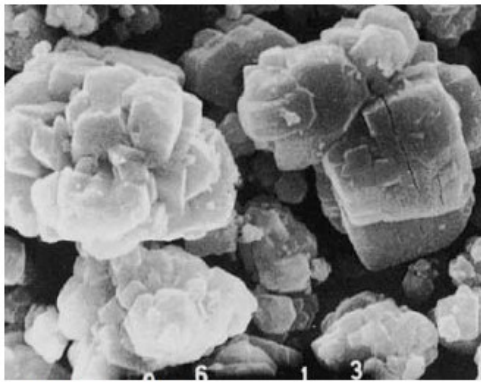
A-26 : Smaller α crystal size with lower calcination than A-21. Used as a reactive alumina when ground.

A-210 : High calcined. Low dust and good fluidity.



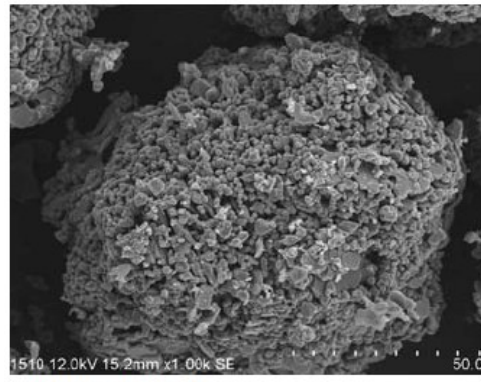
A-21

20μm



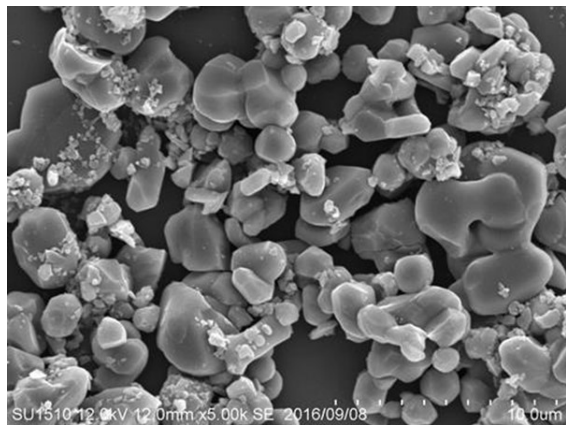
A-26

20μm



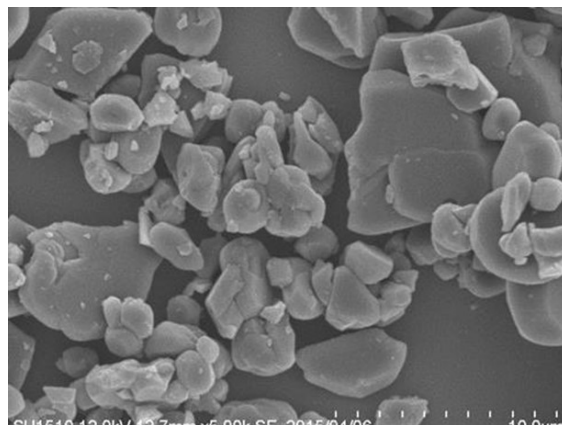
A-210

20μm



AM-21

10μm



AM-210

10μm

Normal Soda / Ground

Typical Properties		Product	AM-21	AM-210-02	AM-210	AM-28B	AM-29B	AM-27
Chemical Composition	H2O	[%]	0.06	0.05	0.06	0.05	0.05	0.1
	L.O.I	[%]	0.05	0.05	0.05	0.05	0.05	0.1
	Fe2O3	[%]	0.02	0.02	0.02	0.04	0.04	0.02
	SiO2	[%]	0.01	0.02	0.02	0.02	0.02	0.01
	Na2O	[%]	0.21	0.27	0.27	0.15	0.15	0.21
	Al2O3	[%]	99.7	99.6	99.6	99.7	99.7	99.7
Specific Gravity		[-]	3.95	3.95	3.95	3.95	3.95	3.90
D50 (MT-3300, Laser Diffraction)		[μ m]	4.8	7.9	4.8	19	8.2	2.8
α Crystal Size		[μ m]	2~4	2~4	2~4	2~5	2~5	0.3
Bulk Density	Green	[g/cm3]	0.7	-	0.7	0.6	0.6	0.6
	Packed	[g/cm3]	1.3	-	1.3	1.6	1.6	1.3
Oil Absorption	Boiled Linseed Oil	[ml/100g]	16	-	-	21	18	27
Green Density		[g/cm3]	2.26	-	2.26	-	-	-
Fire Density*		[g/cm3]	3.72	-	3.72	-	-	-
Packing	Big Bag		1,000kg					
	Paper Bag		25kg					

* Flux 4%, 49MPa(500kg/cm²), sample sintered at 1600 degC.

AM-21 / AM-210 : Ground high calcined alumina. Used for intermediate buffing stages of stainless steel.

AM-210-02 : A variation of AM-210 with bigger particle size and bi-modal particle size distribution. Used for both initial and intermediate buffing stages of stainless steel.

AM-28B/29B : Specially developed for intermediate buffing stages of stainless steel. Some of coarse particles crumble to fine particles.

AM-27 : Finely ground for mirror surface buffing stages of stainless steel.

Low Soda / Unground

Typical Properties		Product	AL-41-01	AL-43A	AL-44
Chemical Composition	H2O	[%]	0.05	0.05	0.05
	L.O.I	[%]	0.05	0.05	0.05
	Fe2O3	[%]	0.02	0.02	0.02
	SiO2	[%]	0.05	0.05	0.05
	Na2O	[%]	0.01	0.01	0.01
	Al2O3	[%]	99.9	99.9	99.9
D50 (MT-3300, Laser Diffraction)		[μ m]	50	50	50
α Crystal Size		[μ m]	1~2	2~3	3~4
Packing	Big Bag		1,000kg		

Molding density and firing shrinkage vary between these products due to α crystal size differences.

