



**Hebei Suoyi New Material Technology Co., Ltd.**

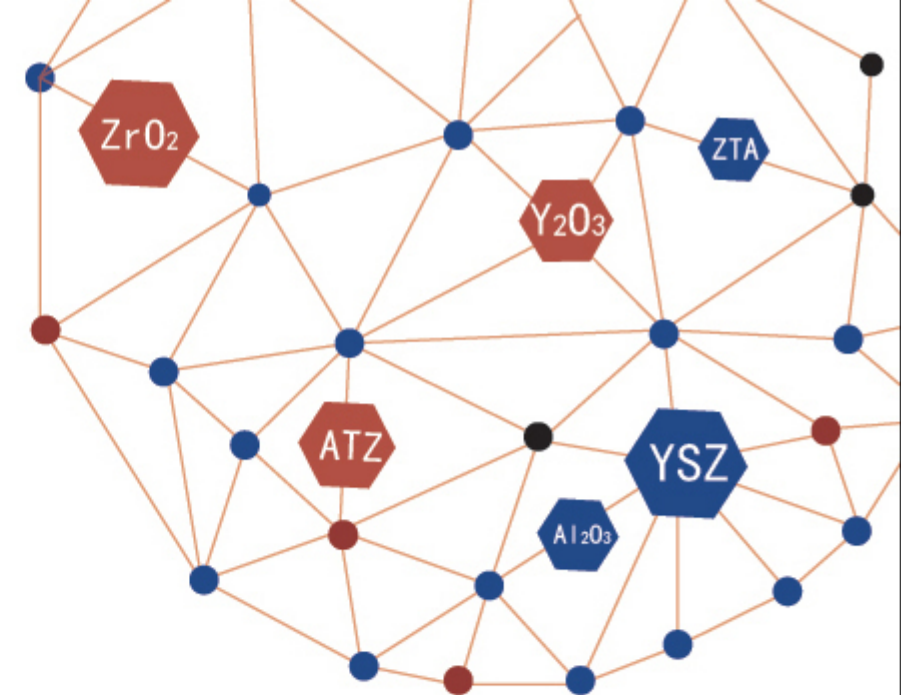
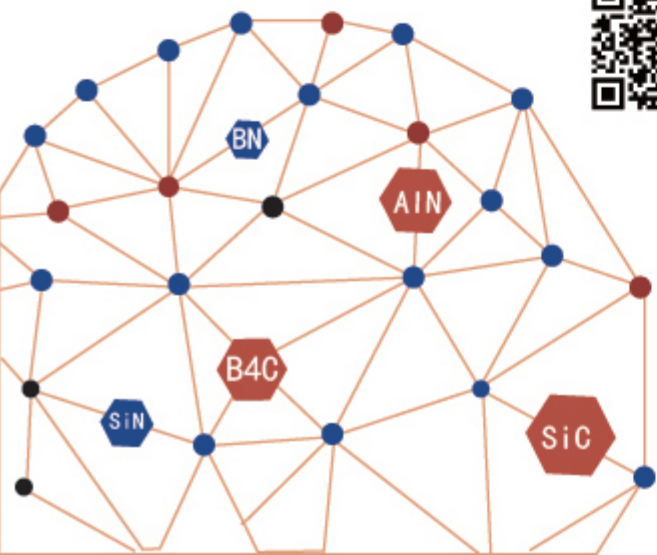
No.89,Zhonghua St,Congtai EDZ,Handan,Hebei China

TEL:+86 310 6932202 Mobile:+86 17733022666

Email:sales@hbsuoyi.com

Site1:www.hbsuoyi.com

Site2:www.suoyi-group.com



**Advanced Ceramic Materials Solution**  
**先进陶瓷材料解决方案**

Hebei Suoyi New Material Technology Co., Ltd.

# 企业简介 Company Profile



使命：一站式解决客户对先进陶瓷材料的需求难题

Mission: One-stop Solution to Customer Needs for Advanced Ceramic Materials

河北索亿新材料科技有限公司是专业研发、生产多品种氧化锆、钇稳定氧化锆、氧化铝等陶瓷材料的现代高新技术企业。公司成立于2014年12月，位于邯郸市经济开发区，占地面积56500平方米，年产能5万吨，拥有自营进出口权。

“一站式解决客户对先进陶瓷材料的需求难题”是我们的企业使命；“成为世界最受尊敬的先进陶瓷材料供应商”是企业的发展目标。我们拥有专业热情的服务团队、积极创新的研发团队、执着严谨的品质控制团队、乐观敬业的生产团队和一流的生产检测设备。公司生产管理已通过ISO 9001加工管理体系认证和ISO 14001环境管理体系认证。

我们立足自身优势，与中科院、清华大学等科研机构、院校开展材料研究与合作，努力提升企业综合竞争力。我们致力于成为全球领先的陶瓷材料制造商，为国内外用户提供优质的产品和一流的服务。

Hebei Suoyi New Material Technology Co., Ltd. is a modern high-tech enterprise specializing in the research, development and production of various types of zirconia, yttrium-stabilized zirconia, alumina and other ceramic materials. Founded in December 2014, the company is located in Handan Economic Development Zone, covers an area of 56,500 square meters, has an annual production capacity of 50,000 tons, and has the right to import and export.

"One-stop solution to customers' demand for advanced ceramic materials" is our corporate mission; "Becoming the world's most respected supplier of advanced ceramic materials" is the company's development goal. We have a professional and enthusiastic service team, an active and innovative R&D team, a persistent and rigorous quality control team, an optimistic and dedicated production team and first-class production testing equipment. The company's production management has passed ISO 9001 processing management system certification and ISO 14001 environmental management system certification.

Based on our own advantages, we carry out material research and cooperation with scientific research institutions and universities such as the Chinese Academy of Sciences and Tsinghua University, and strive to enhance the comprehensive competitiveness of the enterprise. We are committed to becoming the world's leading ceramic material manufacturer, providing high-quality products and first-class services to domestic and foreign users.

# 索亿价值观 Suoyi's Corporate Culture

客户第一	Customers first, employees second, shareholders third.
团队合作	Share and grow up together, do a meaningful thing together.
积极向上	Full of positive energy and never give up.
迎接变化	Embrace change, embrace it, enjoy it, execute it, create it.
诚实守信	Honesty and integrity, words and deeds magnanimous.
感恩奉献	Take care of yourself, be a positive influence on others, be grateful and give.
结果为王	Results-oriented, get the best results.

愿景：致力成为一家受人尊敬的材料公司，存活300年！

Vision: Committed to becoming a respected material company, Survive for 300 years!

