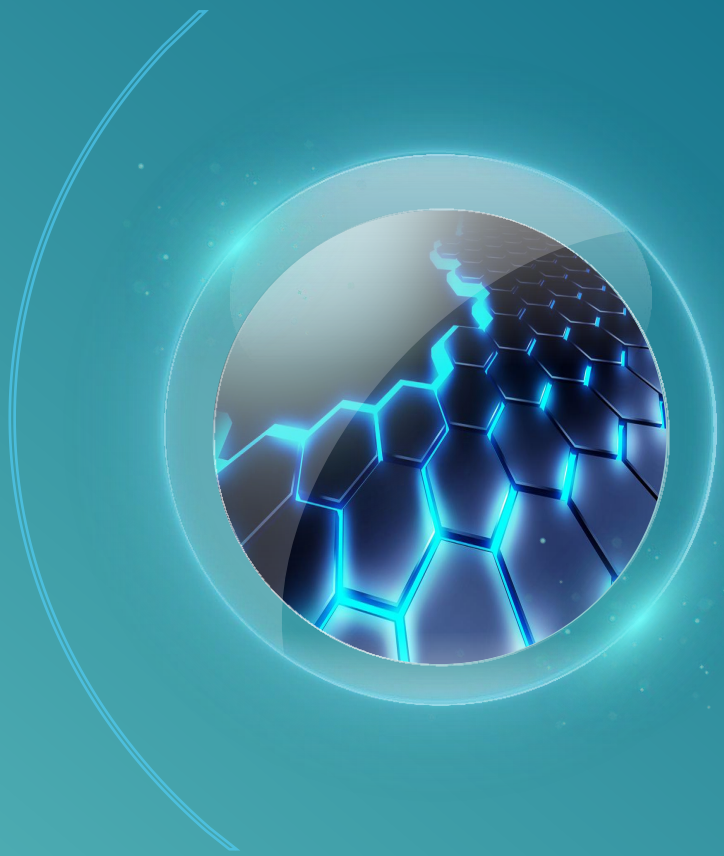
NKM
— ADVANCED CERAMICS —

Professional Advanced Ceramics Manufacturer
- Global Solutions for Extreme Industries

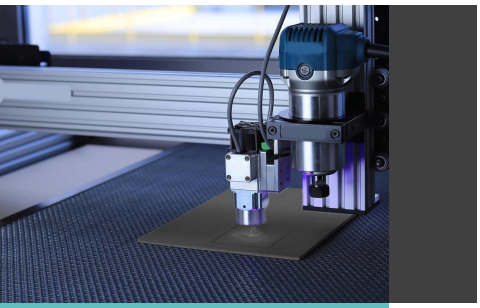
Qingdao Newthink New Materials Co., Ltd.

https://nkmceramic.com

Precision Ceramics Manufacturer



Catalogue



About us

NewthinK new Materials

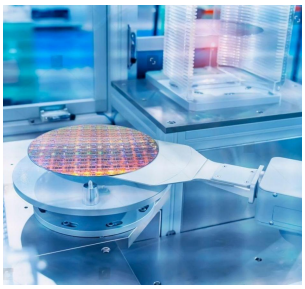
DEDICATED TO
ENHANCING YOUR INDUSTRIAL EFFICIENCY

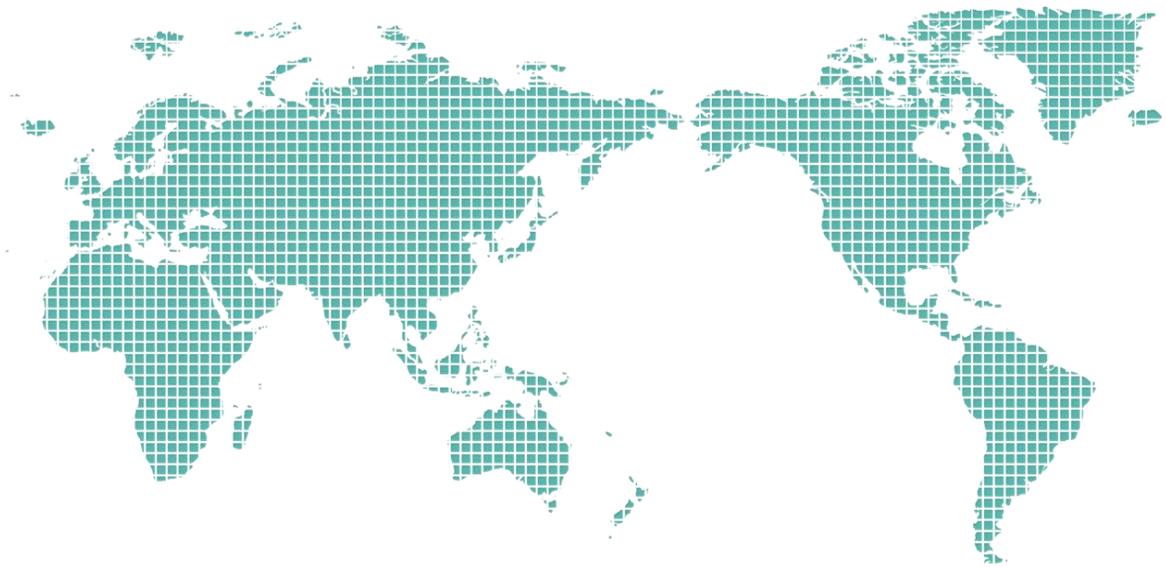
Qingdao Newthink New Materials Co., Ltd., founded in 2011, is a leading Chinese provider of advanced ceramic solutions, operating ISO-certified facilities and serving clients in over 40 countries. With 200+ employees and 70+ precision units, we've delivered 3,000+ ceramic product types globally. Our high-performance materials—including silicon carbide, alumina, boron nitride and more—support industries like semiconductors, aerospace, and medical in meeting stringent manufacturing demands. We offer:

