Turning the Axis of the World!
The Supplier Specialized in Precision Structured Ceramics
COMPANY PROFILE

公司简介

深
圳市商德先进陶瓷有限公司是一家在先进陶瓷领域集研发、制造与销售为一体的现代化企业。工厂设立在中国广东省深圳市。

公司主要为包括来自美国、德国、以色列、新加坡、日本等世界各地的客户提供精密陶瓷零部件。产品满足不同行业客户的设备需求，在SMT、半导体设备、医疗器械、流体控制、打印设备等领域都得到了广泛应用。

公司拥有一批高端机械设备，实现了从陶瓷粉料调配、生坯成型、毛坯烧结到精密陶瓷二次机械精加工整个陶瓷零件生产流程的自主完成。

公司现有一批技术经验丰富的陶瓷制造和研发团队，不断地进行新技术、新工艺开发和改进，为公司的快速和可持续发展提供了保障。

公司在2008年5月首次通过ISO9001质量管理体系认证，在2013年9月再次通过了ISO9001质量管理和ISO14001环境管理体系双体系认证。我司在先进陶瓷领域已经拥有6项国家专利和20项科研成果，并成功的实现了科研到生产的转换。公司秉承商品无销、服务天下的经营路线致力于做全球先进陶瓷材料的领跑者。

我们提供的服务如下：

◆部分稳定（钇、铈和镧）氧化锆陶瓷和高纯度氧化铝（99.8%）的生坯成型

◆部分稳定（钇、铈和镧）氧化锆陶瓷和高纯度氧化铝（99.8%）的毛坯烧结

◆各种先进陶瓷材料的精密机械加工

◆各种特殊先进陶瓷材料的开发定制（导电陶瓷、防静电陶瓷、自润滑陶瓷）

◆先进陶瓷机械或电子零部件的设计、开发和生产

Suntech Advanced (Shenzhen) Co., Ltd. is a supplier of advanced ceramic parts. Our manufacturing facility is in Shenzhen, China. Suntech have established our own capability in research, development and various manufacturing processes and techniques in the field of advanced ceramics.

Suntech supply high-precision ceramic parts for customers of America, Germany, Israel, Singapore, Japan and the rest of the world. Our products can meet both application and quality requirements of industries such as Surface-Mount-Technology (SMT), semiconductors equipment, medical equipments, flow-control equipments and printing machines.

Through the years of use of highly specialized ceramics fabrication equipment coupled with a team of well experienced engineers, Suntech has mastered the entire manufacturing process of advanced ceramics from powder preparing, green body forming, sintering to 2nd time precision machining.

As a technology company, we recognize the importance of engineering innovation. Therefore, we have put in high priority in areas of new manufacturing technique and process. This philosophy has been the driving force to safeguard continuous product improvement of our company.

Suntech have acquired ISO9001 for the first time in May 2008, and we once again acquired ISO9001 as well as ISO14001 in September 2013. We have owned 6 national patents and 20 achievements in scientific research and have successfully transformed these scientific researches into actual manufacturable products. Our company has always been committing to supplying the highest quality of advanced ceramic products to our customers. Suntech’s management philosophy is as follows, Business expands boundlessly when integrity is pronounced.

Area of Service:

◆Molding of Partially Stabilized (Y2O3-Ce2O3) Zirconia and high purity Alumina (99.8%)

◆Sintering of Partially Stabilized (Y2O3-Ce2O3) Zirconia and high purity Alumina (99.8%)

◆Precision Machining of Various Advanced Ceramic Material

◆Development and Composition of Various Advanced Ceramic material, (Conductive Ceramic, ESD Ceramic, Self-lubricated Ceramic)

◆Design, Development, Manufacturing of Mechanical or electronic components of Advanced Ceramic
企业文化

理念：
商者无域，德行天下

价值观：
为客户提高产品竞争力，创造最大效益；为员工创建实现个人价值的平台；感恩并回报社会。

愿景：
致力于全球先进陶瓷材料研发和制造的领跑者。

品质政策：
提升技术品质，领行行业标准，完善服务体系，实现客户满意

环境政策：
遵守法规，预防污染，节能降耗，持续改善

Management Philosophy:
Business expands boundlessly when integrity is pronounced.

Core Values:
Upgrade Customer Products Competitive Strength, Create utmost benefits. Provide employees with self-realized value platform, be grateful for we have and return to community.

Company Vision:
Committed in pioneering Global Advanced Ceramic material design and manufacturing.

