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Zhongli Nano Ceramics

成为全球最可靠最具
竞争力的先进陶瓷材料供应商

Become the world's most reliable and competitive
advanced ceramic material supplier



东莞众力纳米陶瓷提供

先进陶瓷及复合材料解决方案

Dongguan Zhongli Nano Ceramic Provides
Advanced Ceramic and Composite Material Solutions

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东莞市众力纳米陶瓷科技有限公司

Dongguan Zhongli Nano Ceramic Technology Co., Ltd.

公司简介 Company Introduction

众力纳米陶瓷是一家专注先进陶瓷及复合陶瓷材料的研发生产制造商，以客户为中心，根据客户的应用要求，研发和优化各种陶瓷材料制成的特定产品。我们的产品主要应用于半导体制程、LED制程、TFT/LCD制程、汽车新能源、化工机械、医疗制药、国防军工、航空航天等众多高端领域。

众力纳米陶瓷拥有先进的成型技术、烧结技术、陶瓷加工技术以及分析检测技术。公司产品：氧化铝、氧化锆、碳化硅、氮化硅，及陶瓷复合材料高端零部件，自我们成立以来，质量严格的承诺是众力纳米陶瓷获得客户信赖的本源。经过多年的发展，公司已拥有一支专业程度高，创新能力强的开发团队，公司产品服务应用于国内知名企业，远销欧洲、北美、亚洲等国内外市场，致力于先进陶瓷材料应用的开拓者。

Zhongli Nano Ceramic is a manufacturer dedicated to the research, development, and production of advanced ceramics and composite ceramic materials. Customer-centric, we focus on developing and optimizing specific products made from various ceramic materials according to the application requirements of our clients. Our products are mainly applied in numerous high-end fields such as semiconductor processes, LED processes, TFT/LCD processes, new energy vehicles, chemical machinery, medical pharmaceuticals, defense industry, aerospace, and more.

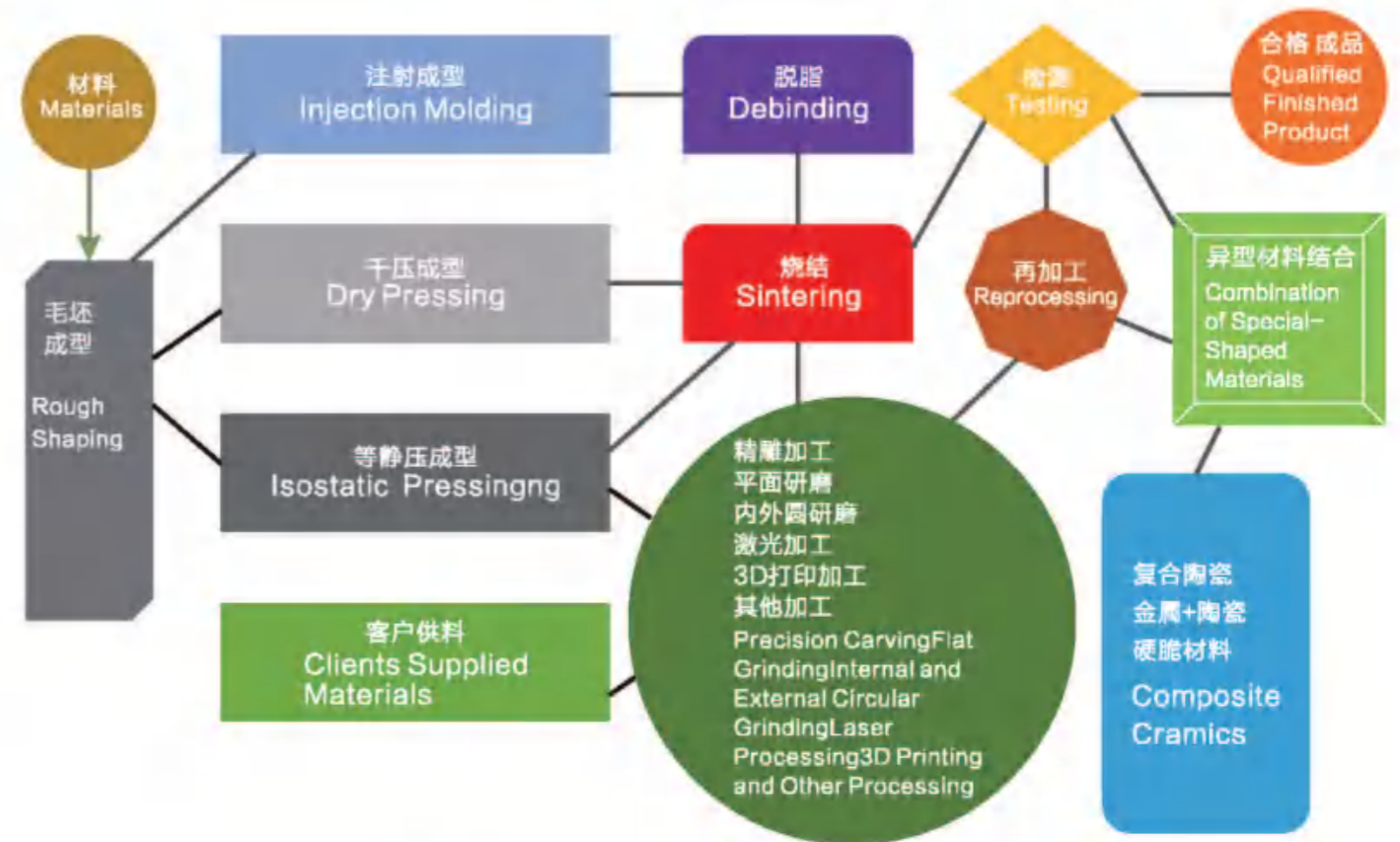
Zhongli Nano Ceramic possesses advanced molding technology, sintering technology, ceramic processing technology, and analysis detection technology. Our product range includes alumina, zirconia, silicon carbide, silicon nitride, and high-end components of ceramic composite materials. Since our establishment, our strict commitment to quality has been the cornerstone of Zhongli Nano Ceramic earning the trust of our customers. After years of development, we have built a highly professional and innovative development team. Our products and services are utilized by renowned domestic enterprises and exported to markets in Europe, North America, Asia, and beyond. We are committed to being pioneers in the application of advanced ceramic materials.



