



ENGINEERED PRODUCTS FOR SEVERE SERVICE APPLICATIONS™

ValvTechnologies' products and
capabilities overview

www.valv.com

VALV TECHNOLOGIES



A CULTURE OF INNOVATION

ValvTechnologies' mission is to provide **zero leakage** isolation valves and process solutions for severe service applications.



Corporate Capabilities

We work directly with customers to develop solutions that meet their unique process requirements and specialty applications.

Solutions

As a global leader in the design and manufacturing of severe service valves, ValvTechnologies has established a worldwide reputation for superior quality and dependability with customers in every industry.

All of ValvTechnologies' valves are designed with customers' requirements in mind and offer proven reliability, superior engineered performance and unique safety features. Our testing exceeds industry standards to ensure true zero leakage when performance is critical.

Company

Since 1987, ValvTechnologies has maintained a culture of innovation by continuously expanding its design, production, and technology capabilities.

We provide an unsurpassed level of reliability to customers in fossil power, nuclear generation, oil and gas, mining and minerals processing, refining and chemical processing, chemical recycling, hydrogen, and various specialty industries. Global facilities include research and development, production, machining, certified welding, and testing, to meet our customer's demanding application requirements.

The ValvTechnologies' Difference

People

From engineering and design to manufacturing, our employees make the difference.

At ValvTechnologies, our employees are our most valuable assets. Our employees are committed to continually developing innovative designs, production and technology capabilities. With a full staff of professional engineers, a technical sales team and certified service technicians, ValvTechnologies is more than a manufacturer - we are a partner for providing superior solutions to your process needs.

Process

At ValvTechnologies, our processes and procedures ensure that our valves exceed our customers' needs.

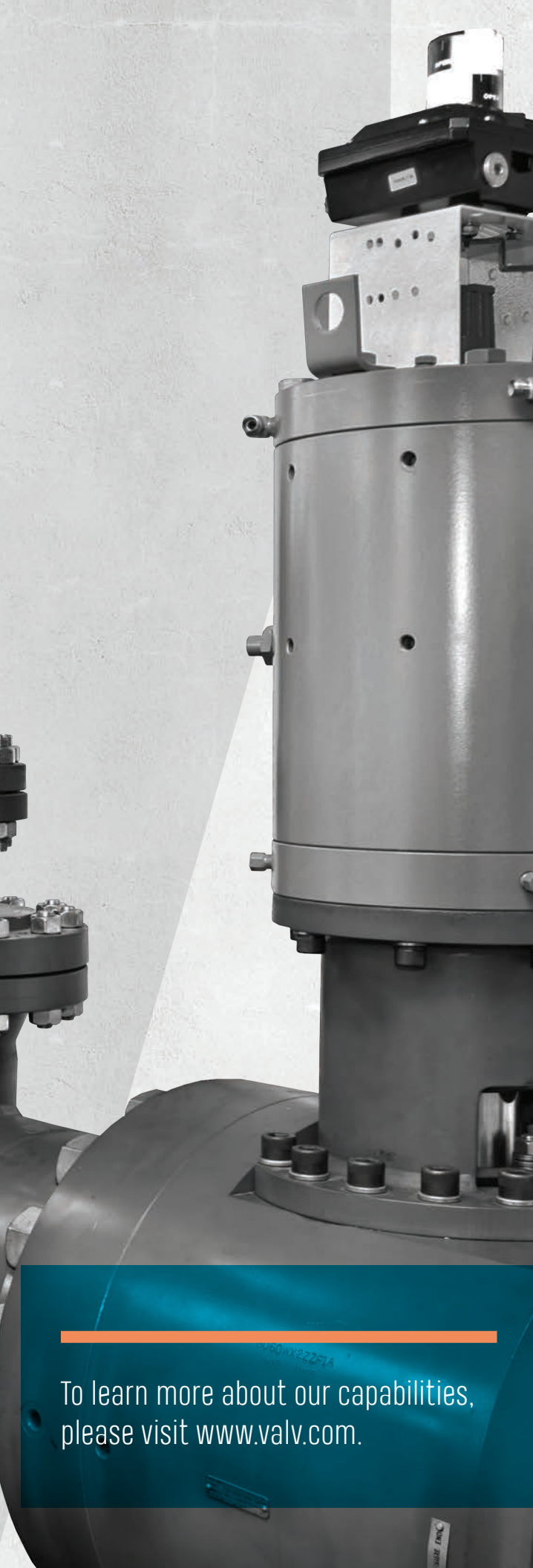
From raw material to the finished product, we are constantly looking for methods to apply innovative technologies to our process. We remain true to our core design principles, relentlessly pursuing product and process improvements that in the long term provide measurable benefits for our customers.