Quality Policy:

Environmental Policy:
Abide by Rules and Regulations, Prevent Pollution, Save Energy and Lower Consumption, Improve Continuously.
COMPANY MILESTONE

2006.04  深圳市商德电子有限公司成立
2006.12  成立陶瓷事业部
2007.08  建立自己的生产基地
2008.03  成为环球仪器的合格供应商
2008.04  成为AVC的合格供应商
2008.05  成为Kulicke&Soffa的合格供应商
2008.06  通过ISO9001质量管理体系认证
2009.04  成为ASM的合格供应商
2009.09  成为TycoFlowControl的合格供应商
2010.08  成为大族激光的合格供应商
2011.03  成功开发蓝&白色的青花瓷手机后盖
2011.05  成为桂林优利特和长春迪瑞的合格供应商
2011.07  成为南京富士通的合格供应商
2011.09  成为上海明志的合格供应商
2011.09  工厂搬至宝安沙井，厂房面积由800平方米增加到3700平方米
2012.03  成为FBDA和Microls的合格供应商
2012.05  “自备石墨模制磷化铜陶瓷及滑动轴承”获得国家发明专利
2012.06  深圳市商德电子有限公司更名为深圳市商德先进陶瓷有限公司
2012.09  成为HCT的合格供应商
2013.03  成为北京中电科的合格供应商
2013.04  成为Nordson和Heraeus的合格供应商
2013.05  成为江西特康的合格供应商
2013.06  成为Makino的合格供应商
2013.09  通过ISO9001质量管理和ISO14001环境管理体系认证
2013.11  荣获深圳市高新技术企业认定
2014.03  成为艾斯特科的合格供应商
2014.08  成为翠海的合格供应商
2014.09  荣获国家级高新技术企业认定

2006.04  Shenzhen Suntech Electronics Co., Ltd founded
2006.12  Started Ceramics Business Division
2007.08  Established own Ceramics Manufacturing Base
2008.03  Qualified as supplier of Universal Instruments
2008.04  Qualified as supplier of AVC
2008.05  Qualified as supplier of Kulicke&Soffa
2008.06  Started work to Qualified ISO9001
2009.04  Qualified as supplier of ASM
2009.09  Qualified as supplier of Tyco Flow Control
2010.08  Qualified as supplier of Hans Laser
2011.03  Successfully developed ceramic back cover in blue& white glaze for mobile phones
2011.05  Qualified as supplier of Guilin URIT and Changchun Diri
2011.07  Qualified as supplier of Nanjing Fujitsu
2011.09  Qualified as supplier of Shanghai Moons
2011.09  Factory moved to Shajing Bacon, plant factory grew from 900 sqm to 3700 sqm
2012.02  Qualified as supplier of FBDA & Microls
2012.05  Zirconia Ceramics Self-lubricated Bearing has got the national patent
2012.06  Suntech Ceramics (Shenzhen)Co., Ltd changed the name to Suntech Advanced (Shenzhen)Co., Ltd
2012.09  Qualified as supplier of HCT
2013.03  Qualified as supplier of Beijing CETC
2013.04  Qualified as supplier of Nordson & Heraeus
2013.05  Qualified as supplier of Tecom
2013.06  Qualified as supplier of Makino
2013.09  Acquired ISO9001 and ISO14001
2013.11  Crowned Shenzhen High-tech Enterprises
2014.03  Qualified as supplier of Astek
2014.08  Qualified as supplier of Junes
2014.09  Crowned High-tech Enterprises
Certificate of honor
荣誉证书
Enterprise honorary certificate
企业荣誉证书
Patent certificate
专利证书
Factory and product certification
工厂和产品认证
Suntech Service Support

With our excellent talents, advanced techniques, solution-oriented design capability and one-stop service, Suntech has been committing in vitally important ceramic requirement in the world.

We have established complete set of production facilities to manufacture the required quality standard of ceramic products.

**Service Process**

1. Understand customers requirements
2. On site analysis, provide the optimized solution meeting mechanical requirements and cost expectation
3. Customer confirm 1st sample and test.
4. Confirm design optimized solution
5. Confirm sample and start mass production

As a manufacturer of advanced ceramic parts, Suntech has been serving industries like semiconductor, SMT, energy, environmental techniques, equipments, machinery and medical instrumentation.

Selection and optimization of ceramic material to meet requirements of different applications. All of them are Suntech’s core competencies.
Manufacturing Techniques Advantages
制造技术优势

Semiconductor 半导体

- 小孔同心度要求达到0.02mm;
- 内壁表面粗糙度要求达到Ra0.2 μm;
- 内孔径小，最小达0.34mm;
- 内壁所有特征光滑过渡

- Hole concentricity reaches 0.02mm
- Surface roughness reaches Ra0.2 μm
- Inner hole diameter is small, minimum reaches 0.34mm
- Sharp edge free
内孔径小，最小可达0.07mm；
独特的选材，高耐磨黑色氧化锆陶瓷（防静电可选）；

Inner hole diameter is small, Minimum reaches 0.07mm
Unique chosen material, Black zirconia with high abrasion resistance (ESD ceramic alternative).
分血阀 Shear Valve

- 独特的选材：高耐磨和耐腐蚀氧化铝陶瓷；
- 表面形貌加工波纹度严格控制；
- 小孔孔径小且多，最小孔径0.4mm；
- 细孔深度大达到5mm；
- 小孔位置度要求高，需达到位置度0.02mm

- Unique chosen material: high wear resistance and corrosion resistance Aluminum Oxide Ceramic
- Surface shape machining micro waveness strictly controlled
- Hole diameter is small but many, the smallest one is 0.4mm.
- The depth of thin hole reaches 5mm.
- Position tolerance requirement is high, the accuracy reaches 0.02mm
注样针 Sample Needle