目标发展 Service Scoep

品质信赖 诚信服务
Sincere Service & Strict Inspection

众力纳米陶瓷精密制造
Precise Manufacturing Processes

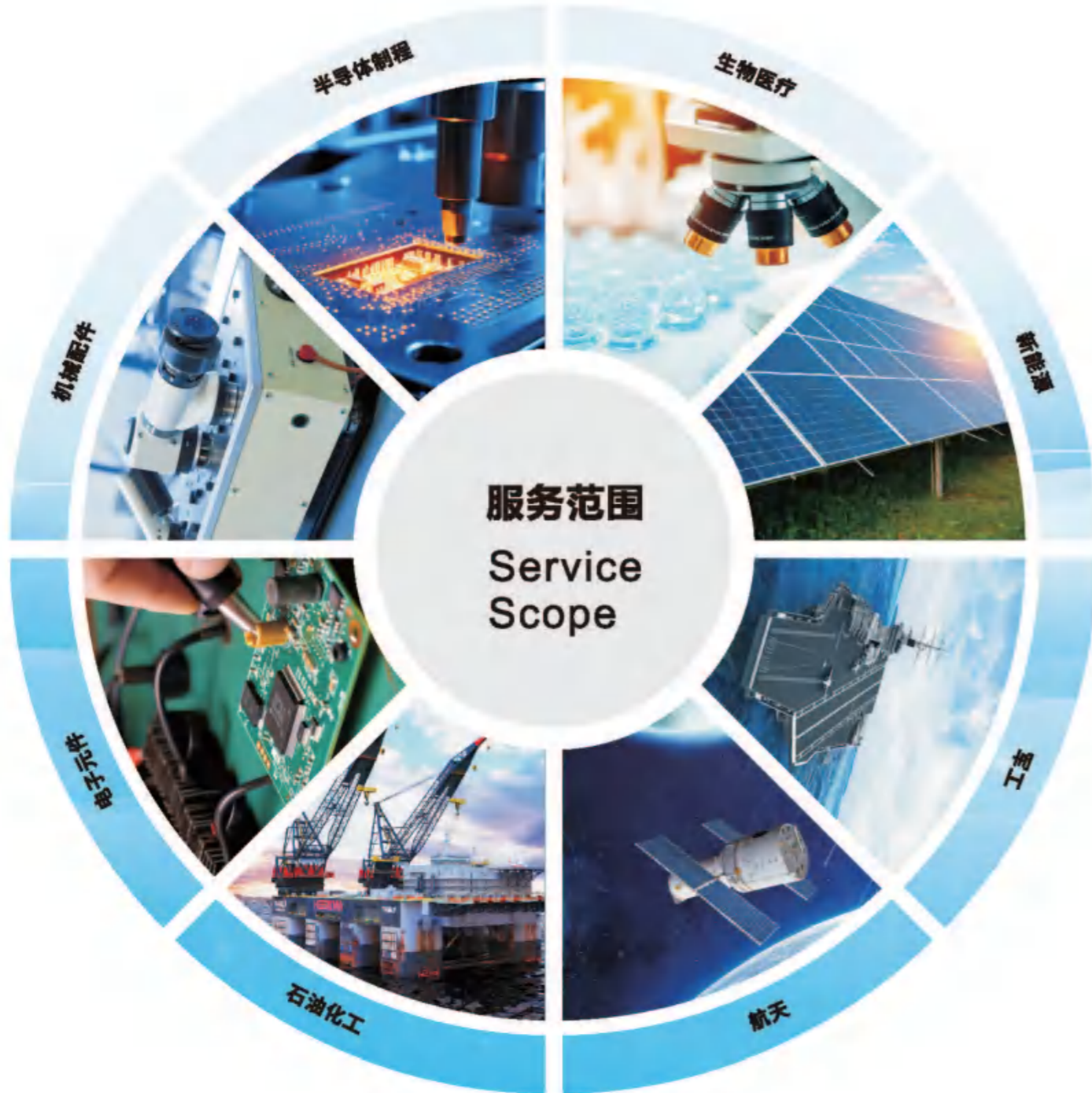


企业精神 Spirit of the enterprise:

