



PT Indonesia Chemical Alumina

Anak Perusahaan PT ANTAM Tbk
A Subsidiary of PT ANTAM Tbk



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MEMPERKENALKAN PT INDONESIA CHEMICAL ALUMINA

INTRODUCING PT INDONESIA CHEMICAL ALUMINA



**CADANGAN DAN SUMBER
DAYA BAUKSIT**
BAUXITE RESERVES AND
RESOURCES

197 JUTA MWT
MILLION WMT



**KAPASITAS TERPASANG
PER TAHUN**
ANNUAL NAMEPLATE
CAPACITY

300.000 TON ALUMINA
TONS OF ALUMINA



**SUMBER DAYA MANUSIA
YANG KOMPETEN DAN
BERPENGALAMAN**
COMPETENT
AND EXPERIENCED
HUMAN RESOURCES



**KUALITAS PRODUK YANG
BAIK DENGAN SERTIFIKASI
INTERNASIONAL**
EXCELLENT PRODUCT QUALITY
WITH INTERNATIONAL
CERTIFICATION



**PABRIK ALUMINA DENGAN
TEKNOLOGI PENGOLAHAN
TERKINI DAN TERDEPAN**
ALUMINA PLANT WITH
THE LATEST AND LEADING
PROCESSING TECHNOLOGY



**KEPEMILIKAN MAYORITAS
OLEH PT ANTAM TBK,
BUMN BERBASIS SUMBER
DAYA ALAM TERKEMUKA
DI INDONESIA**
MAJORITY OWNED BY PT ANTAM
TBK, A LEADING NATURAL
RESOURCES BASED INDONESIA
STATE-OWNED ENTERPRISE

SEKILAS PT INDONESIA CHEMICAL ALUMINA

PT INDONESIA CHEMICAL ALUMINA AT A GLANCE



2007

Pembentukan PT Indonesia Chemical Alumina (ICA). PT Indonesia Chemical Alumina (ICA) was established

2011

Konstruksi pabrik CGATayan dimulai. Construction of Tayan CGA Plant commenced

2013

Fase *commissioning* pabrik CGATayan dimulai. Commissioning phase of Tayan CGA Plant commenced

2015

Fase operasi komersial pabrik CGATayan dimulai. Commercial operations phase of Tayan CGA Plant commenced

2017

Operasi pabrik CGATayan berhenti sementara. Operations of the Tayan CGA plant was temporarily stopped

2018

Penandatanganan SPA antara ANAM, SDK, dan ICA; ANAM memiliki 100% ICA. Pabrik CGATayan kembali beroperasi. Signing of SPA between SDK, ANAM, and ICA; ICA 100% owned by ANAM. Tayan CGA Plant resumed operation.

2021

Kontinu beroperasi, mengembangkan pasar serta menyediakan produk ATH dan Alumina yang berkualitas. Continuously operate, develop the market, and provide high quality ATH and Alumina products.

SEKILAS

PABRIK CHEMICAL GRADE ALUMINA TAYAN

TAYAN CHEMICAL GRADE ALUMINA PLANT OVERVIEW

Pabrik *Chemical Grade Alumina* (CGA) Tayan yang memiliki kapasitas produksi terpasang 300.000 ton alumina per tahun melalui pengolahan 850.000 wmt bijih bauksit berlokasi di Tayan, Kalimantan Barat.

Konstruksi pabrik CGA Tayan dimulai pada tahun 2011, memasuki fase *commissioning* tahun 2013 dan memulai operasi komersial pada tahun 2015.

The Tayan Chemical Grade Alumina (CGA) plant has an annual nameplate production capacity of 300,000 tons of alumina, processing 850,000 wmt of bauxite ore.

The plant is located in Tayan, West Kalimantan. Construction of the CGA Tayan plant commenced in 2011 with commissioning phase in 2013 and commercial production started in 2015

BORNEO ISLAND



SEKILAS CHEMICAL GRADE ALUMINA

CHEMICAL GRADE ALUMINA OVERVIEW



01

- Bijih bauksit ditambang dengan metode penambang terbuka menggunakan ekskavator dan truk.
- Bijih yang telah ditambang kemudian dicuci dan disaring.
- Bauxite ore is mined using open pit methods with excavator and truck.
- After the ore is mined, the ore is washed and screened.

02

- Proses penjernihan *liquor* dimulai dari penggerusan bijih bauksit dengan menggunakan *rod mill*.
- Hasil dari *rod mill* akan dicampurkan dengan larutan kaustik soda yang telah dipanaskan.
- Dilanjutkan dengan proses penurunan temperatur dan pemisahan larutan yang kaya dengan alumina dengan padatan yang tidak bereaksi (*red mud*).
- Liquor clarification process begins with the grinding of bauxite ore by using rod mill.
- The results of the rod mill will be mixed with caustic soda solution that has been heated.
- The process continues with temperature reduction and the separation of the solution which is enriched by alumina and un-dissolved solid (*red mud*).

