



FS FLUIDS

Investment Casting for Precision Pump and Valve Components



- ▶ Titanium and Zirconium
- ▶ Nickel Alloys
- ▶ Specialty Stainless Steels



The FS Fluids Group Difference

As part of Fusheng Precision Company, FS Fluids Group manufactures the highest precision Titanium, Zirconium, and corrosion resistant specialty stainless steel alloy castings for the global fluids handling industry.

Our long history and deep engineering expertise — combined with the most technically sophisticated production processes — enables FS Fluids Group to deliver quantifiable value to our demanding industrial customers.

How FS Fluids Group Customers Benefit:

- ▶ Improved speed-to-market for new products
- ▶ Reduction of production cycle times
- ▶ Reduction or total elimination of finish machining process
- ▶ Net cost reduction for component sourcing
- ▶ Improved competitiveness, increased market share, and increased overall profitability



How We Are Different

- ▶ Our culture combines Eastern service loyalty with technology matching or exceeding that of Western suppliers.
- ▶ Our engineering teams collaborate with yours to create synergies and innovative solutions.
- ▶ We produce all tooling in-house.
- ▶ We excel at limited volume runs.
- ▶ We keep our commitments. Always.

Our Model: Designed to Fit Your Markets

Whether it's a dozen components or a thousand, our team is prepared to help you to meet the unpredictable demands of your markets:

- ▶ Rapid Prototyping using Stereolithography (SLA) and Selective Laser Sintering (SLS) for low volume runs and rapid product launch
- ▶ Machined patterns for medium volume runs
- ▶ Rapid in-house permanent tooling for higher volume runs

FS Fluids Group Employs the Most Advanced Technologies Available

- ▶ Wax Injection Molding
- ▶ In-house Tool Production
- ▶ Forging
- ▶ Robotic Shell Dipping
- ▶ Vacuum Arc Remelting (VAR)
- ▶ Vacuum Induction Melting (VIM)
- ▶ Gravity-Fed/Static Casting
- ▶ Centrifugal Casting
- ▶ Surface Protection Air Liquide (SPAL™)
- ▶ Hot Isostatic Pressing (HIP)
- ▶ Post Cast Heat Treatment
- ▶ 5-Axis Computer Numerical Control (CNC) Machining
- ▶ Chemical Milling
- ▶ Surface Passivation
- ▶ Component Finishing
- ▶ Radiographic Inspection
- ▶ CMM Inspection
- ▶ Point Cloud Modelling

A Long and Proven History of Industrial Excellence

From our modest beginnings as an air compressor overhaul and repair company in 1953, Fusheng has evolved into an ISO/TS 16949 certified company that provides innovative casting solutions and service to technically demanding industries including automotive, oil and gas, medical, electronics, and aerospace. During the last 20 years, we have established numerous technologies such as:

- ▶ Titanium vacuum heat treatment
- ▶ Rapid prototyping
- ▶ 5-Axis laser cutting technologies
- ▶ Advanced Topometric Sensor (ATOS)
- ▶ ImageWare reverse engineering
- ▶ Unigraphics CAD/CAM systems
- ▶ Procast for centrifugal casting simulation
- ▶ Moldex 3D system for wax pattern injection simulation

Investment Casting: When machining has lost its luster

High precision near-net investment casting can reduce or eliminate many of the high costs of machining.

- ▶ Reduce buy-to-fly ratios
- ▶ Eliminate capital cost of machining equipment
- ▶ Reduce machining labor
- ▶ Reduce tooling wear and costs
- ▶ Eliminate cost of equipment maintenance
- ▶ Reduce WIP and production cycle times

Let FS Fluids Group help you improve profitability by producing your components to final dimensional tolerances.



Reliable Pump Components... What's Inside Matters

Only the world's best pumps use the very best components. If you are going to maintain customer loyalty and grow your business, you can't afford to cut corners. FS Fluids Group delivers the highest precision, most reliable, and most efficient component castings available anywhere to ensure that your pumps outperform and outlast the competition.

We supply components that thrive in the most rigorous applications:

- ▶ Oxidizing acids
- ▶ Chlorine
- ▶ Pure Terephthalic Acid (PTA)
- ▶ Hydrochloric acids
- ▶ Hot chlorides
- ▶ Other corrosive industrial fluids
- ▶ Cavitation applications



Durable Pump Components from FS Fluids Group

- ▶ Housings
 - Pump casings
 - Bearing housings
- ▶ Impellers
 - Radial flow
 - Axial flow
 - Mixed flow
 - Single suction
 - Double suction
 - Multi-stage suction
 - Mechanical Construction:
 - Open type
 - Closed type
 - Semi-open (vortex) type
- ▶ Seals
- ▶ Sleeves
- ▶ Discharge flanges and volutes





▶ Heat Treatment



▶ Superior Components

Customer Success Story

- ▶ **Situation:** Reverse osmosis (RO) systems required corrosion-resistant pumps to convert seawater into drinking water aboard large marine vessels
- ▶ **Opportunity:** A leading Titanium pump manufacturer was tasked with producing high-pressure, multistage centrifugal pumps operating at relatively low suction head
- ▶ **Application:** The manufacturer turned to FS Fluids for Titanium components that could withstand the harsh environment
- ▶ **Results:**
 - 100% corrosion-free pumps
 - Elimination of impeller erosion from cavitation
 - Increased lifetime of the RO systems
 - Reduced service and maintenance costs



Dependable Valve Components

The FS Fluids Group delivers exceptional, reliable Titanium, Zirconium, and specialty stainless steel valve components, which provide overall strength and resistance to erosion, corrosion, and abrasion. Other benefits include:

- ▶ Wide temperature and pressure operating ranges
- ▶ Enhanced performance in harsh environments

Engineering and Manufacturing Capabilities

- ▶ Joint design and development capabilities
- ▶ Rapid prototyping
- ▶ In-house tooling
- ▶ Forging
 - Heat treatment
 - Hot Isostatic Pressing (HIP)
 - Chemical milling
 - Radiographic inspection





Certifications and Compliances

- ▶ ISO/TS 16949 certified
- ▶ ISO 9001:2007 certified
- ▶ NORSOK compliant
- ▶ PED compliant

A Diverse Portfolio of Valve Components from FS Fluids Group

Using its expertly-developed investment casting procedures, FS Fluids Group provides Titanium bodies, discs, stems, and seat rings for valves, such as:

- ▶ Gate valves
- ▶ Globe valves
- ▶ Ball valves

Our components provide:

- ▶ Easy maintenance
- ▶ Stability at extreme temperatures and pressures
- ▶ Exceptional performance in corrosive environments
- ▶ Extended maintenance and repair cycles

Markets Served

- ▶ Desalination
- ▶ Oil & Gas
- ▶ Petrochemical
- ▶ Pollution Control Systems
- ▶ Pulp & Paper
- ▶ Marine & Offshore
- ▶ Wastewater Treatment
- ▶ Electronics
- ▶ Metal Refining & Plating
- ▶ Pure Terephthalic Acid (PTA)
- ▶ Acetic Acid
- ▶ Power Generation
- ▶ Subsea
- ▶ Food
- ▶ Pharmaceutical
- ▶ Defense & Aerospace



Customer Service, Support, and Sales

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