Performance

ValvTechnologies sets the standard for zero leakage valve solutions.

We continue to lead the market in metal-seated valve technology and innovation. We raised the bar with our industry leading Four Year Power Product Warranty, and our standard warranty for all products has always included our performance commitment to you, our customer.





Customer Focus

We partner with the leading operators in the world to provide products specific to their applications. We prioritize safety, reliability, and superior engineered performance.

Safety

ValvTechnologies is committed to providing our customers with solutions so they can improve safety for their most valuable assets: their people.

Research and Development

ValvTechnologies' Research and Development facility is located in Houston, Texas and is equipped with the latest equipment resources available.

ValvTechnologies' in-house research and design capabilities include:

- High-temperature testing
- High-pressure testing
- Load/force testing
- Torque testing
- Cycle testing
- Fugitive emissions testing
- Data acquisition
- Cryogenic Testing
- Type Testing
- Qualification testing to API and ISO standards

To learn more about our capabilities,
please visit www.valv.com.

Applications

ValvTechnologies' valves are built to withstand the most severe applications. High-pressure, high-temperature, high-cycle, abrasive, corrosive and caustic media have all been considered in the design of our product line.

Conventional Power

- Above and below seat drains
- Ash handling
- Attenuator spray control
- Boiler drains
- Boiler feed pump isolation
- Continuous boiler blowdown
- Electronic relief
- Feedwater heater drains
- Feedwater isolation
- Instrument isolation
- Main steam stop
- Recirculation
- Seal steam regulators
- Sight/gauge glass drains
- Soot blower regulators
- Startup vents
- Steam dump
- Turbine bypass systems
- Turbine drain

Nuclear Power

- Boiler feedwater
- Circulating water system
- Component cooling
- Condensate extraction
- Condensate cooling water
- Emergency feedwater
- Fire protection system
- HP safety injection
- HP and LP heater drains
- Heat exchanger vent and drains
- Main steam system isolation, drain and vent
- Power operated relief valve
- Pressurizer drain and vent
- Rad waste system
- Reactor coolant pump drain and vent
- Reactor head vents
- Reactor water cooling vents and drains
- Safety injection system
- Secondary system isolation, drain and vent
- Service water system isolation
- Steam generator system
- Turbine bypass
- Turbine drain and vent
- Fukushima tie ins
- Reliable hardened vents

Mining and Minerals

High-pressure slurry

- Transportation systems
- Pump discharge isolation
- Pipeline isolation stations
- Pipeline choke stations
- Rupture disc isolation
- Instrument isolation

Autoclave, HPAL & POx

- Autoclave feed and discharge
- Acid injection
- Gas injection
- Steam injection

Mineral concentrators

- Thickener underflow
- Discharge isolation
- Filter press manifold isolation
- Slurry transfer systems
- PRV isolation

Waste disposal

- Tailings pipelines
- Paste backfill



Conventional Power



Nuclear Power



Mining & Minerals



Upstream Oil & Gas



Refining & Chemicals



Pulp & Paper

Upstream Oil and Gas

- Wellhead choke isolation
- HIPPS
- Emergency shutdown
- Compressor recycle and isolation
- Sour gas isolation and control
- Steam, water and gas injection
- Steam chokes
- SAG-D isolation
- Scraper Trap Isolation
- Mud drilling isolation
- Lean and rich amine isolation
- Molecular sieve switching valves
- First and second stage separator isolation

Refining and Chemicals

Coking (delayed and flexi)

- Switching
- Feed isolation
- Blowdown isolation
- Overhead vapor line
- Cutting water isolation

Fluidized catalytic cracking

- Catalyst handling
- Slurry isolation and control steam

Ethylene

- Steam decoke isolation
- Furnace isolation
- Steam vent
- Quench oil isolation and control

Polyethylene

- Isolation
- High-cycle (PTO)
- Reactor block

Heavy oil upgrading and hydrocracking (H-oil and LC fining)

- Catalyst addition and withdrawal
- Filter and pump isolation
- Reactor isolation
- Overhead vapor isolation and control
- High ΔP isolation and control

Reforming (CCR)

