



# Hydrosys Hot Isostatic Pressing (HIP) Equipment

Hydrosys Isostatic Pressing Enabling High-End Materials



Hydrosys (Beijing) High Pressure Equipment Co., Ltd.

Official Hotline: 400-001-3375

Mobile Phone: +86 188 1319 8490 (WhatsApp)

Official E-mail: [mkt-global@hydrosyscorp.com](mailto:mkt-global@hydrosyscorp.com)

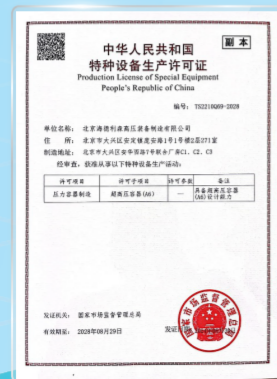
Official Website: [www.hydrosys-global.com](http://www.hydrosys-global.com)

# Honors & Certifications



## Certification of A6

Certificate for Design and Manufacture of Ultra-High Pressure Vessels (A6)



## ISO 9001:2015

ISO 9001:2015 Quality Management System Certification



# 01 About HYDROSYS

## Target & Commitment

Leading position of high-pressure technology in global market.  
 Supplier of competitive safe and reliable high pressure compression and refueling system.

**Chris Gong**  
 Chairman of Hydrosys

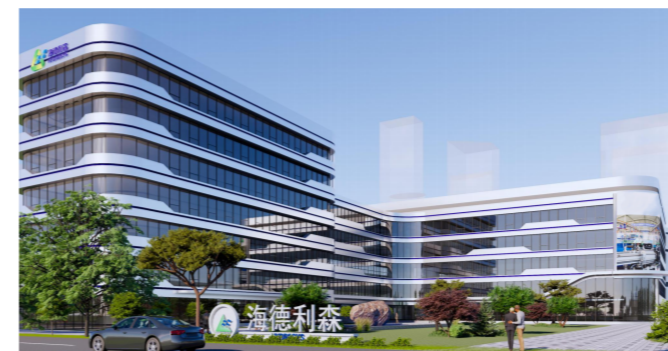


## Hydrosys (Beijing) Technology Co.,Ltd.

Hydrosys (Beijing) Technology Co., Ltd. was founded in 2001. It is a high-end equipment enterprise integrating the R&D, production, sales and service of high pressure solution. Headquartered in Beijing, the company now has 300 employees and covers total area of 72,000 m<sup>2</sup>. Hydrosys specializes in providing high-pressure system solutions for global customers. Its core self-developed product, the liquid-driven booster compressor, stands at the forefront of the industry, with a maximum output pressure up to 400 MPa for air and 1600 MPa for hydraulic. The company holds over 130 intellectual property rights and has participated in more than ten national key research projects. It has been awarded numerous honors including the Second Prize of the National Science and Technology Progress Award . Committed to technological innovation and heritage, Hydrosys integrates cutting-edge international technologies with independently developed processes. It has formed mature solution portfolios covering petrochemicals, semiconductor manufacturing, aerospace, new energy, research institutions, isostatic pressing, and high-end equipment manufacturing, earning high recognition and trust from customers worldwide.

## Hydrosys (Beijing) High Pressure Equipment Co., Ltd.

It is a wholly-owned subsidiary of Hydrosys(Beijing) Technology Co., Ltd., founded in June 2023. Backed by the world-leading booster technology independently owned by the Group, the company has built a strong R&D and production team. It has been awarded the Special Equipment Manufacturing License (Category A6 Ultra-high Pressure Vessels) issued by the State Administration for Market Regulation, qualifying it for the independent design and manufacture of ultra-high pressure vessels (≥100MPa). The company focuses on hot isostatic pressing, warm isostatic pressing, cold isostatic pressing and ultra-high pressure vessel technologies. As China's first private enterprise accredited for the design and manufacturing of ultra-high pressure vessels, it has emerged as a rising powerhouse in the isostatic pressing equipment industry. With high cost-performance advantages, As new area of commercialization for high-end materials.