- 细长孔，长径比达350:1
- 内孔孔径小长度大，孔径0.2mm，长度70mm；
- 内孔直线度要求高0.05mm；
- 内孔表面粗糙度要求高达Ra0.2µm，保证流体顺畅通过

- Slim hole, Leng/Diameter 350:1
- Hole diameter is small but long diameter is 0.2mm, length is 70mm
- Hole Straightness requirement is high, 0.05mm.
- Hole surface roughness requirement reaches highly to Ra0.2µm, ensure smooth flow for fluid.
High-end Machining Equipment
高端机械加工设备

- 内孔孔径小，最小可达0.04mm
- 陶瓷材料上磨制加工螺纹，便于与其他材料的连接
- Hole diameter is small, the smallest can reach 0.04mm.
- Machine threads on ceramic materials, to facilitate the connection with other materials.
球阀 Ball Valve

- Product dimensions are large, with the largest diameter reaching 330mm, the longest reaching 380mm, and weight reaching 28Kg.
- Special material: Mg-PSZ can meet the stability over 850°C in a water vapor environment at high temperature for a long time without performance degradation.

蝶阀 Butterfly Valve

- Sizes of products are very large; the largest diameter can reach 330mm, the longest can reach 380mm, and weight is 28Kg.
- Specially chosen material, when Mg-PSZ is immersed in a water vapor environment at high temperature of 850°C for a long time, timely performance degradation will not occur.
24孔独孔导针板
24 single holes wire guide

24孔斜边导针板
24-holes wire guide with cant

- 产品尺寸小，长宽最小5*3，厚度最小0.38mm
- 产品规格多，分为单片24孔、12孔、9孔
- 小孔孔间距小，最小孔间距仅0.05mm
- 小孔位置度要求达到0.02，平行度要求高0.01mm

- At small size, length*width minimum 5*3, thickness minimum 0.38mm
- At various specifications, ranging from single plate 24 holes, 12 holes, 9 holes
- Small holes distance are small, the smallest one is 0.05mm
- Small hole position tolerance can reach 0.02, parallelism requires 0.01m higher position tolerance
Radiator Fans Bearing
风扇轴承

- Concentricity requires high, it reaches 0.02mm.
- Special chosen material from self-lubricated ceramic material, in order to reduce friction & noise.
- It requires high cylindricity, reaches 0.004mm.
- Cylindricity diameter tolerance reaches 0.002mm.
Ceramic Piston
陶瓷柱塞

- 圆柱度要求高，需达到0.04mm
- 表面粗糙度要求高，需达到Ra0.02 μm
- 密封性好，能承受3kg压力不漏气
- If requires high cylindricity, reaches 0.04mm
- If requires high surface roughness, reaches Ra0.02 μm
- It has small clearance, can bear 3kg pressure without leakage.
Microwave Ceramics

- Dielectric constant adjustable range: $\varepsilon = 6-150$
- Frequency Temperature Coefficient: $T_f = \pm 10$PPM/°C
- Application Range: Compass Navigation Antenna, GPS Navigation Antenna, Bluetooth Antenna, RFID Ceramic Antenna, Communication Base Station in TE01 Mode Dielectric Resonator, Filter etc.

Microwave Dielectric Ceramics Plate

Microwave Ceramics Substrate
Quality Inspection Procedure Introduction

1. **Start**
   - Suppliers deliver goods
   - Storage Reception

2. **Transfer for inspection**
   - Incoming inspection IOQC

3. **IOQC**
   -合格
   - Deliver to warehouse
   - Molding department receives material for production

4. **Molding parameter adjustment**
   - First piece inspection FAQC
   -合格
   - Mass production

5. **First piece inspection**
   -合格
   - Mass production

6. **Production imprvement**
   - Stop production & improvement
   - Unqualified products treatment (repair, special treatment, discard)

7. **Shipment**
   - Finished products inspection

8. **Discard**
   - Stop production & improvement
   - Unqualified products treatment (repair, special treatment, discard)

9. **End**
FA Qualification Process
首样认证过程

尺寸测试
Form test

装配测试
Fit test

功能测试
Function test

客户进行装配测试来确认是否装配合格。如果合格，则确认装配测试合格。
Customer do the fit test to verify the assembly. If qualified, it confirms the fit test is OK.

客户对产品进行功能测试来确认产品是否合乎使用。如果产品能够满足客户功能使用，则确认产品合格。
Customer do the function test for their application test. If the FA is acceptable in function, the function test is done.

硬度测试仪
Hardness tester

晶相显微镜
Crystalline phase microscope

影像测量仪
Image measuring instrument

同心度仪
Concentricity instrument
R&D center and New Ceramic material
研发中心与新陶瓷材料

R&D center
研发中心

Suntech has always been putting great importance on engineering, manufacturing techniques and products innovation as our long-term development strategy. In doing so, we have invested heavily on building a world-class ceramic R&D laboratory. This laboratory greatly enhances our product competitiveness. There is also technology cooperation between Suntech and academic institutions; Suntech has signed cooperation agreement with Shenzhen University of China in the areas of engineering design, manufacturing techniques of advanced ceramics.