- High-Quality Products
- Competitive Pricing
- Dependable Delivery
- Strict Dimensional Tolerance Compliance
- Customized Solutions
- Product Confidentiality
- Rapid Response

Advanced Ceramic Solutions Across Global Sectors

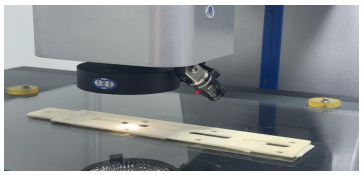
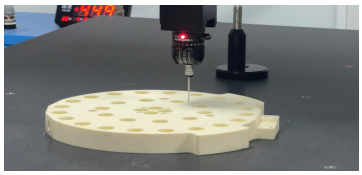
We support industries worldwide—including military, semiconductors, kilns, and high-temperature sectors—with reliable and innovative ceramic technologies.





Advanced Ceramic Products

Our Ceramic Product Range


BN

ZrO_2

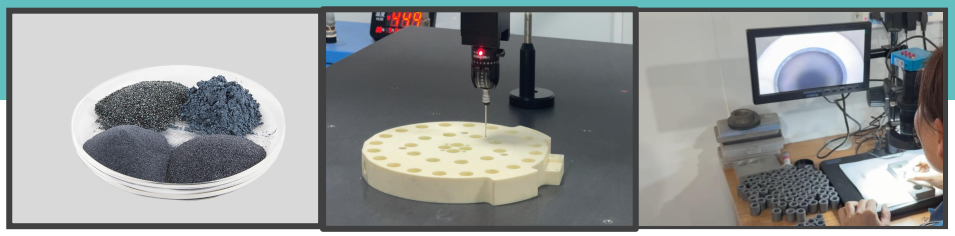
SiC

Al_2O_3

Si_3N_4

NKM offers a wide portfolio of advanced ceramics, including SiC, alumina, zirconia, BN, and Si_3N_4. Our products are engineered for strength, heat resistance, and wear protection across industries from semiconductors and kilns to mining, defense, aerospace, automotive, energy, and other high-demand sectors worldwide.

Ceramic Product Processing Flow



Raw Material Preparation

Powder selection, additives, crushing, sieving, mixing

Drying

Moisture or solvent removal to prevent cracking and deformation

Sintering

- Conventional Sintering
- Pressureless Sintering
- Reaction Bonded Sintering
- Hot Isostatic Pressing (HIP)
- CVD / PVD Coating Sintering

Quality Control & Testing

Dimensional inspection, density testing, strength testing, microscopic examination, thermal performance testing

Packaging & Delivery

Protective packaging, labeling & traceability, export-proofing against shock and moisture

Forming

- Dry Pressing
- Cold Isostatic Pressing (CIP)
- Slip Casting
- Extrusion
- Ceramic Injection Molding (CIM)
- Hot Pressing
- Gel Casting
- Additive Manufacturing

Rough Machining / Pre-Machining

Basic cutting or shaping to prepare green bodies for sintering

Machining & Surface Treatment

Cutting, turning, grinding, polishing, laser/ultrasonic machining, coating, impregnation, etc.

Final Inspection

Appearance check, performance sampling inspection

Silicon Carbide (SiC) Ceramic

Silicon carbide is a high-performance ceramic material known for its exceptional hardness, strength, and stability. With superior resistance to heat, wear, and corrosion, SiC has become the material of choice in demanding industrial applications.