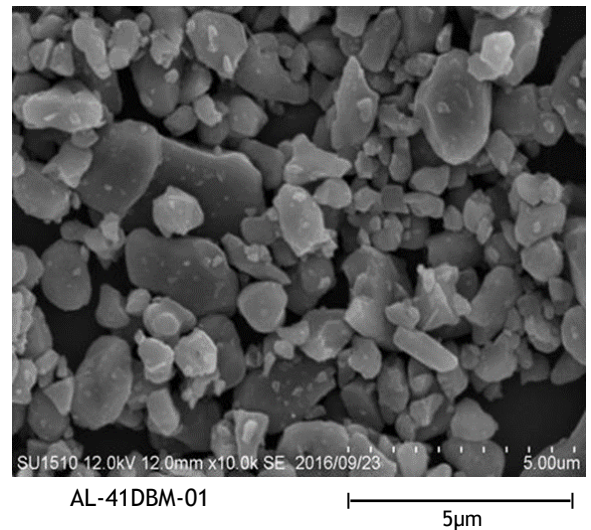
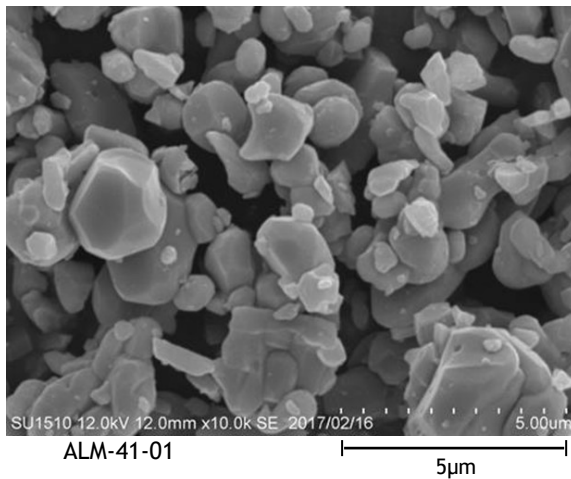
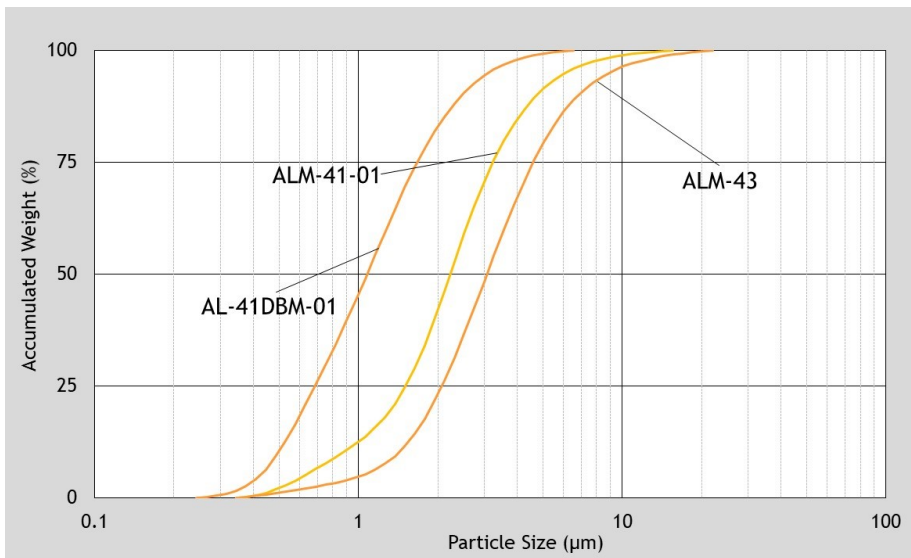
Low Soda / Ground

Typical Properties		Product	ALM-41-01	ALM-43	AL-41DBM-01
Chemical Composition	H ₂ O	[%]	0.08	0.07	0.08
	L.O.I	[%]	0.07	0.05	0.07
	Fe ₂ O ₃	[%]	0.02	0.02	0.02
	SiO ₂	[%]	0.05	0.05	0.05
	Na ₂ O	[%]	0.01	0.01	0.01
	Al ₂ O ₃	[%]	99.9	99.9	99.9
D50 (MT-3300, Laser Diffraction)		[μm]	2.2	3.7	1.3
BET Specific Surface Area		[m ² /g]	1.8	1.2	2.6
α Crystal Size		[μm]	1~2	2~3	1~2
Green Density		[g/cm ³]	2.23	2.27	2.23
Fire Density*		[g/cm ³]	3.71	3.67	3.71
Linear Shrinkage*		[%]	16	15	15
Packing	Big Bag		1,000kg		-
	Paper Bag		25kg		

*Flux 4%, 49MPa (500kg/cm²), sample sintered at 1600 degC.

ALM-41-01 / ALM-43 : Ground down close to α crystal sizes.

AL-41DBM-01 : PSD of ALM-41-01 shifted to smaller side. Used for LTCC and thermal conductive fillers.



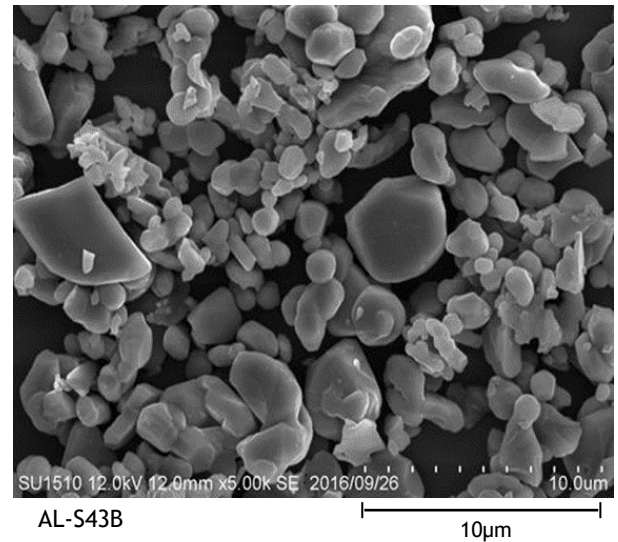
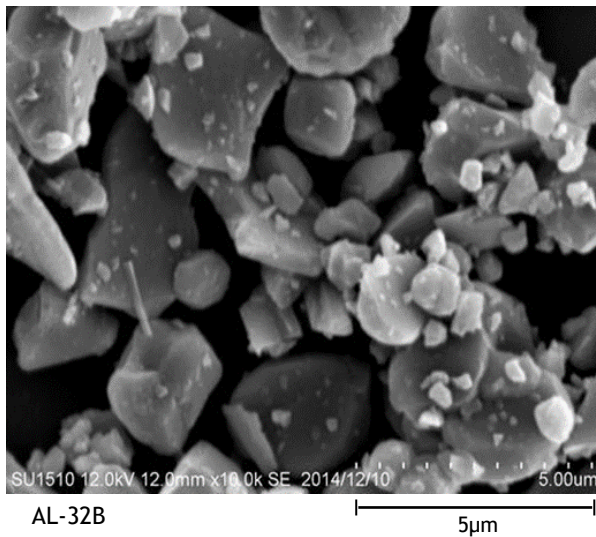
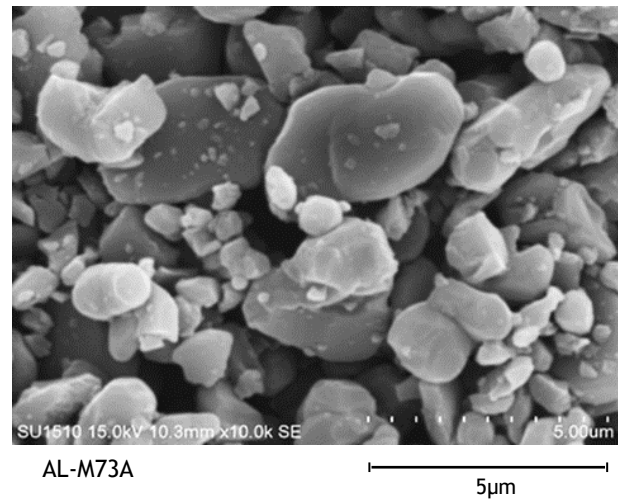
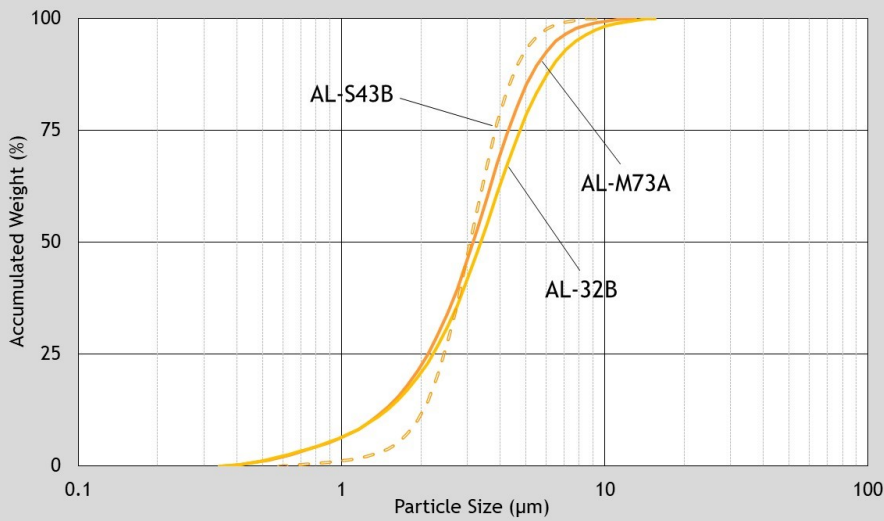
Low Soda / Ground (for Functional Fillers)