Suntech has 14 R&D engineers; 1 is doctor, 4 are post-graduates. Sare undergraduates, 4 are technical college diploma, one of these staffs is Shenzhen high-level professional talent and senior engineers have worked on the advanced ceramic industry more than 20 years. Some R&D staffs as core backbones have participated the 10th 5 years National Scientific Technological Projects and the National Natural Science Foundation projects of China. Company respectively signed a research cooperation agreement with Shenzhen University and Guangdong University of Technology, keeping long-term technical cooperation and exchange with each other. In 2014, Suntech and Guangdong University of Technology built a Joint Laboratory for Advanced Ceramics to carry out joint development in the field of high-end technology ceramics.

In recent 4 years, Suntech has always been putting great importance on transforming R&D results to actual manufacturable products. The company has established more than 20 R&D projects and successfully finalized in achievement transformation into production which brought in a good economic value and social benefits. Suntech has made a major breakthrough in the field of modified ceramic and molding process transformation which significantly increasing the diversity and practicality of our products. Suntech emphasizes on research innovation and intellectual property protection. Suntech has acquired six patents, and now applying for seven patents. What's more, Suntech has an achievement that has identified as Shenzhen science and technology achievement. Suntech has successfully developed anti-static ceramic materials, conductive ceramic material, porous zirconia ceramics, porous alumina ceramic, microwave dielectric ceramics, magnetic functional ceramics, etc., and those materials were successfully applied to the production. According to customers requirements, Suntech plans to develop the high thermal conductive ceramics, transparent ceramics, metal ceramics, antibacterial functional ceramics, and special composite ceramic materials.
New Ceramic Material
新材料

Anti-static ceramic
防静电陶瓷
性能：具有迅速将静电耗散的特殊功能，具有硬度高，耐磨损，耐高温，不变形的特点。
应用领域：SMT陶瓷吸嘴，防静电镊子，防静电刀子，半导体行业，LCD液晶生产行业，硬盘磁头生产行业夹具和支撑件。
Property：Anti-static ceramic can quickly dissipate static electricity and possesses features of high hardness, wear resistance, high temperature resistance and no deformation.
Application area：SMT ceramic nozzle, anti-static tweezers, anti-static knife, semiconductor industry, LCD industry and hard drive head fixture and supports industry.

Porous alumina ceramic
多孔氧化铝陶瓷
性能：具有微米级三维多孔特殊结构，高孔隙率和连通性，而且具有耐高温，耐腐蚀，不生锈，卫生清洁，环保等特点。
应用领域：医药工业、食品工业（明胶、葡萄酒、白酒、果汁、牛奶等）、高纯水、城市污水、工业废水、饮用水、生物技术、生物发酵等行业，用于过滤。
Property：Porous alumina ceramic possesses a special three-dimensional porous microstructure and it possesses features of high porosity connectivity, high temperature resistance, corrosion resistance, no rust, hygiene and environmental protection.
Application area：medical industry, food industry (gelatin, grape wine, white wine, juice, milk), high purity water, city wastewater, industrial wastewater, potable water, biotechnology, biological fermentation. Porous alumina ceramic is mainly used to filter.

Porous zirconia ceramic
多孔氧化锆陶瓷
性能：具有高的含油率，硬度高，耐磨性，噪音低，寿命长等特点。
应用领域：笔记本散热风扇轴承，各种微电机轴承。
Property：Porous zirconia ceramic possesses features of high oil content, high hardness, wear resistance, low noise, and long lifetime.
Application area：bearings of notebook cooling fan and various micro-motor bearings.

Conductive ceramics
导电陶瓷
性能：具有与金属同样优异的导电性能，且耐高温，防氧化，具有优异的散热性能。
应用领域：导流管，导电陶瓷蒸发舟，导电陶瓷坩埚，LED和IGBT散热。
Property：Conductive ceramic possesses features of excellent conductivity same as metal, high temperature resistance, anti-oxidation and outstanding heat dispersion.
Application area：diversion tube, conductive ceramic evaporation boat, conductive ceramic crucible, LED and IGBT heat dispersion.

Micro dielectric ceramic
微波介质陶瓷
性能：具有介电常数可调，介电损耗小，温度稳定性高，不变形，不氧化，不生锈的特点。
应用领域：GPS导航，北斗导航陶瓷天线，通信基站谐振器，滤波器。
Property：Micro dielectric ceramic possesses features of adjustable dielectric constant, small dielectric loss, high temperature stability, no deformation, no oxidation and no rust.
Application area：GPS navigation, Compass navigation ceramic antenna, communication base station resonator, and filter.
Manufacturing Platform

Suntech breaks through the traditional ceramic manufacturing and take the innovation model integrate the mixing powder, green body molding, green body machining, sintering and second machining technology together, with the systematic detection control process, to create an integrative manufacturing platform.