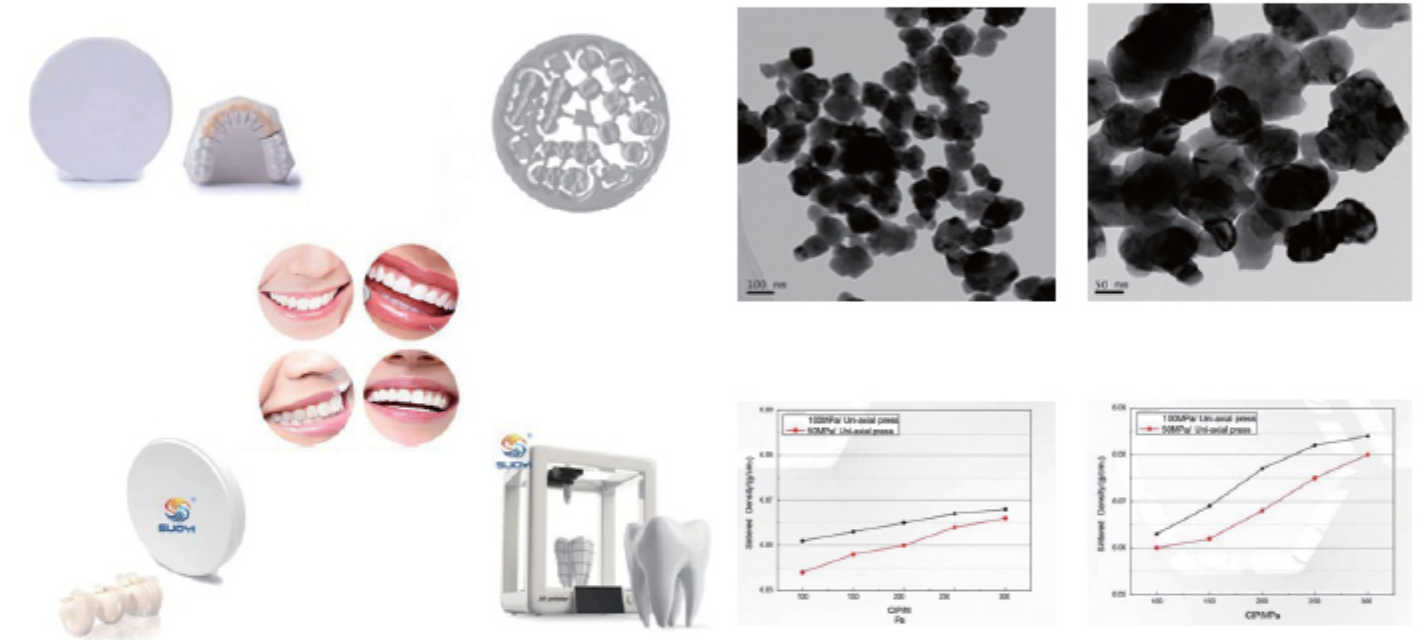
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钇稳定性氧化锆用于牙科上硬度高,透度更好,粒度均匀,韧性更好。  
Yttrium Stabilized Zirconia has High Hardness, Better Penetration, Uniform Particle Size and Better Toughness when used in dentistry.

应用 Application



Zirconia powders for dental use

Technical Data Sheet

INDEX	UNITE	SY-3YB-1	SY-3YB-3	SY-3YB-5	SY-3YB-P	SY-3YB-G	SY-4YB	SY-4YB-Y	SY-4YB-P	SY-4YB-G	SY-5YB	SY-5YB-Y	SY-5YB-P	SY-5YB-G	METHOD
LOI	wL%	<3.0	<3.0	<3.0	<3.0	<1.0	<3.0	<3.0	<3.0	<1.0	<3.0	<3.0	<3.0	<1.0	TG-DSC
Binder	wL%	2.5	2.5	2.5	2.5	—	2.5	2.5	2.5	—	2.5	2.5	2.5	—	—
Y <sub>2</sub> O <sub>3</sub>	wL%	5.5±0.2	5.5±0.2	5.5±0.2	—	5.5±0.2	7.2±0.2	7.2±0.2	—	7.2±0.2	9.2±0.2	9.2±0.2	—	9.2±0.2	XRF
Al <sub>2</sub> O <sub>3</sub>	wL%	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	XRF
SiO <sub>2</sub>	PPm	<300	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	ICP
Fe <sub>2</sub> O <sub>3</sub>	ppm	<300	<100	—	<100	<100	<100	—	<100	<100	<100	—	<100	<100	ICP
S <sub>max</sub>	m <sup>2</sup> /g	13±1	11±1	8±1	8±1	8±1	10±1	8±1	8±1	8±1	9±1	8±1	8±1	8±1	—
Bulk Density	g/cm <sup>3</sup>	1.3±0.2	1.3±0.1	1.3±0.1	1.3±0.1	1.2±0.1	1.3±0.1	1.3±0.1	1.3±0.1	1.2±0.1	1.3±0.1	1.3±0.1	1.3±0.1	1.2±0.1	GB/T 1478-1-2011
Sintered Density	g/cm <sup>3</sup>	>6.05	>6.05	>6.05	>6.30	>6.06	>6.05	>6.04	>6.34	>6.03	>6.04	>6.02	>6.40	>6.02	ISO 6872: 2016
Bending Strength	MPa	>1100	>1100	>950	>950	>1100	>900	>850	>750	>900	>600	>550	>550	>600	ISO 14704: 2016
Hardness	Hv6	>1200	>1200	>1200	>1200	>1200	>1200	>1200	>1200	>1200	>1200	>1200	>1200	>1200	ISO 14706: 2016
Translucency	%	39	41	—	—	—	44	—	—	—	48	—	—	—	ISO 13468-2: 2006
COLOR	—	White	White	Yellow	Pink	Gray	White	Yellow	Pink	Gray	White	Yellow	Pink	Gray	—
Sintering Temperature	°C	1500	1500	1500	1500	1500	1480	1480	1480	1480	1500	1500	1500	1500	—
Rapid Sintering	—	X	O	O	O	O	O	O	O	O	O	O	O	O	—
Multilayer Block	—	X	O	O	O	O	O	O	O	O	O	O	O	O	—

SY-B: Powder with binder  
SY-S: Powder without binder

Note: The chart is intended to illustrate typical properties. Property values vary with method of manufacture, size, and shape of part. Data contained herein is not to be construed as absolute and does not constitute a representation or warranty for which SIZE assumes legal responsibility. Please consult our technical staff for appropriate material and specific test results.

## 氧化锆 Zirconia Powder

氧化锆材料具有高硬度，高强度，高韧性，极高的耐磨性及耐化学腐蚀性等等。优良的氧化锆材料具有高硬度，高强度，高韧性，极高的耐磨性及耐化学腐蚀性等等优良的物化性能，氧化锆已经在陶瓷、耐火材料、机械、电子、光学、航空航天、生物、化学等等各种领域获得广泛的应用。

Zirconia material is with excellent physical and chemical properties such as high hardness, high strength, high toughness, high wear resistance and chemical resistance, etc. Zirconia has been widely used in various fields such as ceramics, refractory materials, machinery, electronics, optics, aerospace, biology, chemistry and so on.



项目 Item	型号 Type	SY-H999	SY-H9995	SY-D993	SY-D990	SY-D985
	晶相 Crystalline Phase	单斜相 Monoclinic Phase	单斜相 Monoclinic Phase	单斜相 Monoclinic Phase	单斜相 Monoclinic Phase	单斜相 Monoclinic Phase
化学成分 Chemical composition(Wt%)	ZrO2%(+HfO2)	99.9	99.5	Monoclinic	Monoclinic	Monoclinic
	Al2O3	0.005	0.005	Phase	Phase	Phase
	SiO2	0.005	0.01	0.2	0.3	0.6
	Fe2O3	0.003	0.005	0.04	0.05	0.05
	CaO	0.003	0.005	—	—	—
	MgO	0.003	0.005	—	—	—
	TiO2	0.001	0.003	0.13	0.13	0.2
	Na2O	0.001	0.005	—	—	—
	Cl- (ppm)	200	300	—	—	—
物理指标 Physical Parameter	灼减 Burning reduction%	0.8	0.8	—	—	—
	水分 Moisture%	0.5	0.5	0.3	0.3	0.3
	粒度/比表 Particle Size/ ratio table	根据客户要求和使用条件进行加工和调整 Can be customized according to customers, requirements				

## 工业钇锆 Industry Yttrium stabilized zirconia Powder

通过自蔓延水解工艺生产YSZ粉体，通过Y2O3含量不同的调整，可生产不同类别YSZ粉体。常规粉体以3Y-YSZ粉体为主，根据客户工艺的不同分为压制粉和非压制粉，其物理性能分别满足客户对于干压、等静压、注射、流延、热压铸、注浆等成型条件的要求。

We produce YSZ powder by self-propagating hydrolysis process. Based on different content of Y2O3, we can produce different YSZ powder. Normal products are 3mol-YSZ powder-based, divided into compacted powder and non-compacted powder depending on the customers' requirements. The physical properties could meet customers' different requirements for dry pressing, isostatic pressing, injection, casting, injection moulding, slip casting and so on.