诚信为本, 质量为根, 开拓创新, 勇于挑战

质量方针 Policy of the quality:

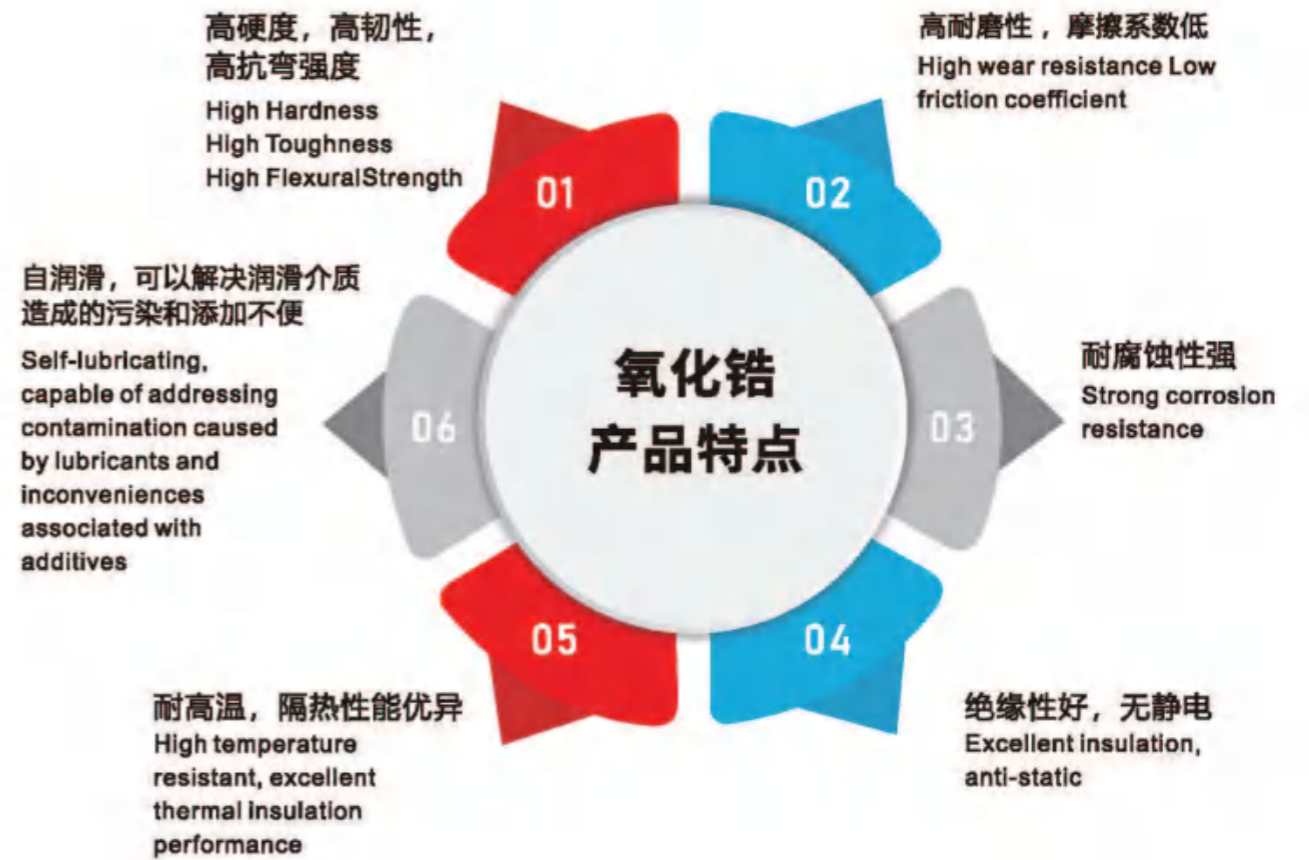
优选材; 精制造; 严检验; 诚服务



氧化锆产品 Zirconia Ceramic

氧化锆陶瓷(ZrO₂陶瓷)具有比其他陶瓷优异的性能,熔点和沸点高,硬度高,常温下为绝缘体,高温下具有导电性。具有相变增韧特性,消费电子用陶瓷材料大部分为氧化锆陶瓷。相对于其他陶瓷密度高,韧性更高,粉碎研磨极佳材料。氧化锆具有在医疗器械中得天独厚的亲和力。

Zirconia ceramic (ZrO₂ ceramic) possesses outstanding properties compared to other ceramics. It has a high melting and boiling point, high hardness, and acts as an insulator at room temperature while exhibiting conductivity at high temperatures. With phase transformation toughening characteristics, zirconia ceramic is predominantly used in consumer electronics. Compared to other ceramics, it has higher density and greater toughness, making it an excellent material for crushing and grinding. Zirconia enjoys exceptional biocompatibility, making it uniquely suitable for medical devices.