Suntech has established complete supporting facilities and large modern factory in line with international standards in Shenzhen. Suntech fully applies ProE, Lotus, PDM, ERP and other advanced software and equipment with high-end advanced production and testing equipment to ensure that Suntech's ceramic products meet the highest international quality standards.
Molding Process Diversity
成型多样性

商德拥有5种成型工艺：干压成型、高压注射成型、低压注射成型、等静压成型、凝胶成型。针对客户产品结构、尺寸、精度要求、需求数量不同，选用合适的成型工艺。

SunTech has 5 molding techniques: dry pressing, high pressure injection molding, low pressure injection molding, isostatic pressing molding, gel casting molding. In accord with customers' specific structure, size, accuracy and quantity requirements, we choose suitable molding technique.

### 干压成型  Dry Pressing

- **成型优势**: 生产效率高，工艺简单；模具费用较低
- **成型缺点**: 只能成型结构简单、横截面一致，厚度较小的产品

Molding advantages: High production efficiency, easy techniques, low tooling cost
Molding weakness: molding structure simple only, cross section is the same, small thickness

### 高压注射成型  High Pressure Injection Molding

- **成型优势**: 可成型结构复杂产品，成型产品尺寸精度高、生产效率高
- **成型缺点**: 模具费用高，生产周期长

Molding advantages: can mold complex structural products, the finish products have high precision, and can be produced in high efficiency
Molding weakness: high tooling cost and long production cycle

### 低压注射成型  Low Pressure Injection Molding

- **成型优势**: 可成型结构复杂产品，模具费用相对较低
- **成型缺点**: 产品精度中等，生产效率低

Molding advantages: can mold complex structural products, tooling cost is relatively low
Molding weakness: products precision is medium, low production efficiency

### 等静压成型  Isostatic Pressing Molding

- **成型优势**: 可成型大件产品，产品实体强度高，陶瓷材料强度高
- **成型缺点**: 生产效率低，成型产品结构简单，需后续加工多，产品单价高

Molding advantages: can mold large size products, products bodies have high hardness, ceramic material is of high hardness
Molding weakness: low capacity, molding products in easy structure, requires much machining work with high unit price.

### 凝胶成型  Gel Casting Molding

- **成型优势**: 可成型大件产品，模具费用低
- **成型缺点**: 生产周期长，尺寸精度控制不高

Molding advantages: can mold big size product, lower tooling cost
Molding weakness: long production cycle, not well controlled precision size
○ 万能磨削 Grinding

万能磨削可以用来加工各种结构特征，根据产品特征的不同进行调整。可以用来加工结构复杂的零件。

Grinding: grinding can be used to machine various structural characteristics, in accord with products' different characteristics. It can adjust to machine complex structural parts and components.

○ 内孔精密研磨 High precision Internal Grinding

内孔精密研磨加工主要用于进行内孔精磨，其表面粗精度可达到Ra 0.04 μm，内孔公差可控制到0.005mm以内，直线度可达0.004mm。

Inner hole precision grinding: it's mainly used to machine precision inner hole, the surface roughness can reach Ra 0.04 μm, the inner hole tolerance can be controlled within 0.005mm, the straightness can reach 0.004mm.
Competitive Advantages in Various Applications
应用领域优势

SMT Nozzle Tip
SMT吸嘴吸头

<table>
<thead>
<tr>
<th>名称</th>
<th>Material</th>
<th>颜色</th>
<th>应用特性</th>
<th>加工难点</th>
</tr>
</thead>
<tbody>
<tr>
<td>弹孔吸头</td>
<td>Single Nozzle Tip</td>
<td>Zirconia</td>
<td>Black/Silver  wear resistant, ESD</td>
<td>小孔径，高精度 requiring small hole diameter, high precision</td>
</tr>
<tr>
<td>扁平吸头</td>
<td>Flat Nozzle Tip</td>
<td></td>
<td></td>
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<tr>
<td>三孔吸头</td>
<td>3–hole Nozzle Tip</td>
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<tr>
<td>五孔吸头</td>
<td>5–hole Nozzle Tip</td>
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<tr>
<td>X型吸头</td>
<td>X Shape Nozzle Tip</td>
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</tbody>
</table>

Ceramic Nozzle Tip Application
陶瓷吸嘴应用

陶瓷作为一种耐磨材料，广泛被应用到表面制造中贴片机的吸嘴中，受贴片元器件尺寸的限制，吸嘴头的直径非常小，甚至只有0.2mm的细薄，因而传统的金属的耐磨性远远不能达到功能的要求，比金属耐磨的陶瓷材料就成为吸嘴头最理想的材料。

商德生产的陶瓷吸嘴包括导电和不导电两种，其中导电的通常被装配成防静电吸嘴。

Ceramic as wear-resistant material used widely in pick and place components in SMT assembly machine. Since the SMC/SMD components size limits, the nozzle tip diameter is very small, the thickness is about 0.2mm, so metal material can’t meet the wear-resistant equipment for function, only ceramic material can meet the wear-resistant requirement.