Typical Properties		Product	AL-M73A	AL-S43B	AL-32B
Chemical Composition	H2O	[%]	0.07	0.07	0.04
	L.O.I	[%]	0.05	0.05	0.04
	Fe2O3	[%]	0.02	0.02	0.02
	SiO2	[%]	0.05	0.05	0.05
	Na2O	[%]	0.01	0.01	0.01
	Al2O3	[%]	99.9	99.9	99.9
D50 (MT-3300, Laser Diffraction)	[μm]	3.0	3.1	3.4	
BET Surface Area	[m^2/g]	1.5	1.3	1.6	
+45 μm	[%]	0.0	0.0	0.0	
α Crystal Size	[μm]	2~3	1.5~2.5	3~4	
Packing	Paper Bag	20kg	25kg		

AL-M73A : Top-cut version of ALM-43.

AL-S43B : PSD of ALM-43 narrowed.

AL-32B : Big α crystal size, and easy to mix with resins.



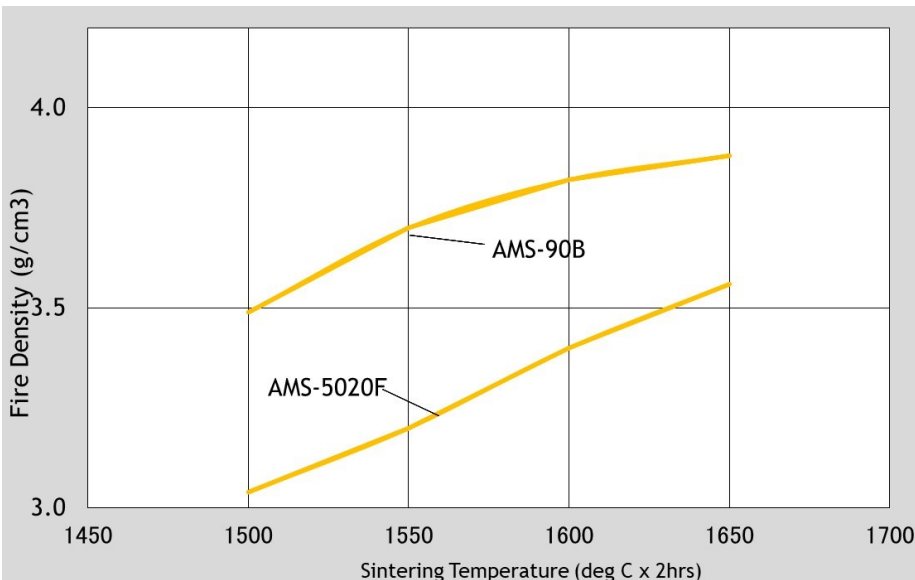
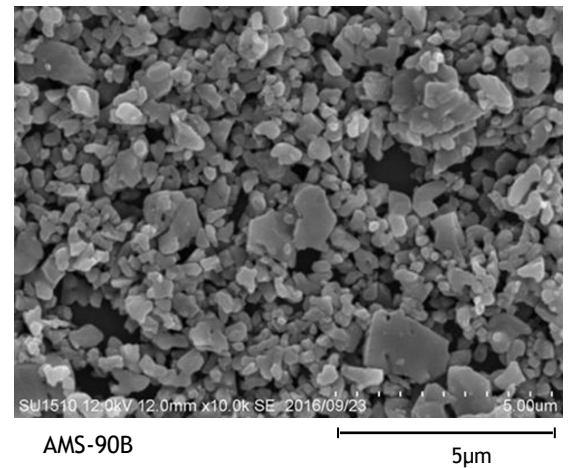
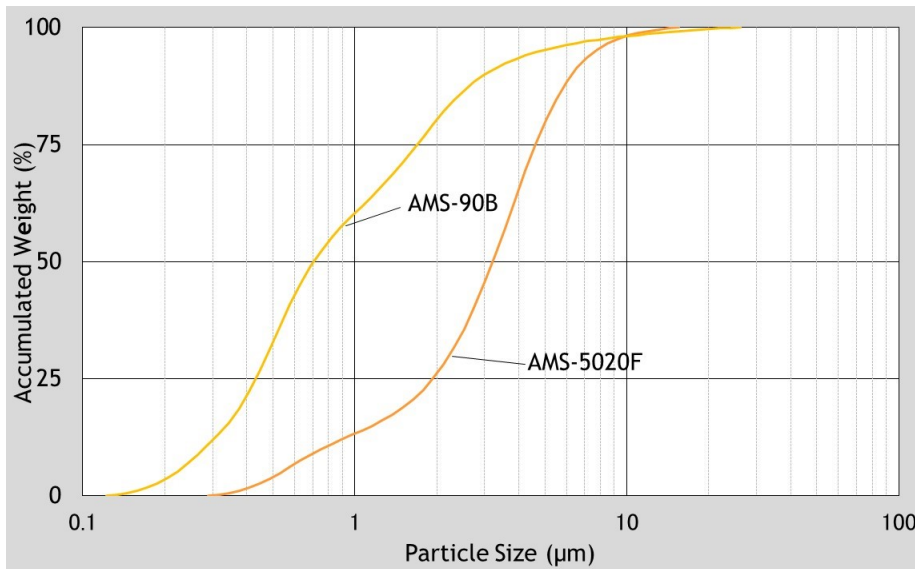
Normal Soda / Easy Sintering (Reactive)

Typical Properties		Product	AMS-5020F	AMS-90B
Chemical Composition	H ₂ O	[%]	0.1	0.1
	L.O.I	[%]	0.1	0.3
	Fe ₂ O ₃	[%]	0.02	0.02
	SiO ₂	[%]	0.02	0.02
	Na ₂ O	[%]	0.27	0.27
	Al ₂ O ₃	[%]	99.6	99.6
Specific Gravity		[-]	3.95	3.90
D50 (MT-3300, Laser Diffraction)		[μm]	3.2	0.7
α Crystal Size		[μm]	0.3~4	0.3
Green Density*		[g/cm ³]	2.44	2.07
Fire Density*		[g/cm ³]	3.40	3.82
Packing	Big Bag		1,000kg	
	Paper Bag		25kg	

* No flux added, 29.4MPa (300kg/cm²), sample sintered at 1600 deg C.

AMS-5020F : Enables high filling ratio because of bi-modal and broad particle size distribution.
Typically used for castable plasticizer and low shrinkage ceramics.

AMS-90B : Mono-modal particle size distribution, ground down to 0.7μm.



