TECHNICAL DATA SHEET

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2MG.007
Ceramic Powders

Summary

Final Advanced Materials Sàrl
4 avenue de Strasbourg
68350 Didenheim – France
Tel : +33 (0) 3 67 78 78 78

Final Advanced Materials GmbH
Basler Strasse 115
79115 Freiburg – Deutschland
Tel: + 49 (0) 761 47 87 336

www.final-materials.com

Overview

Our range of powders, oxides and fillers encompass a wide range of materials and fulfil many applications and needs: fillers for polymer resins or cements, production of sintered parts, electrical insulation, thermal conduction, abrasion and more.

Applications

- Precision honing and polishing
- Precision Sandblasting/Micro sandblasting
- Metallographic and mineralogical polishing
- Filler for synthetic resins and elastomers
- Special filler
- Additives for epoxy moulding compounds
- Oven filling
- Dry pressing
- Injection moulding
- Thermal interface material
- Manufacture of substrates
- Removal and lubrication
- Coating
- Filtration
- Manufacture of oxygen sensors
- Thermal barrier coatings for gas turbines and diesel engines
- Grain growth inhibitor for non-oxide ceramics

info@final-materials.com

Product Range

Alumina Powder

The structure, the purity, the hardness and the specific surface area area are the main characteristics of Al_2O_3 powders. The differences between the products may seem minimal but the physico-chemical properties between two ranges are completely different.

Our wide range of alumina powder will allow you to select the product best suited to your application., are available:

- Sintering powders
- Filling powders
- polishing powders
- Anti-sticking powder (to prevent parts sticking during heat treatment)

When choosing the product, the following criterias have to be taken into account:

- Granulometry
- Calcination time
- Hardness
- Specific surface area

Applications:

- Precision honing and polishing
- Precision Sandblasting/Micro sandblasting
- Metallographic and mineralogical polishing
- Filler for synthetic resins and elastomers
- Special filler
    - Example: flame retardant filler for synthetic resins, foams and elastomers
- Oven filling

Ceramic Powders

Item N°	Purity	Hardness	d_{50}	Ex. Application
Serie 100	average	Very high	1,5 µm to 2,35 mm	Precision honing and polishing Precision Sandblasting/Micro sandblasting Compressed air surface treatment Electrical insulation
Serie 200	High	High	3 µm to 80 µm	Filler for synthetic resins Filler for elastomers
Serie 300	< Serie 200	High	0,50 µm to 80 µm	Filler for synthetic resins Filler for elastomers Anti-stick agent
Serie 400	Average	High	0,6 µm & 80 µm	Added to certain paints/inks, formation of a particularly hard coating
Serie 500	Average	Average	3 µm & 60 µm	Filler for synthetic resins Filler for elastomers
Serie 600	Somewhat low	Average	3 µm & 60 µm	Common or special industrial sanding/polishing
Serie 900	Average	Low	0,3 & 10 mm	Filtration, purification
Serie 1000	High	Average	0,05 to 3 µm	Metallographic and mineralogical polishing
Serie 1100	High	Low	10 to 80 µm	Precision polishing
Serie 1400	-	-	150 µm	Electrical resistance filling
Serie 2000	High	Average	0,4 to 80 µm	Filler for wear resistance Electrical insulation Electronic components Porous ceramics Catalyst support
Serie 3000	High	Very high	15 µm	High purity polishing Special filler for synthetic resins and elastomers
Serie 4000	Average	High	80 to 118 µm	Micro sandblasting and micro polishing
Serie 5000	Very high	Low	0,5 to 10µm & 0,6 to 20 µm	Special high purity filler
Serie 5100	Average	High	0,7 to 90 µm	Special filler for synthetic resins and elastomers
Serie 5200	Average	Average	0,65 to 80 µm	Sanding and polishing
Serie 5300	High	High	3 µm	Special filler for synthetic resins and elastomers
Serie 5400	High	High	0,6 µm	Special filler for synthetic resins and elastomers Nanometric polishing

Magnesium Oxide Powder

Magnesium oxide is both an excellent electrical insulator and a very good thermal conductor. These properties are appreciated in the thermal industry as a component of thermocouples and heating systems.

