

# Sundi Precision Tools

A Professional High Precision Components and Mold Maker

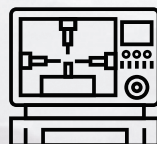
Precision Grinding



E.D.M Service



Metal CNC Service



Mold and Fixture





# Custom Ceramic Parts Maker

(Al<sub>2</sub>O<sub>3</sub>, ZrO<sub>2</sub>, Si<sub>3</sub>N<sub>4</sub>, SiC)

## OVERVIEW

Industrial ceramic has better conductivity, higher hardness, and higher temperature resistance. In our workshop, for mass production, there are three ways of molding technologies used to make the raw material into different shapes, they are drying processing, high-pressure injection molding, and Isostatic pressing molding.

Because of the special ceramic technical property, its machining way is not easy as traditional machining, Since 2019, through the combination of grinding, drilling, and milling, we've participated in and provided more than 2000 precision engineering ceramics parts to hundred companies.

## FEATURES

### Quick production as fast as 3 day

On average, we return quotations within 24 hours. We are good at manufacturing various highly qualified ceramic parts(Al<sub>2</sub>O<sub>3</sub>, ZrO<sub>2</sub>, Si<sub>3</sub>N<sub>4</sub>, SiC) as fast as 3 days.

### High Accuracy Guaranteed

We offer various tolerance according to different demands, the tolerance can reach +/-0.005mm.

### OEM/ODM Service

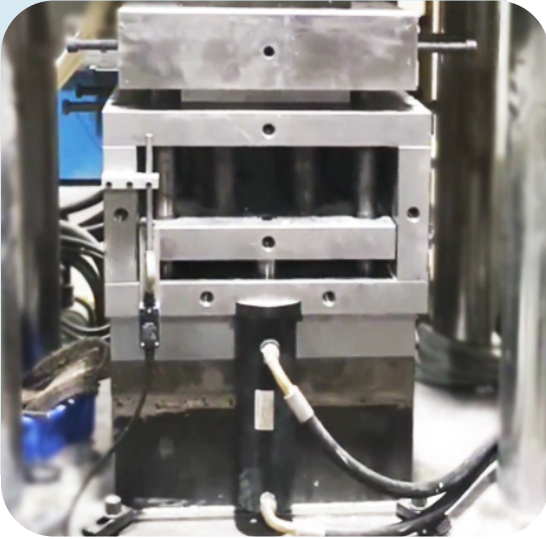
Our engineers have built up rich experience from our previous projects, so we can handle all precision machining ceramic process projects, serving in various sectors.

### Quality Assurance

Our Company has a sound quality assurance system, advanced detection equipment, and a strict quality management system.

# WHAT WE CAN DO

We're offering an Omni-directional manufacturing service in ceramic parts

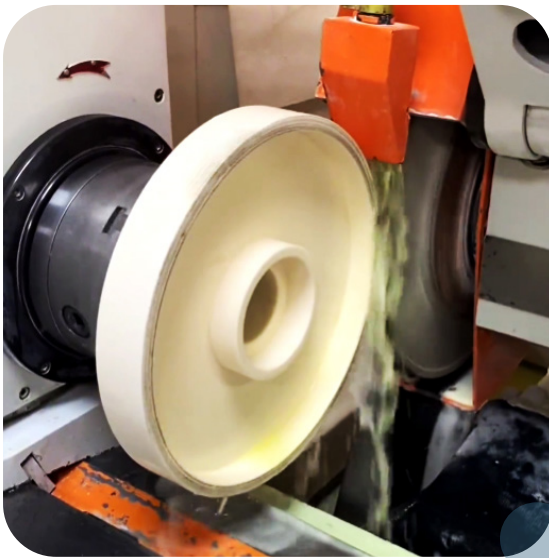


## 1. Molding Support

- Sundi Tools have three molding techniques: dry pressing, pressure injection molding, and Isostatic processing Molding.
- We choose the most suitable molding technique according to customers' specific structure, size, accuracy, and quantity requirements.

## 2. CNC Machining

- As for the ceramic parts with complex shapes, We will set up the CNC machining program and greatly control the machining precision and position.
- CNC drilling is available for mass production.



## 3. Cylindrical Grinding

- The main purpose of outer circle grinding is to machine the outer circle.
- The cylindricity can reach 0.005mm, the surface roughness can reach Ra0.05 $\mu$ m, straightness can reach 0.003mm.