Key Properties >

- High hardness and strength
- Excellent wear resistance and self-lubricating behavior
- High thermal conductivity and low thermal expansion
- Outstanding thermal shock resistance
- Superior chemical inertness, acid and alkali resistance
- Excellent performance under high temperature up to 1600°C

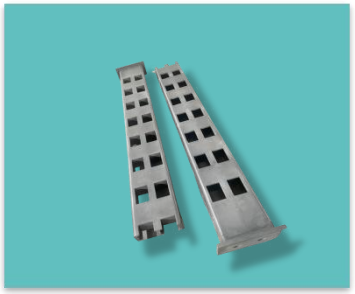
Applications Across Industries

Steel & Metallurgy | Power & Energy | Metal Smelting | Mining & Mineral Processing | Semiconductor & Photovoltaic | Chemical Industry | Military & Defense

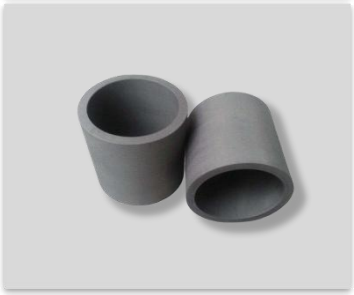
Key Parameters >

Item	Unit	Data				
		RBSiC(SiSiC)	NBSiC	SSiC	RSiC	OSiC
Max service temperature	℃	1380	1450	1650	1620	1400
Density	g/cm^3	3.02	2.75-2.85	3.08-3.16	2.65-2.75	2.75-2.85
Open porosity	%	0	13-15	0	15-18	7-8
Bending strength 20℃	Mpa	250	160	380	100	/
Bending strength 1200℃	Mpa	280	180	400	120	/
Modulus of elasticity 20℃	Gpa	330	580	420	240	/
Modulus of elasticity 1200℃	Gpa	300	/	/	200	/
Thermal conductivity 1200℃	W/m.k	45	19.6	100-120	36.6	/
Coefficient of thermal expansion	$K^{-1}x10^{-6}$	4.5	4.7	4.1	4.69	/
HV	kg/mm^2	2115	/	2800	/	/









SiC

Popular SiC Components

Kiln Furniture: rollers, beams, plates, burner nozzles
High-Temperature Applications: heat exchanger tubes, radiant tubes, heater rods, thermocouple protection tubes, crucibles
Wear-Resistant Applications: liners, sandblasting nozzles, grinding barrels
Military & Ballistic Protection: bulletproof plates, vehicle armor,
Semiconductors: wafer chucks, susceptors, structural parts, handling end-effectors, wafer boats
Mechanical Seals: seal rings, sleeves, bearings
.....








Zirconia (ZrO_2) Ceramic

Zirconia ceramics are advanced materials recognized for their exceptional strength, toughness, and durability. With superior resistance to wear, heat, and corrosion, zirconia components ensure reliable performance across a wide range of demanding industrial applications.

Applications Across Industries

Mechanical Engineering | Valves & Pumps | Grinding & Polishing Media | Electronics & Semiconductors | Energy & Chemical Industries | Aerospace & Defense | New Energy & Battery Processing

Key Parameters >

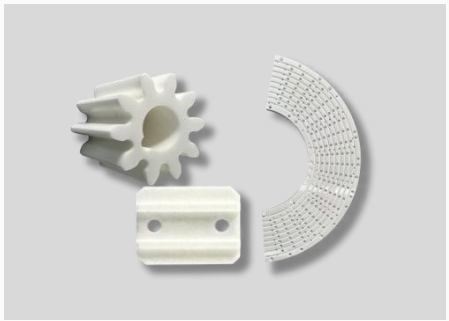
Category	Parameter	Typical Value	Unit
Physical Properties	Density	6.00 - 6.05	g/cm^3
	Water Absorption	0	%
	Grain Size	0.3 - 0.8	μm
Mechanical Properties	Flexural Strength	900 - 1400	MPa
	Compressive Strength	2000 - 2500	MPa
	Fracture Toughness	6 - 12	$MPa \cdot m^{1/2}$
	Vickers Hardness	1200 - 1400	HV
	Elastic Modulus	200 - 220	GPa
Thermal Properties	Max Operating Temp	800 - 1000	℃ (short-term)
	Thermal Expansion Coefficient	10.5	$\times 10^{-6}/℃$
	Thermal Conductivity	2 - 3	W/(m·K)
	Thermal Shock Resistance	250 - 300	℃
Chemical Properties	Acid Resistance	< 0.01	mm/year
	Alkali Resistance	Almost no erosion	-
Electrical Properties	Volume Resistivity	$> 10^{14}$	Ω·cm
	Dielectric Constant	28 - 33	1 MHz
Machining Properties	Dimensional Tolerance	± 0.005	mm (fine grinding)
	Surface Roughness	≤ 0.01	μm