Applications:

- Dry pressing
- Injection moulding

Technical Data:

Property	Unit	Grade 94 %	Grade 99 %			Grade 99,6 %
N° article		171-0010	171-0020	171-0030	171-0040	171-0050
Grain Size	µm	45-425	45-425	75-180	63-90	75-180
Standard Purity						
MgO	%	> 94.0	> 99	> 99	> 99	> 99.6
Al_2O_3		< 1.2	< 0.15	< 0.15	< 0.15	< 0.10
Fe_2O_3		< 0.22	< 0.10	< 0.10	< 0.10	< 0.08
SiO_2		< 4.0	< 0.25	< 0.25	< 0.25	< 0.08
CaO		< 1.6	< 0.5	< 0.50	< 0.60	< 0.15
B_2O_3		< 0.01	< 0.03	< 0.03	< 0.03	< 0.02
Grain-Size-Distribution						
< 45 µm	%	7	0	0	< 20	0
>45 µm		0	0	< 15	0	< 15
> 106 µm		0	0	< 10	< 5	< 10
> 250 µm		26 - 38	0	0	0	0
> 355 µm		< 7	< 5	0	0	0
> 425 µm		< 0.1	0	0	0	0

Graphite Powder

Graphite is a black mineral from carbon, with hexagonal cristalline strucutre. It is composed of graphene sheet which give it dieletric and anisotropic properties.

This material is found naturally in the form of flakes in the sediments, in veins or in amorphous form. The synthesis of graphite allows to obtain purer qualities, perfect for technical components.

Graphite is a tender material, thermal and electrical conductor with a fusion point of 3,500 °C.

Our screened graphite powder is obtained from our machinable graphite production scraps. Therefore the impurity rate is approximately at 200 ppm.

Applications:

- Filler for thermal conductivity improvement
- Thermal interface material
- Additives for epoxy molding components
- Filling for thermal heatsink
- Filler for electrical conductivity improvement

Technical Data:

Item N°	Screening en µm
113-0025	315 - 500
113-0024	200 - 315
113-0023	100 - 200
113-0022	50 - 100
113-0021	0 - 50

A custom-made screening or bulk filling are also available.

Packaging :

- 1 L bottle
- 5 L bottle
- 20 kg bag

Aluminium Nitride Powders

Final Advanced Materials offer a range of high purity aluminium nitride powders. The thermal and electrical properties of these powders are particularly appreciated in the semiconductor and electronics industry.

Aluminium nitride powders are distinguished by their thermal conductivity and high resistivity. They are resistant to corrosion, have a high hardness and a contain few metallic impurities.

Warning: Since the powders have not undergone any surface treatment, they must not be brought into contact with air or moisture before being used.

Applications :

- Filler for improving thermal conductivity
- Thermal interface material
- Manufacture of substrates
- Additives for epoxy moulding compounds
- Filling for LED bulb heat sinks

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Property		Unit	107-0101	107-0102	107-0103	107-0104	107-0105	107-0106	107-0107
Colour			grey	grey	grey	grey	grey	grey	grey
Density		g/cm²	3,26	3,26	3,26	3,26	3,26	3,26	3,26
Melting Point		°C	2,200	2,200	2,200	2,200	2,200	2,200	2,200
Particle Type			amorph	amorph	amorph	amorph	amorph	amorph	amorph
Particle Structure			irregular	irregular	irregular	irregular	irregular	irregular	irregular
Surface Coating			no	no	no	no	no	no	no
Granulometry	d_{10}	µm	1	2	4	6	9	40	58
	d_{50}	µm	2	5	10	20	30	50	80
	d_{90}	µm	4	10	25	60	82	72	108
Specific surface area		m²/g	< 3	< 2	< 1.5	< 1.5	< 0.5	< 0.5	< 0.5
Purity		%	98	98	98	98	98	98	98
Impurity	Ca	ppm	< 100	< 100	< 100	< 100	< 100	< 100	< 100
	Fe		< 700	< 700	< 700	< 700	< 700	< 700	< 700
	Si		< 200	< 200	< 200	< 200	< 200	< 200	< 200
	Pb		< 10	< 10	< 10	< 10	< 10	< 10	< 10
	Ca	%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Fe		< 1.5	< 0.75	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anti-Hydrolyse Property	Water Resistant Time Period		no	no	no	no	no	no	no
		h	< 8	< 8	< 8	< 8	< 8	< 8	< 8

A purified version at < 200 ppm of Iron is also available.

Boron Nitride Powders

Final Advanced Materials offers a wide range of boron nitride powders, purity and grain sizes from 1 to more than 100µm. The grades of these powders may vary depending on:

- Purity
- Grain distribution and size
- Level of agglomeration
- Specific surface area area
- Additives

These characteristics affect:

- Interaction with other materials
- Dispersion of particles
- Lubrication
- Thermal conductivity
- Electrical insulation

The high degree of crystallinity gives to this material incredible lubricating properties. It is used as charge to increase thermal conductivity of a piece.

