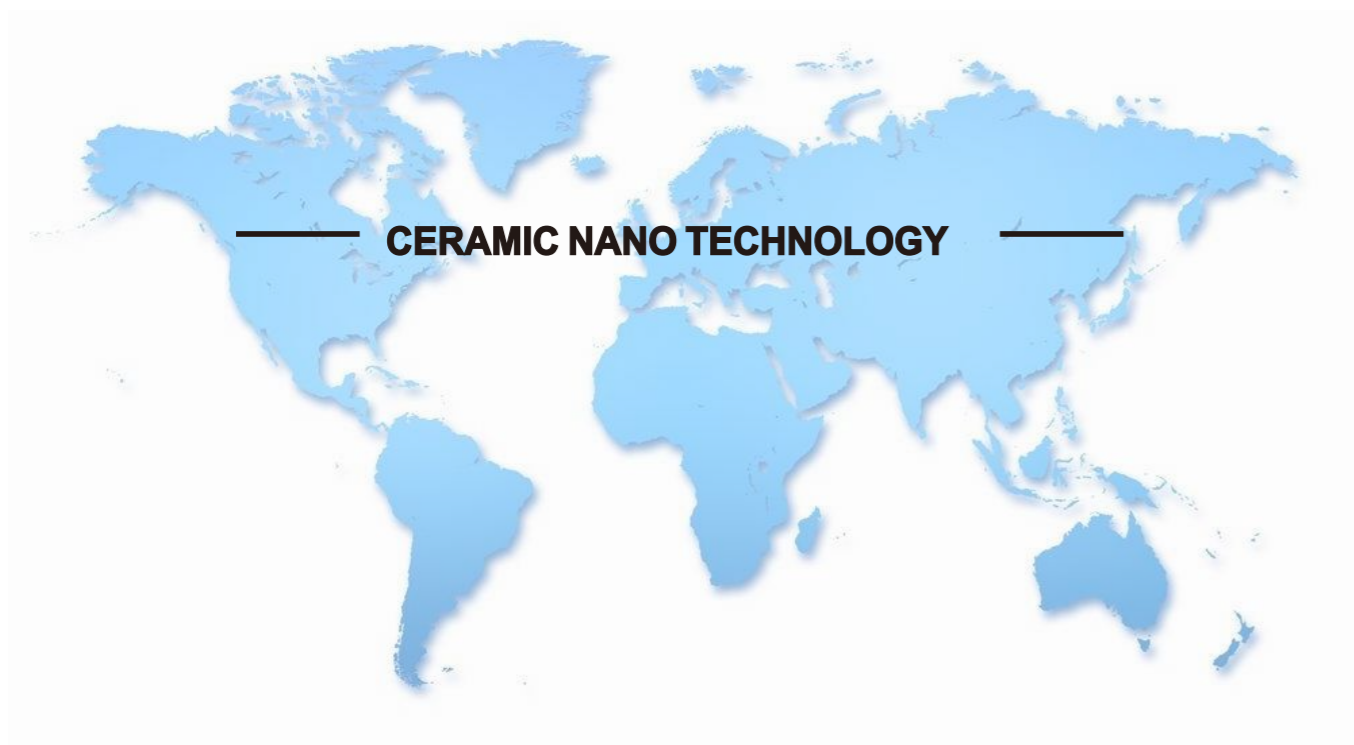




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2019.V.1.0

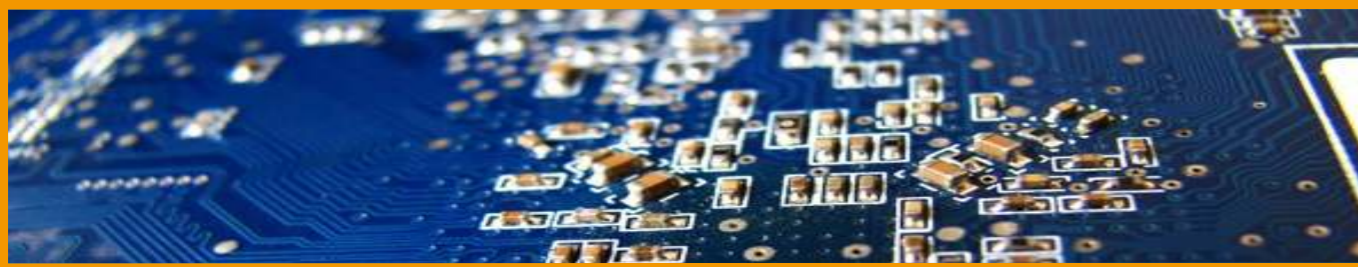
# 陶瓷纳米技术 CERAMIC NANO TECHNOLOGY



叁鑫新材  
SANXIN NEW MATERIALS



江西省叁鑫新材料有限公司  
Jiangxi Sanxin New Materials Co.,Ltd.



## 纳米氧化锆微珠 (YZV)

YZV高品质纳米微珠采用高品位质量稳定水解法制取的钇稳定氧化锆粉，具有高强度、超低磨耗及高研磨效率性能，产品各项性能指标已达到国际先进水平。主要应用于电子陶瓷、陶瓷墨水、MLCC;CMP和照片催化剂等材料的纳米研磨。



### 尺寸:

Ø 0.03mm, Ø 0.05mm, Ø 0.1mm, Ø 0.2mm, Ø 0.3mm (纳米研磨)。其它按客户要求订做。

### 产品特性:

- 1 高强度高韧性超耐磨在高速冲击力下无碎珠。
- 2 球形度好、表面光滑。
- 3 高密度、物料研磨至纳米级效率高。
- 4 性价比优越。

### 性能指标:

型号	密度 (g/cm <sup>3</sup> )	堆比重 (g/cm <sup>3</sup> )	化学成分 (%)	抗压强度 (N)	维氏硬度 (HV1)
YZV	≥6.0	≥3.7	ZrO <sub>2</sub> ≥94.6 Y <sub>2</sub> O <sub>3</sub> ≥5.2	≥90 (Ø0.3mm)	≥1350

## Zirconia Fine Beads (YZV)

YZV high quality microsphere grinding beads are produced from the consistent high quality yttria-stabilized zirconia powder through the latest hydrolysis process. It have super grinding efficiency because of highest crushing strength, lowest wear loss. The qualities and properties reach the international advanced level. It is suitable for grinding material down to Nano size such as electronic ceramics;ceramic ink;MLCC;CMP and Photo Catalysts etc.