# 02 Hot Isostatic Pressing (HIP) Technology and System Composition

High Quality & Efficiency-Oriented HIP Technology

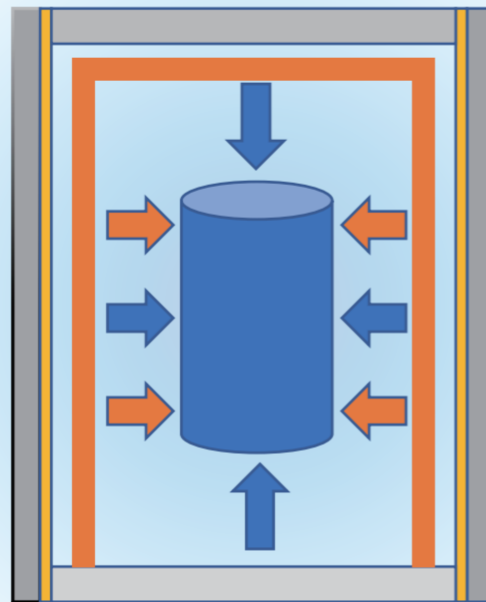
Hot Isostatic Pressing (HIP) is a material processing technology. High temperature ( $\leq 2000^{\circ}\text{C}$ ) and uniform isostatic gas ( $\leq 200\text{ MPa}$ ) are applied in powder components or compacts of vessel, so as to realize inter-particle bonding and eliminate internal defects of parts. This process is commonly used to produce fully-dense components (100% theoretical density).



2000°C, 200MPa



Uniform Pressure in All Directions



Schematic Diagram of Pressure Vessel



Wide Range of Materials



Material Solid-State Forming

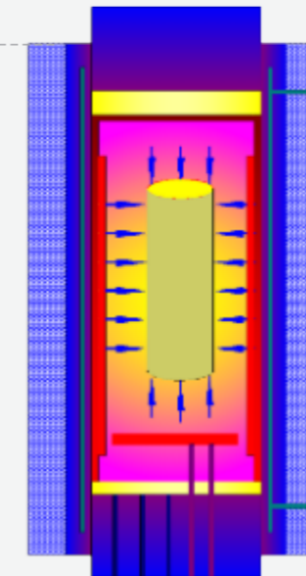
## HIP Technology Advantages



## Schematic Diagram of HIP System

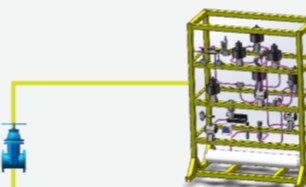
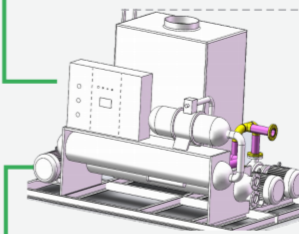
### Ultra-high Pressure Device

Wire-wound main structure. Capable of withstanding high-temperature and high-pressure conditions. Providing an environment for hot isostatic pressing treatment.



### Cooling System

Provide cooling for the furnace body, booster valves, etc., to ensure that the equipment operates within a safe temperature range.



### High-pressure Gas System

Composed of high-pressure gas tanks, ultra-high pressure compressors, and ultra-high pressure valve racks, providing the material forming pressure for hot isostatic pressing equipment.

### Control System

The control system operates automatically and features one-touch operation with safety interlock functions.

### Vacuum System

Extract furnace internal air to create a clean environment.

### Heating System

It provides a uniform high-temperature environment for the system, and consists of heating elements (metal, graphite, C/C, etc.) and matching high-temperature heat insulation shields.

Hot isostatic pressing equipment consists of ultra-high pressure device, high-pressure gas system, cooling system, heating system, vacuum system, control system, etc. The hot isostatic pressing equipment independently developed by Hydrosys leading the industry.

# 03 Technical Advantages of Hydrosys Hot Isostatic Pressing Equipment

Through continuous technological innovations in cooling efficiency (microchannel heat exchange and optimized airflow), energy recovery (residual gas recovery system), temperature uniformity and safety design (prestressed steel wire winding structure and multi-layer protection), Hydrosys hot isostatic pressing equipment is committed to providing customers with high-efficiency, energy-saving, stable and safe HIP solutions. These proprietary technologies are of great significance for improving product quality, reducing production costs, increasing equipment utilization and promoting green manufacturing.

## Modular Design

Independent design of six major modules facilitates customer layout and maintenance.



## Self-developed Pressurizing Equipment

The company's in-house pressurization system delivers greater operational flexibility for the equipment.



## Stable Safety

The A6 system ensures the safety of the ultra-high pressure vessel, while the electric control system achieves multiple safety interlocks.



## Prefabricated Process Package

Customized one can be developed. The prefabricated process package is convenient for customer operation.



Hot  
Warm  
Cold

Isostatic Pressing Service

Isostatic Pressing Materials and Products

# 04 Hot Isostatic Pressing Technology Applications

Hot Isostatic Pressing (HIP) technology fundamentally improves the properties of components at the material microscopic level, delivering higher reliability, longer service life and superior comprehensive mechanical properties. As a decisive manufacturing process, it determines whether numerous critical components can meet design specifications and satisfy the operation requirements under extreme working conditions.