Key Properties >

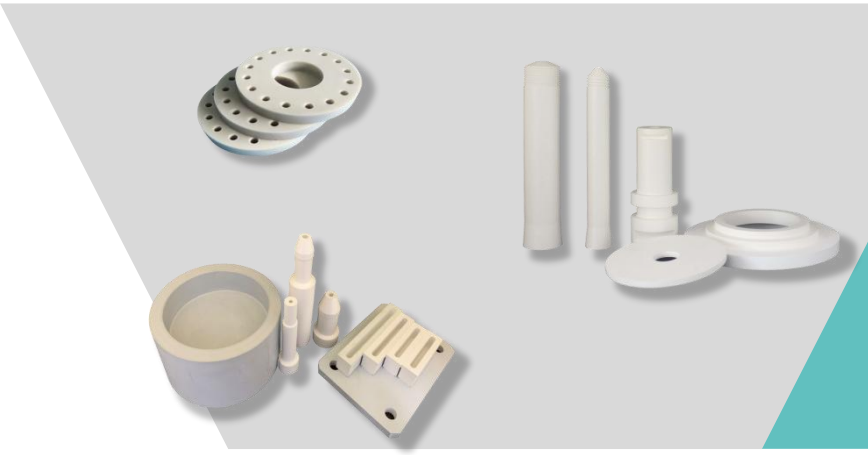
- High strength and fracture toughness
- Excellent wear resistance and hardness
- High temperature resistance up to 1000 ℃
- Low thermal conductivity and good thermal insulation
- Chemical stability and corrosion resistance
- Electrical insulation at room temperature, ionic conductivity at high temperature
- Non-magnetic characteristics

ZrO_2


Popular Zirconia Components

Powder, beads, balls, crucibles, bearings, plates, bushings, plungers, nozzles .....



Boron Nitride (BN) Ceramic

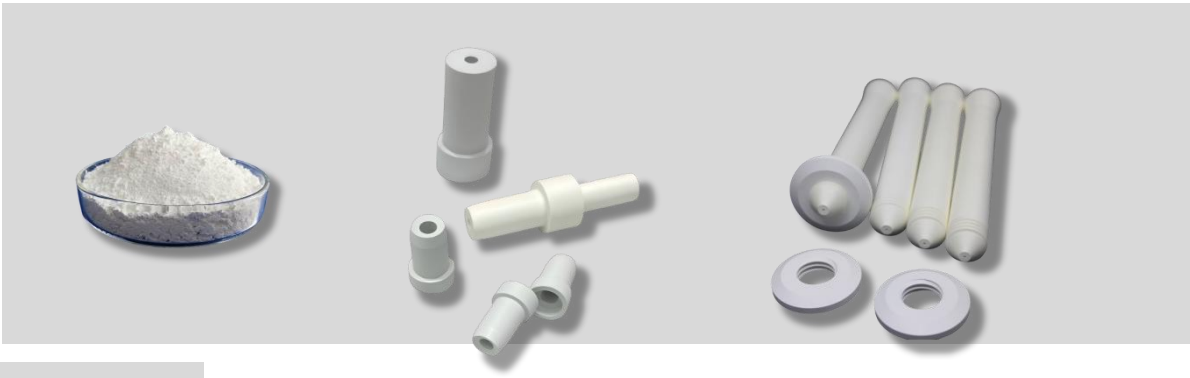
Boron Nitride (BN) is a high-performance ceramic material known for its exceptional thermal conductivity, electrical insulation, and chemical stability. With unique structures such as hexagonal BN (h-BN) and cubic BN (c-BN), it has become indispensable in advanced industrial applications.

Key Properties >

- High thermal conductivity
- Excellent electrical insulation, low dielectric constant
- Outstanding high-temperature resistance, stable up to 2300 ℃ in inert atmosphere
- Chemical inertness against strong acids, bases, and molten metals
- Low thermal expansion and strong thermal shock resistance
- Wide hardness range: soft h-BN to ultra-hard c-BN