03

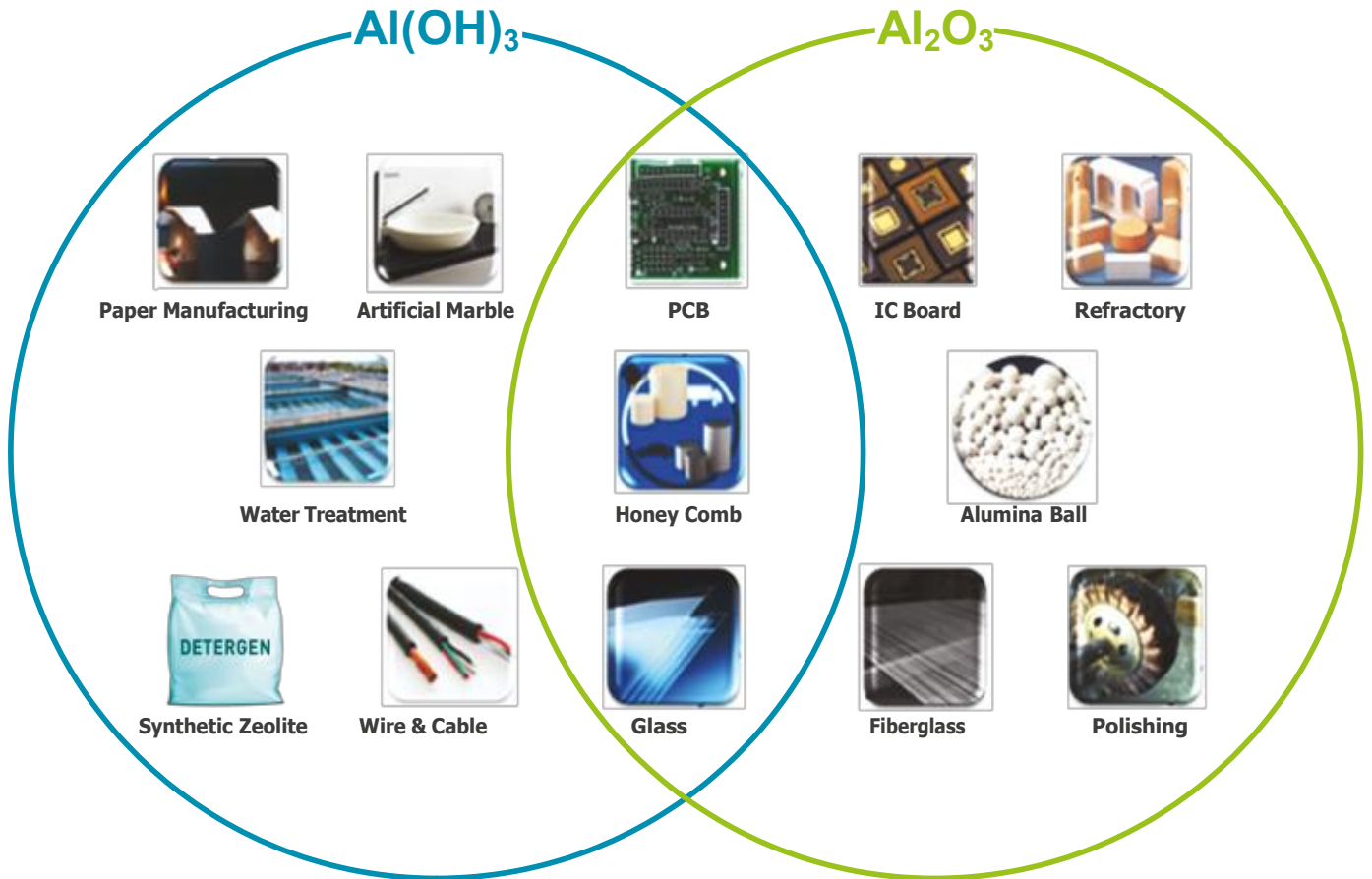
- Proses pengendapan dibagi ke dalam 4 jalur rantai.
- Setelah terjadi kristalisasi dalam proses pengendapan maka dilanjutkan proses klasifikasi untuk memisahkan alumina trihidrat.
- Produk alumina trihidrat hasil dari proses pengendapan akan difiltrasi sebelum menuju proses kalsinasi.
- The precipitation process is divided into 4 chain lines.
- After crystallization occurs in the precipitation process, it continues with the classification process to separate the alumina trihydrate.
- The product of alumina trihydrate which results from the precipitation process will be filtrated prior to the calcination process.

04

- Proses kalsinasi adalah perlakuan panas pada suhu tinggi di bawah *melting point*.
- Setelah proses kalsinasi, alumina didinginkan di *planetary cooler* yang berputar mengikuti rotasi *kiln*.
- Setelah proses pendinginan, produk alumina ditampung di dalam silo.
- Calcination process is the heating treatment at high temperature below melting point.
- After the calcining process, the alumina is cooled in the planetary cooler that rotates following the rotation of the kiln.
- After the cooling process, alumina products are accommodated in silos.

APLIKASI CHEMICAL GRADE ALUMINA

CHEMICAL GRADE ALUMINA APPLICATION



PRODUK KAMI

OUR PRODUCTS

Aplikasi Umum Aluminum Hydroxide Aluminum Hydroxide General Application

Grades		Applications		Chemicals						Rubber & Plastics							Ceramics			Others				
				Aluminum Sulfate	Poly-aluminum chloride	Aluminum Fluoride	Synthetic zeolit	Sodium aluminate	Various aluminum salts	Roof and ceiling materials	Print circuit board	Electric wire and cable	BMC, SMC	FRP	Artificial marble	Rubber	Adhesive	Tire	Paint	Synthetic mulite	Glass	Ceramics fiber	Separator	Paper Manufacture
Standard	H-WB	x	x	x	x	x	x	x	x									x			x		x	
	H-10	x	x		x	x	x	x	x	x	x	x				x		x	x	x	x		x	
Fine & Extra Fine	H-21					x	x	x	x	x	x						x	x						
	H-31						x	x	x	x	x			x	x							x		
	H-32						x	x	x	x	x			x	x	x						x	x	
	H-42																					x	x	x
	H-42M									x		x		x	x	x	x					x	x	
	H-43																					x	x	x
	H-43M													x	x	x	x					x	x	
	HP Process	HP-350						x	x	x	x	x	x	x	x		x					x		x
Specialty Process	Coupling Treated Products										x	x		x	x	x	x							
	Low Viscosity Products											x		x			x							
	Low Electro Conductivity Products												x			x								
	Stearic Acid Treated Products													x										
High Whiteness	H-100-ME										x		x											
	H-210, H-310, H-320										x		x		x									
	H-141										x		x											
	HS-320, HS-300										x		x		x									
	Specially Processed Products										x		x		x									