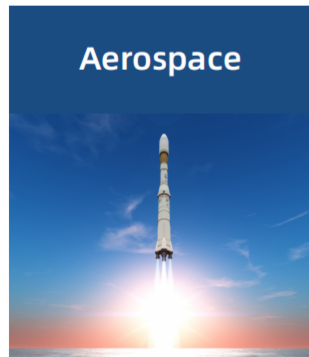


## Aerospace

engine&structural components

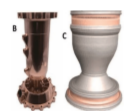


The main applications in the aviation industry include: manufacturing and repair of aero-engine key components, aircraft structural parts and landing gears, post-processing of additive manufacturing (3D printing), as well as advanced materials and diffusion bonding.



## Aerospace

engine&structural components



Hot Isostatic Pressing (HIP) technology is widely used in the aerospace field: powder superalloy components, titanium alloy components, superalloy blades, complex structural components, rocket engine components, space telescope mirrors, etc.



## Medical Field

metal implants

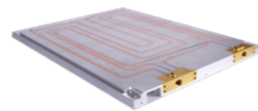


The major applications in the medical sector cover: manufacturing of implantable medical devices, post-processing for additive manufacturing (3D printed) implants, high-grade surgical tools, and other core medical equipment.



## Semiconductor

consumer electronics & high-end sputtering targets



The main applications in the electronic semiconductor field include: preparation of high-end targets and key materials, high-reliability electronic packaging (ceramic/metal), heat dissipation of third-generation semiconductor power devices, microwave and radio frequency (RF) components, and other applications (bonding, sintering of graphene/nanomaterials), etc.



## Mechanical Field

high-performance gears, bearings, tools and dies, complex-shaped parts, cemented carbide cutting tools, etc



The main applications in the mechanical field include: defect repair and performance improvement of high-end castings, tool and die manufacturing, powder metallurgy near-net-shape components, component repair and remanufacturing, etc.



## Oil and Gas Field

valve seat valve core flange rotating components

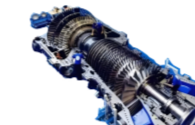


The main applications in the oil and gas industry include: downhole tools and completion equipment, oil & gas transportation and processing facilities, drilling and logging equipment, offshore platforms and subsea production systems.



## Energy Field

nuclear power components, thermal power gas turbines, hydropower rotors, solar panels, wind power bearings, etc.



The main applications in the energy field include: nuclear energy industry, fossil energy (supercritical power generation), renewable energy (hydrogen energy, wind power), energy storage and battery technology, etc.

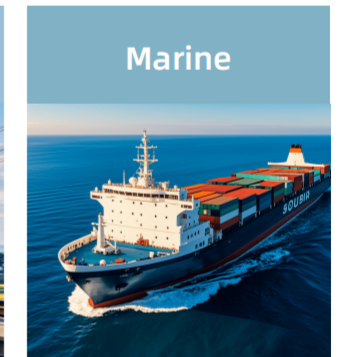


## Rail Transit Field

automotive structural components&high-speed railway aluminum alloys



The main applications in rail transit include: key bogie components, power transmission systems, braking systems, lightweight design and advanced new materials.



## Marine

gas turbine blades, seawater pipeline systems, seawater pumps, valves, etc.



The main applications in marine and shipbuilding industry include: densification treatment of key castings, powder metallurgy near-net-shape components, diffusion bonding (dissimilar materials joining), component repair and remanufacturing, etc.

# 05 Typical Products by HIP

## Additive Manufacturing

For all metal additive manufacturing technologies, internal defects inevitably occur in the as-printed state, which are generally caused by the layer-by-layer processing characteristics. The hot isostatic pressing (HIP) process can eliminate internal defects and improve the fatigue performance of materials.



## Consumer Electronic Products

Many consumer electronic components achieve required aesthetic and performance standards through densification. Typical examples include watch cases, mobile phone housings, semiconductor components, and thin coating targets for PVC functional surface coating tools. The elimination of pores and voids can enhance reliability and electrical conductivity, enabling the surface to be polished to a mirror finish.

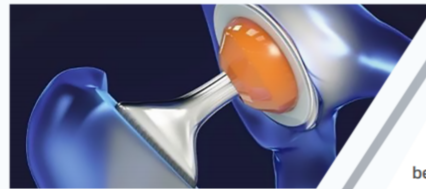


## Si<sub>3</sub>N<sub>4</sub> (Silicon Nitride) Ceramic Bearing Ball Sintering

Even micron-scale defects will deteriorate the final performance of ceramic components. Therefore, hot isostatic pressing treatment has become a standard process for manufacturing high-performance ceramic materials. Typical application scenarios include helicopter rotor bearings, wind power bearings, and electric vehicle bearings.