氧化锆陶瓷转子 Zirconia Ceramic Rotor

采用冷等静压制造的一体式全陶瓷涡轮，能够有效避免磨损产生磨屑，隔绝金属污染，还能延长陶瓷涡轮使用寿命，减少检修次数，达到节约成本、保证物料品质的效果。

An integrated all-ceramic turbine manufactured using cold isostatic pressing can effectively avoid wear debris, isolate metal contamination, extend the service life of the ceramic turbine, reduce the number of maintenance occurrences, achieve cost savings, and ensure material quality.



陶瓷内衬和轧辊 Ceramic Cylinder and Roller

等静压成型工艺，可根据客户要求定制各种尺寸。

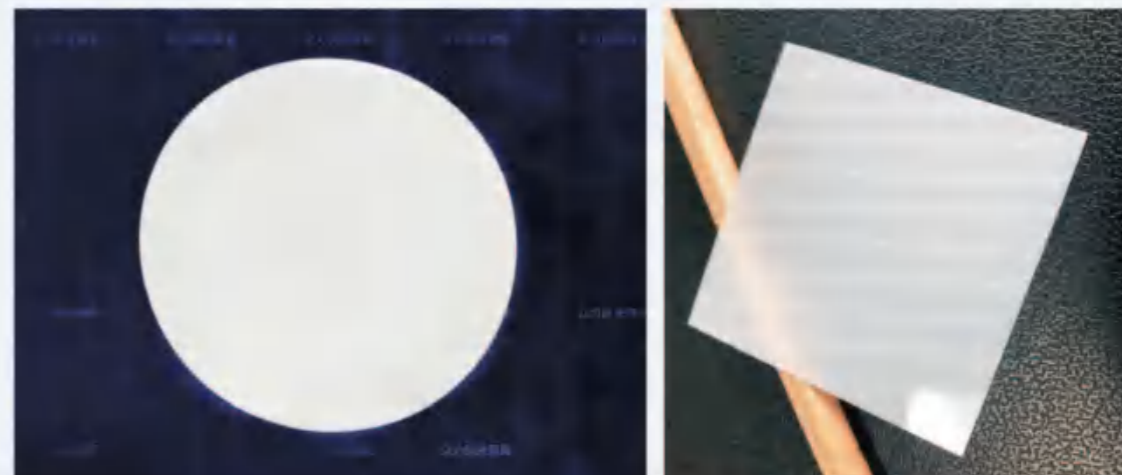
The zirconia ceramic barrels use an isostatic pressing forming process and can be customized to various sizes and specifications according to customer requirements.



氧化锆陶瓷板 Zirconia Ceramic Plate

板状可以达到730mm，最厚50mm（根据形状），薄板研磨薄片，最薄的可达0.05mm。

The zirconia ceramic plates we offer can reach up to 730mm in length, with a maximum thickness of 50mm (depending on the shape). The thin plates can be ground to a precision of 0.05mm, with the thinnest being as thin as 0.05mm.



氧化锆陶瓷轴 Zirconia Ceramic Shaft

产品密度大(密度大于6.02)最小直径可以做到 $\phi 0.5\text{mm}$ 。精加工精度可以达到 $\pm 0.005\text{mm}$ ，表面粗糙度可达0.1微米。产品平行度可达0.01mm，同心度高。

The zirconia shaft series products are formed using isostatic pressing or dry pressing, resulting in dense green bodies and high sintering density (density greater than 6.02). The minimum diameter can be as small as $\phi 0.5\text{mm}$. The precision of fine machining can reach $\pm 0.005\text{mm}$, and the surface roughness can be as fine as 0.1 microns. The product parallelism can reach 0.01mm, with high concentricity.



氧化锆陶瓷结构件 Zirconia Ceramic Structural Component

- 极高的韧性6-8MPa·m^{1/2}高
- 热膨胀性能($\alpha = 10 \times 10^{-6} / K$, 接近于钢)
- 出色的隔热性
- 低导热率(3W / mK)
- 最高使用温度1000°C
- Extremely high toughness: 6-8 MPa·m^{1/2}
- High thermal expansion performance ($\alpha = 10 \times 10^{-6} / K$, close to that of steel)
- Excellent insulation
- Low thermal conductivity (3 W/m·K)
- Maximum operating temperature: 1000°C