型号 Product Code	SY-3Y	SY-4Y	SY-5Y	SY-8Y	SY-13Y
ZrO2%(+HfO2)	94.7	92.8	91.5	88.5	79.697
Y2O3 (wt%)	5.2±0.2	7.0±0.3	8.5±0.3	13.5±0.3	20.5±0.3
Al2O3%≤	0.01	0.01	0.01	0.01	—
SiO2%≤	0.01	0.01	0.01	0.01	0.012
Fe2O3%≤	0.01	0.01	0.01	0.01	0.0007
CaO%≤	0.005	0.005	0.005	0.005	—
MgO%≤	0.005	0.005	0.005	0.005	—
TiO2%≤	0.002	0.002	0.002	0.002	0.001
Na2O%≤	0.005	0.005	0.005	0.005	—
Cl-%≤	0.01	0.01	0.01	0.01	0.3
常用性 Usage Rate	***	*	**	**	***
备注 NOTE	***为较常用，以此类推***stands for mostly commonly used.				



## 彩色钇锆粉 Colored Yttrium stabilized zirconia powder

彩色钇稳定氧化锆粉是公司主要氧化锆粉体材料之一。目前我们可以生产蓝色、黑色、黄色、绿色、粉色、紫色等色系的钇稳定氧化锆粉体，以据客户需求可以进行相关色系和色相调节。彩色钇稳定氧化锆粉体的典型指标为：3Y-YSZ>95%色素成分≤5%，典型比重≥5.85g/cm<sup>3</sup>，公司目前的彩色钇稳定氧化锆粉有干压造粒粉和干燥粉，可以满足客户干压、等静压、注射、流延等不同成型工艺的需求。

Colored Yttrium stabilized zirconia powder is one of the company's main featured zirconia powder materials. At present we can produce blue, black, yellow, green, purple, pink and other colors. The color and hue could be adjusted according to customers' requirements. Typical indicators of color Yttria stabilized zirconia powder: 3Y-YSZ≥95%, Pigment composition≤5%, Typical specific gravity≥5.85g/cm<sup>3</sup>. Currently, the Colored Yttrium stabilized zirconia powder are granular and spray-drying powders, which can meet different requirements of different production process like dry pressing, isostatic pressing, injection, tape casting and so on.

### 粉料颜色 Powder color



## 氢氧化锆 Zirconium Hydroxide

氢氧化锆是一种不溶于水、碱性稍强的两性氢氧化物，外观为白色粉末固体，广泛应用于各种化工行业。

应用：

用于制造其他锆化合物、颜料、染料、玻璃等。主要用于制备锆及锆化合物，也用于塑料、橡胶、离子交换树脂等行业的填料、催化剂、除臭剂和颜料。

用作分析试剂，也用于制备铬化合物和颜料制剂；用作其他锆产品的中间体。

Zirconium hydroxide is a kind of water insoluble, alkaline slightly stronger amphoteric hydroxide, the appearance of white powder solid, widely used in various chemical industry.

Application:

Used in the manufacture of other zirconium compounds, pigments, dyes, glass, etc. Mainly used in the preparation of zirconium and zirconium compounds, also used in plastics, rubber, ion exchange resins and other industries of filler, catalyst, deodorant and pigment.

Used as an analytical reagent, also used in the preparation of chromium compounds and pigment preparation; Used as intermediate in other zirconium products.

产品名称 Product Name	氢氧化锆 Zirconium Hydroxide	产品规格 Product Specifications	SY-P200
产品批号 Product Lot	H230410	产品数量 Product Quantity	1000kg
检验项目 Test items	单位 Unit	分析结果 Analysis results	检测仪器及标准/方法 Testing instruments and standards/methods
ZrO(OH) <sub>2</sub>	(wt)%	>99.96	Shimadzu, ICP
ZrO <sub>2</sub>	(wt)%	>87%	
SiO <sub>2</sub>	(wt)%	0.007	
Fe <sub>2</sub> O <sub>3</sub>	(wt)%	0.001	
TiO <sub>2</sub>	(wt)%	0.0014	
松装密度 Bulk Density	g/cm <sup>3</sup>	0.63	霍尔流速计 Hall flowmeter
比表面积 Specific Surface Area	m <sup>2</sup> /g	277.6	DA, BET
灼减L.O.I	(wt)%	11	电阻炉 Resistance Furnace, 1050°C 1h
粒径(D50) Particle Size(D50)	μm	126.867	Marvern Mastersize2000激光粒度仪 Laser particle size analyzer
D10	μm	9.528	
D90	μm	420.815	

## 氧化锆增韧氧化铝粉末 ZTA

ZTA陶瓷粉体是以超细氧化铝晶粒为基质，以YSZ氧化锆四方晶相为增韧介质制成的粉体。粉体具有：颗粒分布均匀、烧结范围可控、烧结体强度和韧性高，微观结构晶粒尺寸均匀、致密等特点。可广泛用于各类结构陶瓷、电子陶瓷、生物陶瓷、高级耐火材料、光通讯器件、人造宝石、氧传感器、固体氧燃料电池、研磨抛光等行业和产品。

ZTA ceramic powder is based on ultra-fine alumina grains as matrix, and YSZ zirconia tetragonal phase as the toughening medium. It has the features such as the uniform particle distribution, controllable sintering range, sintered body strength and toughness, microstructure uniform grain size, dense and so on. It can be widely used in various types of structural ceramics, electronic ceramics, biological ceramics, advanced refractory materials, optical communication devices, artificial gems, oxygen sensors, solid oxygen fuel cells, grinding and polishing industries.

型号 Product Code	化学成分 Chemical composition%					烧结密度 Sintered Density(g/cm <sup>3</sup> )	性状 Appearance	其他 Other
	Y-ZrO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>			
SY-ZTA10	10	89.9	0.01	0.02	0.02	4.08	粉料/造粒 Powder/Granule	可按用户要求调整 Can be adjusted according to customers' requirements
SY-ZTA15	15	84.9	0.01	0.02	0.02	4.1	粉料/造粒 Powder/Granule	
SY-ZTA16	16	83.9	0.01	0.02	0.02	4.12	粉料/造粒 Powder/Granule	
SY-ZTA20	20	79.9	0.01	0.02	0.02	4.2	粉料/造粒 Powder/Granule	
SY-ZTA20BL	19	76	黑色素 Melanin < 5			4.05	粉料/造粒 Powder/Granule	黑色ZTA专用 For Black ZTA ceramics

## 氧化铝增韧氧化锆粉末 ATZ

ATZ陶瓷粉是纳米氧化铝与纳米氧化锆的复合材料，本公司生产的ATZ分为化学级和物理级两种，分别满足不同客户的需求。ATZ陶瓷可部分替代氧化钇稳定氧化锆陶瓷，特别在耐磨损结构件中具有一定的优势，化学法生产的更具有粉体晶粒细腻、烧结温度低，强度、韧性和耐磨性等好的优点。

ATZ ceramic powder is a composite material of nano Alumina and nano Zirconia. ATZ produced by our company is divided into chemical grade and physical grade, which can meet the demands of different customers. ATZ ceramics can partly replace yttria stabilized zirconia ceramics, especially in wear-resistant structural parts. The chemical method has the advantages of fine grain, low-sintering temperature, good strength, toughness and wear resistance.