### Size:

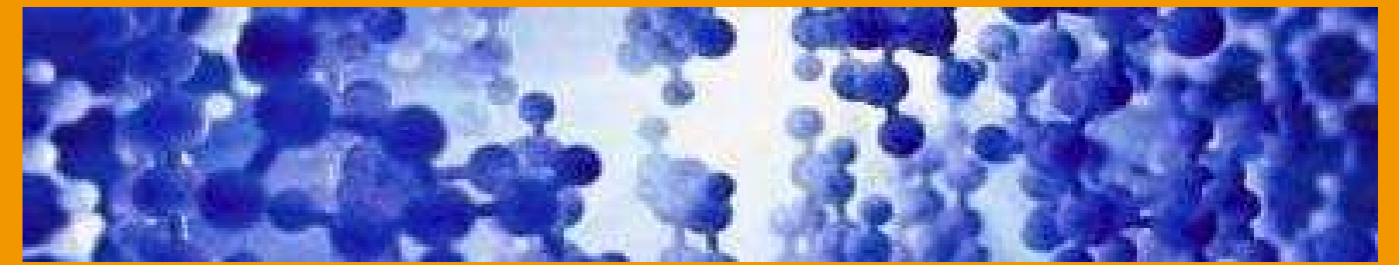
Ø 0.03mm, Ø 0.05mm, Ø 0.1mm, Ø 0.2mm, Ø 0.3mm (Nano grinding). Allowable requests for different sizes.

### Product Features:

- 1 High crushing strength and fracture durability, superior wear resistance which has no any break under high speed impact.
- 2 Smooth surface,good sphericity.
- 3 High density and excellent grinding efficiency for grinding materials down to Nano size.
- 4 Significant cost and waste reduction.

### Specifications:

Type	Density (g/cm <sup>3</sup> )	Bulk density (g/cm <sup>3</sup> )	Major composition (%)	Crush strength (N)	V-Hardness (HV1)
YZV	≥6.0	≥3.7	ZrO <sub>2</sub> ≥94.6 Y <sub>2</sub> O <sub>3</sub> ≥5.2	≥90 (Ø0.3mm)	≥1350



## 钇稳定氧化锆珠(YZ)

YZ高品质研磨介质采用高品位的钇稳定氧化锆粉，具有高强度、超低磨耗及高研磨效率性能，产品各项性能指标已达到国际先进水平。主要应用于电子陶瓷、磁性材料、氧化铝粉、石英、硅酸锆、钛白粉等高纯陶瓷材料以及食品、化妆品、油漆、涂料、颜料和油墨的超细研磨与分散。



### 尺寸:

B系列:  $\Phi$  0.3-5mm (超细研磨);  
C柱状球系列: 3X3 5.5X5.5 7.5X7.5 10X10 12X12;  
L系列:  $\Phi$  5mm,  $\Phi$  6mm,  $\Phi$  8mm,  $\Phi$  10mm,  $\Phi$  15mm,  
 $\Phi$  20mm,  $\Phi$  25mm,  $\Phi$  30mm (粗磨);  
其它按客户要求订做。

### 产品特性:

- 1 高强度高韧性在高速冲击力下无碎珠。
- 2 球形度好、表面光滑。
- 3 超低磨耗，耐磨性是玻璃珠的30-50倍，硅酸锆珠的5倍，氧化铝珠的6-8倍。
- 4 高密度、高研磨效率。

### 性能指标:

型号	密度 (g/cm <sup>3</sup> )	堆比重 (g/cm <sup>3</sup> )	化学成分 (%)	抗压强度 (N)	维氏硬度 (HV10)
YZ	≥6.0	≥3.7	ZrO <sub>2</sub> ≥94.6 Y <sub>2</sub> O <sub>3</sub> ≥5.2	≥2000 ( $\Phi$ 2mm)	≥1250

## Y-TZP Grinding Media (YZ)

YZ high quality grinding media are produced from the high quality yttria-stabilized zirconia powder. It have super grinding efficiency because of highest crushing strength, lowest wear loss. The qualities and properties reach the international advanced level. It is suitable for grinding and dispersion of ultrafine materials such as electronic ceramics; magnetic materials; high purity ceramics material such as aluminum oxide, silicon oxide, zirconium silicate and titanium dioxide; foodstuffs; cosmetic and pigment, inks, paint and coating materials.



### Size:

B series:  $\Phi$ 0.3-5mm (Ultrafine grinding)  
C series: 3X3, 5.5X5.5, 7.5X7.5, 10X10, 12X12;  
L series:  $\Phi$ 5mm,  $\Phi$ 6mm,  $\Phi$ 8mm,  $\Phi$ 10mm,  $\Phi$ 15mm,  
 $\Phi$ 20mm,  $\Phi$ 25mm,  $\Phi$ 30mm (Coarse grinding).  
Allowable requests for different sizes.

### Product Features:

- 1 High crushing strength and fracture durability which has no any break under high speed impact.
- 2 Smooth surface, good sphericity.
- 3 High wear resistance, longer service life 30-50 times than glass beads, 5 times than zirconium silicate beads and 6-8 times than Al<sub>2</sub>O<sub>3</sub> beads.
- 4 High density and excellent grinding efficiency.

### Specifications:

Type	Density (g/cm <sup>3</sup> )	Bulk density (g/cm <sup>3</sup> )	Major composition (%)	Crush strength (N)	V-Hardness (HV10)
YZ	≥6.0	≥3.7	ZrO <sub>2</sub> ≥94.6 Y <sub>2</sub> O <sub>3</sub> ≥5.2	≥2000 ( $\Phi$ 2mm)	≥1250

## 高纯氧化铝球(HAB)

各种材料的研磨粉碎；电介质、压电体、磁性体等电子零部件制造材料；稀土荧光体材料制造；锂电池电极材料粒度控制；研磨粉、CMP用研磨粒；高级颜料、油墨等材料制造；医药、农药、抗菌材料、粉末食品类材料制造；高性能陶瓷用材料制造。



### 尺寸:

0.1 0.2 0.3-0.4 0.4-0.6 0.6-0.8 0.8-1.0  
1.0-1.2 1.2-1.4 1.4-1.6 1.6-1.8 1.8-2.0  
其它尺寸可根据客户要求定制。