- Lock hopper
- Isolation

Pulp and Paper

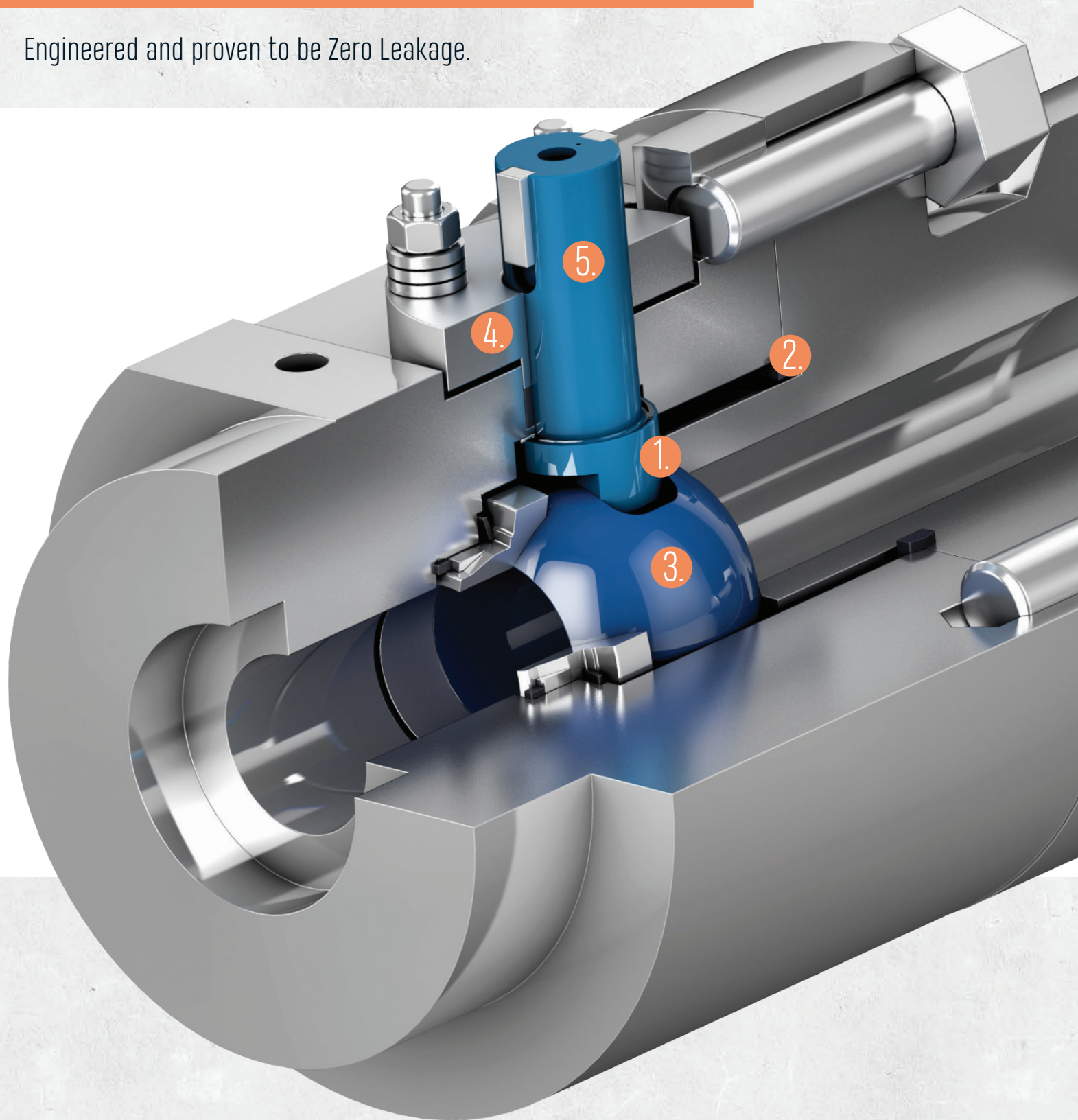
- Boiler vent and drain
- Liquor isolation and control
- Rapid drain
- Steam isolation
- Sky vents
- Dryer pressure control
- Digester steam control
- Lime mud isolation and control

ValvTechnologies provides field-proven solutions for severe service applications.