型号 Product Code	化学成分 Chemical composition%					烧结密度 Sintered Density (g/cm <sup>3</sup> )	性状 Appearance	其他 Other
	Y-ZrO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>			
SY-ATZ10	90	9.8	0.01	0.02	0.02	5.8	粉料/造粒料 Powder/Granule	可按用户要求调整 Can be adjusted according to customers' requirements
SY-ATZ20	80	19.8	0.01	0.02	0.02	5.6	粉料/造粒料 Powder/Granule	
SY-ATZ20B	79.95	19.95	0.001	0.001	0.001	5.65	粉料/造粒料 Powder/Granule	化学法生产 Produced by chemical method

## 镁稳定氧化锆 Magnesium stabilized zirconia Powder

用特殊工艺生产陶瓷级Mg-YSZ粉末，通过MgO含量不同的调整，可生产不同类别Mg-YSZ粉体。

目前，本公司氧化镁稳定氧化锆粉分为两类：一类是白色，另一类是黄色和土黄色的，分别用于不同的结构陶瓷、耐腐蚀陶瓷和耐热陶瓷。

With special production process, we can produce different Mg-YSZ powder by adjusting the content of MgO. Our Mg-YSZ powder can be divided into two types. One is white and the other is yellow and earth yellow, which are applied for different structural ceramics, anti-corrosion ceramics and Refractory ceramics.

型号Type	SY-3M01	SY-3M01B	SY-3M02	SY-3M02B	SY-3M03
ZrO2(+ HfO2)	95.65	96.65	95.65	96.65	96.65
MgO (wt%)	3.2 ±0.2	3.2 ±0.2	3.2 ±0.2	3.2 ±0.2	3.2 ±0.2
Al2O3%≤	0.01	0.01	0.01	0.01	0.01
SiO2%≤	0.01	0.01	0.01	0.01	0.01
Fe2O3%≤	0.01	0.01	0.01	0.01	0.01
CaO%≤	0.02	0.02	0.02	0.02	0.02
其它others≤	1	0	1	0	0
IL (%)≤	3		3	3	3
密度 Density (g/cm3) >	5.7	5.6	5.75	5.65	5.5
弯曲强度Bending strength (Mpa)	550	500	650	600	450
耐腐蚀性Corrosion resistance	良 good	优 excellent	良 good	优 excellent	良 good
烧成后颜色Color after sintering	白色 white	灰白色 grey white	黄色 yellow	黄色 yellow	土黄色 earth yellow
HV (Mpa) >	1000		1200		
用途 Application	结构陶瓷、机械零部件、拔丝器、耐腐蚀化工陶瓷、耐热陶瓷 Structural ceramics, mechanical parts, anti-corrosion chemical ceramics, refractory ceramics.				

## 氧化钙稳定氧化锆 Calcium oxide stabilized zirconia Powder

用特殊工艺生产Ca-YSZ粉体，通过CaO含量不同的调整，可生产不同类别Ca-YSZ粉体。

氧化钙稳定氧化锆粉以热震性见长，本公司生产的陶瓷级氧化钙稳定氧化锆钙锆兼顾强度、韧性与热震性，是制作热陶瓷的理想原材料。

With special production process, we can produce different Ca-YSZ powder by adjusting the content of CaO. With high strength, tenacity and good performance of thermal shock, our Ca-YSZ powder is the ideal material to make the thermal ceramics.

型号 Product Code	化学成分 Chemical composition%						密度 Density (g/cm3)	成瓷颜色 Ceramic color	性状 Appearance	长期使用温度 Long-term service temperature
	ZrO2	Al2O3	SiO2	CaO	Fe2O3	TiO2				
SY-3C01	94	0.4	0.1	3.0±0.2	0.01	0.01	5.7	浅白色 light white	造粒料 Granular material	1200
SY-3C01F	94	0.4	0.1	3.0±0.2	0.01	0.01	5.7	浅白色 light white	粉料 Powder material	1200
SY-3C02	94	0.4	0.4	3.5±0.2	0.1	0.2	5.8	土黄色 earth yellow	造粒料 Granular material	1500
SY-3C02F	93	0.4	0.5	3.5±0.2	0.1	0.2	5.8	土黄色 earth yellow	粉料 Powder material	1500

## 氧化铝造粒粉 Alumina Granulation Powder

氧化铝陶瓷颗粒粉

电子陶瓷、结构陶瓷的干压及等静压生产

特征

固体颗粒中等，粒度分布合理，强度适中 流动性好，易脱模

坯体强度高，瓷体密度高

Alumina Ceramic Granulated Powder

Dry pressing and isostatic pressure production of electronic ceramics and structural ceramics

Features

Medium solid particles, reasonable particle size distribution, moderate strength

Good fluidity and easy demoulding High strength of green body, high density of porcelain

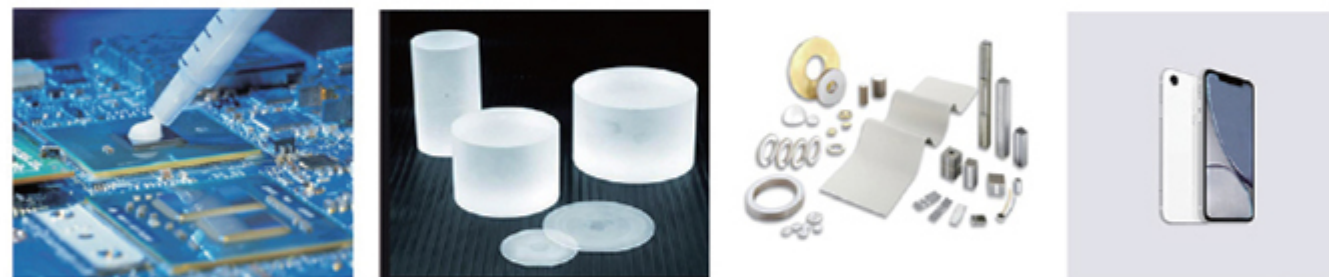
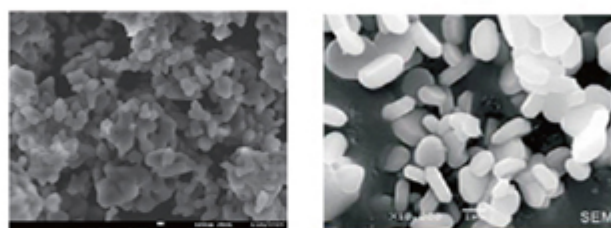


Classify	Model	Granularity D50 (um)	Sintering Temperature °C	Soaking Time h	Shrinking Percentage %	Porcelain Density g/cm3	Ceramic color	Applicable process
Low temperature powder	SY-DC-R95	3±0.2	1560	2.5	13±0.5	≥3.65	white	injection moulding
	SY-DC-R99	2.7±0.2	1650	2.5	15±0.5	≥3.85	yellowish	Direct with wax
	SY-DC-D95	2.7±0.2	1560	2.5	15±0.5	≥3.68	white	Spray-dried Granulation
	SY-DC-D99	0.5±0.2	1630	2.5	16±0.5	≥3.90	yellowish, white	Extruding Slip Casting Gelatum

## 高纯氧化铝 High Purity Alumina Powder

高纯氧化铝是指纯度为99.9% 以上的氧化铝。高纯氧化铝粉呈白色粉末，化学性能稳定，高温收缩性能适中，具有良好的烧结性能以及普通氧化铝粉无法比拟的光、电、磁、热和机械性能，在高技术新材料领域和现代工业中有着广泛应用。

High-purity alumina refers to alumina with a purity of more than 99.9%. High-purity alumina powder is a white powder with stable chemical properties, moderate high-temperature shrinkage performance, good sintering performance, and optical, electrical, magnetic, thermal and mechanical properties that cannot be compared with ordinary alumina powder. It is used in the field of high-tech new materials and modern Widely used in industry.