### 产品特性:

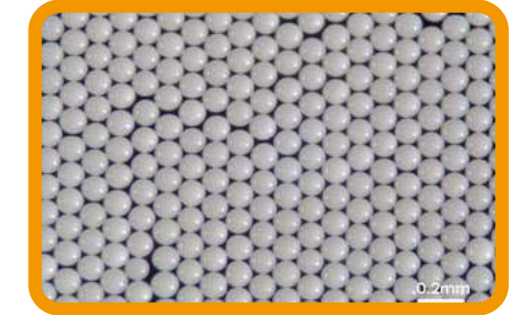
- ① 高硬度，最高达到1800HV10，高机械强度。
- ② 微细结晶，高致密性多结晶构成，耐磨耗性优良。
- ③ 化学性能稳定，酸碱的耐腐蚀性好。
- ④ 99.9%高纯度，无氧化铝外其它成分，适应于高纯度材料加工。
- ⑤ 热传导率高。

### 性能指标:

特性	单位	值
纯度	Al <sub>2</sub> O <sub>3</sub>	≥99.9%
密度	g/cm <sup>3</sup>	3.9
HV硬度	GPa	17.2
弯曲强度	Kgf/m <sup>2</sup> (室温)	60
热膨胀系数	1/°C	8*10 <sup>-6</sup>
热传导率	W/m.k	37
电阻	Ohm.cm	>10 <sup>6</sup>

## High Purity Alumina Beads(HAB)

Dielectric, piezoelectric, magnetic substance materials.  
Rare earth phosphor material.Lithium battery electrode material.CMP Polishing powder.High grade pigment and ink.Medicine, pesticide, antibiotic material and food.High performance ceramic materials.



### Size:

0.1 0.2 0.3-0.4 0.4-0.6 0.6-0.8 0.8-1.0  
1.0-1.2 1.2-1.4 1.4-1.6 1.6-1.8 1.8-2.0  
Allowable Requirement for Different Size.

### Specifications:

Item	Unit	Data
Purity	Al <sub>2</sub> O <sub>3</sub>	≥99.9%
Density	g/cm <sup>3</sup>	3.9
HV Hardness	GPa	17.2
Flexural Strength	Kgf/m <sup>2</sup> (Room tempreture)	60
Coefficient of Thermal Expansion	1/°C	8*10 <sup>-6</sup>
Thermal Conductivity	W/m.k	37
Volume Resistivity	Ohm.cm	>10 <sup>6</sup>

### Product Features:

- ① High Hardness, Over 1800HV10,High Machine Strength.
- ② High compactness, Fine Microcrystal, Lower Wear Loss.
- ③ Chemical Stability, Good corrosion resistance.
- ④ High Purity 99.9% Alumina content. No more other metal content except Al<sub>2</sub>O<sub>3</sub>.Suit for grinding high purity materials.
- ⑤ High thermal conductivity.



## 铈稳定氧化锆珠(CZ)

CZ研磨介质选用高品位铈稳定氧化锆粉，烧结成微晶四方稳定的氧化锆晶体结构，具有高强度、高密度、低磨损特性，产品各项性能指标已达到国际先进水平。主要应用于高粘度的印刷油墨、胶印油墨、重钙、电子材料、磁性材料及金属矿的超细研磨。



### 尺寸:

B系列:  $\varnothing$  0.4-5mm (超细研磨)。  
L系列:  $\varnothing$  5-100mm (粗磨)。  
其它按客户要求订做。

### 产品特性:

- ① 性价比优。
- ② 球形度好、表面光滑。
- ③ 高密度、高研磨效率。
- ④ 高强度高韧性，在高速研冲击力下无碎珠。

### 性能指标:

型号	密度 (g/cm <sup>3</sup> )	堆比重 (g/cm <sup>3</sup> )	化学成份 (%)	抗压强度 (N)	维氏硬度 (HV10)	颜色
CZ	≥6.0	≥3.6	ZrO <sub>2</sub> ≥80 CeO <sub>2</sub> ≥18 Other≤2	≥1100 (Φ2mm)	≥1100	黄色

## CE-TZP Grinding Media(CZ)

CZ grinding media, produce from high grade ceria stabilized zirconia powder. It have high hardness, density and low wear resistance because of the fine and homogenous tetragonal zirconia crystal structure. It is suitable for ultrafine grinding high viscosity pastes such as screen printing inks, offset inks, GCC, and electronic ceramics, magnetic materials, metal mine etc.



### Size:

B series: 0.4-5mm (Ultrafine grinding).  
L Series: 5-100mm (Coarse grinding).  
Allowable requests for different sizes.

### Product Features:

- ① Excellent cost and performance.
- ② Smooth surface, good sphericity.
- ③ High cost-effective grinding bead with high-density.
- ④ High fracture toughness and nice impact resistance that causes no break under high speed impact.

### Specifications:

Type	Density (g/cm <sup>3</sup> )	Bulk density (g/cm <sup>3</sup> )	Major composition(%)	Crush strength (N)	V-Hardness (HV10)	Color
CZ	≥6.0	≥3.6	ZrO <sub>2</sub> ≥80 CeO <sub>2</sub> ≥18 Other≤2	≥1100 (Φ2mm)	≥1100	Yellow



## 锆铝复合球(AZ/ZA)

AZ/ZA复合研磨介质选用高纯超细的钇锆粉和氧化铝粉，由于氧化锆的增韧性研磨介质具有强度更高，耐磨性更优越，产品各项性能指标已达到国际先进水平。主要应用于金属及非金属矿如金、银、镍、锌及铅矿，重钙、硅酸锆、钛白粉以及油漆、涂料、颜料和油墨的超细研磨。



### 尺寸:

B系列:  $\Phi 0.4-5\text{mm}$  (超细研磨)。

L系列:  $\Phi 5\text{mm}, \Phi 6\text{mm}, \Phi 8\text{mm}, \Phi 10\text{mm}, \Phi 15\text{mm}$  (粗磨)。

其他按客户要求订做。

### 产品特性:

- ① 性价比优越。
- ② 超耐磨使用寿命长。
- ③ 高强度在高速冲击力下无碎珠。
- ④ 球形度好、表面光滑。

### 性能指标:

型号	密度 ( $\text{g}/\text{cm}^3$ )	堆比重 ( $\text{g}/\text{cm}^3$ )	化学成分 (%)	抗压强度 (N)	维氏硬度 (HV10)
AZ	$\geq 5.2$	$\geq 3.1$	ZrO <sub>2</sub> $\geq 75$ Al <sub>2</sub> O <sub>3</sub> $\geq 20$ Other $\leq 5$	$\geq 2000$ ( $\Phi 2\text{mm}$ )	$\geq 1200$
ZA	$\geq 4.2$	$\geq 2.4$	ZrO <sub>2</sub> $\geq 15$ Al <sub>2</sub> O <sub>3</sub> $\geq 80$ Other $\leq 5$	$\geq 1100$ ( $\Phi 2\text{mm}$ )	$\geq 1100$

## Compound Beads (AZ/ZA)

AZ/ZA toughened grinding media, produce from high quality and ultrafine YTZP and alumina powder. They exhibit high wear resistance and high strength because of high toughness by zirconia. The qualities and properties reach the international advanced level. They are specifically suitable for grinding metal and non-metal ore such as gold, silver, nickel, zinc and lead; GCC, zirconium silicate and titanium dioxide; pigment, inks, paint and coating materials.