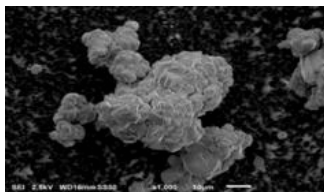
Aplikasi Umum Alumina Alumina General Application

Grades \ Applications		Ceramics								Refractories				Polishing & Lapping			Others										
		Laboratory porcelain	Abrasion-resistant porcelain	Crucible	Insulator	Spark plug	Electronic parts	Ceramic tool	IC Substrate package	Semiconductor parts	Ceramic filter	Fused alumina	Sintered alumina	Synthetic spinel	Formed refractory	Castable refractory	Ceramic fiber	For hard material	For soft material	Fine polishing	Glass	Welding rod	Separator	Catalyst	Resin filler	Paint	Blast
Standard	A-12			x	x						x		x	x		x					x	x					
	A-13 Series	x	x	x	x							x	x		x	x					x	x					
Coarse	A-12C										x					x											
Fine	A-42 Series		x	x	x								x	x	x		x		x	x	x	x	x	x	x	x	x
	A-420	x	x	x		x																		x			
Extra Fine	A-43 Series					x																					
	AL-13 Series	x	x		x	x																					
Low Soda	AL-13KT																						x		x		
	AL-17 Series	x			x			x	x																		
	AL-43 Series	x	x																							x	
	AL-47 Series	x				x			x																	x	
Thermally Reactive	AL-160SG	x	x			x	x		x	x			x	x	x		x						x	x	x	x	x
	AL-170		x			x	x						x	x											x		
	A-172, A-173														x												
	A-161SG	x	x			x									x												

ALUMINUM HYDROXIDE

PARTIKEL STANDAR DAN KASAR

ALUMINUM HYDROXIDE-STANDARD AND COARSE PARTICLE



SEM H-WB



SEM H-10

Aluminum hydroxide berukuran standar merupakan produk aluminum hydroxide terkemuka yang diproduksi dengan proses Bayer dan digunakan sebagai sumber aluminum yang memiliki tingkat kemurnian tinggi sebagai material dasar untuk produk-produk kimia, gelas, katalis dan lain-lain. Grade H-W yang merupakan aluminum hydroxide berkarakteristik *highly reactive* dengan tingkat kelembaban sekitar 10% sangat cocok untuk material dasar untuk memproduksi *aluminum salts* dan *aluminates* melalui reaksi dengan asam dan alkali. Grade H-10, produk *aluminum hydroxide* kering, digunakan untuk material gedung bersifat *flame retardant*, gelas dan katalis.

Standard-sized aluminum hydroxide is the leading aluminum hydroxide produced with Bayer process and is used as a highly pure aluminum source for base materials of chemical products, glass, catalysts, and others. The H-W grade, a highly-reactive aluminum hydroxide with moisture content of about 10%, is suitable for base material to produce aluminum salts and aluminates by reaction with acids and alkalis. The H-10 grade, a dry aluminum hydroxide, is used for flame retardant building material, glass, and catalysts

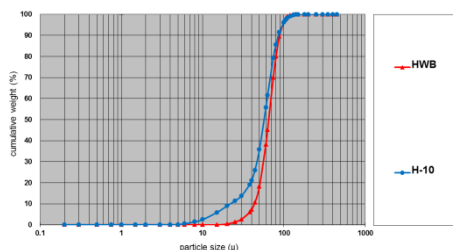
Karakteristik Umum | Typical Properties

Properties*	Grades		
	Wet Type H-WB	Dry Type H-10	
Chemical Composition	Moisture (%)	10	0.03
	Al(OH) ₃ (%) **	99.9	99.9
	Fe ₂ O ₃ (%)	0.01	0.01
	SiO ₂ (%)	0.00	0.00
	Na ₂ O (%)	0.13	0.13
Mean particle size (µm)	Loosed	61	59
	Tapped	0.5	1.0
Bulk density (g/cm ³)	Loosed	1.4	1.6
	Tapped	89	92
Whiteness			

* Dianalisa menggunakan metode standar ICA yang setara dengan standar global pemurnian alumina | Analyzed by ICA test methods which are in line with the global standards for alumina refinery

** Batas kandungan Al(OH)₃ minimum adalah 99,8% | The limit of Al(OH)₃ content is 99.8% minimum

Distribusi Ukuran Partikel | Particle Size Distribution



Penggunaan Utama | Main Application

1. Aluminum sulfate, aluminum fluoride, cryolite, polyaluminum chloride, and other aluminum salts
2. Synthetic mullite, and refractories
3. Porcelain materials/pigments
4. Glass and glass fiber
5. Latex compounds, flame-retardant building material, and resin filler
6. Catalyst and catalyst carrier

Kemasan | Packing

Bulk
Flexibel Container Bag (1,000 kg)
Paper Bag (25 kg)

ALUMINUM HYDROXIDE PARTIKEL HALUS DAN SANGAT HALUS

ALUMINUM HYDROXIDE-FINE PARTICLE AND EXTRA-FINE PARTICLE

Aluminum hydroxide terdekomposisi melalui dehidrasi di temperatur 200-350°C, diiring dengan penyerapan panas secara substansial. Oleh karena itu, *aluminum hydroxide* yang diisikan di karet, plastik atau kertas, meminimalisir peningkatan temperatur meski dipanaskan. Produk ini juga memiliki karakteristik *self-extinguishing* dan menurunkan keluarnya uap. Sebagai tambahan, *aluminum hydroxide* tidak mengeluarkan gas beracun dan karenanya berfungsi sebagai *filler flame retardant* yang baik. Produk ini juga meningkatkan resistensi *arc* dan resistensi *tracking* pada plastik. Untuk produk-produk dengan karakteristik tersebut, produk *fine or extra fine particles* (H-42M and H-43M) adalah yang paling cocok.