SPECIFICATION OF ALUMINA FOR COATING LITHIUM BATTERY SEPARATOR				
TEST ITEMS	UNIT	SY - AL -3N	SY-AL-4N	SY - AL -5N
Al <sub>2</sub> O <sub>3</sub>	%	≥99.9	≥99.99	≥99.999
IMPURITY CONTENT	Fe	≤18.4	≤2	≤1
	Na	≤194.8	≤1	≤1
	Ca	≤5	≤2	≤1
	Mg	≤5	≤2	≤1
	Si	≤46.4	≤12	≤2.5
	Cu	/	≤3	≤1
PH 值	/	7-10	7-10	7-10
BET	m <sup>2</sup> /g	5-9	3-8	3-12
GRANULARITY	D10	≥0.10	≥0.30	≥0.30
	D50	0.4-1.0	0.5-20	0.3-10
	D90	≤0.9	≤1.6	≤1.6
	D99	≤1.2	≤2.8	≤2.8
EXTERIOR	WHITE POWDER, NO AGGLOMERATION OR FOREIGN MATTER IN THE POWDER			

Customizable according to customer requirements.

## 碳化硅 Silicon Carbide

磨料级立方 SiC 微粉

产品纯度高、自然堆积密度高、粒度分布窄，基本粒含量在 60~80%，用于精磨抛光、制造高级油石、精细研磨/抛光液，替代金刚石、B4C、AlN、CBN等。

Abrasive grade cubic SiC micro powder

The product has high purity, high natural stacking density, narrow particle size distribution, and the basic particle content is 60-80%. It is used for fine grinding and polishing, manufacturing advanced oilstone, fine grinding/polishing liquid, and replacing diamond, B4C, AlN, CBN, etc.

规格型号 Specification model	D50	D90	D100	化学组分 Chemical Composition
W0.1	0.09	0.166	0.276	SiC:97-99.99%; F.C:0-0.3%; Fe <sub>2</sub> O <sub>3</sub> :0-0.3%; SiO <sub>2</sub> :0-1.2% F.Si:0-0.2% Al <sub>2</sub> O <sub>3</sub> :<0.03% MgO:<0.03% CaO:<0.03% It can be handled according to customer requirements. 可根据客户需求进行处理。
W0.2	0.148	0.22	0.353	
W0.3	0.211	0.334	0.436	
W0.4	0.283	0.438	0.568	
W0.5	0.4	0.5	0.65	
W1	0.84	1.1	1.37	
W1.5	1.26	1.55	1.87	
W2.5	1.91	2.46	3.3	
W3.5	2.99	3.44	4.9	
W5	4.23	5.28	6.5	
W7	5.74	7.31	9.36	
W10	7.57	10.38	13.89	
W14	10.12	14.06	19.31	
W20	14.74	21.24	26.83	
W28	22.61	27.8	32.15	
W40	37.56	41.34	45.13	

Note: Due to different product batches, the particle size distribution of W0.03-W0.1 will fluctuate by ±0.01μm, that of W0.2-W1.5 will fluctuate by ±0.05μm, that of W2.5-W7 will fluctuate by ±0.3μm, and that of W10-W40 will fluctuate by ±1μm.

注: 由于产品批次的不同, W0.03-W0.1 粒度分布会有 ±0.01μm 的波动, W0.2-W1.5 粒度分布会有 ±0.05μm 的波动, W2.5-W7 粒度分布会有 ±0.3μm 的波动, W10-W40 粒度分布会有 ±1μm 的波动。



## 碳化硼 Boron Carbide

碳化硼特点是密度低、强度高、高温稳定性好、化学稳定性好。在耐磨材料中，陶瓷增强，特别是在轻装甲、反应堆中子吸收剂应用中。另外，与金刚石和立方氮化硼相比，碳化硼易于制造，成本低廉，因此应用更为广泛，在某些地方可以替代昂贵的金刚石，常见于磨削、磨削、钻孔等应用。

Boron carbide is characterized by low density, high strength, good high temperature stability and good chemical stability. Among wear-resistant materials, ceramics are reinforced, especially in light armor, reactor neutron absorber applications. In addition, compared with diamond and cubic boron nitride, boron carbide is easy to manufacture and low in cost, so it is more widely used and can replace expensive diamond in some places, commonly used in grinding, grinding, drilling and other applications.

F 系列粗粒度号 F Series Coarse Grain Number	F 系列粗粒度号基本粒度范围(Nominal Size Range)( $\mu\text{m}$ )		F 系列微分粒 度号 F-series differential granularity number	F 系列粗粒度号基本粒度范围(Nominal Size Range)( $\mu\text{m}$ )	
	中国标准GB/T2481.1-1998国 际标准 ISO (86) FEP (84)	美国标准 ANSI B74.12-1992		FEPA F Standard42-GB-1984 Equipment: ByMalvern Mastersizer2000/3000	国际标准 ISO8486-2: 1996
F4	5600-4750	5600-4750	F230	66.0 $\pm$ 3.0	55.7 $\pm$ 3.0
F5	4750-4000	4750-4000			
F7	3350-2800	3350-2800	F240	55.5 $\pm$ 2.0	47.5 $\pm$ 2.0
F8	2800-2360	2800-2360			
F10	2360-2000	2360-2000	F280	46.0 $\pm$ 1.5	39.9 $\pm$ 1.5
F12	2000-1700	2000-1700			
F14	1700-1400	1700-1400	F320	39.0 $\pm$ 1.5	32.8 $\pm$ 1.5
F16	1400-1180	1400-1180			
F20	1180-1000	1180-1000	F360	30.0 $\pm$ 1.5	26.7 $\pm$ 1.5
F22	1000-850	--			
F24	850-710	850-710	F400	21.5 $\pm$ 1.5	21.4 $\pm$ 1.0
F30	710-600	710-600			
F40	500-425	--	F500	16.5 $\pm$ 1.0	17.1 $\pm$ 1.0
F46	425-355	425-355			
F54	355-300	355-300	F600	12.5 $\pm$ 1.0	13.1 $\pm$ 1.0
F60	300-250	300-250			
F70	250-212	250-212	F700	--	--
F80	212-180	212-180			
F90	180-150	180-150	F800	9.5 $\pm$ 1.0	11.0 $\pm$ 1.0
F100	150-125	150-125			
F120	125-106	125-106	F1000	6.2 $\pm$ 0.8	9.1 $\pm$ 0.8
F150	106-75	106-75			
F180	90-63	90-63	F1200	4.1 $\pm$ 0.5	7.6 $\pm$ 0.5
F220	75-53	75-53			

25KGS (50KGS) 的标准包装可根据要求提供定制包装。

Standard packaging of 25KGS (50KGS) can provide customized packaging upon request.