Suntech can make conductive/ Non-conductive ceramic tip, and the conductive ceramic tip can be made ESD nozzle.
### Semiconductor Instruments

#### 半导体设备

<table>
<thead>
<tr>
<th>名称</th>
<th>材料</th>
<th>颜色</th>
<th>应用特性</th>
<th>加工难点</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceramic Plate</td>
<td>Ceramic Plate</td>
<td>陶瓷板</td>
<td>zirconia</td>
<td>white</td>
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<tr>
<td>Ceramic Ring</td>
<td>Ceramic Ring</td>
<td>陶瓷环</td>
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<tr>
<td>Gas Cover</td>
<td>Gas Cover</td>
<td>气盖</td>
<td></td>
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<td>Ceramic Cap</td>
<td>Ceramic Cap</td>
<td>陶瓷盖</td>
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<tr>
<td>Multi-Hole Ceramic Plate</td>
<td>Multi-Hole Ceramic Plate</td>
<td>多孔陶瓷板</td>
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**Products Application**

**产品应用**

1. Bonding Machine
2. Bonder
3. Chip Lithography Machine
Ceramic Bearing
陶瓷轴承

轴芯轴承
Shaft and Bearing

陶瓷轴
Ceramic Shaft

氧化铝轴承
Ceramic Shaft

陶瓷轴
Ceramic Shaft

陶瓷轴
Ceramic Shaft

氧化锆轴承
Ceramic Shaft

球头轴芯
Bail Shaft

轴套
Sleeve

Products Application
产品应用

1. 直流无刷电机
2. 电子产品散热风扇
3. 高精密机械轴承部件

1. Brushless DC motor
2. Computer Radiator Fans
3. High Precision Mechanical Bearing Parts

<table>
<thead>
<tr>
<th>名称</th>
<th>材料</th>
<th>颜色</th>
<th>应用特性</th>
<th>加工难点</th>
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<tr>
<td>Plain bearing</td>
<td>zirconia/Aluminum</td>
<td>白色、黑色、各种颜色</td>
<td>wear resistant, anti-corrosion, high temperature resistant, anti-oxidation, self-lubricated</td>
<td>精度高、粗糙度要求高</td>
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<tr>
<td>Ball bearing</td>
<td>zirconia/Aluminum</td>
<td>white, black, various colors</td>
<td>high precision, requiring high roughness</td>
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</table>
### Medical Instruments

<table>
<thead>
<tr>
<th>名称 Name</th>
<th>材料 Material</th>
<th>颜色 Color</th>
<th>应用特性 Application Characteristics</th>
<th>加工难点 Machining Difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td>分血阀 Shear Valve</td>
<td>高纯氧化铝 High Purity Alumina</td>
<td>棕色 brown</td>
<td>耐磨性、耐腐蚀性、密封性、灰水性 wear resistant, anti-corrosion, tightness, water resistant</td>
<td>平面度、平行度、粗糙度要求高，小孔位置度、精度高 requires high flatness, parallelism, roughness, and small hole position, high precision</td>
</tr>
<tr>
<td>样本针 Sample Needle</td>
<td>氧化锆 zirconia</td>
<td>白色 white</td>
<td>生物相容性、耐磨性、耐腐蚀性，灰水性 bio-compatibility, wear resistant, anti-corrosion, water resistant</td>
<td>细长孔、内孔粗糙度、同心度要求高 long &amp; thin hole, inner hole roughness, requires high concentricity</td>
</tr>
<tr>
<td>射流管 Jet Pipe</td>
<td>氧化锆 zirconia</td>
<td>白色 white</td>
<td>密封性、耐腐蚀性、耐磨性、灰水性 tightness, wear resistant, anti-corrosion, water resistant</td>
<td>表面粗糙度要求高，圆柱度要求高 requires high surface roughness and cylindricity</td>
</tr>
<tr>
<td>柱塞管 Piston</td>
<td>氧化锆,氧化铝 zirconia, Aluminum</td>
<td>白色 white</td>
<td>密封性、耐腐蚀性、耐磨性、灰水性 tightness, wear resistant, anti-corrosion, water resistant</td>
<td>内孔圆柱度要求高, 内孔粗糙度要求高 requires high inner hole cylindricity and roughness</td>
</tr>
<tr>
<td>注射器管 Syringe</td>
<td>氧化锆 zirconia</td>
<td>白色 white</td>
<td>耐磨性、硬度高刃口锋利 wear resistant, high hardness, sharp edge</td>
<td>产品尺寸小, 精度高 small size, high precision</td>
</tr>
</tbody>
</table>