### Size:

B series:  $\Phi 0.4-5\text{mm}$  (Ultrafine grinding).

L series:  $\Phi 5\text{mm}, \Phi 6\text{mm}, \Phi 8\text{mm}, \Phi 10\text{mm}, \Phi 15\text{mm}$   
(Coarse grinding).

Allowable requests for different sizes.

### Product Features:

- ① Significant cost and excellent performance.
- ② High wear resistance and longer service life.
- ③ High crush strength and no break under high speed impact.
- ④ Smooth surface, good sphericity.

### Specifications:

Type	Density ( $\text{g}/\text{cm}^3$ )	Bulk density ( $\text{g}/\text{cm}^3$ )	Major composition (%)	Crush strength (N)	V-Hardness (HV10)
AZ	$\geq 5.2$	$\geq 3.1$	ZrO <sub>2</sub> $\geq 75$ Al <sub>2</sub> O <sub>3</sub> $\geq 20$ Other $\leq 5$	$\geq 2000$ ( $\Phi 2\text{mm}$ )	$\geq 1200$
ZA	$\geq 4.2$	$\geq 2.4$	ZrO <sub>2</sub> $\geq 15$ Al <sub>2</sub> O <sub>3</sub> $\geq 80$ Other $\leq 5$	$\geq 1100$ ( $\Phi 2\text{mm}$ )	$\geq 1100$



## 硅酸锆复合珠(ZS/MX)

ZS/MX耐磨介质选用高纯超细的硅酸锆粉，具有均匀微晶结构，内部无空心，与电熔法及其它硅酸锆珠相比，硅酸锆复合珠强度更高性价比更优。产品各项性能指标已达到国际先进水平。主要应用于金属及非金属矿如金、银、镍、锌及铅矿，重钙、硅酸锆、钛白粉以及油漆、涂料、颜料和油墨的超细研磨。



### 尺寸:

B系列:  $\Phi$  0.4-5mm (超细研磨)。

L系列:  $\Phi$  5mm,  $\Phi$  6mm,  $\Phi$  8mm,  $\Phi$  10mm,  $\Phi$  15mm (粗磨)。

其它按客户要求订做。

### 产品特性:

- ① 无空心，在高速冲击力下无碎珠。
- ② 球形度好、表面光滑。
- ③ 高强度、超耐磨。
- ④ 耐磨性是电熔法硅酸锆珠的2倍以上。

### 性能指标:

型号	密度 (g/cm <sup>3</sup> )	堆比重 (g/cm <sup>3</sup> )	化学成分 (%)	抗压强度 (N)	维氏硬度 (HV10)	颜色
ZS	≥4.0	≥2.4	ZrO <sub>2</sub> ≥65 SiO <sub>2</sub> ≥35	≥1000 ( $\Phi$ 2mm)	≥900	白色
MX-1	≥4.0	≥2.4	Al <sub>2</sub> O <sub>3</sub> ≥60 ZrO <sub>2</sub> ≥30 Other≤8	≥1100 ( $\Phi$ 2mm)	≥1000	淡黄色
MX-2	≥3.2	≥1.9	Al <sub>2</sub> O <sub>3</sub> ≥25 ZrO <sub>2</sub> ≥25 Other≤45	≥900 ( $\Phi$ 2mm)	≥900	白色

## Zirconium Silicate Beads (ZS/MX)

ZS/MX grinding media are produced from high purity and ultra-fine zircon powder. They have homogenous microstructure and no hollow. ZS/MX exhibit high strength and excellent cost effective performance compared against fused zirconium silicate bead and others. The qualities and properties reach the international advanced level. They are specifically suitable for ultrafine grinding metal and non-metal ore such as gold, silver, nickel, zinc and lead; GCC, zirconium silicate and titanium dioxide; pigment, inks, paint and coating materials.



### Size:

B series:  $\Phi$  0.4-5mm (Ultrafine grinding).

L series:  $\Phi$  5mm,  $\Phi$  6mm,  $\Phi$  8mm,  $\Phi$  10mm,  $\Phi$  15mm  
(Coarse grinding).

Allowable requests for different sizes.

### Product Features:

- ① No air pockets and no break under high speed impact.
- ② Smooth surface, good sphericity.
- ③ High crush strength and wear resistance.
- ④ Longer service life, 2 times than fused zirconium silicate beads.

### Specifications:

Type	Density (g/cm <sup>3</sup> )	Bulk density (g/cm <sup>3</sup> )	Major composition (%)	Crush strength (N)	V-Hardness (HV10)	Color
ZS	≥4.0	≥2.4	ZrO <sub>2</sub> ≥65 SiO <sub>2</sub> ≥35	≥1000 ( $\Phi$ 2mm)	≥900	White
MX-1	≥4.0	≥2.4	Al <sub>2</sub> O <sub>3</sub> ≥60 ZrO <sub>2</sub> ≥30 Other≤8	≥1100 ( $\Phi$ 2mm)	≥1000	Light Yellow
MX-2	≥3.2	≥1.9	Al <sub>2</sub> O <sub>3</sub> ≥25 ZrO <sub>2</sub> ≥25 Other≤45	≥900 ( $\Phi$ 2mm)	≥900	White



## 微晶氧化铝球(AO)

AO微晶氧化铝研磨介质选用高品位微晶氧化铝粉及其它超白原材料,具有超白、超耐磨、高强度、高研磨效率。产品各项性能指标已达到国际先进水平。主要应用于氧化铝、高岭土、重钙、石英、硅酸锆及金、银、镍、锌、铅矿的研磨,尤其适用白色物料的研磨与分散。



### 尺寸:

B系列:  $\varnothing$  0.3-5mm (超细研磨)。  
L系列:  $\varnothing$  5-100mm (粗磨)。  
其它按客户要求订做。