## 氮化硅 Silicon Nitride

氮化硅陶瓷材料热稳定性高、抗氧化能力强、产品尺寸精度高。由于氮化硅是共价化合物，键合强度高，在空气中能形成氧化物保护膜，因此还具有良好的化学稳定性。具有氧化性，不被许多熔融金属或合金如铝、铅、锡、银、黄铜、镍等渗透或腐蚀，但能被熔融液体如镁、镍铬合金、不锈钢。

氮化硅陶瓷材料可用于高温工程部件、冶金行业的高级耐火材料、化工行业的耐腐蚀部件和密封部件、机械加工行业的切削工具和刀具等。氮化硅还可用于太阳能电池。此外，氮化硅用于超高温燃气轮机、航空发动机、电炉等。

Silicon nitride ceramic materials have high thermal stability, strong oxidation resistance and high dimensional accuracy of products. Since silicon nitride is a covalent compound with high bond strength and can form an oxide protective film in the air, it also has good chemical stability. It is oxidized, and is not infiltrated or corroded by many molten metals or alloys such as aluminum, lead, tin, silver, brass, nickel, etc., but can be corroded by molten liquids such as magnesium, nickel-chromium alloy, and stainless steel. Silicon nitride ceramic materials can be used for high-temperature engineering components, advanced refractory materials in metallurgical industry, corrosion-resistant components and sealing components in chemical industry, cutting tools and cutting tools in machining industry, etc. Silicon nitride can also be used in solar cells. In addition, Silicon nitride for ultra-high temperature gas turbines, aircraft engines, electric furnaces, etc.

产品名称 Product name	产品级别 Product level	产品纯度 Product Purity	粒径规格 Particle size specification	牌号 Grade	备注 Notes	产品名称 Product name	产品级别 Product level	产品纯度 Product Purity	粒径规格 Particle size specification	牌号 Grade	备注 Notes
$\alpha$ -Si3N4	H	99.995%	1-3 $\mu\text{m}$	Destek020H		$\beta$ -Si3N4	H	99.90%	1-2 $\mu\text{m}$	Destek010H	
			3-5 $\mu\text{m}$	Destek040H					3-5 $\mu\text{m}$	Destek040H	
			5-10 $\mu\text{m}$	Destek080H					1-3 $\mu\text{m}$	Destek020M	
			10-15 $\mu\text{m}$	Destek130H					3-5 $\mu\text{m}$	Destek040M	
			0.5-1.0 $\mu\text{m}$	Destek005M					10 $\mu\text{m}$	Destek100M	
	M	99.90%	1-3 $\mu\text{m}$	Destek020M			M	99.80%	10-15 $\mu\text{m}$	Destek130M	
			3-5 $\mu\text{m}$	Destek040M					15-20 $\mu\text{m}$	Destek180M	
			5-10 $\mu\text{m}$	Destek080M							

## 氮化硼 Boron Nitride

氮化硼是氮和硼原子的晶体。化学成分为43.6%硼和56.4%氮，有四种不同的变体：六方氮化硼（HBN）、菱形氮化硼（RBN）、立方氮化硼（CBN）和纤锌矿氮化硼（WBN）。

应用

- 1、金属成型脱模剂和金属拉丝润滑剂。
- 2、高温状态下的特殊电解材料和电阻材料。
- 3、高温固体润滑剂、挤压抗磨添加剂、陶瓷复合材料生产用添加剂、耐火材料和抗氧化添加剂，特别是抗熔融金属腐蚀场合的添加剂、热增强添加剂、耐高温绝缘材料。
- 4、晶体管热封干燥剂和塑料树脂等聚合物添加剂。
- 5、氮化硼制品压制成各种形状可用作高温、高压、绝缘、散热零件。

Boron nitride is a crystal of nitrogen and boron atoms. The chemical composition is 43.6% boron and 56.4% nitrogen, with four different variants: hexagonal boron nitride (HBN), rhomboidal boron nitride (RBN), cubic boron nitride (CBN) and wurtzite boron nitride (WBN).

Application

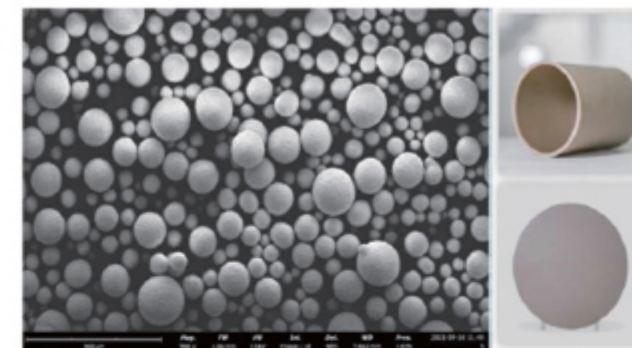
1. Metal forming release agent and metal wire drawing lubricant.
2. Special electrolytic and resistance materials in high temperature state.
3. High temperature solid lubricants, extrusion anti-wear additives, additives for the production of ceramic composite materials, refractory materials and anti-oxidation additives, especially for the occasion of anti-molten metal corrosion, heat reinforcement additives, high temperature resistant insulation materials.
- 4 transistor heat sealing desiccant and polymer additives such as plastic resin.
5. Boron nitride products pressed into various shapes can be used as high temperature, high pressure, insulation, heat dissipation parts.

Grade	BN (%)	B2O3 (%)	C (%)	Total oxygen (%)	Si, Al, Ca	Cu, K, Fe, Na,	D50	Crystal Size	BET	Tap Density
					(%)	Ni, Cr(%)			(m2/g)	(g/cm3)
TW02	99.3	0.2	0.05	0.5	<10ppm each	<10ppm each	2-4um	1um	15-30	0.15-0.25
TW06-H	99.7	0.1	0.05	0.3	<10ppm each	<10ppm each	6-8um	7um	4-8	0.40-0.60
TW10-H	99.7	0.1	0.05	0.3	<10ppm each	<10ppm each	9-12um	12um	4-8	0.35-0.50
TW20-H	99.7	0.1	0.05	0.3	<10ppm each	<10ppm each	18-22um	12um	3-6	0.35-0.50
TW20-W	99.5	0.1	0.05	0.5	<10ppm each	<10ppm each	20-25um	20um	0.7-1.5	0.40-0.60
TW50-H	99.7	0.1	0.05	0.3	<10ppm each	<10ppm each	45-55um	12um	3-6	0.35-0.50
PN02	99	0.5	0.05	1.0	<10ppm each	<10ppm each	2-4um	1um	15-30	0.15-0.25
PN06-H	99	0.5	0.1	0.8	<30ppm each	<10ppm each	6-8um	7um	4-8	0.40-0.60
PN10-H	99	0.5	0.1	0.8	<30ppm each	<10ppm each	9-12um	12um	4-8	0.35-0.50
PN20-H	99	0.5	0.1	0.8	<30ppm each	<10ppm each	18-22um	12um	3-6	0.35-0.50
PN50-H	99	0.5	0.1	0.8	<30ppm each	<10ppm each	45-55um	12um	3-6	0.35-0.50

## 氮化铝 Aluminum Nitride

应用

1. 由于氮化铝的压电特性，氮化铝晶体的外延延伸也被用于表面声波探测器。探测器放置在硅晶片上。能够可靠地制造这些薄膜的地方很少。
- 2、氮化铝陶瓷具有较高的室温和高温强度，膨胀系数小，导热性能好，可作为换热设备的高温结构件材料。
- 3、氮化铝陶瓷凭借其对铁、铝等金属及合金的耐腐蚀性能，可作为熔炼Al、Cu、Ag、Pb等金属的坩埚和铸造模具材料。



Application

1. Because of the piezoelectric properties of Al nitride, the extensional extension of Al nitride crystals is also used in surface acoustic wave detectors. The detectors are placed on silicon wafers. There are very few places where these thin films can be reliably made.
2. Aluminum nitride ceramics have high room temperature and high temperature strength, small coefficient of expansion, good thermal conductivity, can be used as high temperature structural parts of the heat exchange equipment materials.
3. Aluminum nitride ceramics can be used as crucible and casting mold material for melting of Al, Cu, Ag, Pb and other metals by virtue of its corrosion resistance of iron, aluminum and other metals and alloys.