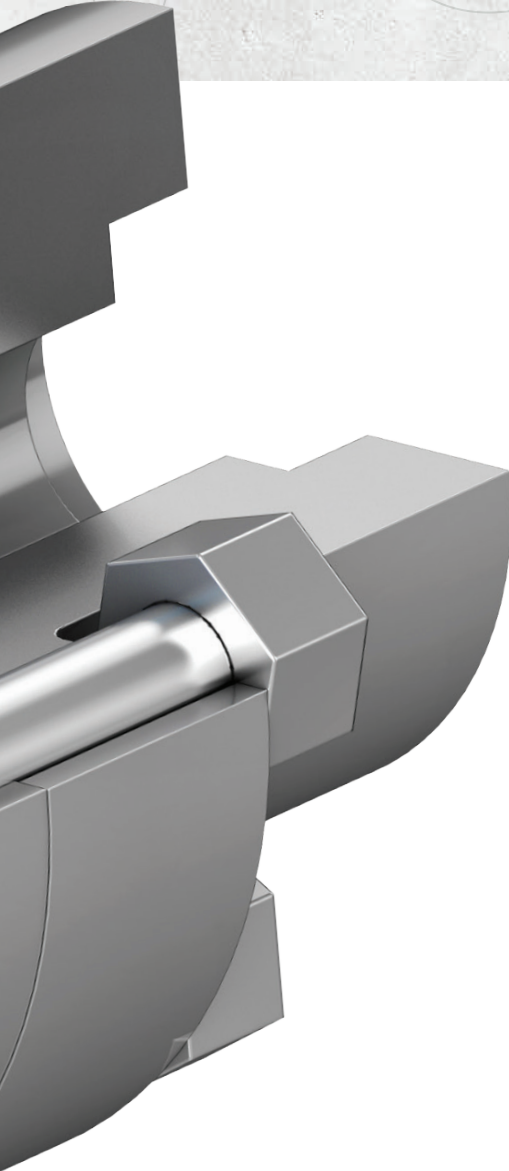
V Series Metal Seated Ball Valves

The flagship of the ValvTechnologies' product line

Engineered and proven to be Zero Leakage.



V SERIES



1. Integral Metal Seat

With our patented HVOF RiTech® coating technology, the integral seat in ValvTechnologies' valves is resistant to the attack of abrasive and corrosive production applications.

2. Body Seal Ring

ValvTechnologies employs a field-proven seal ring technology to ensure sealing under all operating conditions, up to 1400°F. The body seal ring is loaded at a pressure higher than 20,000 psi. In addition, valves sized 3" and above contain a secondary Grafoil® seal to further guarantee reliability.

3. Patented Coating Process

The sealing surfaces are overlaid with tungsten or chromium carbide using our in-house HVOF RiTech® coating process. These surfaces have a hardness of 68 - 72 Rc to provide uninterrupted operation in the most severe conditions with zero leakage.

4. Live-loaded Gland Area

The V Series' stem sealing design features a four stud, live-loaded assembly designed for heavy industrial applications. The sealing material is high purity Grafoil® surrounded by stainless steel wire mesh anti-extrusion rings. The six Belleville® springs (per stud) provide constant load pressure through extreme thermal shocks and prevent wear leaks in high-cycle service.

5. Blow-out Proof Stem

ValvTechnologies' design utilizes a single-piece, hard-coated, blow-out proof stem that is inserted through the inside of the body cavity eliminating the possibility of blow-out through the gland area. There are no pins, collars or other devices used to retain the stem in the valve body.

The V Series metal seated ball valves ensure longer service life for reliable operation, and reduced maintenance.

The V Series can be engineered for your specific application or process need, it is proven to be true zero leakage, reduce the total cost of ownership, and eliminate emissions in the toughest applications.

Size

- 3/8 - 36"

Pressure Class

- ASME/ANSI 150 to 4500

End Connection

- Flanged, weld ends, hubs, threaded or custom end connections

Material

- Any ASME B16.34 Material

Zero Leakage Power Solutions

IsoTech®

Parallel slide gate valve

Isolation metal-seated gate valve, with position-seated discs and through conduit design. Offers bi-directional zero-leakage capabilities.

- 4 - 36"
- ANSI/ASME Class 600 - 4500

ERV

Electronic relief valve

Metal-seated quarter-turn ball valve, with zero-leakage isolation capabilities. Designed for fast acting pilot-operated relieving capacities with diffuser to minimize outlet velocities. Can also be optioned with integral isolation valve for a compact package and electronic control box to monitor and regulate system pressure.

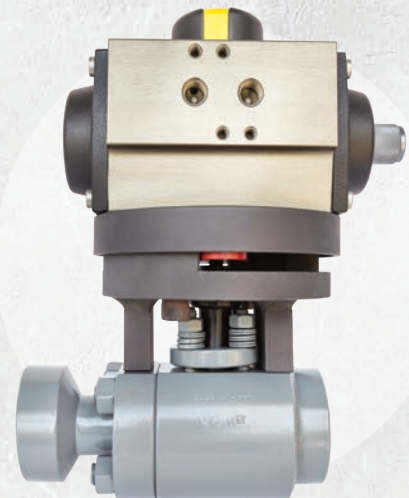
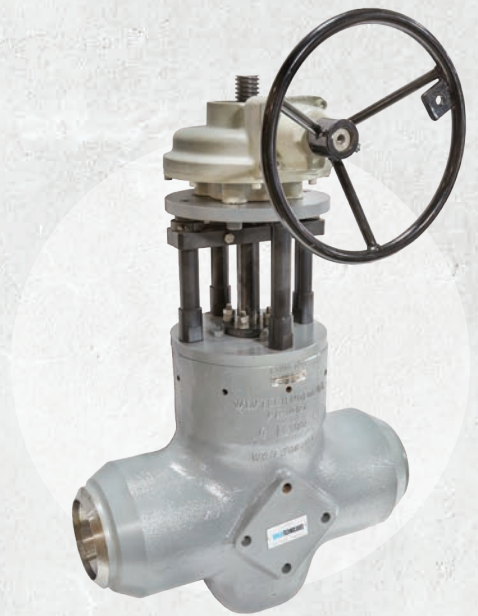
- 1/2 - 12"
- ANSI/ASME Class 150 - 4500

Xactrol®

Control valve

Metal-seated quarter-turn ball valve that allows modulating/throttling with application specific internal features for pressure and flow control capabilities while maintaining zero-leakage isolation.