Low Soda / Easy Sintering (Reactive)

Typical Properties		Product	AES-12	AES-11	AES-11C	AES-11H	AES-23
Chemical Composition	H ₂ O	[%]	0.1	0.1	0.1	0.1	0.1
	L.O.I	[%]	0.1	0.2	0.1	0.2	0.1
	Fe ₂ O ₃	[%]	0.02	0.02	0.02	0.02	0.02
	SiO ₂	[%]	0.04	0.04	0.03	0.04	0.04
	Na ₂ O	[%]	0.04	0.04	0.05	0.04	0.03
	MgO*	[%]	-	0.11	0.05	0.04	-
	Al ₂ O ₃	[%]	99.9	99.9	99.9	99.9	99.9
D50 (MT-3300, Laser Diffraction)	[μ m]	0.44	0.43	0.39	0.54	2.2	
BET Specific Surface Area	[m ² /g]	6.9	6.7	5.5	6.3	3.4	
α Crystal Size	[μ m]	0.3	0.3	0.3	0.3	0.3~4	
Green Density	[g/cm ³]	2.22	2.22	2.20	2.20	2.57	
Fire Density**	[g/cm ³]	3.88	3.93	3.94	3.87	3.77	
Linear Shrinkage**	[%]	17	17	18	17	12	
Packing	Paper Bag						25kg

* MgO is an additive and not considered as an impurity in Al₂O₃.

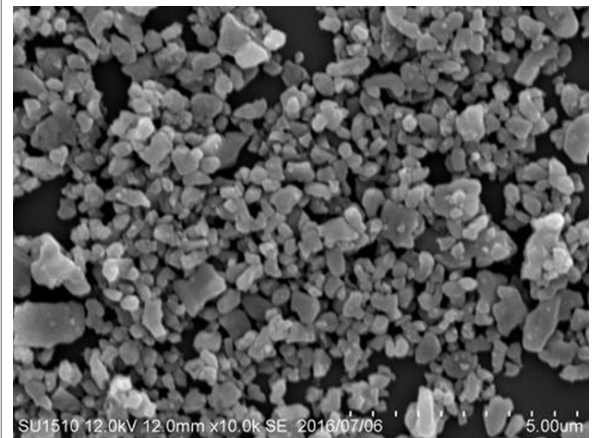
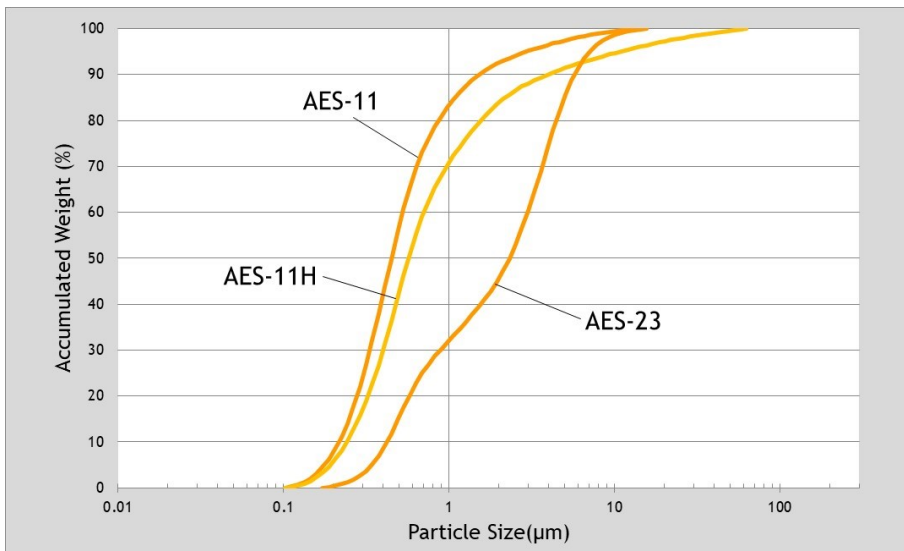
**No flux added, 29.4MPa (300kg/cm²), sample sintered at 1600 deg C.

AES-11/11C : Sub-micron size particles. Used for fine ceramic applications requiring 99% purity or higher.

AES-11H : Contains less re-agglomeration than AES-11 / 11C, and it makes slurry dispersion easier.

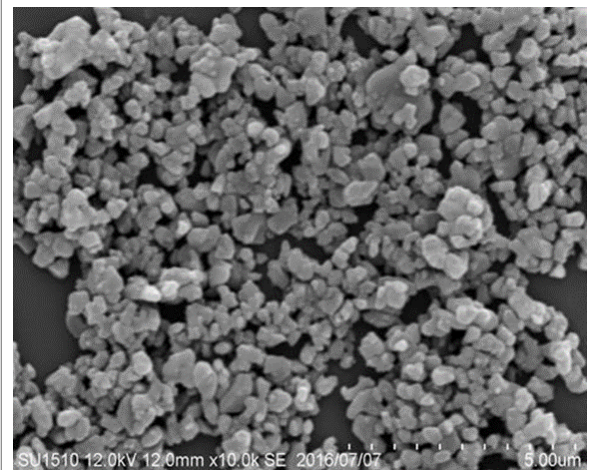
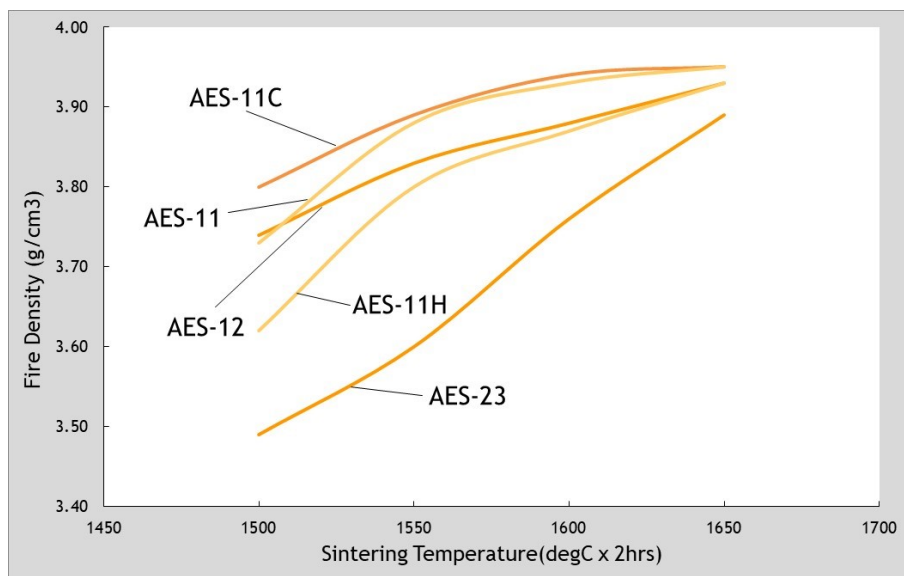
AES-12 : MgO not added. Also used as a sub-filler of thermal interface materials.

AES-23 : Thixotropic and low viscosity.