Aluminum hydroxide is decomposed by dehydration at 200-350°C, accompanied by substantial heat absorption. Therefore, aluminum hydroxide filled in rubber, plastic, or paper minimizes its temperature increase even if heated, promotes self-extinguishing performance, and reduces the release of fumes. In addition, aluminum hydroxide generates no poisonous gas and consequently functions as an excellent flame-retardant filler. It also improves the arc resistance and tracking resistance of plastic. As such, fine or extra fine particles (H-42M and H-43M) are suitable for these purposes.

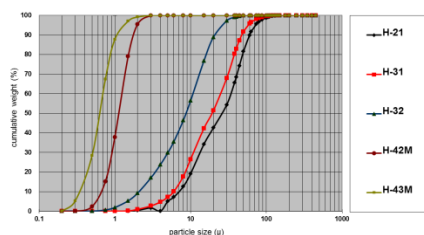
Karakteristik Umum | Typical Properties

Properties*	Grades	Fine Particle			Extra-fine particle	
		H-21	H-31	H-32	H-42M	H-43M
Chemical Composition	Moisture (%)	0.08	0.08	0.15	0.27	0.30
	Al(OH) ₃ (%) **	99.9	99.8	99.9	99.8	99.8
	Fe ₂ O ₃ (%)	0.01	0.01	0.01	0.01	0.01
	SiO ₂ (%)	0.00	0.00	0.00	0.01	0.01
	Na ₂ O (%)	0.13	0.14	0.13	0.18	0.24
	W-Na ₂ O (%)	0.02	0.02	0.02	0.02	0.04
+74 μm (%)		0.19	0.04	-	-	-
+44 μm (%)		-	-	0.05	0.01	0.01
Mean particle size (μm)		30.0	19.2	8.2	1.0	0.6
Bulk density (g/cm ³)	Loosed	0.9	0.9	0.6	0.3	0.2
	Tapped	1.4	1.2	1.1	0.8	0.8
Whiteness		98	97	99	100	100
BET specific surface area (m ² /g)		0.5	1.0	2.4	5.2	7.0

* Dianalisa menggunakan metode standar ICA yang setara dengan standar global pemurnian alumina | Analyzed by ICA test methods which are in line with the global standards for alumina refinery

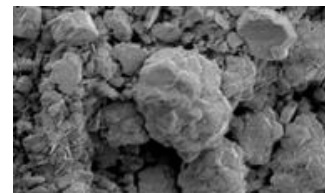
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Distribusi Ukuran Partikel | Particle Size Distribution

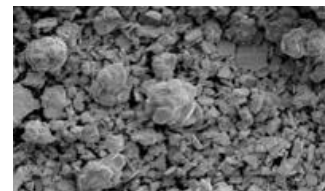


Penggunaan Utama | Main Application

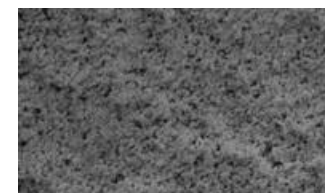
1. PAC, various kinds of aluminum salt
2. Flame-retardant filler for latex compounds and synthetic rubber
3. Flame-retardant filler for PVC, epoxy resin, polyurethane resin, and polyolefin resin
4. Pigment for coated paper



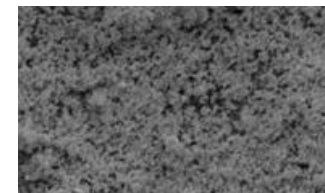
SEM H-21



SEM H-31



SEM H-42M



SEM H-43M

Kemasan | Packing

Flexibel Container Bag (1,000 kg)
Paper Bag (25 kg)

ALUMINUM HYDROXIDE

PROSES SPECIALTY

ALUMINUM HYDROXIDE-SPECIALTY PROCESS

Untuk meningkatkan penggunaan aluminum hydroxide yang memiliki karakteristik superior seperti *flame retardant* yang tinggi dan pengeluaran uap yang kecil, ICA memiliki beragam jenis produk *specialty*, termasuk produk-produk yang memiliki kesesuaian lebih baik dengan karet dan plastik. Produk-produk ini termasuk produk yang diproses dengan *coupling agent*, produk yang memiliki viskositas rendah, produk dengan *low electrical conductivity* dan produk yang diproses menggunakan *stearic acid*.

In order to expand usage of aluminum hydroxide, which has superior characteristics such as high flame retardant and low fume release, ICA has various kinds of specialtyprocessed products including those with improved compatibility with rubber and plastic. These products includes products processed with coupling agent, low- viscosity products, low electrical-conductivity products and products processed with stearic acid.

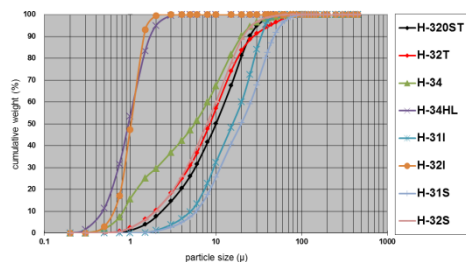
Karakteristik Umum | Typical Properties

Properties*	Grades	Coupling-agent-treated		Low-viscosity		Low-conductivity		Stearic-acid-treated	
		H-320ST	H-32T	H-34	H-34HL	H-31I	H-32I	H-31S	H-32S
	Moisture (%)	0.06	0.13	0.15	0.16	0.03	0.07	0.12	0.10
	Al(OH) ₃ (%) **	99.9	99.9	99.8	99.8	99.9	99.9	99.9	99.9
Chemical Composition	Fe ₂ O ₃ (%)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	SiO ₂ (%)	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
	Na ₂ O (%)	0.12	0.13	0.18	0.18	0.09	0.12	0.13	0.11
	W-Na ₂ O (%)	0.01	0.02	0.02	0.02	0.002	0.004	0.02	0.01
	+44 μm (%)	0.05	-	0.03	0.03	-	0.01	-	0.04
	Mean particle size (μm)	11.3	7.9	5.7	4.9	16.2	7.8	19.7	7.8
Bulk density (g/cm ³)	Loosed	0.8	0.7	0.5	0.6	0.8	0.6	1.1	0.8
	Tapped	1.2	1.2	0.7	1.0	1.5	1.1	1.5	1.2
	Whiteness	99	98	99	99	100	100	99	100
	BET specific surface area (m ² /g)	1.5	0.8	2.3	1.7	4.5	2.4	0.7	0.8
	Oil absorption (ml/100g)	24	16	20	14	26	25	19	20
	Electric conductivity (μS/cm)	-	-	-	-	18	17	-	-