- 1/2 - 36"
- ANSI/ASME Class 150 - 4500



Specialty Valve and Actuator Solutions

ValvXpress®

V Series valve with pneumatic actuator

The ValvXpress® package includes the superior quality of the V1-1 valve and ValvTechnologies' actuator, backed with the best four-year warranty in the industry. ValvXpress® pre-engineered, automated packages are compact, robust, and ready to ship.

- 1/2-4"
- ANSI/ASME Class 900-4500

ValvXpress® Actuator

Pneumatic Actuator

The actuators utilize a rack and pinion design which provides constant torque output in a compact package.

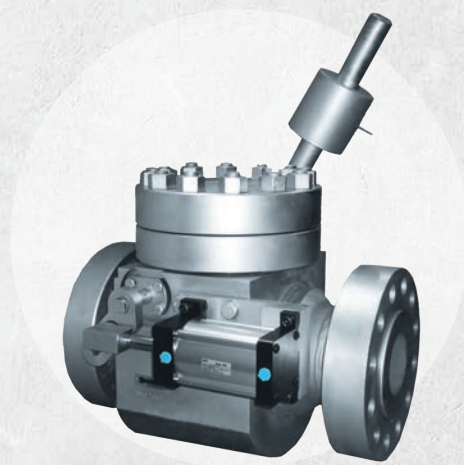
- Hard anodized body with high-temperature Viton® seals
- Maximum working pressure 145 psi/10 bar
- Maximum working temperature 320 ° F/160°C



FOUR YEAR

Power Products Warranty.

Zero Leakage Mining Solutions



AbrasoTech®

Slurry ball valve

For the utmost dependability in moving slurries of all kinds in cross-country pipelines, specify our severe service AbrasoTech® valves, with the design and engineering that have been proven tough in more than two decades of use globally. Characterized by exceptional flexibility, these valves are available in a wide variety of sizes and pressure classes, and in carbon and stainless steel materials to assure exact fit-for-purpose. Internal components can be protected against erosion and corrosion with the use of our high-performance HVOF RiTech® coating process and metallic or urethane liners. It is used in tandem with AbrasoTech valves.

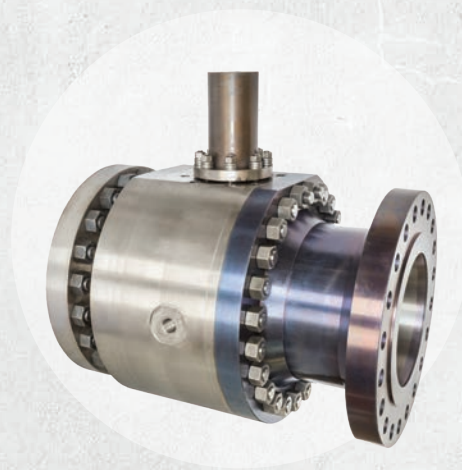
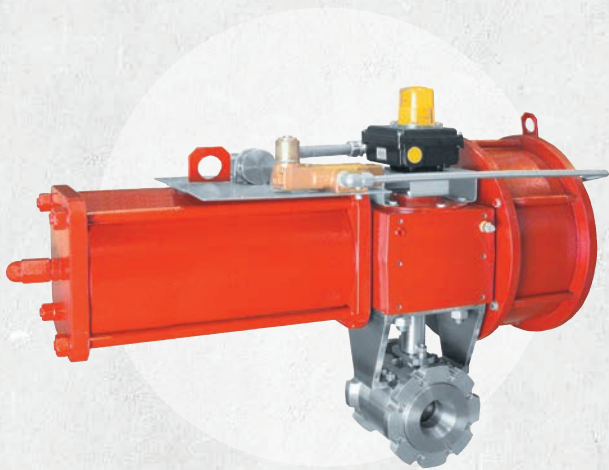
- ½ - 40"
- ANSI/ASME Class 150-2500

AbrasoCheck®

Slurry swing check valve

The AbrasoCheck® slurry swing type check valve is designed specifically for Positive Displacement pump discharge isolation and allows in-line maintenance. It is used to positively isolate the discharge side of positive displacement pumps, when operating in manifold configurations.