AES-12

5 μ m



AES-11

5 μ m

3. High Purity Alumina - HPA

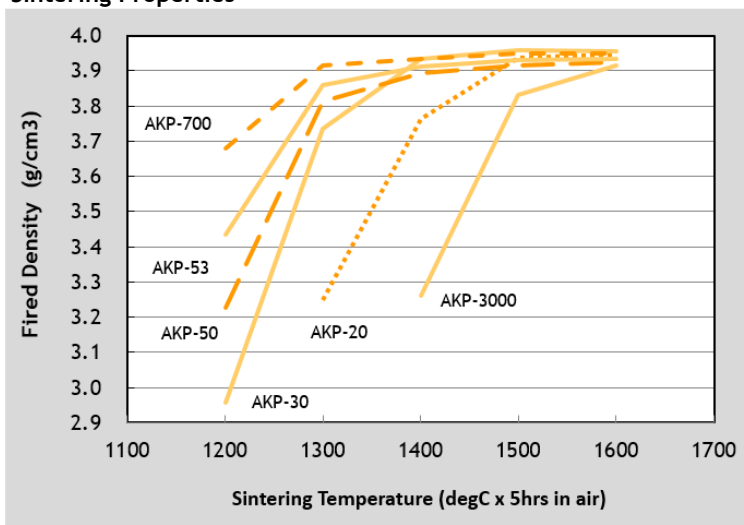
Sumitomo Chemical's High Purity Aluminas(HPA) are uniform fine powders characterized by highly pure and homogeneous crystal structure. We produce HPA by Aluminum Alkoxide Hydrolysis process.

AKP Series

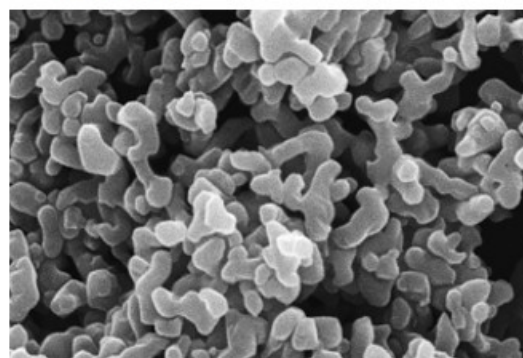
Typical Properties		Product	AKP-15	AKP-20	AKP-30	AKP-50	AKP-53	AKP-700	AKP-3000
Crystal Structure			α	α	α	α	α	α	α
Purity(Al ₂ O ₃)	[%]		≧ 99.99	≧ 99.99	≧ 99.99	≧ 99.99	≧ 99.99	≧ 99.99	≧ 99.99
D50 (MT3300)	[μm]		0.60	0.42	0.26	0.20	0.17	-	0.67
Loose Bulk Density	[g/cm ³]		0.9	1.0	0.9	0.9	1.1	0.7	0.43
Tapped Bulk Density	[g/cm ³]		1.5	1.4	1.3	1.3	1.4	1.1	0.81
BET Specific Surface Area	[m ² /g]		3.6	4.6	7.4	11.1	13.7	17.8	4.4
Impurity	Si	[ppm]	20	16	9	10	36	8	3
	Na		6	3	3	3	3	3	2
	Mg		3	3	2	2	6	1	1
	Cu		1	1	1	1	1	1	1
	Fe		2	2	2	2	3	3	2
Packing	PE Bag		20kg	20kg	20kg	20kg	20kg		10kg
	Pail Can							10kg	

Application	High-strength and High-density Ceramics, Translucent Ceramics, Composite Materials, Additives for non-Oxide Ceramics, Abrasives, Ceramic Filter, Resin Filler, etc.
	Insulation layer of Li-ion Secondary Battery

Sintering Properties



AKP-3000

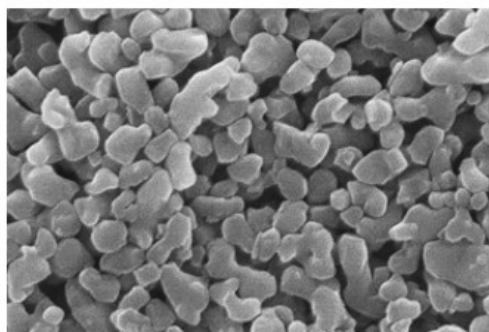


1μm

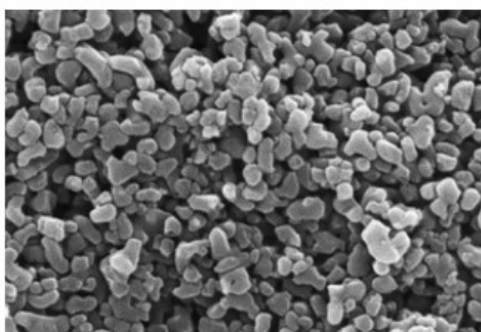
AKP-20

AKP-30

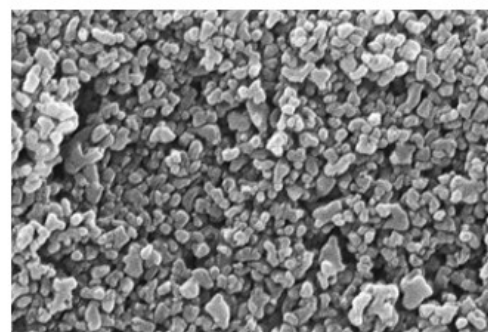
AKP-50



1μm



1μm

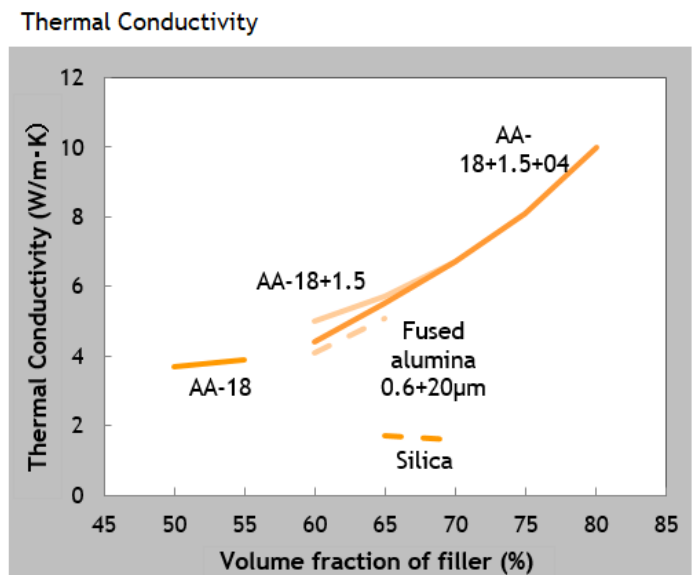
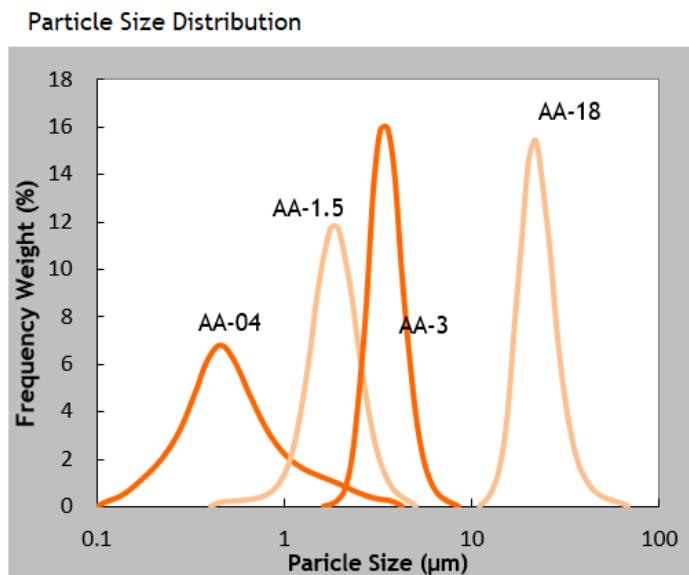
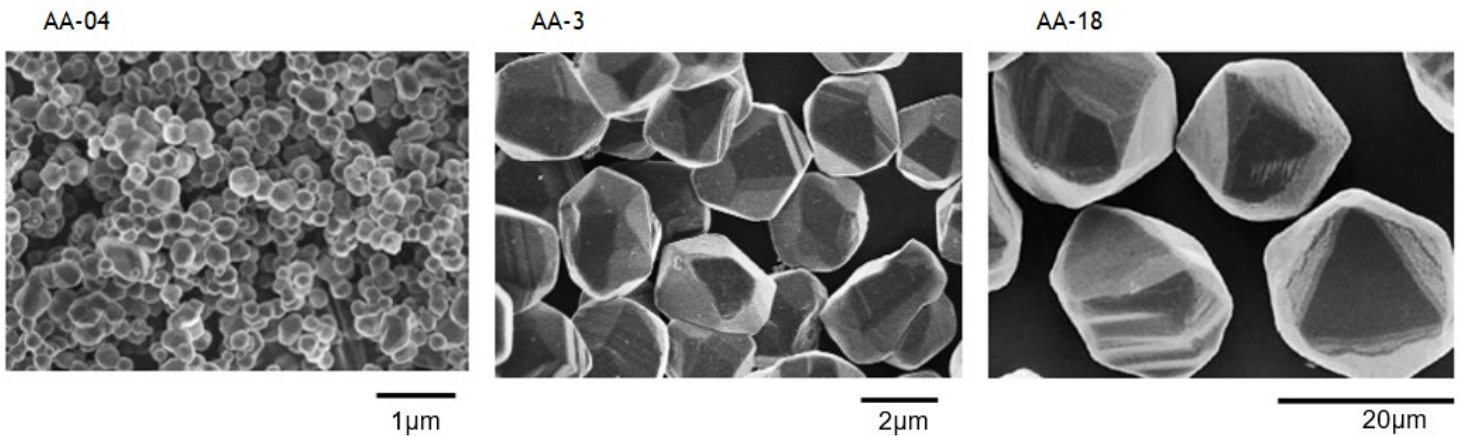