* Dianalisa menggunakan metode standar ICA yang setara dengan standar global pemurnian alumina | Analyzed by ICA test methods which are in line with the global standards for alumina refinery

** Batas kandungan Al(OH)₃ minimum adalah 99,8% | The limit of Al(OH)₃ content is 99.8% minimum

Distribusi Ukuran Partikel | Particle Size Distribution

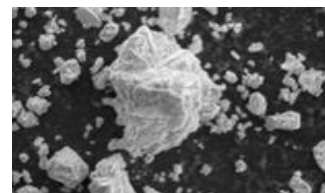


Penggunaan Utama | Main Application

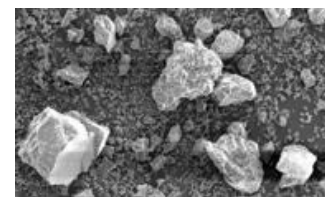
1. For epoxy moldings, and polyolefin wire
2. For BMC, SMC, and various FRP products
3. For epoxy and polyurethane resin cast articles, PCB and other electrical parts
4. For Rubber, polyvinyl chloride resin, and polyolefin products

Kemasan | Packing

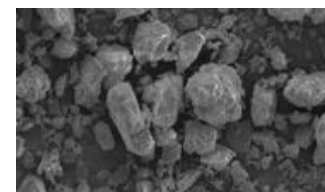
Flexibel Container Bag (1,000 kg) Paper Bag (25 kg)



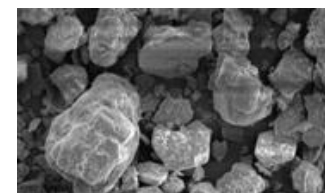
SEM H-32T



SEM H-34



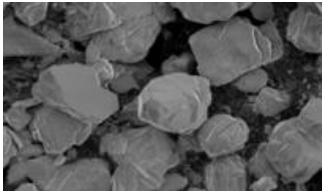
SEM H-31I



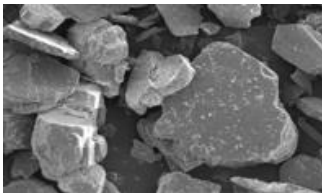
SEM H-31S

ALUMINUM HYDROXIDE HIGH-WHITENESS

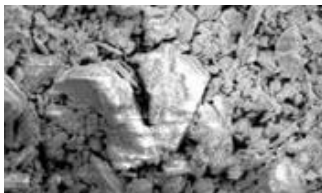
ALUMINUM HYDROXIDE-HIGH-WHITENESS



SEM H-100-ME

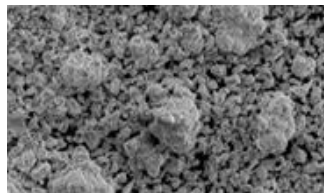


SEM H-210



SEM HS-320ST

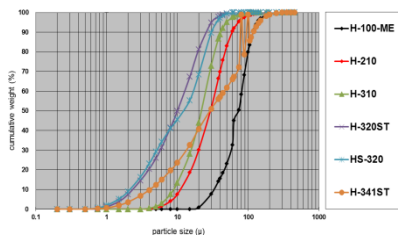
Aluminum hydroxide dengan karakteristik *high whiteness* diendapkan dari solusi *sodium aluminate* dengan kemurnian tinggi yang bersifat bebas organik. Memanfaatkan karakteristik optik yang dimiliki (dengan indeks refraktif 1,57), aluminum hydroxide ini digunakan sebagai *filler* pualam artifisial yang dibuat dari *unsaturated resin polyester* atau resin akrilik. ICA juga menyediakan produk yang diproses secara khusus selain beragam produk yang dihasilkan seperti produk dengan ukuran standar sampai dengan ukuran halus, tergantung dari maksud penggunaan. HS series adalah *grade* dengan desain kualitas eksklusif untuk pualam artifisial dan memiliki partikel berbentuk lingkaran dengan *fine powder* lebih sedikit. Oleh karena itu, produk ini memiliki area permukaan spesifik yang lebih kecil dan *ambient-temperature curing rate* lebih tinggi dibanding seri konvensional.



SEM HS-320

High whiteness aluminum hydroxide is precipitated from organics-free, high-purity sodium aluminate solution. Taking advantage of its optical characteristics (with refractive index of 1.57), aluminum hydroxide is used as an artificial marble filler made from unsaturated polyester resin or acrylic resin. ICA also provides specially processed products in addition to various products ranging from standard-sized to fine particles, depending on the purpose of use. HS series is the grade with a quality design exclusive for artificial marble, and has round shaped particles with less fine powder. Because of that, the specific surface area is smaller and the ambient-temperature curing rate is higher than conventional series.