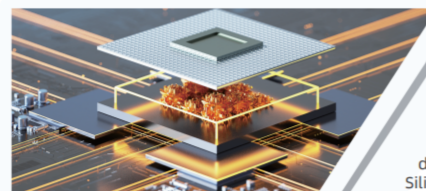
## ZTA Zirconia Toughened Alumina

Featured with low friction, favorable wettability, high wear resistance and biocompatibility, it is widely applied in artificial hip joints. To fully tap the potential of this material system, hot isostatic pressing densification treatment on pores and voids serves as the optimal solution, which ensures excellent toughness and mechanical strength of ZTA materials.



## Silicon Carbide (SiC)

Widely adopted in the electronics and semiconductor fields, silicon carbide has extensive applications in power semiconductors, electric vehicles, photovoltaics and other sectors. Silicon carbide treated by hot isostatic pressing (HIP) exhibits excellent heat resistance, wear resistance and corrosion resistance.



## Material Diffusion Bonding

The hot isostatic pressing process is suitable for joining materials that are not applicable to fusion welding, such as ceramics and certain metals. It enables the microstructure and properties of the joint to be close to those of the base material, and realizes the connection of complex structures and dissimilar materials.

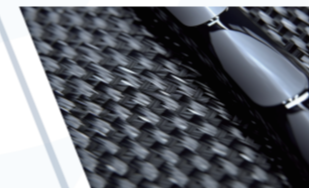


## Densification Treatment of Casing and Cascade

## Repair of Castings



## Aerospace Carbon Fiber Material Impregnation



## MIM (Metal Injection Molding)



## Energy and Energy Storage



## Powder Metallurgy and 3D Printing



# 06 HIP Equipment

## Model and Basic Technical Parameters



### Laboratory/Small

Diameter: 80mm-200mm  
 Height: 100mm-300mm  
 Temperature: 1400-2000°C  
 Pressure: 100-200MPa

### Medium

Diameter: 350mm-750mm  
 Height: 500mm-2000mm  
 Temperature: 1400-2000°C  
 Pressure: 100-200MPa

### Large

Diameter: 800mm-1250mm  
 Height: 2000mm-3500mm  
 Temperature: 1400-2000°C  
 Pressure: 100-200MPa

\*Super large can be customized according to customer needs.

### Models and Technical Parameters of HIP Equipment

No.	Product Model	Max. Diameter		Max. Height		Pressure	Temperature
		mm	in	mm	in	MPa	°C
1	RDJ80/150-200-2000	80	3	150	6	200	2000
2	RDJ200/300-200-2000	200	8	300	12	200	2000
3	RDJ350/500-200-2000	350	15	500	20	200	2000
4	RDJ500/1000-200-2000	500	20	1000	40	200	2000
5	RDJ500/1500-200-2000	500	20	1500	60	200	2000
6	RDJ750/1500-200-2000	750	30	1500	60	200	2000
7	RDJ750/2000-200-2000	750	30	2000	80	200	2000
8	RDJ800/2000-200-2000	800	32	2000	80	200	2000
9	RDJ800/2500-200-2000	800	32	2500	100	200	2000
10	RDJ850/2500-200-2000	850	35	2500	100	200	2000
11	RDJ1000/2500-200-1400	1000	40	2500	100	200	1400
12	RDJ1000/3500-200-1400	1000	40	3500	140	200	1400
13	RDJ1250/2000-200-1400	1250	50	2000	80	200	1400
14	RDJ1250/2500-200-1400	1250	50	2500	100	200	1400
15	RDJ1650/2500-160-1400	1650	65	2500	100	160	1400
16	RDJ1850/3500-120-1400	1850	75	3500	140	120	1400
17	RDJ2100/3500-120-1250	2100	85	3500	140	120	1250
18	RDJ2100/4250-120-1250	2100	85	4250	170	120	1250

\*The above products can be customized.



### Quick Delivery

Medium-sized equipment will be shipped 10 months after the contract is finalized. Shipment 13 months after the contract for large equipment is confirmed.



### Turnkey Solution

Conduct comprehensive pressure measurement and test of each system before equipment installation. Thermal isostatic pressing equipment provides a complete set of equipment. Assist customers in completing the process development of products

## HYDROSYS'S OFFERS



### Long Warranty Period

Provide ≥2 years warranty for customer products. Provide timely and enthusiastic after-sales service during the warranty period



### Comprehensive Training

Provide training on equipment structure and subsystems; equipment use training. Equipment maintenance training



INTEGRITY · PROFESSION · SAFETY · INNOVATION

**HYDROSYS**