HEPHYS SOLUTIONS

ADVANCED CERAMICS

High-Performance Engineering & Precision Manufacturing



Hephys Solutions Import and Export Co., Ltd

Advanced Ceramic Component Partner

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ABOUT OUR COMPANY

Hephys Solutions operates as a specialized technical ceramic consultant and supply chain integrator with more than five years of industry experience. Our lean business model allows us to remain fully objective. We collaborate with top-tier, ISO 9001 certified, and stable suppliers, matching your specific project with the optimal facility based on material properties, precision tolerances, and cost efficiency.

We specialize in delivering high-precision, customized ceramic components engineered to withstand the most demanding industrial environments. From initial prototype development to high-volume contract manufacturing, we partner with the industry worldwide—including semiconductors, medical devices, aerospace, automotive, chemical processing, and power electronics—to provide tailored technical ceramic solutions that enhance system efficiency, operational durability, and extreme performance. In the past, we have supported 50+ overseas clients with precision ceramic component requirements, including thermal shock resistance, electrical insulation, wear resistance, and tight dimensional tolerances for semiconductor and medical applications.

Our Strategic Vision

To empower global industrial innovation by delivering advanced ceramic solutions with uncompromised quality, ultra-precision machining limits, and unmatched supply chain reliability. We strive to be the technical resource for engineering teams facing extreme thermal, electrical, and wear environments.

Our Core Operating Philosophy:

- **Uncompromising Quality:** Fully documented batch traceability from raw sub-micron powder to finished components.
- **Precision as Standard:** Continuously pushing machining limits to meet tighter sub-micron design tolerances.
- **Collaborative Engineering:** Working directly with client R&D teams to optimize components for both cost and manufacturability.



CORE MATERIALS PORTFOLIO

We offer a highly comprehensive range of advanced ceramic materials, each formulated and processed with distinct physical, thermal, chemical, and electrical properties to satisfy your targeted application demands.

Material	Key Technical Properties	Typical System Applications
Alumina (Al_2O_3) 95% - 99.8% Purity	High wear resistance, excellent electrical insulation, high temperature stability, corrosion resistant.	Insulating washers, pump seals, wear plates, textile guides, high-temp furnace tubes.
Zirconia (ZrO_2) Yttria/Magnesia Stabilized	Extreme fracture toughness, high mechanical strength, excellent wear & corrosion resistance, low thermal conductivity.	Cutting blades, ceramic industrial valves, grinding media, heavy-duty pump plungers, dental blanks.
Silicon Nitride (Si_3N_4) Gas-Pressure Sintered/Hot Pressed	Excellent thermal shock resistance, high mechanical strength at extreme temperatures, low density, non-magnetic.	High-speed bearing balls, welding nozzles, gas turbine components, heavy industrial cutting tools.
Aluminum Nitride (AlN) High Density Sintered	Outstanding thermal conductivity (>170 W/m·K), high electrical insulation, thermal expansion matches Silicon.	Semiconductor heat sinks, LED submounts, laser diode coolers, power electronics substrates.
Boron Nitride (BN) Hot-Pressed / Pyrolytic	Excellent manual machinability, exceptional thermal shock resistance, high electrical resistivity, non-wetting by molten metals.	Crucibles for metallurgy, insulator components for vacuum furnaces, advanced semiconductor parts.



ADVANCED MACHINING CAPABILITIES

Precision machining is essential to transforming advanced ceramic materials into reliable, high-performance components. Through our network of qualified ceramic manufacturing partners, we support the production of custom components with complex geometries and tight dimensional tolerances.

From material selection and machining coordination to quality inspection, we work closely with our manufacturing partners to help ensure that each component meets the specified technical requirements and is ready for integration into your application.

Machining Capabilities Available Through Our Manufacturing Network

CNC Turning & Milling
Custom machining for complex ceramic geometries and application-specific designs.

ID / OD Grinding
Precision grinding of ceramic bores, shafts, sleeves, and cylindrical components.

Lapping & Polishing
Surface finishing for components requiring controlled flatness, parallelism, or surface roughness.

Laser Processing
Specialized drilling, cutting, and micro-machining, subject to material and component requirements.

PRECISION MACHINING CAPABILITIES:

Dimensional Tolerance:	**As tight as ±0.001 mm for suitable geometries and machining conditions.**
Surface Roughness (Ra):	**As low as 0.05 µm for suitable materials and finishing processes.**
Flatness / Parallelism:	**As tight as 0.002 mm for suitable component designs and dimensions.**

INDUSTRIES WE SERVE

Our high-performance advanced ceramics act as critical system components enabling technological breakthroughs across several key industries:

Semiconductors & Electronics
Electrostatic wafer chucks, ion implanter parts, plasma etch chamber components, gas distribution plates, and high-conductivity AlN submounts.

Chemical & Process Industries
Corrosion-resistant valve balls & seats, reliable mechanical shaft seals, high-stability pump impellers, and wear parts for lithium battery lines.

Medical & Life Sciences
Inert, biocompatible ceramic implants, high-precision ceramic dosing pumps, and wear-free microfluidic valves.

Industrial Machinery
Ultra-hard wire guide bushings, high-speed hybrid ceramic bearings, and abrasive-resistant waterjet / sandblasting nozzles.

Aerospace & Defense
High-temperature radomes, rocket engine nozzles, advanced thermal protection shields, and structural aerospace components.

WHY PARTNER WITH HEPHYS SOLUTIONS?

Industrial clients choose Hephys Solutions because we understand that components in harsh environments cannot afford to fail. We combine material science with strict production management.

1. Engineering Collaboration & Customization

We don’t just supply the product, we also co-design when a change is needed. Our experienced team works closely with your engineering departments from the drawing board to prototype testing, ensuring optimal material selection and manufacturing cost reductions.

2. Stringent Quality Assurance

Quality is our ultimate commitment. We implement a highly rigorous quality control system across every phase of production, utilizing advanced metrology equipment.

- ISO 9001:2015 Certified manufacturing facilities.
- In-house coordinate measuring machines (CMM), surface profilometers, and ultrasonic flaw detectors.
- 100% critical-dimension inspection before overseas shipping.

3. Flexible Volume & Rapid Prototyping

Whether you need a single prototype for initial R&D verification or high-volume contract runs, our production facilities are designed to scale and adapt seamlessly to your project’s strict schedule.

4. Robust Packaging & Safe Global Transit

Given the brittle nature of high-performance ceramics, we design custom high-density foam packaging structures to ensure absolute safety and zero-damage transit from our facility to your production floor worldwide.



HOW WE WORK WITH YOU

We believe in simple, transparent, and technically sound communication channels. Here is how we ensure your design requirements translate perfectly into product:

1 Inquiry & Drawing Submission

Send us your 2D/3D technical drawings (STEP, CAD or PDF format) along with your specific thermal, mechanical, and environmental operating conditions.

2 Technical Evaluation

Our engineering team analyzes material suitability, design tolerances, and high-efficiency manufacturing processes to optimize your costs.

3 Technical Quote & Proposal

Receive a highly detailed commercial quote outlining the selected materials, processing steps, tolerances, and accurate lead times within 24 to 48 hours.

4 Sampling & Prototyping

We produce and deliver low-volume sample batches for your internal R&D verification, dimensional approval, and functional testing.

5 Mass Production & Global Delivery

Upon approval, we execute scale production under rigorous ISO quality controls, pack securely, and deliver reliably to your facility.

Contact Our Engineering Sales Team

Ready to elevate your equipment performance with advanced ceramic components? Get in touch with our engineers today for a free consultation or quotation.

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