Distribusi Ukuran Partikel | Particle Size Distribution



Penggunaan Utama | Main Application

1. Artificial marble filler
2. Rubber and plastic filler

Kemasan | Packing

Flexibel Container Bag
(1,000 kg)
Paper Bag (25 kg)

Karakteristik Umum | Typical Properties

Properties*	Grades	Standard Particle	Fine Particle			Specially processed	HS Series
		H-100-ME	H-210	H-310	H-320ST	H-341ST	HS-320
Chemical Composition	Moisture (%)	0.03	0.02	0.14	0.06	0.02	0.14
	Al(OH) ₃ (%) **	99.9	99.9	99.8	99.8	99.9	100
	Fe ₂ O ₃ (%)	0.01	0.01	0.01	0.01	0.01	0.01
	SiO ₂ (%)	0.00	0.00	0.00	0.00	0.00	0.00
	Na ₂ O (%)	0.14	0.12	0.15	0.14	0.02	0.03
	W-Na ₂ O (%)	0.00	0.00	0.01	0.01	0.01	0.00
+74 µm (%)		-	0.61	0.00	-	-	-
+44 µm (%)		-	-	-	0.05	-	0.33
Mean Particle size (µm)		73.3	29.3	21.9	10.0	45.3	7.6
Bulk density (g/cm ³)	Loosed	1.2	0.9	0.7	0.8	1.0	0.7
	Tapped	1.8	1.4	1.2	1.2	1.7	1.3
Whiteness		94.4	98.7	99.9	99.2	99	100.0
BET specific surface area (m ² /g)		-	0.5	0.9	2.0	0.5	1.8
Tone of Color (Powder)	Color L	98.4	-	100	99	-	-
	Color a	-0.5	-	-0.5	-0.4	-	-
	Color b	1.2	-	0.5	0.8	-	-
Oil absorption (ml/100g)		-	-	21	19	12	18

* Dianalisa menggunakan metode standar ICA yang setara dengan standar global pemurnian alumina | Analyzed by ICA test methods which are in line with the global standards for alumina refinery
** Batas kandungan Al(OH)₃ minimum adalah 99,8% | The limit of Al(OH)₃ content is 99.8% minimum

ALUMINA

PARTIKEL STANDAR DAN KASAR

ALUMINA-STANDARD AND COARSE PARTICLE

Alumina berukuran standar adalah alumina paling umum dengan diameter partikel rata-rata sekitar 60µm dan diameter kristal akhir dikendalikan. A-12 adalah aluminayang dikalsinasi pada temperatur tinggi dan berisikan partikel kristal akhir yang relatif besar. A-13 series terdiri dari Kristal akhir yang bersifat halus dan seragam dan memiliki karakteristik *highly thermal-reactive* dengan 3 *grades*, tergantung dari ukuran kristal akhir. Alumina kasar memiliki tingkat kekasaran yang lebih dibandingkan produk berukuran dan standar. Produk inimemiliki karakteristik kandungan soda yang rendah dan *low dusting* serta *high fluidity*.

Standard-sized alumina is the most general alumina with mean particle diameter of about 60µm and ultimate crystal diameter is controlled. A-12 is alumina calcined at high temperature and consists of relatively large ultimate crystal particles. A-13 series consists of fine and uniform ultimate crystals and is highly thermal-reactive, with 3 grades depending on ultimate crystal size. Coarse alumina is coarser than standard-sized one and characterized by low soda contents, with low dusting and high fluidity.

Karakteristik Umum | Typical Properties

Properties*	Grades	Standard Particle				Coarse Particle
		A-12	A-13-H	A-13-M	A-13-L	A-12C
Chemical Composition	LOI (%)	0.08	0.08	0.07	0.13	0.08
	Fe ₂ O ₃ (%)	0.02	0.02	0.02	0.02	0.02
	SiO ₂ (%)	0.01	0.01	0.01	0.01	0.01
	Na ₂ O (%)	0.22	0.26	0.21	0.20	0.17
	Al ₂ O ₃ (%)	99.7	99.6	99.7	99.6	99.7
Specific gravity		3.95	3.95	3.94	3.94	3.95
Mean particle size (µm)		56.3	55.0	55.1	53.3	84.7
Bulk density (g/cm ³)	Loosed	0.7	0.8	0.9	0.7	0.9
	Tapped	1.3	1.4	1.4	1.3	1.6
BET specific surface area (m ² /g)		0.6	0.9	3.8	7.5	0.8

* Dianalisa menggunakan metode standar ICA yang setara dengan standar global pemurnian alumina | Analyzed by ICA test methods which are in line with the global standards for alumina refinery

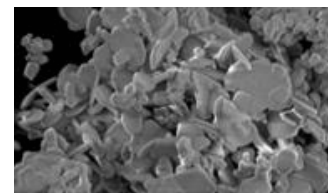
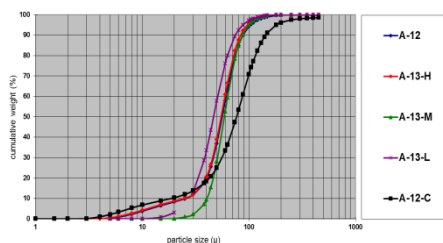
Penggunaan Utama | Main Application

1. Sintered alumina, mullite, and spinel
2. Fused alumina, Fused mullite
3. Formed and castable refractory
4. Ceramics fiber and glass fiber
5. Glass
6. High-alumina porcelain
7. Separators

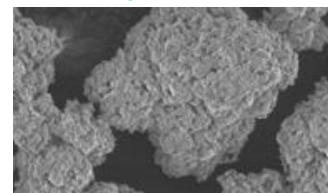
Kemasan | Packing

Flexibel Container Bag (1,000 kg)
Paper Bag (25 kg)

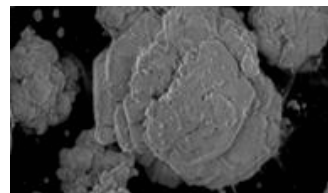
Distribusi Ukuran Partikel | Particle Size Distribution