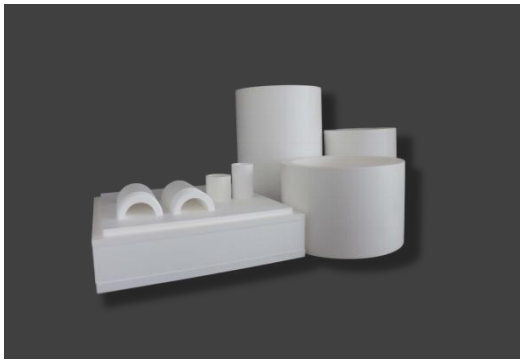
Key Parameters >

Property / Parameter	Hexagonal BN (h-BN)	Cubic BN (c-BN)	Pyrolytic BN (PBN)	BN Composite Materials
Crystal Structure	Hexagonal	Cubic	High-purity hexagonal structure	Composite structure
Color	White	Black / Brown	White	Depends on base material
Density (g/cm^3)	2.1 - 2.3	3.45 - 3.50	2.0 - 2.2	2.5 - 3.5
Mohs Hardness	1 - 2	9.5	1 - 2	5 - 8
Thermal Conductivity (W/m·K)	30 - 300	1300	50 - 200	50 - 150
Thermal Expansion Coefficient ($\times 10^{-6}$ /K)	0.5 - 5.0	3.5 - 4.5	1.0 - 3.0	2.0 - 6.0
Electrical Resistivity (Ω·cm)	$>10^{14}$	10^{10} - 10^{14}	$>10^{14}$	10^{12} - 10^{14}
Dielectric Constant (1 MHz)	4.0 - 5.0	4.5 - 7.0	3.5 - 4.5	4.0 - 6.0
Maximum Service Temperature (Air)	900℃	1200℃	2000℃	800 - 1500℃
Chemical Resistance	Resistant to acids, bases, and molten metals	Resistant to acids and bases	Ultra-high purity, corrosion-resistant	Depends on base material



Popular BN Parts

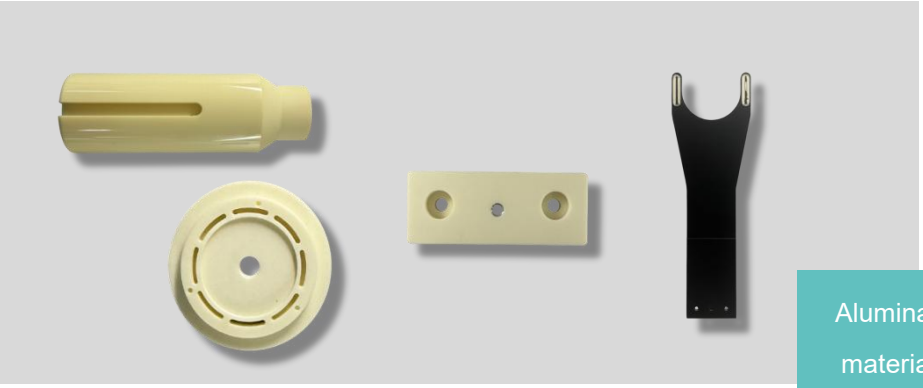
High-purity crucibles and boats
Insulating tubes and thermocouple protection tubes
Heat dissipation substrates and semiconductor components
Nozzles and wear-resistant seals
Powders for lubricants and coatings
Plates for high-temperature furnaces
.....



BN

Applications by Industry

Electronics & Semiconductors | Aerospace | Renewable Energy | Chemical & Metallurgy | Machinery & Processing | Nuclear Industry | Advanced Manufacturing



Alumina (Al_2O_3) Ceramic

Alumina (Al_2O_3) is a high-performance ceramic material known for its outstanding mechanical strength, thermal stability, electrical insulation, and chemical resistance. With purity levels up to 99.8% and versatile product forms, alumina serves as a critical material in numerous advanced industries.

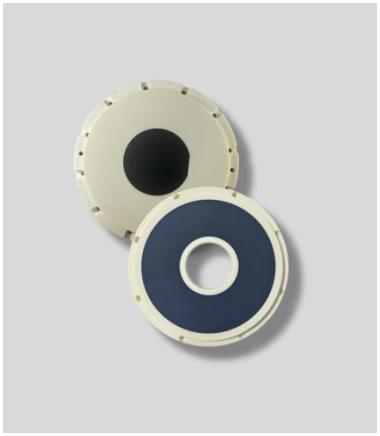
Applications by Industry

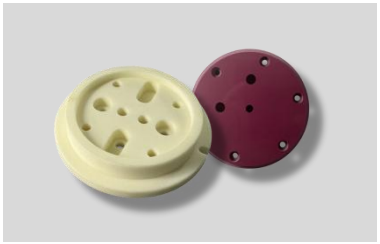
Electronics & Semiconductors | Mechanical & Industrial Engineering | Chemical & Energy | Medical & Biological | Aerospace | Refractories & High-Temperature Applications