氧化锆陶瓷柱塞 Zirconia Ceramic Plunger

- 1、泵体结构采用与产品结构精细密封，方便拆卸。
 - 2、该产品已经过耐腐蚀、耐酸碱度安全性能检测，其各项指标均已达到先进水平。
 - 3、陶瓷柱塞采用高性能技术陶瓷材料，具有硬度高、耐磨、耐高温、耐腐蚀等性能。保证材质性能可靠。
 - 4、陶瓷柱塞工作面采用独特的加工手段而获得的微孔组织具有自润滑作用，改变了传统柱塞泵滑动摩擦与润滑的机理。
 - 5、内腔表面采用流体结构，无死角、沟槽。内腔表面与柱塞表面配合采用先进的高精度内外圆磨床加工至镜面，外表面振动抛光，方便清洗、消毒。
1. The pump body structure is finely sealed with the product structure, facilitating easy disassembly.
 2. This product has been rigorously tested for corrosion and acid-base resistance, with all performance indicators meeting advanced standards.
 3. Made from high-performance technical ceramic materials, the ceramic plunger offers high hardness, wear resistance, high-temperature resistance, and corrosion resistance, ensuring reliable material performance.
 4. The ceramic plunger's working surface features a unique microporous structure obtained through special processing techniques. This provides self-lubrication, improving upon the traditional sliding friction and lubrication mechanism of plunger pumps.
 5. The inner cavity surface adopts a fluid structure with no dead corners or grooves. Both the inner cavity surface and the plunger surface are processed to a mirror finish using advanced high-precision internal and external cylindrical grinders. The outer surface is vibration polished for easy cleaning and disinfection.



氧化锆陶瓷球阀 Zirconia Ceramic Ball Valve

等静压成型，高温烧结，成球致密度高，精密加工同心度高，真圆度高，球面光洁润滑，研磨加工周期短，装夹方便。

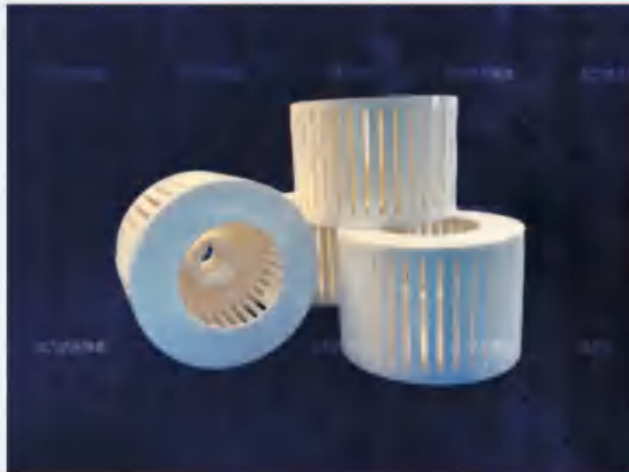
Isostatic pressing forming and high-temperature sintering result in high spherical density. Precision machining ensures high concentricity and roundness. The spherical surface is smooth and lubricated. The grinding process is short, and clamping is convenient.



氧化锆陶瓷分级轮 Zirconia Ceramic Classifying Wheel

采用冷等静压制造的一体式全陶瓷，低能耗：集离心粉碎、冲击粉碎、挤压粉碎于一身，比其它材质节能环保。高细度，低磨损，使用寿命长，无污染，易清洗，韧性大，粉碎材料全。

An integrated all-ceramic piece manufactured using cold isostatic pressing features low energy consumption. It combines centrifugal crushing, impact crushing, and extrusion crushing in one, making it more energy-efficient and environmentally friendly than other materials. It offers high fineness, low wear, long service life, no pollution, easy cleaning, high toughness, and can crush a wide range of materials.



氧化铝陶瓷 Aluminum Ceramic

特点 Highlight

- 高强度
- 熔点高，抗腐蚀
- 高耐磨性
- High strength
- High melting and corrosion resistance
- High wear resistance
- 电绝缘性能好
- 化学稳定性优良
- 热膨胀系数低
- Excellent electrical insulation performance
- Excellent chemical stability
- Low coefficient of thermal expansion
- 硬度高
- 光学特性
- 摩擦系数低
- High hardness
- Optical properties
- Low friction coefficient

重量轻 Lightweight

重量轻便于携带通过特殊材料的使用选料讲究的工业氧化铝陶瓷的密度非常的小，可以大大减轻设备的负荷力。

The lightweight nature of industrial alumina ceramics, achieved through the use of special materials, makes it easy to carry and greatly reduces the load on equipment.

性价比高 Cost Effective

性价比高，使用综合成本价格优越的工业氧化铝陶瓷在很多领域使用不可替代，尤其作为很多设备的重要组成，会影响设备的综合定价。氧化铝市场逐渐代替众多金属产品。

High cost-effectiveness: Industrial alumina ceramics, which offer superior comprehensive cost-performance, are irreplaceable in many fields. Especially as essential components of various equipment, they significantly influence the overall pricing of equipment. The alumina market is gradually replacing numerous metal products.

氧化铝陶瓷分级轮 Alumina Ceramic Classifying Wheel

采用高纯氧化铝粉，采用冷等静压制造的一体式全陶瓷，低能耗：集离心粉碎、冲击粉碎、挤压粉碎于一身，比其它材质节能环保。高细度，低磨损，使用寿命长，无污染，易清洗，韧性大，粉碎材料全。速度快，研磨效率提高。

Crafted from high-purity alumina powder using cold isostatic pressing, our integrated all-ceramic solution offers exceptional performance with minimal energy consumption. Combining centrifugal, impact, and extrusion crushing in one, it outperforms traditional materials in terms of energy efficiency and environmental impact. With superior fineness, extended lifespan, and easy maintenance, it ensures efficient grinding across various materials, boosting productivity.