### 产品特性:

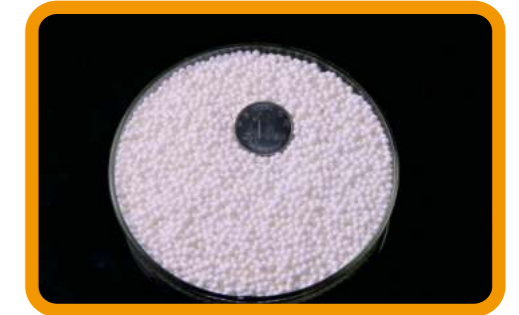
- ① 超白、超耐磨。
- ② 球形度好、表面光滑。
- ③ 性价比优。
- ④ 强度好,在高速研磨机冲击下无碎珠。

### 性能指标:

型号	密度 ( $\text{g}/\text{cm}^3$ )	堆比重 ( $\text{g}/\text{cm}^3$ )	化学成分 (%)	抗压强度 (N)	维氏硬度 (HV10)
AO	$\geq 3.65$	$\geq 2.2$	$\text{Al}_2\text{O}_3 \geq 92$	$\geq 1100$ ( $\varnothing 2\text{mm}$ )	$\geq 1100$

## Alumina Beads (AO)

AO microcrystalline alumina grinding media are produced from the ultrafine alumina and other super whiteness raw material. It exhibit super whiteness and high grinding efficiency because of highest crushing strength, lowest wear loss. The qualities and properties reach the international advanced level. It is suitable for grinding industrial minerals and mine. Such as alumina, Kaolin, GCC, Silica, Zirconium Silicate, Gold, Silver, Nickel, Zinc and lead mine. It's specifically useful for white color minerals.



### Size:

B series: 0.3-5mm (Ultrafine grinding).  
L Series: 5-100mm (Coarse grinding).  
Allowable requests for different sizes.

### Product Features:

- ① Whiteness, Ultra-low wear loss.
- ② Smooth surface, good sphericity.
- ③ Excellent cost, Effective performance.
- ④ High crush strength which has no any break under high speed impact.

### Specifications:

Type	Density ( $\text{g}/\text{cm}^3$ )	Bulk density ( $\text{g}/\text{cm}^3$ )	Major composition (%)	Crush strength (N)	V-Hardness (HV10)
AO	$\geq 3.65$	$\geq 2.2$	$\text{Al}_2\text{O}_3 \geq 92$	$\geq 1100$ ( $\varnothing 2\text{mm}$ )	$\geq 1100$





## 氧化锆陶瓷球(ZBB)

氧化锆陶瓷球主要用作球阀、全陶瓷轴承、测力球、轨迹球、精细研磨球，可以用于高温、耐腐蚀、绝缘、绝磁、无润滑等场合，是腐蚀场合下替代钢球的理想材料。作为阀门球用途，氧化锆陶瓷球目前已经成功用于高压均质机、隔膜泵、计量泵、油田抽油泵、高压喷枪等设备中。



### 尺寸:

密度达到6.05g/cm<sup>3</sup>。

产品规格: 0.4mm~50.8mm(1/64"~2"), 可提供各种规格。

可提供级别: G5~G100

### 产品特性:

- 1 颜色为白色，亦可根据要求制作黄色氧化锆球。
- 2 备有大量库存，可满足随时发货要求。
- 3 可满足各种非标尺寸的要求。
- 4 氧化锆的热膨胀系数 $10.5 \times 10^{-6}/^{\circ}\text{C}$ ，接近于金属的热膨胀系数，和金属的配合较好，但是尺寸稳定性随温度变化较大，疲劳接触失效形式为破坏性碎裂，在一些关键场合不如氮化硅材料稳定。

### 陶瓷球精度等级标准 (国际标准 IS03290~2001)

级别	单粒差	圆度	粗糙度	批差	规值间距	规值	分规值间距	规值
3	0.08	0.08	0.01	0.13	0.5	-5, ...0.5, 0.05...+5	0.1	-0.2, -0.1, 0, +0.1, +0.2
5	0.13	0.13	0.014	0.25	1	-5, ...0.5, 0.05...+5	0.2	-0.4, -0.2, 0, +0.2, +0.4
10	0.25	0.25	0.02	0.5	1	-9, ...-1, 0, +1...+9	0.2	-0.4, -0.2, 0, +0.2, +0.4
16	0.4	0.4	0.025	0.8	2	-10, ...-2, 0, +2...+10	0.4	-0.8, -0.4, 0, +0.4, +0.8
20	0.5	0.5	0.032	1	2	-10, ...-2, 0, +2...+10	0.4	-0.8, -0.4, 0, +0.4, +0.8
28	0.7	0.7	0.05	1.4	2	-12, ...-2, 0, +2...+12	0.4	-0.8, -0.4, 0, +0.4, +0.8
40	1	1	0.06	2	4	-16, ...-4, 0, +4...+16	0.8	-1.6, -0.8, 0, +0.8, +1.6
60	1.5	1.5	0.08	3	6	-18, ...-6, 0, +6...+18	1.2	-2, -1.2, 0, +1.2, +2
100	2.5	2.5	0.1	5	10	-40, ...-10, 0, +10...+40	2	-4, -2, 0, +2, +4
200	5	5	0.15	10	15	-60, ...-15, 0, +15...+60	3	-6, -3, 0, +3, +6
500	12.5	12.5		25				
1000	25	25		50				



## Zirconia Balls (ZBB)

zirconia balls are mainly used as valve balls, fully ceramic bearings, force measurement balls, trackballs, fine mill balls, and can be used in such situations: high temperature, anti-corrosion, electric insulation, anti-magnet, non-lubrication, it's the ideal material for replacing steel balls under corrosive situation.



### Size:

Density can reach 6.05g/cm<sup>3</sup>。

Product standard: 0.4mm~50.8mm(1/64"~2"), can provide other different kinds.

Provide grade: G5~G100

### Product Features:

- 1 The color is white, if necessary, we can provide yellow ones.
- 2 We have mass stock, can deliver anytime you want.
- 3 Can meet the requirements of various non-standard sizes.
- 4 Coefficient of thermal expansion of zirconic is  $10.5 \times 10^{-6}/^{\circ}\text{C}$ , close to the coefficient of thermal expansion of metal, match up with metal but dimensional changes a lot under different temperature, so in some critical situations it's not as stable as silicon nitride.