## 4. Precision Internal Grinding

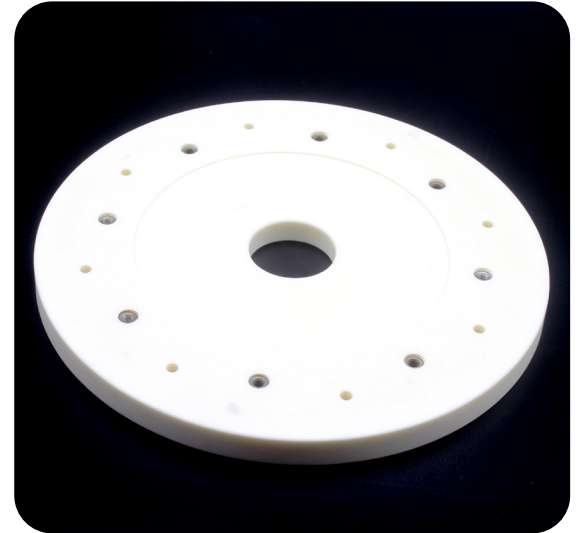
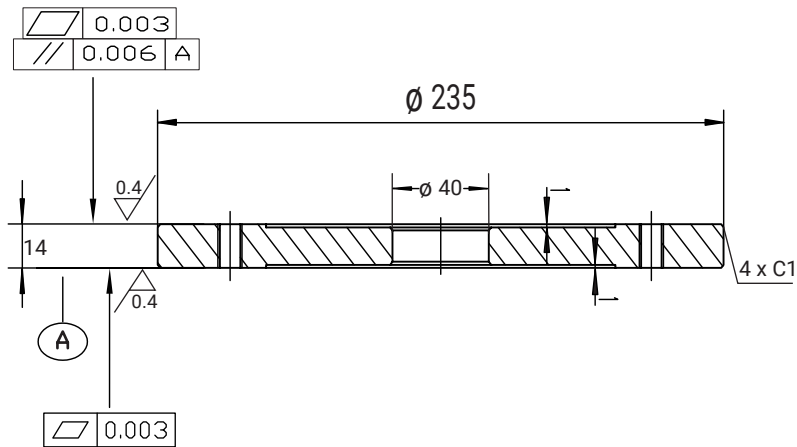
- It's mainly used to machine precision inner holes.
- The surfaces can reach Ra0.05 $\mu$ m, the inner hole tolerance can be controlled within 0.005 mm, and the straightness can reach 0.005mm.



# CERAMIC PROPERTY

Property	Content	unit	AL <sub>2</sub> O <sub>3</sub>		ZrO <sub>2</sub>	SiC	Si <sub>3</sub> N <sub>4</sub>	ALN
			95% AL <sub>2</sub> O <sub>3</sub>	99% AL <sub>2</sub> O <sub>3</sub>	ZrO <sub>2</sub>	SiC	Si <sub>3</sub> N <sub>4</sub>	ALN
<b>Mechanical Characteristics</b>	Color		White	Light Yellow	Ivory White	Black	Grey Black	Grey
	Density	g/cm <sup>3</sup>	3.7	3.85	6.02	3.2	3.2	3.4
	Bending Strength	Mpa	300	310	800	500	750	350
	Compressive strength	Mpa	2300	2400	3000	2200	3800	-
	Elastic Modulus	Gpa	320	340	200	420	290	320
	Fracture Toughness	Mpa m <sup>1/2</sup>	3~4	3~4	8	-	7	-
	Weber Coefficient	m	12	12	15	-	15	-
	Vickers Hardness	HV 0.5	1400	1600	1200	-	1700	1020
<b>Thermal Characteristics</b>	Coefficient of line Thermal Expansion	10 <sup>-6</sup> K <sup>-1</sup>	7~8	7~8	10	4.2	2	4.6
	Thermal Conductivity	W/mK	20	29	3	60	20	150
	Thermal shock resistance	ΔT°C	250	200	300	400	750	-
	Max working temperature	°C	1500	1600	1000	-	1300	-
<b>Electrical Characteristics</b>	Volume Resistance at 20°C	Ωcm	>10 <sup>14</sup>	>10 <sup>14</sup>	>10 <sup>14</sup>	10 <sup>3</sup> - 10 <sup>6</sup>	>10 <sup>14</sup>	>10 <sup>14</sup>
	Dielectric Strength	V/m	15x10 <sup>6</sup>	15x10 <sup>6</sup>	11x10 <sup>6</sup>	-	10x10 <sup>6</sup>	-
	Dielectric Constant	ε r	9	10	33	-	-	8
	One MHZ Dielectric Loss Angle at 20°C	tan	0.004	0.002	0.0016	-	-	-
<b>Chemical Characteristics</b>	Nitric Acid(60%)90°C	WT Loss mg/cm <sup>2</sup> /day	0.1	0.1	0	0.04	1	-
	Sulphuric Acid(95%)95°C		0.3	0.34	0.04	0.01	0	-
	Caustic Soda(30%)80°C		0.9	0.95	0.08	0	0.2	-

## Alumina Oxide



### Advantages

- High mechanical strength
- Electrical insulation
- High-Temperature resistance
- High abrasive resistance

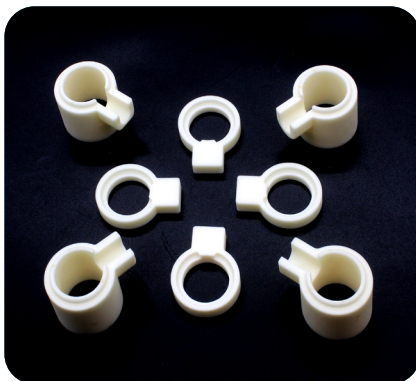
### Machining

- CNC surface, cylindrical and inner grinding
- No burrs on the surface of the product
- High precision in dimensions, parallelism