#### Products Application

**产品应用**

1. 医疗血液分析仪
2. 医疗生化分析仪
3. 电极手术刀

1. Medical Blood Analysis
2. Medical Biochemistry Analyzer
3. Electrode Scalpel
### Fluid Control

<table>
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<th>名称</th>
<th>材料</th>
<th>颜色</th>
<th>应用特性</th>
<th>加工难点</th>
</tr>
</thead>
<tbody>
<tr>
<td>球阀 ball valve</td>
<td>ZrO₂, Al</td>
<td>白色、黄色</td>
<td>wear resistant, anti corrosion, anti high pressure and temperature, tightness</td>
<td>大尺寸，高精度 large size, high precision</td>
</tr>
<tr>
<td>阀门内衬 valve sleeve</td>
<td>ZrO₂, Al</td>
<td>white, yellow</td>
<td>wear resistant, anti corrosion, anti high pressure and temperature, tightness</td>
<td></td>
</tr>
<tr>
<td>密封环 O-ring</td>
<td>ZrO₂</td>
<td>white</td>
<td>密封性, 耐磨性</td>
<td>密封性, 耐磨性</td>
</tr>
<tr>
<td>捏合阀套 Valve core valve set</td>
<td>ZrO₂</td>
<td>white</td>
<td>密封性, 耐磨性</td>
<td>高圆度, 同心度要求高, 尺寸精度要求高</td>
</tr>
<tr>
<td>斜孔阀芯阀套 Oblique hole valve</td>
<td>Al</td>
<td>yellow</td>
<td>wear resistant, anti corrosion, tightness</td>
<td>尺寸精度要求高</td>
</tr>
<tr>
<td>柱塞阀体 sleeve and piston</td>
<td>Al</td>
<td>yellow</td>
<td>wear resistant, anti corrosion, tightness</td>
<td>高精度</td>
</tr>
</tbody>
</table>

### Products Application

1. 石油、化工、电站等恶劣工况环境使用的阀门部件
2. 精装机点胶阀
3. 饮料行业冷饮设备流体控制

1. valve parts of petroleum, Chemical industry, generating plant under harsh environment
2. Dispenser Valve
3. Beverage Industry Cold Drink Equipment Fluid Control
**Printing Instruments**

<table>
<thead>
<tr>
<th>名称</th>
<th>材料</th>
<th>颜色</th>
<th>应用特性</th>
<th>加工难点</th>
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<tbody>
<tr>
<td>9孔导针板</td>
<td>9 holes wire guide</td>
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</tr>
<tr>
<td>24孔斜边导针板</td>
<td>24 holes bevel edge wire guide</td>
<td></td>
<td></td>
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<tr>
<td>24孔独孔导针板</td>
<td>24 holes single hole wire guide</td>
<td></td>
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</tr>
<tr>
<td>24孔菱形导针板</td>
<td>24 holes prismatic wire guide</td>
<td></td>
<td></td>
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<tr>
<td>24孔盲孔导针板</td>
<td>24 holes blind hole guide</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>喷嘴板</td>
<td>Nozzle tip plate</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Products Application**

**产品应用**

1. 针式打印机打印针导向板
2. 高端喷墨打印机喷嘴板

1. Dot matrix printer wire guide
2. Advanced ink-jet printer
## Functional Parts also Serving Aesthetics Purpose

<table>
<thead>
<tr>
<th>名称</th>
<th>材料</th>
<th>颜色</th>
<th>应用特性</th>
<th>加工难点</th>
</tr>
</thead>
<tbody>
<tr>
<td>手机后盖</td>
<td>Zirconia Glazed</td>
<td>多色 Multi-color</td>
<td>整体尺寸大，成型烧结难度大，整体工艺较为复杂。</td>
<td>整体尺寸大，成型烧结难度大，表面要求高。</td>
</tr>
<tr>
<td>Mobile Back Cover</td>
<td></td>
<td></td>
<td></td>
<td>整体尺寸大，成型烧结难度大，表面要求高。</td>
</tr>
<tr>
<td>手机按键</td>
<td>Zirconia</td>
<td>黑色、白色 Black &amp; White</td>
<td>陶瓷外观漂亮，光亮耐磨。</td>
<td>尺寸精度高，表面要求高。</td>
</tr>
<tr>
<td>Mobile Buttons</td>
<td></td>
<td></td>
<td>可用于手机装饰件</td>
<td>尺寸精度高，表面要求高。</td>
</tr>
<tr>
<td>化妆品尖嘴</td>
<td>Zirconia, Aluminum</td>
<td></td>
<td>陶瓷外观漂亮，光亮耐磨。</td>
<td>尺寸精度高，表面要求高。</td>
</tr>
<tr>
<td>Nozzle tip for applying make-up on skin</td>
<td></td>
<td></td>
<td>陶瓷外观漂亮，光亮耐磨。</td>
<td>尺寸精度高，表面要求高。</td>
</tr>
</tbody>
</table>