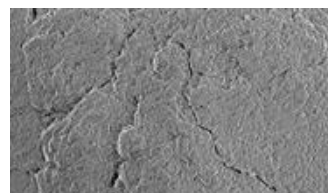
SEM A-12



SEM A-13-H



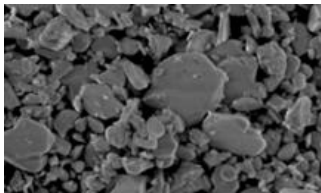
SEM A-13-M



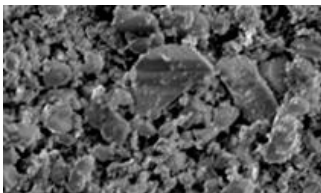
SEM A-12C

ALUMINA PARTIKEL HALUS DAN SANGAT HALUS

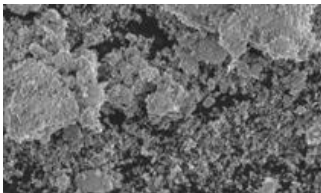
ALUMINA-FINE AND EXTRA-FINE PARTICLE



SEM A-42-2



SEM A-171



SEM A-43-L

Seri A-42 merupakan alumina dengan partikel halus paling umum untuk refraktori dan porselen. A-420 memiliki massa jenis besar yang terkompresi tinggi dan *high thermal reactivity*. Hal ini menjadikan *dense sintered compact* dapat diperoleh. Seri A-43 *minute alumina* sangat baik digunakan dalam aktivitas *sintering* dan memiliki 2 *grade* tergantung dari diameter partikel kristalakhir.

A-42 series is the most general fine-particle alumina used for refractory and porcelain. A-420 has high compressed bulk density and high thermal reactivity, so dense sintered compact can be obtained. A-43 series of minute alumina is excellent in sintering activity and has 2 grades depending on ultimate crystal particle diameter.

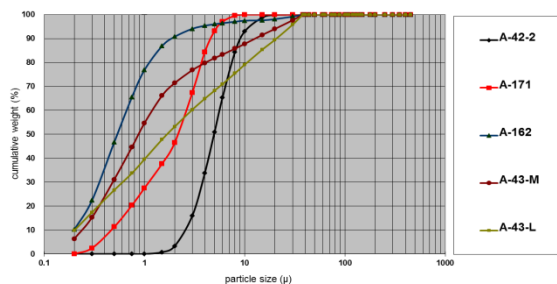
Karakteristik Umum | Typical Properties

Properties*	Grades	Fine Particle		Extra-fine particle		
		A-42-2	A-171	A-162	A-43-M	A-43-L
Chemical Composition	LOI (%)	0.17	0.28	0.43	0.31	0.66
	Fe ₂ O ₃ (%)	0.02	0.02	0.02	0.02	0.02
	SiO ₂ (%)	0.02	0.01	0.02	0.01	0.01
	Na ₂ O (%)	0.21	0.22	0.13	0.20	0.21
	Al ₂ O ₃ (%)	99.6	99.5	99.4	99.5	99.1
Specific gravity		3.95	3.93	3.94	3.94	3.92
Mean Particle size (µm)		4.9	2.3	0.6	0.9	1.8
Bulk density (g/cm ³)	Loosed	0.8	1.0	0.9	0.6	0.8
	Tapped	1.5	1.8	1.5	1.3	1.4
BET specific surface area (m ² /g)		1.3	3.1	5.8	5.7	10.9

* Dianalisa menggunakan metode standar ICA yang setara dengan standar global pemurnian alumina | Analyzed by ICA test methods which are in line with the global standards for alumina refinery

** Batas kandungan Al₂O₃ minimum adalah 99,8% | The limit of Al₂O₃ content is 99.8% minimum

Distribusi Ukuran Partikel | Particle Size Distribution Application



Penggunaan Utama | Main

1. Insulator
2. Crucibles
3. Formed and castable refractory
4. Synthetic spinel
5. Polishing and lapping filler
6. Welding rod, flux
7. Paint
8. Various kind and porcelain

Kemasan | Packing

Flexibel Container Bag (1,000 kg)
Paper Bag (25 kg)

ALUMINA LOW SODA

ALUMINA-LOW SODA

Low soda alumina kebanyakan digunakan untuk komponen elektronik termasuk IC boards dan IC packages, termasuk juga untuk material dasar busi dan produk keramik *electrical insulating* lainnya. ICA dapat menyediakan *low soda* alumina dengan ukuran *standard* dan halus yang memiliki kandungan soda, ukuran kristal akhir, bentuk dan ukuran distribusi dikendalikan dalam produksi.

Low soda alumina is widely used for electronic parts including IC boards and IC packages as well as base material of spark plug and other electrical insulating ceramics. ICA can provide standard-sized and fine-sized low soda alumina with soda content, ultimate crystal size, shape and size distribution adjusted in production.

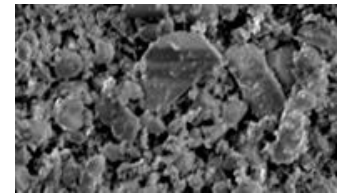
Karakteristik Umum | Typical Properties

Properties*	Grades	AL-13 series		AL-17 Series		AL-43 Series	
		AL-13KT	AL-17-1	AL-17-2	AL-43-M	AL-43-KT	
Chemical Composition	LOI (%)	0.03	0.02	0.02	0.15	0.08	
	Fe ₂ O ₃ (%)	0.03	0.02	0.02	0.02	0.03	
	SiO ₂ (%)	0.02	0.02	0.01	0.01	0.03	
	Na ₂ O (%)	0.06	0.06	0.06	0.02	0.05	
	Al ₂ O ₃ (%) **	99.9	99.9	99.9	99.8	99.8	
Specific gravity		3.97	3.96	3.96	3.95	3.93	
Mean Particle size (µm)		84.6	52.9	50.8	2.1	4.8	
Bulk density (g/cm ³)	Loosed	0.78	0.77	0.75	0.73	0.84	
	Tapped	1.41	1.38	1.38	1.56	1.63	
BET specific surface area (m ² /g)		0.5	1.6	1.0	3.0	1.5	

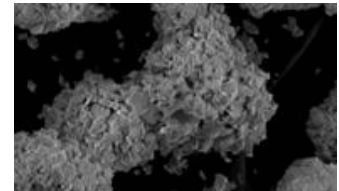
* Dianalisa menggunakan metode standar ICA yang setara dengan standar global pemurnian alumina |