产品参数 (Specification)

检测项目 Item	H-2	M-2
	比表面积(m2/g) Specific surface area	>3.0
平均粒径(um) Mean particle size	<1.5	<1.7
杂质含量 Impurity	o(wt)%	≤0.95
	C(ppm)	≤350
	Ca(ppm)	≤200
	Si(ppm)	≤50
	Fe(ppm)	≤20

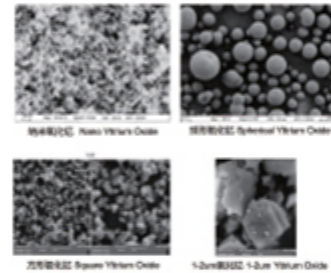
# 稀土-氧化物 Rare earth-oxide

氧化钇主要用作制造微波用磁性材料和军工用重要材料（单晶；钇铁石榴石、钇铝石榴石等复合氧化物），也用作光学玻璃、陶瓷材料添加剂、大屏幕电视用高亮度荧光粉和其他显像管涂料。

还用于制造薄膜电容器和特种耐火材料，以及高压水银灯、激光、储存元件等的磁泡材料。烧结时添加氧化钇可有效降低钨合金的晶粒度。

Yttrium oxide is mainly used to manufacture magnetic materials for microwaves and important materials for military industry (single crystal; complex oxides such as yttrium iron garnet and yttrium aluminum garnet). It is also used as an additive for optical glass, ceramic materials, and high brightness for large-screen TVs. Phosphors and other kinescope coatings.

Also used in the manufacture of film capacitors and special refractory materials, as well as magnetic bubble materials for high-pressure mercury lamps, lasers, storage components, etc. Adding yttrium oxide during sintering can effectively reduce the grain size of tungsten alloy.



规格 (specification) 产品 (product)	Purity					Others	
	99.9%	99.99%	99.995%	99.999%	99.9999%	Exterior	Preparation
Yttrium oxide Y2O3		○		○	○	White powder	Wet
Lanthanum Oxide La2O3	○	○		○		White powder	Wet
Cerium Oxide CeO2	○	○	○	○	△	White powder	Wet
Praseodymium oxide Pr6O11	○	○	○	△		Brown powder	Wet
Neodymium Oxide Nd2O3	○	○	○	○	△	Purple powder	Wet
Samarium Oxide Sm2O3	○	○		△		Lavender powder	Wet
Europium Oxide Eu2O3		○	○	○	△	White powder	Wet
Gadolinium Oxide Gd2O3	○	○	○	○	○	White powder	Wet
Terbium Oxide Tb4O7		○	○			Brown powder	Wet
Dysprosium Oxide Dy2O3	○	○	○			Light yellow powder	Wet
Holmium Oxide Ho2O3	○	○	○			Light yellow powder	Wet
Erbium Oxide Er2O3	○	○	○			Pink powder	Wet
Thulium oxide Tm2O3	○					White powder	Wet
Ytterbium Oxide Yb2O3	○	○	○	○	△	White powder	Wet
Lutetium Oxide Lu2O3		○	○			White powder	Wet
Gallium oxide Ga2O3	○	○	○	○	△	White powder	Wet
备注 (remarks)	生产研发=△ (Pilot Production)			稳定生产=○ (Stable production)			

# 稀土-氟化物 Rare earth-fluoride

氟化钇

电子陶瓷、新能源、靶材、喷涂、等离子喷涂LED/半导体

氟氧化钇

Yttrium fluoride

Electronic ceramics, new energy, target, spray, plasma spray

LED/semiconductor

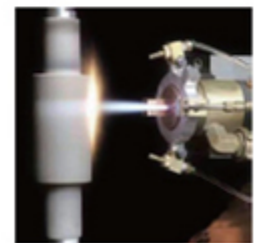
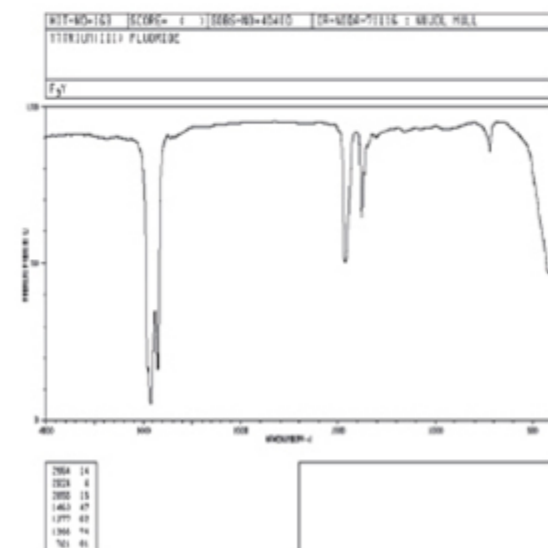
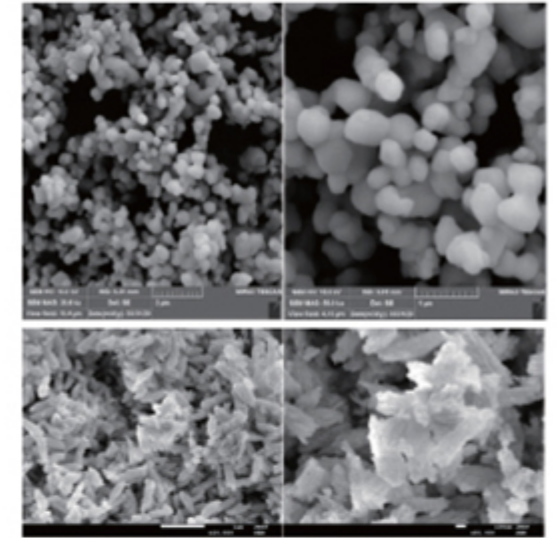
Yttrium Fluoroxy Oxide

高端等离子喷涂氟二甲苯型氟氧化物yof 99-99.999%氟氧化物钇

YOF/Y504F7/Y706F9/YF3 Y2O3等离子喷涂LED/半导体应用领域：热障材料、热喷涂材料、隔热材料、防腐材料、半导体材料、光纤掺杂、激光材料、发光材料、掺杂材料、涂层材料等。

High-end plasma spray-coated fluoroxyalum-shaped fluoroxy oxide yof 99-99.999%Fluoro oxide Yttrium YOF/Y504F7/Y706F9/YF3 Y2O3 Plasma spray LED/semiconductor

Application fields: thermal barrier materials, thermal spraying materials, thermal insulation materials, anti-corrosion materials, semiconductor materials, optical fiber doping, laser materials, luminous materials, doping materials, coating materials, etc.