1μm

Advanced Aluminas are α -alumina single crystals with precisely controlled particle size distribution and almost-spherical polyhedral shape.

Advanced Alumina (AA)

Product		AA-03F	AA-03	AA-04	AA-05	AA-07	AA-1.5	AA-2	AA-3	AA-5	AA-18
Typical Properties											
Crystal structure		α	α	α	α	α	α	α	α	α	α
Purity(Al_2O_3)	[%]	≥ 99.99	≥ 99.99	≥ 99.99	≥ 99.99	≥ 99.99	≥ 99.99	≥ 99.99	≥ 99.99	≥ 99.99	≥ 99.99
D50 (MT3300)	[μm]	0.26	0.40	0.47	0.58	0.88	1.7	2.2	3.5	6.6	20.3
Loose Bulk Density	[g/cm^3]	1.1	0.5	0.5	0.6	0.6	0.6	0.7	0.7	1.3	1.9
Tapped Bulk Density	[g/cm^3]	1.4	0.9	1.0	1.1	1.2	1.5	1.5	1.5	2.0	2.4
BET Specific Surface Area	[m^2/g]	6.2	5.6	4.6	3.2	2.2	1.3	1.1	0.6	0.4	0.2
Impurity	Si [ppm]	14	4	4	4	4	9	11	22	22	17
	Fe [ppm]	4	2	2	2	2	3	2	3	2	2
	Na [ppm]	3	3	3	3	3	3	3	3	3	3
	Mg [ppm]	1	1	1	1	1	1	1	1	1	1
	Cu [ppm]	1	1	1	1	1	1	1	1	1	1
Packing	PE Bag	20kg	20kg	20kg	20kg	20kg	20kg	20kg	20kg	20kg	
	Pail Can										20kg
Application	High-strength and High-density Ceramics, Translucent Ceramics, Resin filler(Thermal Conductive Materials), Plasma Spray, Ceramic Filter, etc.										



NXA is almost-spherical fine α -alumina crystals with excellent dispersion.

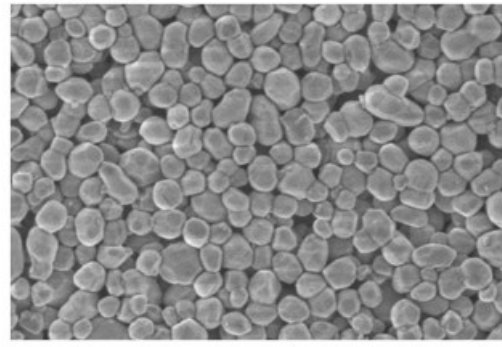
NXA Series

Typical Properties		Product	NXA-100	NXA-150
Crystal structure			α	α
Purity(Al ₂ O ₃)	[%]		≥ 99.99	≥ 99.99
D50 (MT3300)	[μm]		0.21	0.23
Loose Bulk Density	[g/cm ³]		1.0	1.0
Tapped Bulk Density	[g/cm ³]		1.3	1.3
BET Specific Surface Area	[m ² /g]		10.8	9.7
Impurity	Si	[ppm]	12	17
	Fe	[ppm]	3	5
	Na	[ppm]	< 3	< 3
	Mg	[ppm]	2	3
	Cu	[ppm]	< 1	< 1
Packing	AL Laminated Bag		20kg	20kg

Application

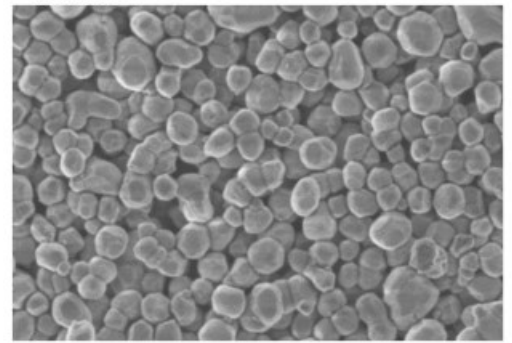
High-strength and High-density Ceramics, Translucent Ceramics, Resin Filler(Thermal Conductive Materials), Precision Abrasives, etc.