### Note

- Applied in Wafer cleaning equipment
- 99.6% alumina ceramic
- Serving for the semiconductor industry
- Customization according to different processing workpieces and working conditions

### Product Showcase



**Endcap and washer parts**

Application for IR tube endcaps



**Location pins**

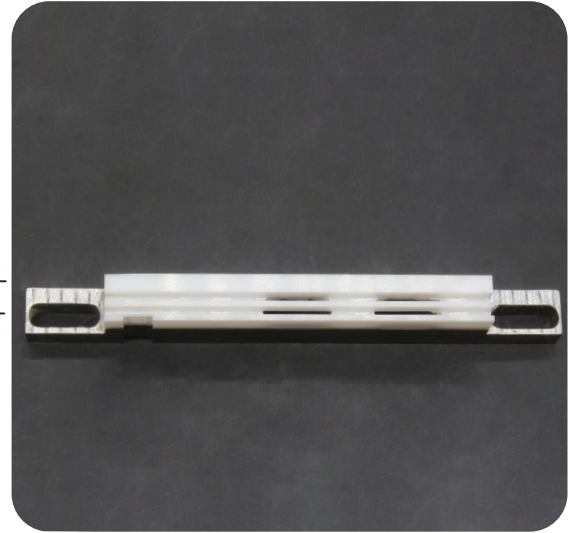
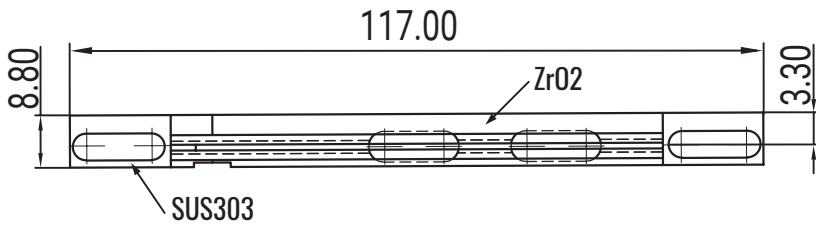
Working in the welding furnace



**Mechanical seal**

Chemical pump ceramic sealing ring

## Zirconia Oxide



### Advantages

- High Hardness
- Wear Resistance
- High Tenacity
- Corrosion Resistance
- Antimagnetic

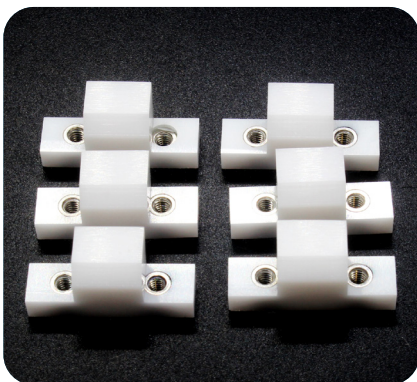
### Machining

- Consist of Zirconia ceramic and SUS303
- Seamless press fitting
- Critical dimension uniformity

### Note

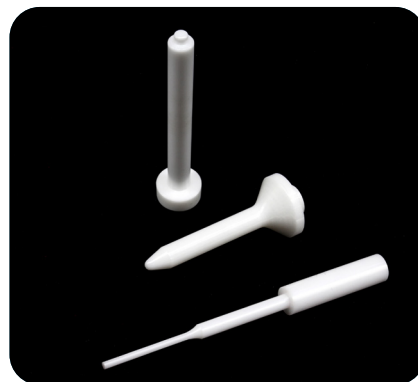
- High-qualified Zirconia Ceramic
- Serving the semiconductor industry
- Especially designed and manufactured to meet the highest demands technology

### Product Showcase



**Ceramic holder**

Great electrical insulation



**Centering pin**

Obvious advantages in wear, corrosion, or temperature resistance



**Roller and Rings**

Working in pumps, valves, automotive engineering

## Silicon Nitride

It is an important structural ceramic material with higher hardness, good lubrication, and wear resistance. And it has a great cold and hot shock resistance.



### Advantages

- Longer life, 20-30 times compared with alloy steel.
- Electrical insulation and non-conductive
- High abrasive resistance
- High mechanical strength

### Note

- Suitable for high-temperature welding
- High precision in dimensions, parallelism
- Design and manufacture to meet different needs.

### Product Showcase



**Welding roller**

Excellent working life



**Si3N4 Ceramic Parts**

Working in heating devices



**Connector**

Passive electrical components



## Silicon Carbide

It is almost like a diamond. It is not only the lightest but also the hardest ceramic material with excellent thermal conductivity, low thermal expansion, very resistant to acids and alkalis, and resistant to chipping under rapid cold and heat.



### Advantages

Very low density (3.20g / cm<sup>3</sup>)

Extremely high hardness: (94HRA)

High thermal conductivity (80W / mk)

Bottom linear expansion coefficient (4.5x10<sup>-6</sup> / k, 400°C)

Maximum working temperature: 1500°C

Good corrosion and wear resistance at high temperatures

### Product Showcase



**Connector Components**

Great wear resistance



**SiC Parts**

Working for the high demands in the jointing methods



**Ceramic Components**

Remarkable hardness and wear resistance