- 4-24"
- ANSI/ASME Class 600-1500



AbrasoGuard™

Autoclave acid valve

The ValvTechnologies' acid injection isolation valve is a unique product created and designed for the isolation and emergency shutdown of HPAL autoclave acid injection systems. This valve uses ceramic seats, plasma coatings and exotic metals to provide plant security in the harshest of process conditions.

- ½ - 4"
- ANSI/ASME Class 600-900

AbrasoBlock®

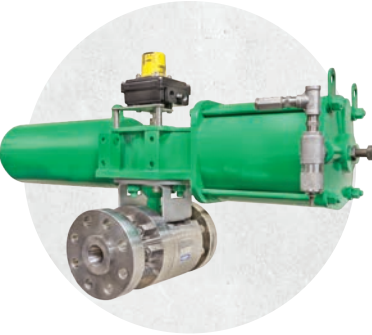
Autoclave ball valve

AbrasoBlock® has been developed specifically to improve the performance and reliability of Autoclave Discharge Block valves, thereby increasing operational uptime and capacity.

This is one of the most severe service applications and is critical to the economic performance of any HPAL (High Pressure Acid Leach) or POx (Pressure Oxidization) facility. Our goal is to extend the installed lifetime of these valves.

- ½ - 20"
- ANSI/ASME Class 150-900s

Zero Leakage Oil & Gas Solutions

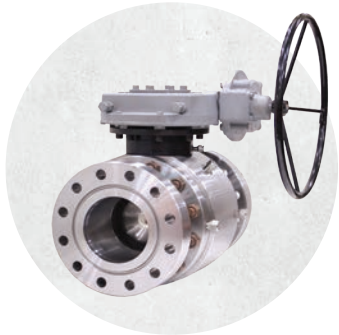


NexTech®

Severe service trunnion, low torque, bi-directional shut-off

Utilizing the same coating and live-loading technology that built the V Series product line, but in a lower-torque, inherently bi-directional package. NexTech® valves are designed and configured to handle corrosive, high-temperature, high-cycle, high-solid applications requiring tight shut-off.

- 4 - 36"
- ANSI/ASME Class 600 - 4500

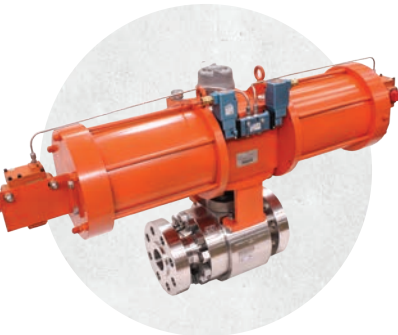


TrunTech®

Designed to API-6D and API-6A

Designed to address the severe service demands of the upstream and midstream oil and gas industries. Its protected seat seal design provides long life and tight shut-off in abrasive/erosive conditions and meets stringent fugitive emission requirements.

- 2 - 36"
- ANSI/ASME Class 150 - 2500
- API 5000 - 15000
- Sized per API 6A and 6D

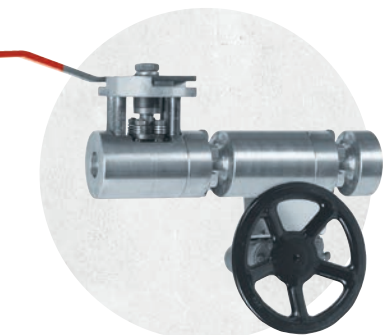


PulseJet

Fast-acting, high-cycle isolation and control-in-one

Characterized and stacked disc trim with leak-free isolation and control in one, the Xactrol® has three design options. From the Mark I's design that features a characterized upstream seat to the Mark III's precision engineered stacked discs, the Xactrol® allows the customer to combine precise flow control with tight shut-off.

- 2 - 6"
- ANSI/ASME Class 150 - 1500
- Includes EcoPack®, a superior stem packing solution for high-cycle, fast-acting valves that meets stringent fugitive emissions requirements.
 - Meets ISO-15848-1 testing requirements
 - Capable of 500,000+ cycles
 - Extremely fast-cycle speeds, less than 0.5 seconds

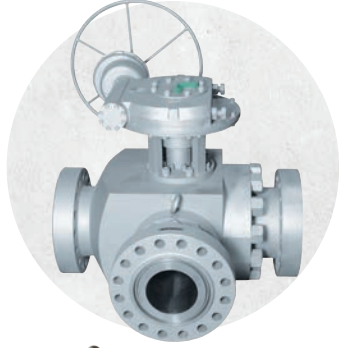


Double Ball Valves

Bi-directional isolation, back pressure protection

Double ball valves fulfill the demanding needs for industrial applications where zero leakage isolation is required in bi-directional or double block-and-bleed valves. This valve is particularly useful when solids and high temperatures, and space is limited. The bi-directional version has the added advantage of back pressure protection. Even in very high-pressure applications, this design prevents the sealing surfaces from separating.