NXA-100



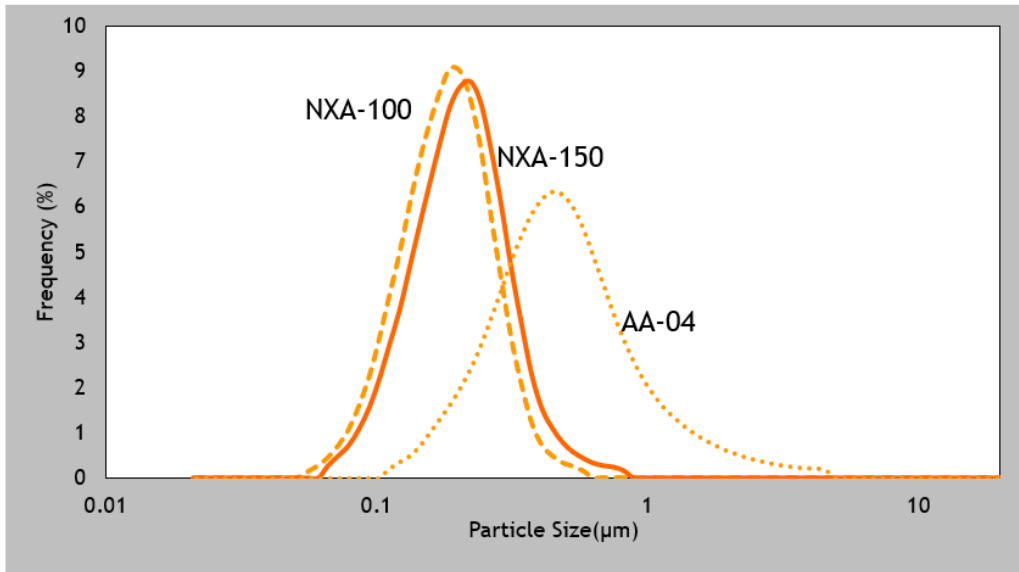
1.0 μm

NXA-150

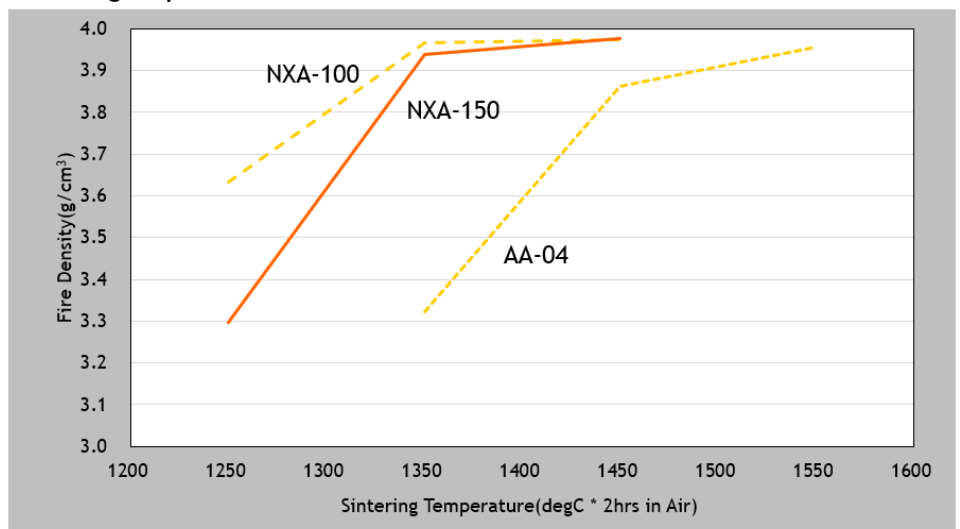


1.0 μm

Particle Size Distribution



Sintering Properties



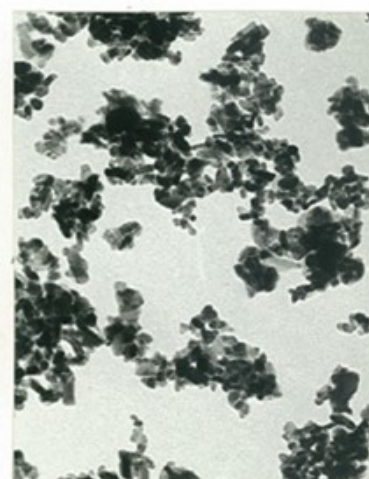
Gamma HPA

Typical Properties		Product	
		AKP-G07	AKP-G15
Crystal Structure		θ	γ
Purity(Al ₂ O ₃)	[%]	≧ 99.99	≧ 99.99
Loose Bulk Density	[g/cm ³]	-	0.13
Tapped Bulk Density	[g/cm ³]	0.3	0.16
BET Specific Surface Area	[m ² /g]	79.9	164
Impurity	Si	[ppm]	3
	Na	[ppm]	3
	Mg	[ppm]	1
	Cu	[ppm]	1
	Fe	[ppm]	4
Packing		20kg Cardboard Box	10kg Cardboard Box
Application		Resin Filler, Catalyst, etc.	



AKP-G15

0.1μm

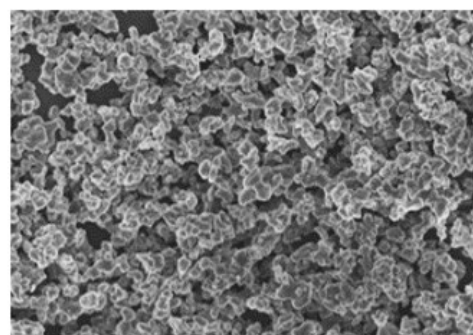


AKP-G07

0.1μm

HIT Series

Typical Properties		Product	
		HIT-60A	HIT-100
Crystal Structure		α	α
Loose Bulk Density	[g/cm ³]	0.8	0.9
Tapped Bulk Density	[g/cm ³]	1.1	1.2
BET Specific Surface Area	[m ² /g]	12.5	36.1
Packing		15kg PE Bag	20kg Pail Can
Application		Abrasive, etc.	



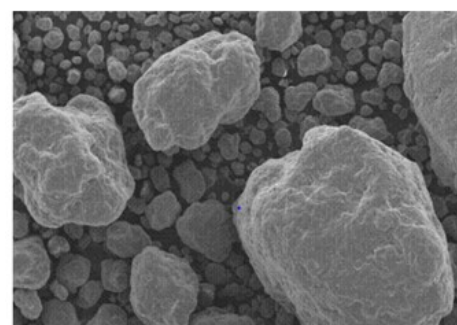
HIT-60A

1μm

HIT-100

High Bulk Density for Single Crystal

Typical Properties		Product	
		AKX-5	
Crystal Structure		α	
Purity(Al ₂ O ₃)	[%]	≧ 99.99	
Loose Bulk Density	[g/cm ³]	1.8	
Tapped Bulk Density	[g/cm ³]	-	
BET Surface Area	[m ² /g]	1.1	
Impurity	Si	[ppm]	9
	Na	[ppm]	3
	Mg	[ppm]	1
	Cu	[ppm]	1
	Fe	[ppm]	3
Packing		100kg Fiber Drum	
Application		Single Crystal	



AKX-5

1mm

4. Activated Alumina / Hydraulic Alumina

Activated Alumina : Powder Shape

Typical Properties		Product	Powders				Chromatography Grade	
			KC-501	A-11	AC-11	AC-12R	KCG-30	KCG-1525W
Chemical Composition	L.O.I	[%]	4.5	4.0	4.5	4.5	3.5	3.5
	Fe2O3	[%]	0.01	0.02	0.02	0.02	0.02	0.02
	SiO2	[%]	0.02	0.02	0.02	0.02	0.02	0.02
	Na2O	[%]	0.45	0.26	0.26	0.26	0.26	0.26
	Al2O3	[%]	99.5	99.7	99.7	99.7	99.7	99.7
Physical Properties	True Specific Gravity		-	3.1	3.1	3.1	3.1	3.1
	Apparent Specific Gravity (Packed Bulk Density)	[g/cm3]	0.3	1.1	1.1	1.1	1.1	1.1
	D50	[µm]	1.5	40-50	80-100	100-200	40-50	80-100
	BET Specific Surface Area	[m2/g]	200	150	140	130	150	140
	Pore Volume	[mL/g]	-	0.30	0.30	0.30	0.30	0.30
Packing	Paper Bag / PE Bag		-	25kg	25kg	-	-	-
	Pail Can		5kg	-	-	15kg	15kg	15kg
	Drum		50kg	-	-	180kg	-	-

Easy to be adsorped ↑	organic acid	PO_4^{-3}	F^-
	water		
	alcohol	F^-	
	amine		
	mercaptan	$[Fe(CN)_6]^{-4}$	
	aldehyde		Cl^-
	ketone	SO_4^{-2}	
	ester		
	ether	$[FE(CN)_6]^{-3}$	
	aromatic hydrocarbon	$Cr_2O_7^{-2}$	Br^-
Difficult to be adsorped ↓	sulfide	Cl^-	
	organic halogen		
	unsaturated hydrocarbon	MnO_4^-	
	saturated hydrocarbon	ClO_4^-	I^-

Activated Alumina can be used as an adsorption refining agent, especially to refine non-polar solvents.