### Products Application

产品应用

1. 手机外观件
2. 包装、手提包的扣合
3. 化妆品包装

1. Mobile Exterior Parts
2. Buckles of Backpack and Handbag
3. Cosmetic Package
ESD safe ceramics & Conductive ceramics

ESD safe ceramics nozzle

ESD safe ceramics tweezers

Conductive ceramics set

Green ESD safe ceramics plate

<table>
<thead>
<tr>
<th>名称 Name</th>
<th>材料 Material</th>
<th>颜色 Color</th>
<th>应用特性 Application Characteristics</th>
<th>加工难点 Machining Difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td>防静电陶瓷吸头 ESD Nozzle Tip</td>
<td>复合氧化锆 Compound Zirconia</td>
<td>黑色/绿色 Black/Green</td>
<td>防静电、耐摩 ESD, Wear resistant</td>
<td>电解脱脂，小孔径，高精度 The resistivity control, small hole diameter, high precision</td>
</tr>
<tr>
<td>防静电镊子 ESD Tweezers</td>
<td>复合氧化锆 Compound Zirconia</td>
<td>黑色/绿色 Black/Green</td>
<td>防静电、耐摩 ESD, Wear resistant</td>
<td>电解脱脂，小孔径，高精度 The resistivity control, small hole diameter, high precision</td>
</tr>
<tr>
<td>防静电陶瓷块 ESD Ceramic Plate</td>
<td>复合导电陶瓷 Composite Conductive Ceramic</td>
<td>灰色 Gray</td>
<td>导电性 Electrical conductivity</td>
<td>电解脱脂，小孔径，高精度 The resistivity control, small hole diameter, high precision</td>
</tr>
<tr>
<td>导电陶瓷套 Conductive Ceramic Set</td>
<td>复合导电陶瓷 Composite Conductive Ceramic</td>
<td>灰色 Gray</td>
<td>导电性 Electrical conductivity</td>
<td>电解脱脂，小孔径，高精度 The resistivity control, small hole diameter, high precision</td>
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</tbody>
</table>

Products Application

产品应用

1. SMT Nozzle
2. Semiconductor
3. The environment of high temperature conductive applications
## Other Application

<table>
<thead>
<tr>
<th>名称</th>
<th>材料</th>
<th>颜色</th>
<th>应用特性</th>
<th>加工难点</th>
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<tbody>
<tr>
<td>Ceramic Thread</td>
<td>Zirconia</td>
<td>白色</td>
<td>高摩擦,高精度</td>
<td>Ceramic Thread Machining</td>
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<tr>
<td>Ceramic Flange</td>
<td>Aluminum</td>
<td>Yellow</td>
<td>绝缘,ESD</td>
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<tr>
<td>Insulation plate</td>
<td>Aluminum</td>
<td>Yellow</td>
<td>绝缘,ESD</td>
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<td>Insulation pipe</td>
<td>Aluminum</td>
<td>Yellow</td>
<td>绝缘,耐磨损,高精度</td>
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<tr>
<td>Ceramic Strip</td>
<td>Aluminum</td>
<td>Yellow</td>
<td>绝缘,耐磨损,高精度</td>
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### Products Application

产品应用

1. 激光设备
2. 电厂
3. 高端精密机械
4. 餐饮设备
5. 其他

- Laser Instruments
- Plant
- Advanced Precision Machinery
- Catering Equiments
- Others

---

**Suntech Advanced Ceramics (shenzhen) Co., Ltd.**

0755-26584521

www.suntechceramics.com
### Material Characteristics Comparison Table

<table>
<thead>
<tr>
<th>Property</th>
<th>Graph</th>
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<tbody>
<tr>
<td>Thermal Expansion</td>
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<tr>
<td>Thermal Conductivity</td>
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<tr>
<td>Heat Shock Resistance</td>
<td><img src="#" alt="Heat Shock Resistance Graph" /></td>
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<tr>
<td>Flesural Strength under different temperature</td>
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<tr>
<td>Max. Use Temperature</td>
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<tr>
<td>Hardness</td>
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<td>Compressive Strength</td>
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<td>Young's Modulus of Elasticity</td>
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<tr>
<td>Specific Gravity</td>
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<tr>
<td>Chemical Durability (30min Boiling)</td>
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### Suntech Advanced Ceramics Standard

#### Oxides

<table>
<thead>
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<th>Properties*</th>
<th>Units</th>
<th>Test</th>
<th>Steatite</th>
<th>Cordierite</th>
<th>Mullite</th>
<th>Muroc</th>
<th>A-98</th>
<th>A-99</th>
<th>A-995</th>
<th>Y-TZP</th>
<th>Ce-TZP</th>
<th>MgO-Psz</th>
<th>ZTA%</th>
<th>Carbide</th>
<th>Nitride</th>
<th>Metal</th>
<th>Steel</th>
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<td>Density</td>
<td>gm/cc</td>
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<td>1.70</td>
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<td>&gt; 230</td>
<td>&gt; 230</td>
<td>&gt; 300</td>
<td>&gt; 900</td>
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<td>800</td>
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<td>Elastic Modulus</td>
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<td>GPa</td>
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<td>Compressive Strength</td>
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Notes:
1. Thermal Shock Resistance - Tests are run by quenching samples into water from various elevated temperatures.
2. Water Resistance - Impregnation tests are run using a dry fused alumina abrasive. Rubbing tests are run using a dry 240 grit fused alumina abrasive. The indices in the chart are calculated by dividing the material volume loss by the volume loss of an AD-85 alumina control. The lower the index, the better the wear resistance.
3. Thermal Shock Resistance - Tests are run by quenching samples into water from various elevated temperatures. The change in temperature where a sharp decrease in flexural strength is observed is listed as Dtc.
4. Ceramic property values vary somewhat with method of manufacture, size, and shape of part. Close control of values of most properties can be maintained if specified.