氧化铝陶瓷柱塞 Aluminum Ceramic Plunger

采用亚微米级纯度为99.7%的氧化铝粉原料，加工同心度高，直线度高，精度达到镜面光洁。

Crafted from raw materials of submicron purity, our products utilize 99.7% alumina powder, ensuring exceptional quality. With meticulous attention to detail, our manufacturing process guarantees high concentricity and straightness, resulting in a mirror-like finish with unparalleled precision.



氧化铝精密结构件 Precision Alumina Ceramic Components

采用高纯度>99.6氧化铝制品，通过冷等静压成型，尺寸精度可达 $\pm 0.002\text{mm}$ ，光洁度可达Ra0.1，平行度好，使用温度最高可达1800度。

Crafted from high-purity (>99.6%) alumina, our products undergo cold isostatic pressing, ensuring exceptional precision. With dimensional accuracy reaching $\pm 0.002\text{mm}$ and a surface finish of Ra0.1, our products exhibit excellent parallelism. They boast a maximum operating temperature of up to 1800 degrees Celsius, making them ideal for demanding applications.



碳化硅陶瓷结构件 Silicon Carbide Ceramic Structural Components

碳化硅具有硬度仅次于金刚石和碳化硼，莫氏硬度为9.5，具有高耐磨性，因此用于滑动部件（机械密封等）。具有高的杨氏模量和小的热膨胀系数，因此用于需要高精度的部件（光学部件，基板等）。由于是致密的烧结体，因此可以进行镜面加工。耐高温超过1600 C，耐热冲击，具有优异的化学稳定性。做为SiC吸盘，SiC护套，薄板产品和厚壁产品。

Silicon carbide boasts a hardness second only to diamond and boron carbide, with a Mohs hardness of 9.5. Its high wear resistance makes it ideal for sliding components such as mechanical seals. With a high Young's modulus and low thermal expansion coefficient, it is suitable for precision components like optical parts and substrates. Its dense sintered structure allows for mirror finishing. Withstanding temperatures exceeding 1600°C and heat shock, it exhibits excellent chemical stability. It is utilized in various applications including SiC suction cups, SiC sheaths, thin plate products, and thick-walled products.

碳化硅陶瓷筒 Silicon Carbide Ceramic Cylinder

研磨筒是由冷等静压成型反应烧结工艺方式成瓷，至目前我们最大直径可做到1250mm，高度可根据客户要求结合直径大小定制，同时小径尺寸也有无压烧结工艺可选择。

由于碳化硅材质有着高强的硬度使它耐磨性稳定，热稳定性强、热膨胀系数低、抗氧化耐腐蚀、耐强酸碱还具有热传导率高等优越性能，极致的应用在砂磨机研磨内衬上。烧成的碳化硅经过精密的机械加工，可高精度的匹配各类设备装配。

研磨桶尺寸可供：0.1L...1200L 砂磨机设备定制。

为了更好增强碳化硅应用强度，本公司有镶嵌铝管工艺和设备，能满足客户包铝加工需求。

可根据客户要求定制各种大尺寸碳化硅管道、炉胆内衬类产品。



The grinding barrel is formed into ceramic using cold isostatic pressing and reaction sintering processes. Currently, we can achieve a maximum diameter of 1250mm, and the height can be customized according to customer requirements in combination with the diameter. Additionally, smaller diameters can be produced using pressureless sintering processes.

Due to the high hardness of silicon carbide material, it has stable wear resistance, strong thermal stability, low thermal expansion coefficient, oxidation resistance, corrosion resistance, and strong acid and alkali resistance, as well as high thermal conductivity. These excellent properties make it ideal for use as grinding linings in sand mills. The sintered silicon carbide undergoes precise mechanical processing to achieve high-precision matching with various equipment assemblies.

Grinding barrel sizes available: 0.1L - 1200L for sand mill equipment customization.

To further enhance the application strength of silicon carbide, our company offers aluminum tube embedding processes and equipment to meet customer requirements for aluminum-clad processing. We can customize various large-size silicon carbide pipes and furnace lining products according to customer requirements.



碳化硅陶瓷板 Silicon Carbide Ceramic Plate

根据使用的领域不同，我们根据不同的工艺，经过不同的烧结方式制作出合适的密封环。保证质量，帮助企业控制成本，扩大市场。精度高，硬度大，碳化硅盘密度大于3.14g/cm³。

Our seal rings boast high precision and hardness, with a silicon carbide disc density exceeding 3.14g/cm³. Depending on the specific application area and requirements, our seal rings are manufactured using different processes and sintering methods to ensure optimal performance. We prioritize quality assurance to help businesses control costs and expand their market presence.



无压碳化硅 Pressureless Sintered Silicon Carbide



碳化硅陶瓷转子 Silicon Carbide Ceramic Rotor

使用高纯度碳化硅粉，通过等静压成型，烧制高密度结构件，寿命长，散热性能好，摩擦系数小，提高研磨效率，重量轻，离心率小，研磨转速高，没有污染，产品纯度高，提高研磨效率，节约成本。

Using high-purity silicon carbide powder, formed through isostatic pressing, fired to create high-density structural components. Long lifespan, good heat dissipation performance, low friction coefficient, enhancing grinding efficiency. Lightweight, minimal centrifugal force, high grinding speed, no pollution, high product purity, improving grinding efficiency, saving costs.