Key Parameters >

Category	Property	Value	Unit
Basic Properties	Purity	≥99.8	%
	Density	3.92 - 3.98	g/cm^3
	Water Absorption	0	%
	Surface Roughness (Ra)	＜0.1	μm
Mechanical Properties	Flexural Strength	380 - 450	MPa
	Compressive Strength	2600 - 3000	MPa
	Hardness	1600 - 1700	HV1
	Fracture Toughness	4.0 - 4.5	$MPa·m^{1/2}$
	Elastic Modulus	360 - 380	GPa
Thermal Properties	Thermal Conductivity (20 ℃)	28 - 32	W/(m·K)
	Thermal Expansion (20 - 800 ℃)	$6.0 - 7.0×10^{-6}$	/K
	Max. Service Temperature (Air)	1700	℃
	Thermal Shock Resistance (ΔT)	200 - 250	℃
Electrical Properties	Volume Resistivity	$＞10^{14}$	Ω·cm
	Dielectric Strength	17 - 22	kV/mm
	Dielectric Constant (1 MHz)	9.5 - 9.9	-
Chemical Properties	Corrosion Rate in HCl (37%)	＜0.25	$mg/cm^2/day$
	Corrosion Rate in H2SO4 (98%)	＜0.23	$mg/cm^2/day$
	Corrosion Rate in NaOH (45%)	＜0.05	$mg/cm^2/day$
	Corrosion Rate in Deionized Water	0	$mg/cm^2/day$
	Corrosion Rate in Organic Solvents	0	$mg/cm^2/day$

Al_2O_3





Popular Alumina Parts

Ceramic substrates
Vacuum suction cups
Insulating rings and spacers
Ceramic bearings and mechanical seals
Wear-resistant liners and tiles
Nozzles
Structural Components
.....

Key Parameters >

- High hardness of Mohs 9
- Excellent wear resistance
- Resistance to most acids, alkalis, and organic solvents
- Superior thermal stability, melting point up to 2072 ℃
- High electrical resistivity and low dielectric loss
- Good thermal conductivity with low thermal expansion
- Non-toxic and non-magnetic

Aluminum Nitride (AlN) Ceramic

Key Properties >

- High thermal conductivity
- Low coefficient of thermal expansion
- High mechanical strength
- Excellent electrical insulation
- Good chemical stability
- Lightweight

Aluminum Nitride (AlN) is a high-performance ceramic material that combines excellent thermal conductivity, electrical insulation, mechanical strength, and chemical stability. With its unique properties, AlN has become a critical material for advanced electronics, semiconductors, and power applications.

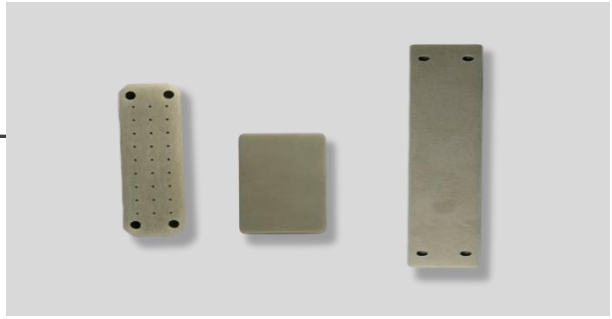
Key Parameters >

Property Category	Specific Parameter	Unit	Typical Value / Range
Physical Properties	Density	g/cm^3	3.26
	Bulk Porosity	%	≤0.1
Thermal Properties	Thermal Conductivity (25 ℃)	W/(m·K)	170 - 230
	Coefficient of Thermal Expansion (25 - 400 ℃)	/K	$4.4 - 4.8\times10^{-6}$
	Maximum Operating Temperature (Air)	℃	1000
	Maximum Operating Temperature (Inert Gas)	℃	2200
Mechanical Properties	Flexural Strength	MPa	300 - 450
	Compressive Strength	MPa	2000 - 2500
	Elastic Modulus	GPa	310 - 330
	Vickers Hardness (HV0.5)	GPa	45974
	Fracture Toughness	$MPa\cdot m^{1/2}$	3.5 - 4.5
Electrical Properties	Volume Resistivity (25 ℃)	Ω·cm	$>10^{14}$
	Volume Resistivity (500 ℃)	Ω·cm	>108
	Dielectric Constant (1 MHz)	-	8.5 - 8.9
	Dielectric Loss (1 MHz)	-	<0.0001
	Dielectric Strength	kV/mm	15 - 20
Chemical Properties	Acid Resistance (20% HCl, 80 ℃)	$mg/cm^2/day$	<0.1
	Alkali Resistance (10% NaOH, 80 ℃)	$mg/cm^2/day$	<0.2
	Oxidation Resistance (Air, 1000 ℃)	mg/cm^2	<0.5 (weight gain)