General Applications:

- Removal
- Lubrication
- Coating
- Polymer filler
- Filler to enhance the thermal conductivity of plastic materials

Grade Presentation

Item N°	Purity	Grain size (µm)	Presentation	Ex. Applications
Grade 301	High	3	Wide spectrum of particle size Small proportion of agglomerates	Improved high temperature properties of oils and greases Filler for separating agents and plastics
Grade 302	High	2	Narrow grain size distribution High specific surface area thanks to its extremely fine quality.	Improved high temperature properties of oils and greases Filler for separating agents
Grade 303	High	4	Safe Temperature resistant in protective gas or under vacuum up to 2,000 °C	Improved high temperature lubricating properties of oils and greases Filler for separating and lubricating agents and plastics
Grade 304	High	5	Specific surface area and granulometry of moderate values	Additive for liquid separating and levelling agents Additive for separating and lubricating agents Filler for applications using plastics Treats coatings
Grade 305	High	1	Low granulometry Average particle size: 2,0 µm.	Additive for liquid separating and levelling agents Additive for separating and lubricating agents Filler for coatings
Grade 307	Very high	45	Ideal filler for plastics whose thermal conductivity needs to be increased while preserving the support's electrical insulation High BN concentration Minimum tool wear	Filler for thermally conductive pastes Filler for silicone resins, thermoplastics, hard plastics
Grade 308	High	10	Thanks to its structure, low to medium filling levels are possible, which allows it to dissipate heat.	Filler for thermally conductive pastes Filler for silicone resins, hard plastics
Grade 309	Average	9,5	Particularly high specific surface area An average particle size of 9µm Good distribution in fluid systems.	Additive for liquid separating and levelling agents Additive for separating and lubricating agents
Grade 310	High	12	High degree of crystallinity Exceptional lubricating properties Relatively small specific surface area As a filler, the viscosity of the matrix is hardly affected	Filler for improving high temperature properties in oils and greases Increased thermal conductivity of plastics Filler for coatings
Grade 311	Very high	20	High purity Crystallites size Exceptional lubricating properties	Filler for silicone resins and thermosets Increased thermal conductivity of plastics
Grade 312	High	120	Very high thermal conductivity – also at low loading levels High grade of agglomeration High loading levels possible in the system	Filler in plastics to increase the thermal conductivity In applications without limitation in particle size

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Grade 313	High	3,5	Optimum release and lubricating properties - also at high temperatures Very good distribution within liquid systems Electrically insulating	Filler and additive in liquid release agents and refractory coatings High temperature additive in lubricants

Technical Data

Property	Unit	Boron Nitride Powders											
Item N°		116-0301	116-0302	116-0303	116-0304	116-0305	116-0307	116-0308	116-0309	116-0310	116-0311	116-0312	116-0313
Colour		white	white	white	white	white	white	white	white	white	white	White	white
BN	%	>98.5	>98.5	>98.5	>98.5	>98.5	>98.5	>98.5	>97	>98.5	>99.0	>99.3	>99
O_2		<1.5	<1.2	<1	<1.7	<1.5	<0.5	<1.3	<2.5	<0.7	<0.5	<0.5	<1.0
B_2O_3		<0.1	<0.2	<0.1	<0.2	<0.1	<0.1	<0.2	<0.5	<0.3	<0.1	<0.1	<0.2
C		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Specific Surface Area (BET)	**m²/g**	~ 12	~ 20	~ 13	~ 13	~ 20	~ 1	~ 14	30	7	~3	~3-6	~13
Average Grain Size (d_{50})	**µm**	3	2	4	5	1	45	10	9.5	12	20	~120	3.5
Packaging	**Sachets (kg)**	1 & 5	1 & 10	1 & 5	1 & 2.5	1 & 5	1 & 5	1 & 5	1.5 & 10	1 & 5	1 & 10	0.1	1 & 10
	Bidon (kg)	20		20	25	20	25	25		25		-	-

Zircon Oxide Powder ZYP

ZYP powder is an ultra-fine, highly reactive powder composed of zirconia stabilised with yttrium oxide. It is made using the original Zircar Process by Zircar Zirconia

Sintering of ZYP powder particles starts around 900°C and it is possible to create zirconia ceramic parts approaching theoretical density using ZYP at only 1,450 °C.

Property

- Extremely high environmental stability
- Stabilized with 10 % yttrium oxide
- Low sintering temperature
- Pre-sintered and binder-free

Applications

- Filtration
- Manufacture of oxygen sensors
- Thermal barrier coatings for gas turbines and diesel engines
- Grain growth inhibitor for non-oxide ceramics
- Polishing

Technical Data

Property		Unit	ZYP-30	ZYP-40	ZYP-55
Item N°			225-0300	225-0310	225-0320
Nominal Composition	ZrO_2*	Wt %	90	90	90
	Y_2O_3		10	10	10
Trace Impurities		Wt %	< 1	< 1	< 1
Ignition Loss		Wt %	1.8	2.2	3.1
Specific Surface Area		m^2/g	25 - 35	35 - 45	50 - 60

*1-2 % weight hafnia (HfO_2) occurs naturally with zirconia (ZrO_2) and does not affect performance.

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