- ANSI/ASME Class 150 - 4500
- One actuation device
- Temperatures up to 1600oF / 870oC



Three and Four-way Valves

Flow diversion and isolation, repeatable tight shut-off

Designed for the most severe applications where flow diversion is combined with the need for repeatable tight shut-off. Both three and four-way valves are available in 'T' and 'L' configurations and in multiple combinations of body materials, trims, and end connections.

- 1-1/2 - 30"
- ANSI/ASME Class 150 - 4500
- Temperatures up to 1400oF / 760oC
- Tight shut-off

Cryogenic Valves

Fire tested to API 607

Provides absolute zero leakage utilizing our HVOF RiTech® coated integral seat, live-loaded fugitive emissions, and fire-safe tested design. Available in a variety of materials suited for extremely low temperatures.

- 1/4 - 36"
- ANSI/ASME Class 150 - 4500

Isolation Valves for Coking Service

Improve plant efficiency and increase reliability



Coking Valves

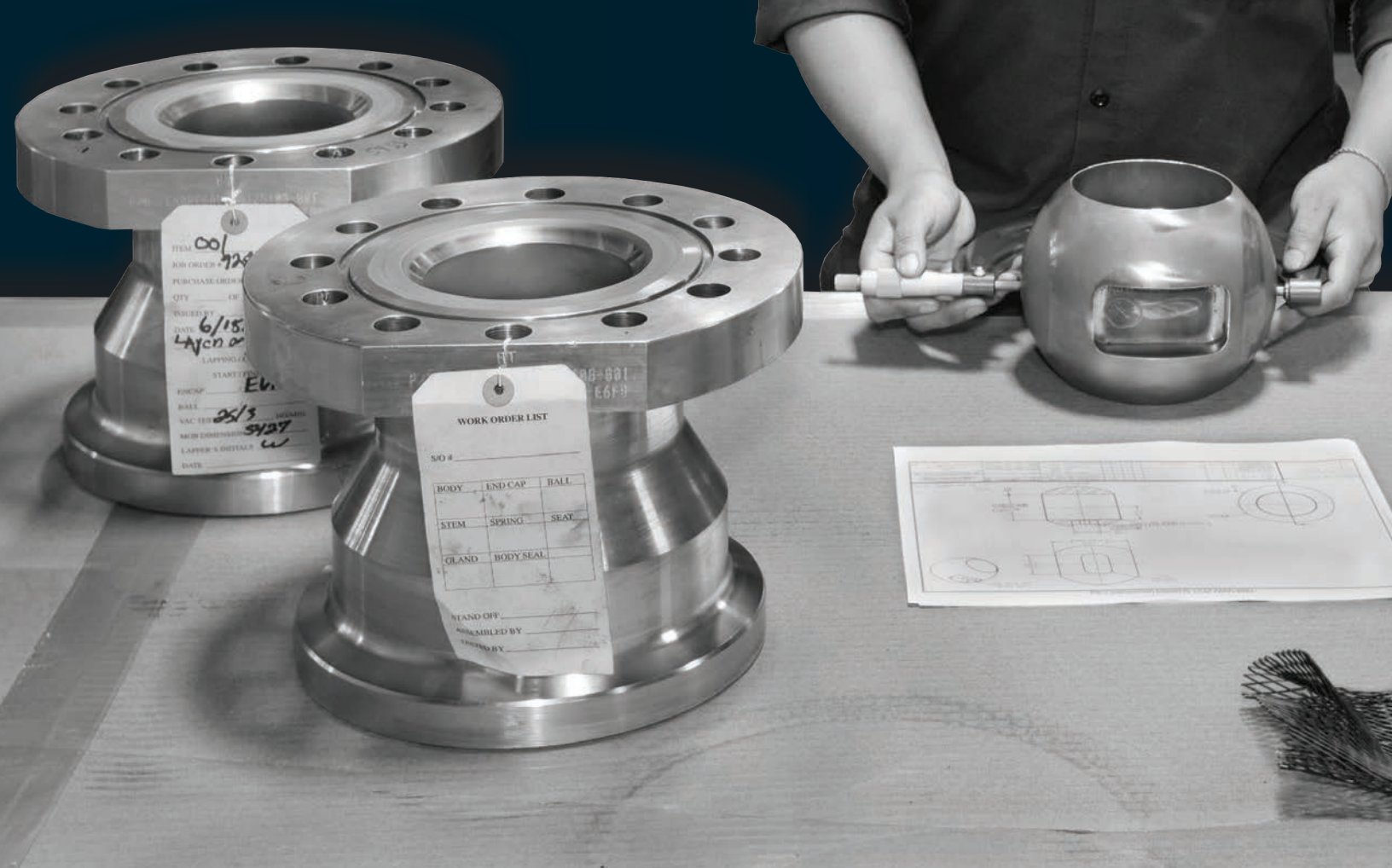
Provides process improvements and reliability between turnarounds. The customized purge design provides a simple, wear and erosion-resistant valve that ensures reduced maintenance time and costs for customers in these severe service applications.