AlN

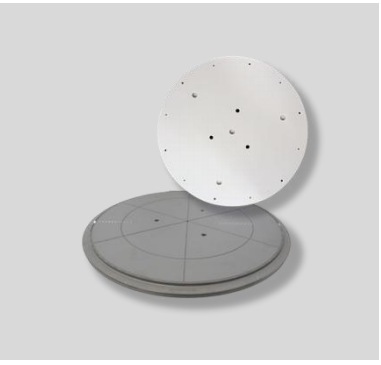
Industry Applications

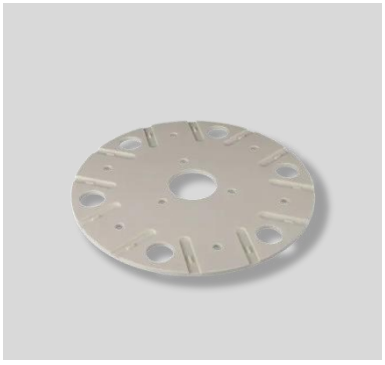
Electronic packaging & semiconductors | Power electronics & new energy | Aerospace & defense | Semiconductor manufacturing equipment | Industrial & mechanical



Popular AlN Components

Substrates
Heat Sinks and Plates
Electrostatic Chucks for semiconductor processing
Tubes and Crucibles
Bearings and Mechanical Parts
.....





Silicon Nitride (Si_3N_4) Ceramic

Silicon nitride (Si_3N_4) is a high-performance advanced ceramic material recognized for its exceptional combination of mechanical, thermal, electrical, and chemical properties. It maintains superior reliability under extreme conditions, making it an ideal choice for demanding industrial applications.

Key Parameters >

Category	Property	Value	Unit
Physical Properties	Density	3.20 - 3.30	g/cm^3
	Apparent Porosity	≤0.1	%
	Color	Gray/Dark Gray	-
Mechanical Properties	Flexural Strength	600 - 1200	MPa
	Compressive Strength	2500 - 3500	MPa
	Elastic Modulus	290 - 320	GPa
	Vickers Hardness	14.5 - 17.0	GPa
	Rockwell Hardness	90 - 92	-
	Fracture Toughness	6.0 - 8.0	$MPa·m^{1/2}$
Thermal Properties	Max Operating Temp (Oxidizing)	1200	℃
	Max Operating Temp (Inert)	1500	℃
	Thermal Conductivity (20℃)	15 - 30	W/(m·K)
	Thermal Expansion (20 - 1000℃)	$3.2×10^{-6}$	/K
	Thermal Shock Resistance (ΔT)	500 - 800	℃
Electrical Properties	Volume Resistivity (20℃)	$>10^{12}$	Ω·cm
	Volume Resistivity (500℃)	10^6 - 10^8	Ω·cm
	Dielectric Constant (1 MHz)	8.0 - 9.0	-
	Dielectric Loss (1 MHz)	<0.001	-
Chemical Stability	HCl (20%)	Excellent	≤100℃
	H_2SO_4 (50%)	Excellent	≤100℃
	HF	Not resistant	Any conc.
	NaOH (30%)	Good	≤80℃
	Molten Aluminum	Excellent	≤800℃
	Molten Copper	Poor	-

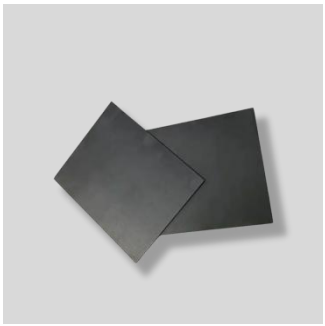
Si_3N_4

Popular Si_3N_4 Parts

High-Performance Bearing Balls
Wear-Resistant Nozzles
Durable Plungers
Thermal-Conductive Substrates
High-Temperature Crucibles
Precision Locating Pins

Industries & Applications

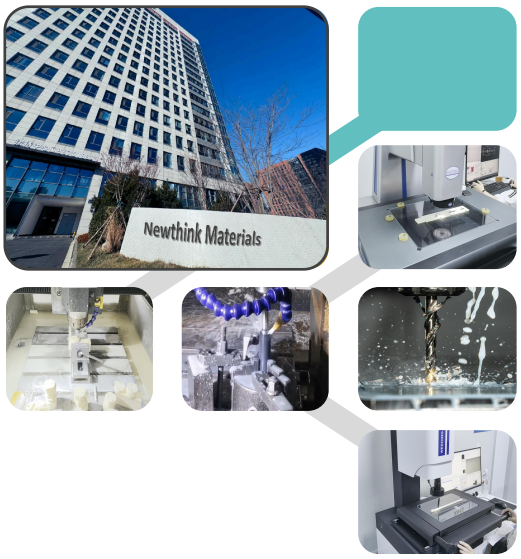
Mechanical engineering | Automotive and new energy | Semiconductor and electronics | Chemical and metallurgical | Aerospace