In general, the more polarity and heavier molecular weight, the better adsorption effect would be obtained.

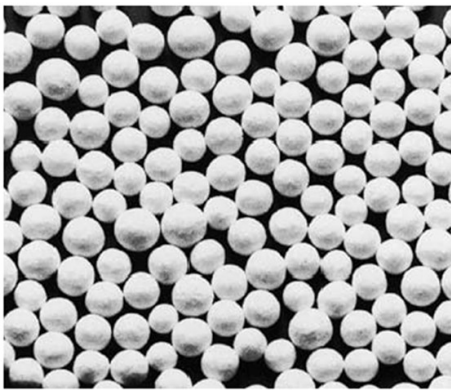
Adsorption order example as follows.
 $-SO_3H > -COOH > -OH, -NH_2, -SH > -CHO$
 $> -CO > -COOR > -S-, -O- > -X$
 $> \text{Unsaturated hydrocarbons}$
 $> \text{Saturated hydrocarbons}$

Adsorption performance can be measured in terms of adsorption rate and transmission rate of the picric acid by sending a benzene solution of picric acid through a column filled with activated alumina.

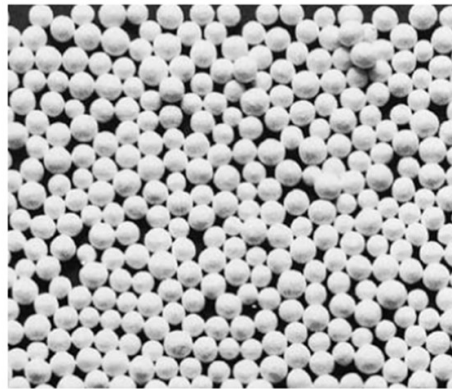
Activated Alumina : Spherical Shape

Typical Properties		Product	KHS		KHA		KHO			NKHO
			-46	-46	-24	-46	-24	-12	-24	
Appearance	Form		Spherical							
	Color		White							
	Particle Size	[mm]	4-6	4-6	2-4	4-6	2-4	1-2	2-4	
Chemical Composition	L.O.I	[%]	3.5	1.9		1.5		2.4	1.8	
	Fe2O3	[%]	0.02	0.02						
	SiO2	[%]	0.02	0.02						
	Na2O	[%]	0.04	0.26						
	Al2O3	[%]	99.9	99.7						
Physical Properties	Bulk Density	[kg/L]	0.60	0.73	0.74	0.80	0.83	0.85	0.61	
	Pore Volume	[mL/g]	0.64	0.51		0.43			0.62	
	BET Specific Surface Area	[m2/g]	165	160		150		210	170	
Mechanical Strength	Attrition Loss	[%]	0.3	0.4		0.4		0.2	0.2	
	Crushing Strength	[daN]	17	26	13	33	18	5	5	
Packing	Drum		120kg	130kg		150kg			120kg	
	Square Can		10kg	10kg		15kg			10kg	

Typical Properties		Product	NKHD				KHD		HD	FD
			-46	-24	-46HD	-24HD	-46	-24	-13	-24
Appearance	Form		Spherical							
	Color		White							
	Particle Size	[mm]	4-6	2-4	4-6	2-4	4-6	2-4	1-2	2-4
Chemical Composition	L.O.I	[%]	6.4		5.9		5.4		6.1	6.3
	Fe2O3	[%]	0.02							
	SiO2	[%]	0.02							
	Na2O	[%]	0.26							
	Al2O3	[%]	99.7							
Physical Properties	Bulk density	[kg/L]	0.60	0.64	0.74	0.77	0.82	0.86	0.80	0.68
	Pore volume	[mL/g]	0.60		0.45		0.38		0.45	0.55
	BET Specific Surface Area	[m2/g]	290				280		290	280
Mechanical Strength	Attrition Loss	[%]	0.3		0.3		0.2		0.4	0.2
	Crushing Strength	[daN]	10	5	30	16	30	16	5	7
H2O Adsorption	Effluent Gas Moisture	[gH2O/m3]	0.003		0.003		0.003			0.003
	Adsorption Capacity	10% RH	5.7	5.7	5.8	6.1	5.3	5.5		5.8
		50% RH	15.5	16.0	15.7	16.7	13.6	14.8		16.0
		90% RH	37.8	39.3	37.0	38.2	34	34.1		37.0
Packing	Drum		120kg	150kg		160kg		150kg	120kg	
	Square Can		10kg	15kg		15kg		-	10kg	



KHD-46



KHD-24

Hydraulic Alumina

Typical Properties		Product	BK-112
Chemical Composition	L.O.I	[%]	6.6
	Fe ₂ O ₃	[%]	0.05
	SiO ₂	[%]	0.01
	Na ₂ O	[%]	0.25
	Al ₂ O ₃	[%]	99.7
Physical Properties	True specific gravity		3.0
	Apparent specific gravity (Packed bulk density)	[g/cm ³]	1.0
	Mean particle size	[μm]	16
Packing		Drum	150kg
		Pail Can	15kg
		Paper Bag	20kg

An alumina powder with a large surface area and some crystal water.

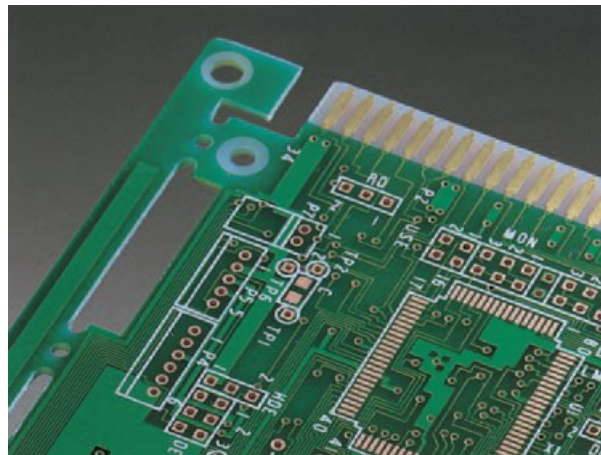
Used as a binder for refractories instead of alumina cement due to large caking capacity and plasticity.

Condition/setting time of the hydraulic alumina and water mixture

Water Volume (g/100g-Al ₂ O ₃)	Kneaded material condition	Setting Time* (min.)
60	Dry	-
70	Impossible to knead	-
75	Creamy	-
80	Creamy	15
90	Slurry with good fluidity	20

* Setting time is determined by JIS R 5210 needle penetration method (slurry thickness 38mm). Distance between the slurry bottom and the needle is 25mm.

Plant & Office Location / Contact



Aluminum Hydroxide as a flame retardant for CCL.



Aluminum Hydroxide as a filler for solid surface.

CONTACTS for Sales and Technical Information

◆ Aluminum Hydroxide / Alumina / High Purity Alumina-HPA

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For a Better Tomorrow
Alumina Products Dept. / High Purity Alumina Dept.
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