### Ceramic ball accuracy class standard (international standard IS03290~2001)

Grade	Primary particle difference	Circular edegre	Roughmess	Color difference	Distance between gauge	Gauge	Distance between subgauge	Subgauge
3	0.08	0.08	0.01	0.13	0.5	-5, ...0.5, 0.05...+5	0.1	-0.2, -0.1, 0, +0.1, +0.2
5	0.13	0.13	0.014	0.25	1	-5, ...0.5, 0.05...+5	0.2	-0.4, -0.2, 0, +0.2, +0.4
10	0.25	0.25	0.02	0.5	1	-9, ...-1, 0, +1...+9	0.2	-0.4, -0.2, 0, +0.2, +0.4
16	0.4	0.4	0.025	0.8	2	-10, ...-2, 0, +2...+10	0.4	-0.8, -0.4, 0, +0.4, +0.8
20	0.5	0.5	0.032	1	2	-10, ...-2, 0, +2...+10	0.4	-0.8, -0.4, 0, +0.4, +0.8
28	0.7	0.7	0.05	1.4	2	-12, ...-2, 0, +2...+12	0.4	-0.8, -0.4, 0, +0.4, +0.8
40	1	1	0.06	2	4	-16, ...-4, 0, +4...+16	0.8	-1.6, -0.8, 0, +0.8, +1.6
60	1.5	1.5	0.08	3	6	-18, ...-6, 0, +6...+18	1.2	-2, -1.2, 0, +1.2, +2
100	2.5	2.5	0.1	5	10	-40, ...-10, 0, +10...+40	2	-4, -2, 0, +2, +4
200	5	5	0.15	10	15	-60, ...-15, 0, +15...+60	3	-6, -3, 0, +3, +6
500	12.5	12.5		25				
1000	25	25		50				



## 氮化硅精密球(SNB)

氮化硅陶瓷球可用于各种有极限性能要求的轴承：高速/超高速轴承、高精度轴承、真空轴承、高/低温轴承、非磁性轴承、高精度滚珠丝杠；也可以用于化工泵、高温泵、计量泵中用作阀球、测量球，还可以用于各种有特殊要求的滑动和测量场合如高温滑轨、耐腐蚀滑轨。氮化硅陶瓷球一般装配成混合轴承，可应用于高技术产业如航空、国防等工业，也可广泛应用于化工、冶金、医疗、食品、油田、电子等其他行业。



### 尺寸：

公司产品特色：产品性能稳定，一致性良好。  
产品规格：0.4mm~100mm  
可提供级别：G5~G100

### 备注：

- 1 以黑色氮化硅球为主，如有需要，亦可提供灰色氮化硅球。
- 2 备有大量库存，可满足随时发货要求。
- 3 可满足各种规格以及非标尺寸要求。

### 陶瓷球精度等级标准（国际标准 ISO3290~2001）

级别	单粒差	圆度	粗糙度	批差	规值间距	规值	分规值间距	规值
3	0.08	0.08	0.01	0.13	0.5	-5, ...0.5, 0.05...+5	0.1	-0.2, -0.1, 0, +0.1, +0.2
5	0.13	0.13	0.014	0.25	1	-5, ...0.5, 0.05...+5	0.2	-0.4, -0.2, 0, +0.2, +0.4
10	0.25	0.25	0.02	0.5	1	-9, ...-1, 0, +1...+9	0.2	-0.4, -0.2, 0, +0.2, +0.4
16	0.4	0.4	0.025	0.8	2	-10, ...-2, 0, +2...+10	0.4	-0.8, -0.4, 0, +0.4, +0.8
20	0.5	0.5	0.032	1	2	-10, ...-2, 0, +2...+10	0.4	-0.8, -0.4, 0, +0.4, +0.8
28	0.7	0.7	0.05	1.4	2	-12, ...-2, 0, +2...+12	0.4	-0.8, -0.4, 0, +0.4, +0.8
40	1	1	0.06	2	4	-16, ...-4, 0, +4...+16	0.8	-1.6, -0.8, 0, +0.8, +1.6
60	1.5	1.5	0.08	3	6	-18, ...-6, 0, +6...+18	1.2	-2, -1.2, 0, +1.2, +2
100	2.5	2.5	0.1	5	10	-40, ...-10, 0, +10...+40	2	-4, -2, 0, +2, +4
200	5	5	0.15	10	15	-60, ...-15, 0, +15...+60	3	-6, -3, 0, +3, +6
500	12.5	12.5		25				
1000	25	25		50				

## Silicon Nitride Balls (SNB)

Silicon nitride balls can be used in bearings which need Extreme performance requirements: highspeed/ superspeed bearings, high precision bearings, vacuum bearings, high/ low temperature bearings, non-magnet bearings, high-precision ball screw; also can be used as valve ball, measurement ball in chemical pump, high-temperature pump, metering pump. And it can be used in slide and measurement such as: high temperature slide trail and anti-corrosion slide trail.



### Size:

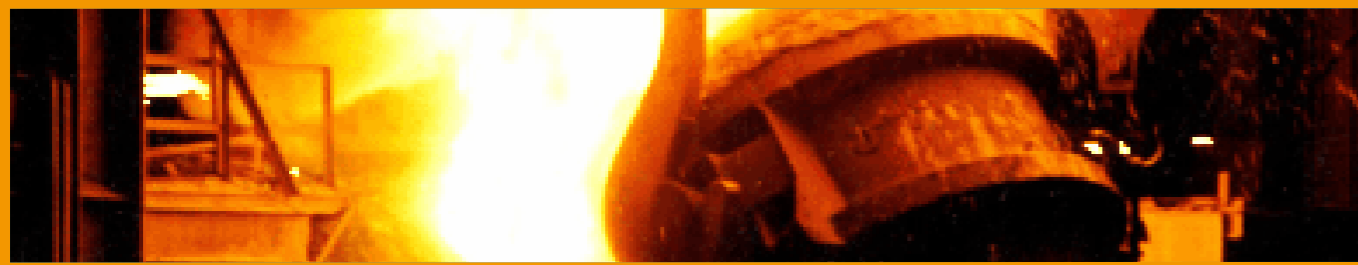
Product feature: stable performance, good consistency.  
Product standard: 0.4mm~100mm  
Provide grade: G5~G100

### Notes:

- 1 Most are black silicon nitride balls, if necessary, we can also provide gray ones.
- 2 We have mass stock, can deliver anytime you want.
- 3 Can meet the requirements of various specifications and non-standard sizes.