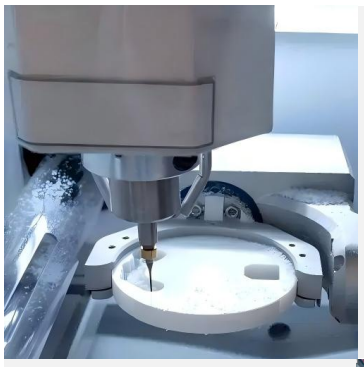
Key Properties >

- Low density and high strength
- Excellent hardness and wear resistance
- High fracture toughness and bending strength
- High temperature capability up to 1500℃ in inert atmosphere
- Low thermal expansion and good thermal conductivity
- Excellent electrical insulation with stable dielectric constant
- Strong resistance to acids, alkalis, and molten metals (except HF)
- Low friction coefficient with self-lubricating behavior

Our Strengths & Reliability



Advanced Manufacturing Facilities



Precision CNC Machining

High-accuracy ceramic shaping and finishing with advanced CNC equipment.

High-Temperature Kilns

Specialized furnaces for reliable sintering and thermal processing.

Automated Production Lines

Streamlined processes ensuring efficiency and consistent product quality.

Strict Quality Control Stations

Dedicated areas for dimensional, strength, and performance testing.

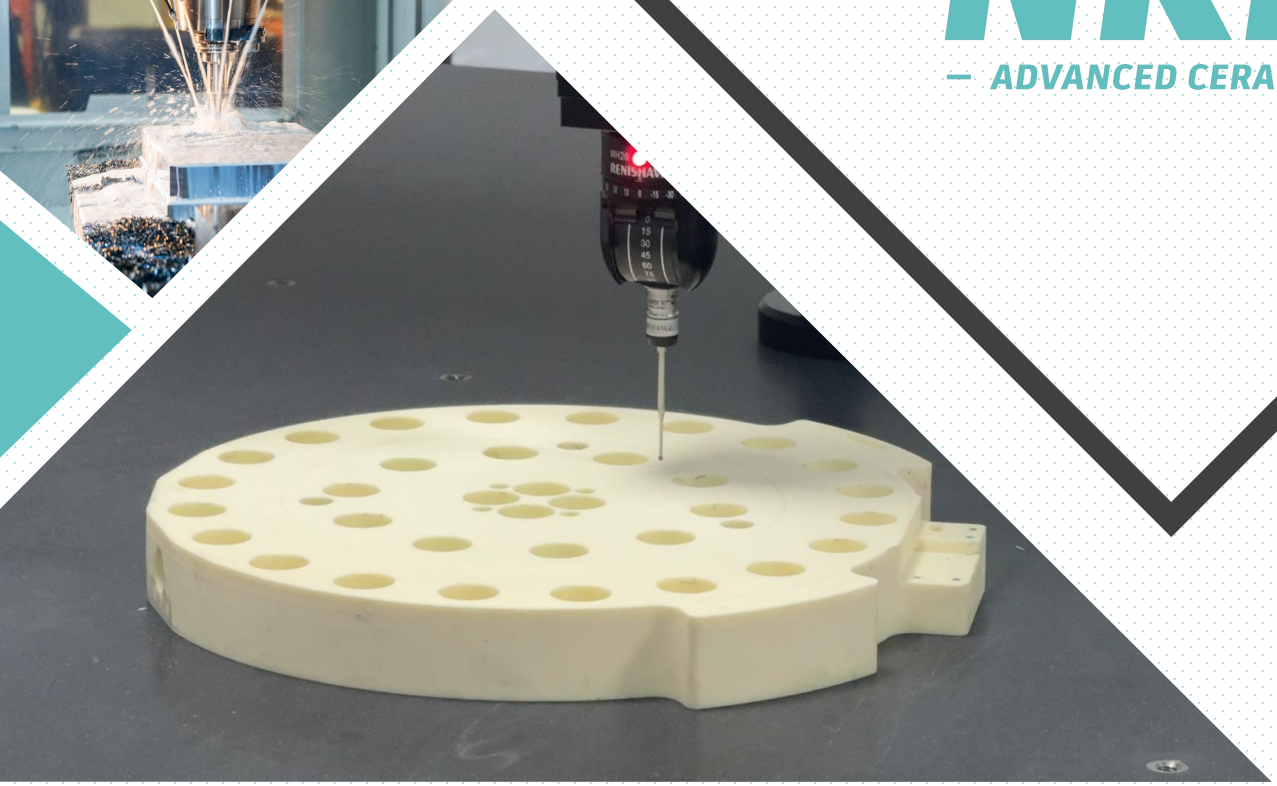
Our Strengths & Reliability

Certifications

Certified with ISO and industry-specific standards, ensuring consistent quality, process control, and compliance with global requirements.

Global Exhibitions

Active participation in worldwide trade shows, meeting customers face-to-face.



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