Analyzed by ICA test methods which are in line with the global standards for alumina refinery

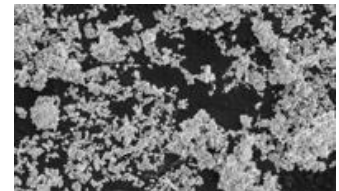
** Batas kandungan Al₂O₃ minimum adalah 99,8% | The limit of Al₂O₃ content is 99.8% minimum



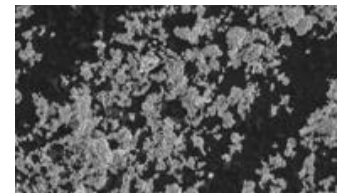
SEM AL-13KT



SEM AL-17-1

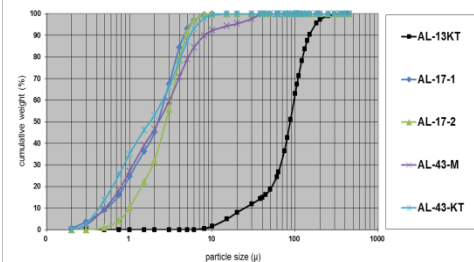


SEM AL-43M



SEM AL-43KT

Distribusi Ukuran Partikel | Particle Size Distribution



Penggunaan Utama | Main Application

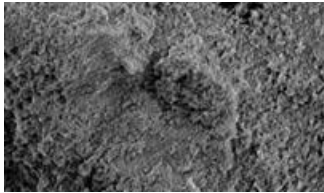
1. IC boards and packages
2. Laboratory porcelains
3. Abrasion-resistant ceramics
4. Resistance insulators
5. Spark plug
6. Resin filler

Kemasan | Packing

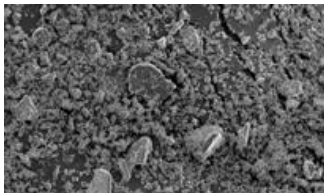
Flexibel Container Bag (1,000 kg)
Paper Bag (25 kg)

ALUMINA THERMALLY REACTIVE

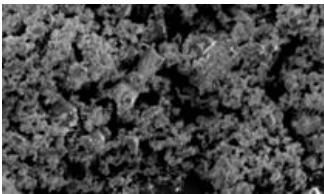
ALUMINA-THERMALLY REACTIVE



SEM AL-160SG-3



SEM AL-170



SEM A-172

Produk *thermally reactive* alumina digunakan dalam pembuatan keramik dan refraktori, serta untuk penggunaan pemolesan, karena dapat dikonversikan menjadi produk keramik dengan tingkat kepadatan yang tinggi pada suhu yang rendah. Produk ini juga memiliki karakteristik yang unggul seperti ukuran partikel sangat halus (seri AL-160SG) dan viskositas rendah (seri AL-170 and A-170).

Thermally reactive alumina products are used in making ceramics and refractories, as well as for polishing use, because of being able to be converted into high density ceramic products at low temperatures but also of their offering advantageous properties such as extra fine particle sizes (AL-160SG series) and low viscosity (AL-170 and A-170 series).

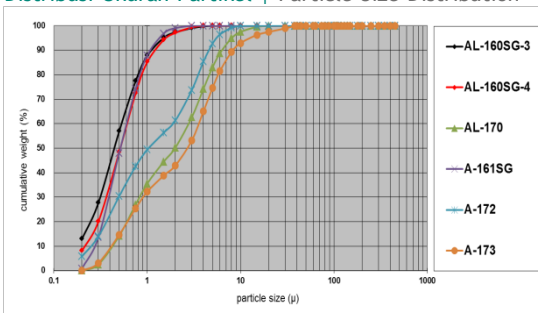
Karakteristik Umum | Typical Properties

Properties*	Grades	Low soda type			Normal soda type	
		AL-160SG-3	AL-160SG-4	AL-170	A-172	A-173
Chemical Composition	LOI (%)	0.37	0.19	0.22	0.19	0.24
	Fe ₂ O ₃ (%)	0.02	0.02	0.02	0.02	0.02
	SiO ₂ (%)	0.02	0.01	0.02	0.02	0.02
	Na ₂ O (%)	0.06	0.06	0.05	0.20	0.12
	Al ₂ O ₃ (%) **	99.5	99.7	99.7	99.6	99.6
Specific gravity		3.93	3.94	3.94	3.93	3.94
Mean Particle size (µm)		0.49	0.52	1.8	1.0	2.9
	Loosed	1.05	0.80	0.95	1.08	0.86
Bulk density (g/cm ³)	Tapped	1.65	1.19	1.70	1.86	1.70
	Pressed	2.29	2.32	2.59	2.54	2.57
	BET specific surface area (m ² /g)	6.9	7.0	3.1	7.5	2.9

* Dianalisa menggunakan metode standar ICA yang setara dengan standar global pemurnian alumina | Analyzed by ICA test methods which are in line with the global standards for alumina refinery

** Batas kandungan Al₂O₃ minimum adalah 99,8% | The limit of Al₂O₃ content is 99.8% minimum

Distribusi Ukuran Partikel | Particle Size Distribution

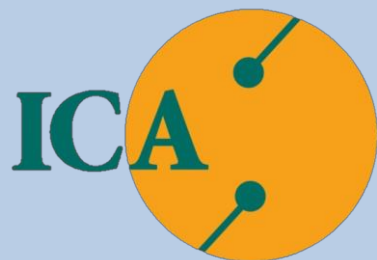


Penggunaan Utama | Main Application

1. IC boards and package
2. Factory machine parts
3. Abrasion-resistant ceramics
4. Heat-resistant ceramics
5. High-quality refractories
6. Castable refractories
7. Catalyst carrier

Kemasan | Packing

Flexibel Container
Bag (1,000 kg) Paper
Bag (25 kg)



Integrity
Customer focus
Accountability



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PT Indonesia Chemical Alumina

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