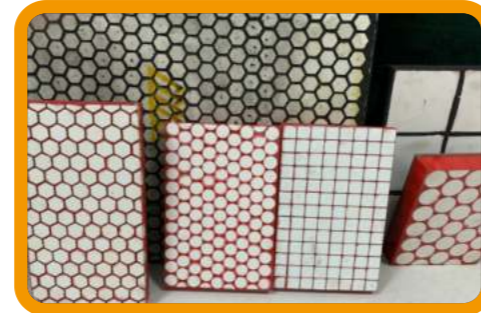
### Ceramic ball accuracy class standard (international standard ISO3290~2001)

Grade	Primary particle difference	Circular edegre	Roughmess	Color difference	Distance between gauge	Gauge	Distance between subgauge	Subgauge
3	0.08	0.08	0.01	0.13	0.5	-5, ...0.5, 0.05...+5	0.1	-0.2, -0.1, 0, +0.1, +0.2
5	0.13	0.13	0.014	0.25	1	-5, ...0.5, 0.05...+5	0.2	-0.4, -0.2, 0, +0.2, +0.4
10	0.25	0.25	0.02	0.5	1	-9, ...-1, 0, +1...+9	0.2	-0.4, -0.2, 0, +0.2, +0.4
16	0.4	0.4	0.025	0.8	2	-10, ...-2, 0, +2...+10	0.4	-0.8, -0.4, 0, +0.4, +0.8
20	0.5	0.5	0.032	1	2	-10, ...-2, 0, +2...+10	0.4	-0.8, -0.4, 0, +0.4, +0.8
28	0.7	0.7	0.05	1.4	2	-12, ...-2, 0, +2...+12	0.4	-0.8, -0.4, 0, +0.4, +0.8
40	1	1	0.06	2	4	-16, ...-4, 0, +4...+16	0.8	-1.6, -0.8, 0, +0.8, +1.6
60	1.5	1.5	0.08	3	6	-18, ...-6, 0, +6...+18	1.2	-2, -1.2, 0, +1.2, +2
100	2.5	2.5	0.1	5	10	-40, ...-10, 0, +10...+40	2	-4, -2, 0, +2, +4
200	5	5	0.15	10	15	-60, ...-15, 0, +15...+60	3	-6, -3, 0, +3, +6
500	12.5	12.5		25				
1000	25	25		50				



## 耐磨陶瓷衬板/橡胶陶瓷衬板(WCL/CRL)

耐磨陶瓷衬板WCL和橡胶陶瓷衬板CRL采用氧化铝、氧化锆、橡胶复合而成。尺寸规整，规格齐全，具有纯度高，致密性好，硬度强，磨损低，不被磨料污染等特点。广泛用于火力发电的输煤、制粉、排灰系统及冶金，钢铁，水泥等行业的输料，配料系统上，如磨煤机的出口管、粗细分离器进口管、一次风管、煤粉管道等。



### 性能指标:

橡胶技术参数	指标	陶瓷技术指标	WCT-92	WCT-95	WCT-ZA
扯断强度 (MPa)	≥12	Al <sub>2</sub> O <sub>3</sub> %	≥92	≥95	≥80
扯断延伸 (%)	≥250	Fe <sub>2</sub> O <sub>3</sub> %	≤0.2	≤0.2	≤0.2
绍氏硬度	55-65	ZrO <sub>2</sub> %	-	-	≥20
橡胶陶瓷粘结力 (MPa)	≥3.5	硬度	≥9	≥9	≥9
使用温度	≤100℃	吸水率 (%)	≤0.2	≤0.2	≤0.2
寿命 (Years)	≥5	体积密度 (g/cm <sup>3</sup> )	≥3.60	≥3.70	≥4.10

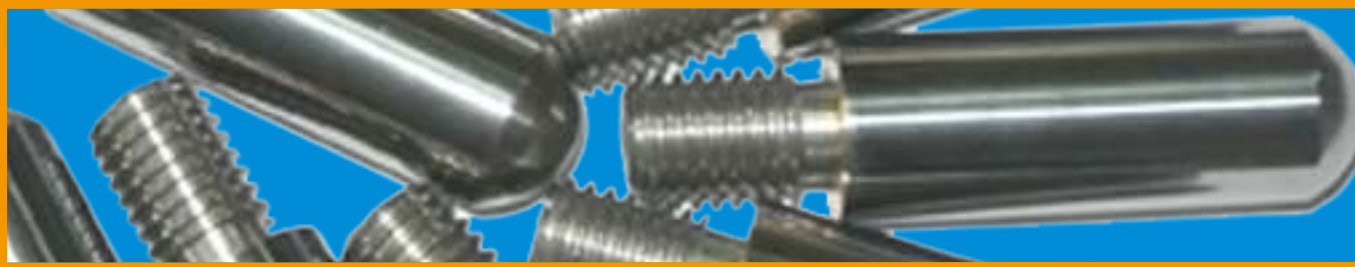
## Ceramic/Rubber Liner(WCL/CRL)

The Wear-resistant ceramic liner (WCL) and ceramic Rubber liner (CRL) are compounded of alumina, zirconia and rubber. They are an extremely dense ceramic material that has excellent resistance to both sliding and impact abrasion. Mainly used as lining materials for applications like coal conveying in power stations, slag conveying pipelines, material conveying for mines and docks, cement powder selecting equipment and crushing equipment for fine ceramic materials. They are featured by high wear resistance and easy for installation.



### Specifications:

Rubber Spec	Index	Ceramic Technical Data	WCT-92	WCT-95	WCT-ZA
Tensile strength (MPa)	≥12	Al <sub>2</sub> O <sub>3</sub> %	≥92	≥95	≥80
Tensile elongation(%)	≥250	Fe <sub>2</sub> O <sub>3</sub> %	≤0.2	≤0.2	≤0.2
Shore hardness	55-65	ZrO <sub>2</sub> %	-	-	≥20
Bond strength of rubber and ceramic (Shear modulus (MPa))	≥3.5	Mohs Hardness	≥9	≥9	≥9
Temperature range	≤100℃	Water Absorption (%)	≤0.2	≤0.2	≤0.2
Aging time (Years)	≥5	Density (g/cm <sup>3</sup> )	≥3.60	≥3.70	≥4.10



## 碳化钨球 (TCB)

硬质合金球俗称钨钢球，是指用硬质合金为材料制成的球珠、滚珠，硬质合金球硬度高、耐磨、抗腐蚀、抗弯曲、使用环境恶劣。硬质合金研磨球采用高硬度难熔金属的碳化物（WC、TiC）微米级粉末为主要成分，以钴（Co）或镍（Ni）、钼（Mo）为粘结剂，在真空炉或氢气还原炉中烧结而成的粉末冶金制品，硬质合金球材质包括YG6、YG6x、YG8、YG8x、YN6、YN9等，可用于比重大、坚硬、粘稠、强腐蚀性物料的研制。