- 1 - 36"
- ANSI/ASME Class 150 - 4500

Switch Valves

ValvTechnologies' four way switch valve design focuses on operational reliability, extended mean time before major repair, and low cost of total ownership.

- 8 - 18"
- ANSI/ASME Class 600 - 900



At Your Service

ValvTechnologies is committed to helping our global network of customers maintain peak valve performance. With authorized repair centers around the world, ValvTechnologies can address virtually any service or repair challenge that may arise, 24 hours a day, seven days a week.

ValvTechnologies' experienced, factory-trained field service engineers and technicians can troubleshoot, diagnose and repair valve and actuator-related problems not only in ValvTechnologies' products, but other manufacturers as well.

Our range of services includes complete factory repairs, in-house or on-site, as well as maintaining an extensive stock of spare parts.



To locate an authorized repair center near you, visit www.valv.com.

Service Capabilities



Testing

Valves repaired in our facility are fully tested per OEM requirements.

Testing capabilities range from 3/8" to 36" for all valve components, actuator and instruments.

Full Overhaul / Outage Support

Our dedicated staff of experienced service professionals can ensure that all aspects of your valve overhaul during outages are done safely and efficiently.

Spare Parts

ValvTechnologies supports service parts sales for both current and out-of-production designs of the product offering.

As a result of our extensive inventory for various valves, production parts can ship in a matter of days to meet your maintenance and repair needs.

Innovative Hardfacing Solutions

Reduce wear and increase reliability with hardfacing solutions specific to your application

HVOF RiTech®

Robotically integrated technology for high-performance valves

RiTech® is a high-velocity oxygen fuel (HVOF) coating process that is excellent for extreme corrosion and wear resistance in many severe service applications. It offers:

- High density
- Low porosity
- Low friction
- High corrosion resistance
- Extreme wear resistance

FuseTech™

Spray-and-fuse process for High-Pressure Applications

For pressures exceeding 3,500 psi FuseTech™ can reduce porosity to zero and prevent even minor infiltration by the smallest molecules or corrosives

Rhinoite® Hardfacing

Wears five to seven times longer than bare metal in process applications

The Rhinoite® process uses a specially formulated tungsten carbide pellet made to predetermined chemistry, applied by a patented metal inert gas (MIG) welding process onto a large variety of base metals.

The process can be adapted to all service environments, in any wear application: erosion, corrosion, adhesion, and high-temperature applications (2200°F). Rhinoite® hardfacing overlays can be completely refurbished after years of service, reducing overall material and maintenance costs.

- Temperatures up to 2200°F / 1204°C



ValvPerformance Testing® Innovative Diagnostic Solutions

Most power plants will see a thermal efficiency (heat rate) system improvement of 1-4%.



Test 75 to 100 Valves a Day
Minimal Plant Downtime

Asset Management

Superior Cycle Isolation Testing and Evaluation Services

- ✓ ValvPerformance Testing® is a cycle isolation or valve leakage diagnostic program that assists end-users in understanding the value of zero leakage isolation and in identifying the best targets in their valve populations for effectively mitigating cycle isolation (plant efficiency) losses.
- ✓ ValvTechnologies' results-driven approach is verified accurate via independent testing and supported by fundamental fluid flow service.
- ✓ The ValvPerformance Testing® program is low-cost and fast time-to-value. Technicians can test an average of 75 to 100 valves in a single day's work without hindering plant operations and with minimal impact on process pipe insulation.

Benefits

- Fast, non-intrusive, low-cost and accurate
- Takes the guesswork out of valve maintenance by making hidden energy losses (leakage) transparent and quantifies the savings opportunities
- Improves or maintains plant operating efficiencies
- Increases plant output and energy/fuel cost savings
- Mitigates adverse environmental impact through improved energy efficiency which equates to reduced air pollution
- Improves diagnostic ability for better decision-making
- Reduces the cost due to unnecessary maintenance of functioning valves (i.e. condition-based maintenance)
- Savings in make-up water consumption
- Protects other plant equipment from unnecessary heat loads resulting from passing isolation valves
- Validates warranties and guarantees

VALV TECHNOLOGIES

Zero Leakage Valve Solutions™

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