碳化硅陶瓷结构件 Silicon Carbide Ceramic Structural Components

采用碳化硅高纯粉末，通过干压或等静压成型，常压烧结，制品不含金属硅等金属杂质。根据客户设计制作各种型式规格，质量稳定，交期可靠，最高使用温度可达1600℃，使用周期长，质量轻振动幅度小，表面易清洁等。

Using high-purity silicon carbide powder, formed through dry pressing or isostatic pressing, and sintered under normal pressure, the product does not contain metal silicon or other metal impurities. We customize various types and specifications according to customer designs, ensuring stable quality and reliable delivery. The maximum operating temperature can reach 1600°C, with a long service life, lightweight, minimal vibration amplitude, and easy-to-clean surface.





碳化硅陶瓷阀 Silicon Carbide Ceramic Valve



氮化硅陶瓷结构件 Silicon Nitride Ceramic Structural Components

氮化硅陶瓷对热、冲击及撞击皆具有高度抗性。卓越的耐热性及抗冲击性加之高强度，使得氮化硅成为高温、高负载应用之优先选择。氮化硅陶瓷的常见应用为半导体加工设备，一般工业机械，耐热零件。氮化硅是一种超硬物质，本身具有润滑性，并且耐磨损，为原子晶体；高温时抗氧化。而且它还能抵抗冷热冲击，在空气中加热到1000°C以上，急剧冷却再急剧加热，也不会碎裂。在耐高温方面，氮化硅远优于其他陶瓷材料，同时它具备抗氧化性、强度大和高蠕变性等优异的性能。氮化硅自身具备的低热传导率和高耐磨性使之能够应用于最为严苛使用环境。抗酸碱腐蚀性方面，除氢氟酸外，它不与其他无机酸反应，抗腐蚀能力强，高温时抗氧化。

Silicon nitride ceramics exhibit high resistance to heat, impact, and collision. Its excellent heat resistance, impact resistance, and high strength make silicon nitride the preferred choice for high-temperature and high-load applications. Common applications of silicon nitride ceramics include semiconductor processing equipment, general industrial machinery, and heat-resistant components. Silicon nitride is an ultra-hard substance with inherent lubrication properties, high wear resistance, and is a crystalline material; it is oxidation-resistant at high temperatures. Additionally, it can withstand thermal shock: heating to over 1000°C in air, rapid cooling, and then rapid reheating without fracturing. In terms of high-temperature resistance, silicon nitride far exceeds other ceramic materials. It also exhibits excellent properties such as oxidation resistance, high strength, and high creep resistance. Its low thermal conductivity and high wear resistance allow it to be used in the most demanding environments. Regarding resistance to acid and alkali corrosion, aside from hydrofluoric acid, it does not react with other inorganic acids, demonstrating strong corrosion resistance and oxidation resistance at high temperatures.



氮化硅陶瓷轴 Silicon Nitride Ceramic Shaft

氮化硅陶瓷柱塞比金属柱塞使用寿命高7~12倍以上。柱塞泵的核心零件，用以替代金属柱塞。降低苛刻环境下的使用和更换成本。

Silicon nitride ceramic plungers last 7-12 times longer than metal plungers. They replace metal plungers in plunger pumps, reducing usage and replacement costs in harsh environments.



氮化硅陶瓷喷嘴 Silicon Nitride Ceramic Nozzle

采用高纯度氮化硅粉，通过等静压成型，烧制高密度结构件，寿命长，散热性能好，摩擦系数小，喷射均匀根据喷的原料，喷雾量、视点、防阻塞状况等，产品有空心锥形、半实心半空心锥形，实心锥形等，质量轻易清洁。

Using high-purity silicon nitride powder, our components are formed through isostatic pressing and fired to create high-density structures. They offer long lifespans, excellent heat dissipation, low friction coefficients, and uniform spray patterns. Depending on the material being sprayed, spray volume, coverage, and clog resistance, we offer hollow cone, semi-solid cone, and solid cone shapes. These products are lightweight and easy to clean.



氮化硅陶瓷转子 Silicon Nitride Ceramic Rotor

采用分散性高，均质性高纯氮化硅粉，成型烧结致密性一致的氮化硅毛坯，精密加工成形。防止金属污染，比重比氧化锆陶瓷小，降低电机能耗，低成本得到粒径更细的颗粒。

Using high-dispersion, high-homogeneity pure silicon nitride powder, we create uniformly dense silicon nitride blanks that are precisely machined. These products prevent metal contamination, are lighter than zirconia ceramics, reduce motor energy consumption, and produce finer particles at a lower cost.



氮化硅陶瓷球阀 Silicon Nitride Ceramic Ball Valve

采用自研氮化硅粉配方，等静压成型球坯，通过精密夹具，精雕研磨抛光，制作出同心度高，真圆度高，球面光滑的氮化硅球阀。

Using our proprietary silicon nitride powder formulation and isostatic pressing, we create silicon nitride ball valves with high concentricity and roundness. Precision fixtures and meticulous grinding and polishing ensure smooth surfaces.