### 用途：

硬质合金研磨球适用范围极为广泛，如：精密轴承、仪器、仪表、制笔、喷涂机、高短路电流自动选择开关、水泵、机械配件、密封阀、制动泵、冲挤孔、油田、盐酸实验室、硬度测量仪、渔具、配重、装饰、精加工、手动开关、鼓形控制器、凸轮控制器、蓄电池车接触器等电器等行业，其具有耐磨损、抗熔焊、化学稳定性好及寿命长等优点。

### 性能指标：

材质	碳化钨%	钴%	镍%	碳化钽%	铁%
YG6	≥93.8	5.8-6.1	0.2	0.1	0.1
硬度	密度	抗弯强度	晶粒度	金相	
≥90.8	≥14.90g/cm <sup>3</sup>	≥1750N/mm <sup>2</sup>	1.2um	A02B04C00	



### 产品特性：

- 1 硬度高，具有很强的粉碎力和混合力；
- 2 耐磨性好；
- 3 耐高温，在1000度的高温情况下仍然可以保持高硬度和其他的力学性能；
- 4 耐腐蚀，能抵抗强酸碱性物质的腐蚀；



## Tungsten Carbide Ball (TCB)

Tungsten Carbide Ball is also called tungsten steel ball or cemented carbide ball. It is grinding ball and bearing ball which is made of cemented carbide, with the advantages of high hardness, wear resistance, corrosion resistance, anti-bending in poor environment. it is a powder metallurgy product sintering in vacuum furnace or hydrogen reduction furnace by using Co, Ni, and Mo as binder. The main component is micro-size powder of WC& Tic, a kind of refractory metal with high hardness. The material of cemented carbide ball contains YG6、YG6x、YG8、YG8x、YN6、YN9 etc, It is used to develop highly corrosive materials of heavy density、hard and sticky.

### Product Features:

- 1 High hardness with strong grinding ability and mixing force.
- 2 High wear-resistance.
- 3 high-temperature resistance, can maintain high hardness and other mechanical properties at 1000 °C.
- 4 Corrosion resistance, can resist corrosion of strong acid and alkali substances.

### Specifications:

Material	WC%	Co%	Ni%	TaC%	Fe%
YG6	≥93.8	5.8-6.1	0.2	0.1	0.1
Hardness	Density	Bending strength	Grain size	Metallographic	
≥90.8	≥14.90g/cm <sup>3</sup>	≥1750N/mm <sup>2</sup>	1.2um	A02B04C00	



### Product Usage:

The usage scope of carbide grinding ball is very widely. such as precision bearing, instrument, pen making, spraying machine, high short circuit current auto select switch, water pump, mechanical accessories, sealing valve, brake pump, punching hole, oil field, hydrochloric acid lab, hardness test fishing gear, counter weight, decoration, finish machining, Manual switch, drum controller, cam controller, battery car contactor and other electric industries.

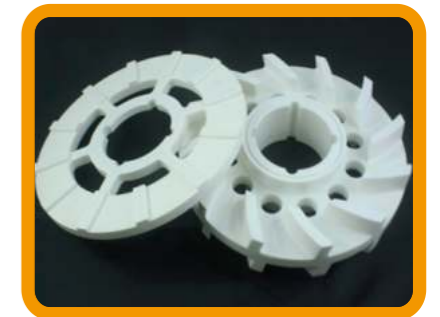
### Advantages:

Wear-resistance, anti-welding resistance, good chemical stability and long life.

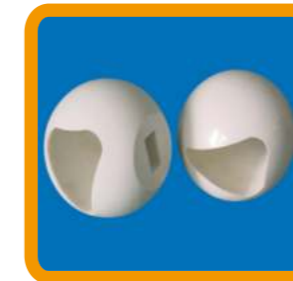


精密陶瓷结构件

Ceramics Structure Parts



项目	指标		碳化硅	氮化硅
化学成份	ZrO <sub>2</sub> 94.5%	ZrO <sub>2</sub> 97%	≥98%	≥95%
	Y <sub>2</sub> O <sub>3</sub> 5.5%	MgO3%		
密度	6.0g/cm <sup>3</sup>	5.5g/cm <sup>3</sup>	3.1g/cm <sup>3</sup>	3.2g/cm <sup>3</sup>
硬度	>11Gpa	>10Gpa	>25Gpa	>15Gpa
抗弯强度	>1100Mpa	>1000Mpa	>550Mpa	>720Mpa
断裂韧性	9Mpa.m <sup>1/2</sup>	8.5Mpa.m <sup>1/2</sup>	4.6Mpa.m <sup>1/2</sup>	6.2Mpa.m <sup>1/2</sup>
弹性模量	200Gpa	180Gpa	410Gpa	300Gpa
导热率	3W/(m.k)	2.8W/(m.k)	120W/(m.k)	25W/(m.k)
热膨胀系数	10×10 <sup>-6</sup> /K	9.5×10 <sup>-6</sup> /K	4.0(10 <sup>-6</sup> /°C)	3.2(10 <sup>-6</sup> /°C)



Attribute	Spec		SiC	Si <sub>3</sub> N <sub>4</sub>
Composition	ZrO <sub>2</sub> 94.5%	ZrO <sub>2</sub> 97%	≥98%	≥95%
	Y <sub>2</sub> O <sub>3</sub> 5.5%	MgO3%		
Density	6.0g/cm <sup>3</sup>	5.5g/cm <sup>3</sup>	3.1g/cm <sup>3</sup>	3.2g/cm <sup>3</sup>
Hardness(HV)	>11Gpa	>10Gpa	>25Gpa	>15Gpa
Bending Strength	>1100Mpa	>1000Mpa	>550Mpa	>720Mpa
Fracture TOUghness	9Mpa.m <sup>1/2</sup>	8.5Mpa.m <sup>1/2</sup>	4.6Mpa.m <sup>1/2</sup>	6.2Mpa.m <sup>1/2</sup>
Elastic Modulus	200Gpa	180Gpa	410Gpa	300Gpa
Thermal Conductivity	3W/(m.k)	2.8W/(m.k)	120W/(m.k)	25W/(m.k)
Thermal Expansion Coefficient (20-400)	10×10 <sup>-6</sup> /K	9.5×10 <sup>-6</sup> /K	4.0(10 <sup>-6</sup> /°C)	3.2(10 <sup>-6</sup> /°C)