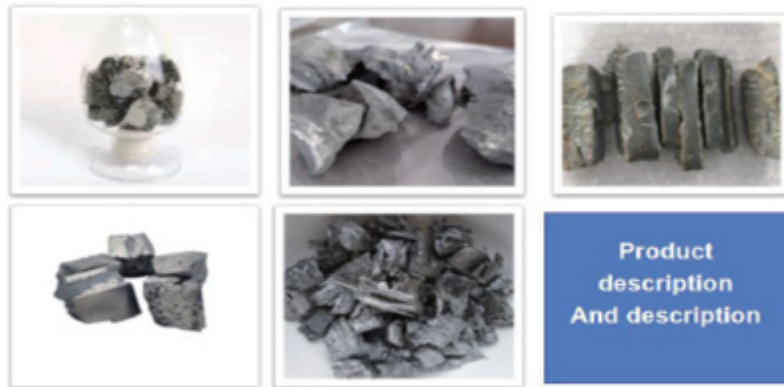


# 稀土-金属 Rare Earth-Metal

由于稀土作用大，用量少，已成为改进产品结构、提高科技含量、促进行业技术进步的重要元素，被广泛应用到了冶金、军事、石油化工、玻璃陶瓷、农业和新材料等领域。

它们的名称和化学符号是钪(Sc)、钇(Y)、镧(La)、铈(Ce)、镨(Pr)、钕(Nd)、钷(Pm)、钐(Sm)、铕(Eu)、钆(Gd)、铽(Tb)、镝(Dy)、钬(Ho)、铒(Er)、铥(Tm)、镱(Yb)、镱(Lu)。

Due to their great effect and low dosage, rare earths have become an important element to improve product structure, increase technological content, and promote technological progress in the industry. They are widely used in metallurgy, military, petrochemical, glass ceramics, agriculture, and new materials. Their names and chemical symbols are scandium (Sc), yttrium (Y), lanthanum (La), cerium (Ce), praseodymium (Pr), neodymium (Nd), promethium (Pm), samarium (Sm), europium (Eu), gadolinium (Gd), terbium (Tb), dysprosium (Dy), holmium (Ho), erbium (Er), thulium (Tm), ytterbium (Yb), lutetium (Lu).

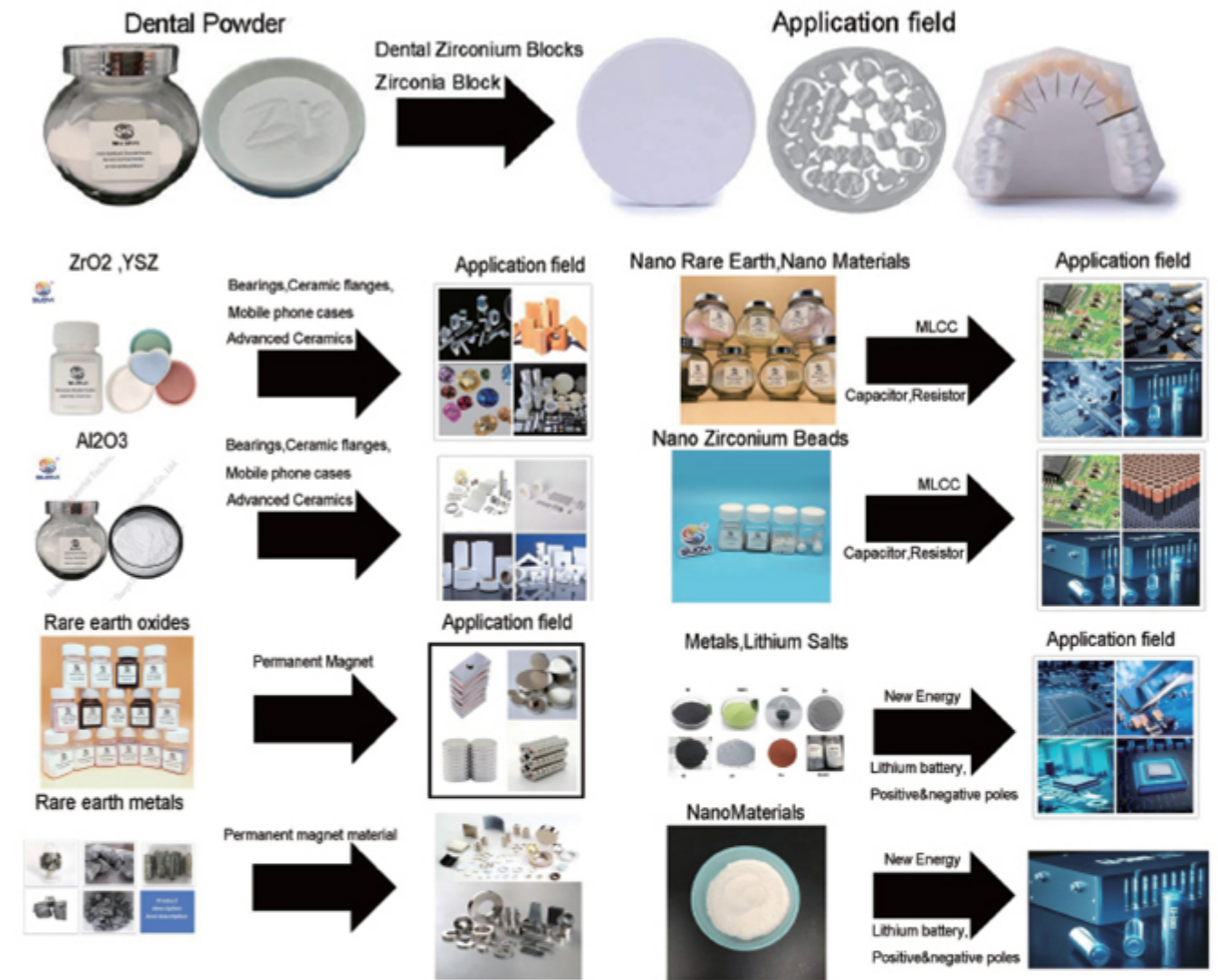


Rare earth metal real shots  
Exquisite products, diverse specifications,  
and a variety of quality options  
Suo Yi  
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Product Process  
Military-grade materials, guaranteed  
quality, exquisite and perfect.

Name	Purity	Powder/Lump Size	Name	Purity	Powder/Lump Size
La	2N-4N	Φ25~Φ127	Dy	2N-4N	Φ25~Φ127
Ce	2N-4N	-----	Ho	2N-4N	-----
Pr	2N-4N	-----	Er	2N-4N	Φ25~Φ127
Nd	2N-4N	Φ25~Φ127	Tm	2N-4N	-----
Sm	2N-4N	-----	Yb	2N-4N	Φ25~Φ127
Eu	2N-4N	-----	Lu	2N-4N	-----
Gd	2N-4N	Φ25~Φ127	Sc	2N-4N	Φ25~Φ127
Tb	2N-4N	Φ25~Φ127	Y	2N-4N	-----

# 方案 Solution



方案名称 SolutionName	产品类别 Product Category	应用领域 Application field
锆块 Zirconium block	钇锆粉, 干压设备, 烧结炉, 等静压机 Yttrium zirconium powder, Dry pressing equipment, Sintering furnace, Isostatic pressing machine	牙科锆块 Dental Zirconium Blocks
先进陶瓷 Advanced Ceramics	氧化锆, 氧化铝, 钇稳定氧化锆 Zirconia, Aluminum Oxide, Yttrium Stabilized Zirconia	轴承, 陶瓷法兰, 手机壳 Bearings, Ceramic flanges, Mobile phone cases
MLCC	纳米稀土, 纳米锆珠, 纳米材料 Nano Rare Earth, Nano Zirconium Beads, Nano Materials	电容器, 电阻器 Capacitor, Resistor
永磁材料 Permanent magnet material	稀土金属, 稀土氧化物 Rare earth metals, Rare earth oxides	永磁铁 Permanent Magnet
新能源 New Energy	金属, 锂盐, 纳米材料 Metals, Lithium Salts, NanoMaterials	锂电池, 正负极 Lithium battery, Positive & negative poles

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