氮化硅陶瓷坩埚 Silicon Nitride Ceramic Crucible

氮化硅自扩散系数低，抗杂质扩散和防水汽渗透能力强；

氮化硅具有良好的抗腐蚀、抗氧化、耐摩擦、自润滑等性能；氮化硅不与熔融硅Si发生反应，与Si硅熔液不粘连，具有优异的抗侵蚀性和可脱离性。

氮化硅坩埚导热系数高几十倍于石英坩埚，使用高纯度高导热氮化硅坩埚替代石英坩埚，在控制单晶硅时，可以大幅压缩熔硅时间和随炉冷却时间，不仅生产效率得以提高，而且用电量也得以减少，节省能源和生产运行成本。

Silicon nitride has a low self-diffusion coefficient, strong resistance to impurity diffusion, and excellent water vapor permeability resistance.

Silicon nitride offers good corrosion resistance, oxidation resistance, wear resistance, and self-lubricating properties, it does not react with molten silicon (Si) and has excellent anti-erosion and non-stick properties.

The thermal conductivity of silicon nitride crucibles is tens of times higher than that of quartz crucibles. Using high-purity, high-thermal-conductivity silicon nitride crucibles instead of quartz crucibles can significantly reduce the melting and cooling time in the production of single crystal silicon. This improves production efficiency, reduces electricity consumption, and lowers energy and operational costs.



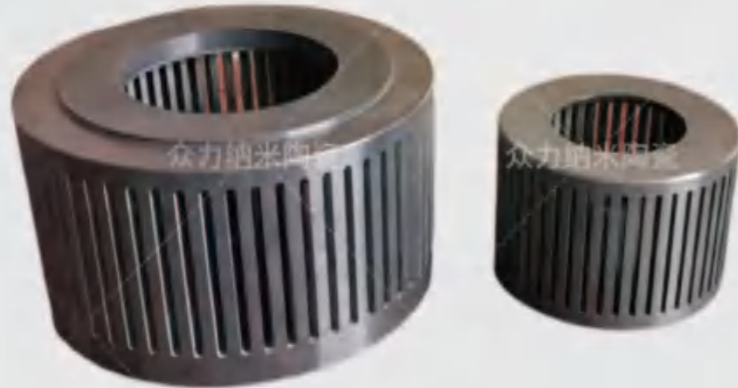
氮化硅陶瓷结构件 Silicon Nitride Ceramic Structural Components

氮化硅弹性模量要比金属要高很多,受力后弹性变形可以在一定的程度上减轻设备的震荡,比重轻,自润滑等特性,超精密设备,航空航天领域的材料首选。

Silicon nitride has a much higher elastic modulus than metals, which can reduce equipment vibration through elastic deformation. Its light weight and self-lubricating properties make it the material of choice for ultra-precision equipment and aerospace applications.



氮化硅陶瓷分级轮 Silicon Nitride Ceramic Classifying Wheel



陶瓷—特性比较表 Ceramic - Property Comparison Table

名称/特性 Name/Characteristics	Al ₂ O ₃ (氧化铝)	ZrO ₂ (氧化锆)	Si ₃ N ₄ (氮化硅)	SiC (碳化硅)	AlN (氮化铝)
外观 Appearance	白色至象牙色 White to ivory	白色 White	灰黑色 Gray-black	黑色 Black	灰色至浅棕色 Gray to light brown
密度 Density(g/cm ³)	3.75-3.96	5.68-6.05	3.17-3.35	3.10-3.21	2.6-3.0
维氏硬度 Vickers Hardness	1450-1600	1300-1450	1600-1800	2000-2200	1200-1500
体积电阻系数 Volume Resistivity(Ω-cm)	>10 ¹⁴	>10 ¹⁰	>10 ¹⁴	10 ² -10 ¹²	>10 ¹¹
热导率 Thermal Conductivity (W/mK)	25-30	2--5	20-40	60-120	120-220
热膨胀系数CTE 10 ⁻⁶ K ⁻¹	7.0-9.0	9.0-12.0	2.5-3.5	4.0-5.0	4.5-5.5
弹性模量 Young's Modulus(GPa)	300-400	190-250	280-320	400-450	310-330
泊松比Poisson's ratio	0.22-0.24	0.30-0.31	0.24-0.27	0.14-0.21	0.23-0.25
最高使用温度 Max Service Temp(C)	优秀 Excellent	良 Good	优秀 Excellent	优秀 Excellent	优秀 Excellent
耐酸碱性Chemical Resistance	优秀 Excellent	优秀 Excellent	优秀 Excellent	优秀 Excellent	良 Good
磁性 Magnetism	无 Non-magnetic	无 Non-magnetic	无 Non-magnetic	无 Non-magnetic	无 Non-magnetic
热震稳定性 Thermal Shock Resistance(ΔT,C)	良 Good	良 Good	优秀 Excellent	良 Good	良 Good