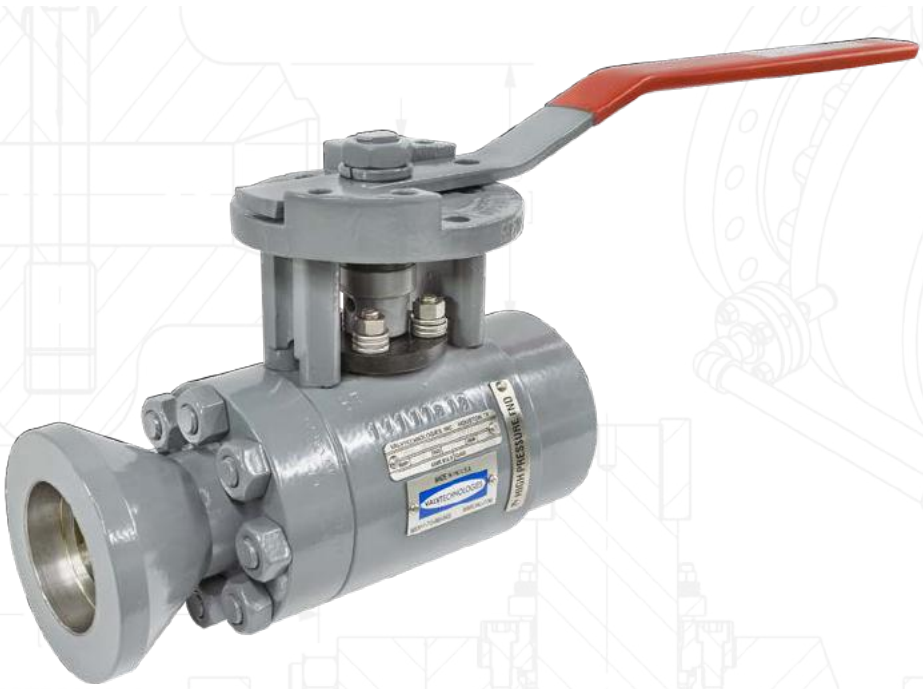


V Series Valve Solutions

The Flagship of the ValvTechnologies' Product Line

VALVTECHNOLOGIES®

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.

Fossil Fuel

- Above and below seat drains
- Ash handling
- Attemperator 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 Generation

- 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 (PORV)
- 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

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
- Pig launcher and receiver
- Mud drilling isolation and check
- Lean and rich amine isolation
- Molecular sieve regeneration isolation
- Molecular sieve absorber isolation
- First and second stage separator isolation

ValvTechnologies provides field-proven solutions for severe service applications.

Downstream and Chemical Processing

Coking (delayed and flexi)

- Switching
- Feed 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
- Overhead vapor isolation and control
- High ΔP isolation and control

Reforming (CCR)

- Lock hopper
- Isolation

Mining and Minerals Processing

High-pressure slurry Transportation systems

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

Autoclaves

- Vessel 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

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

V Series Metal Seated Ball Valves

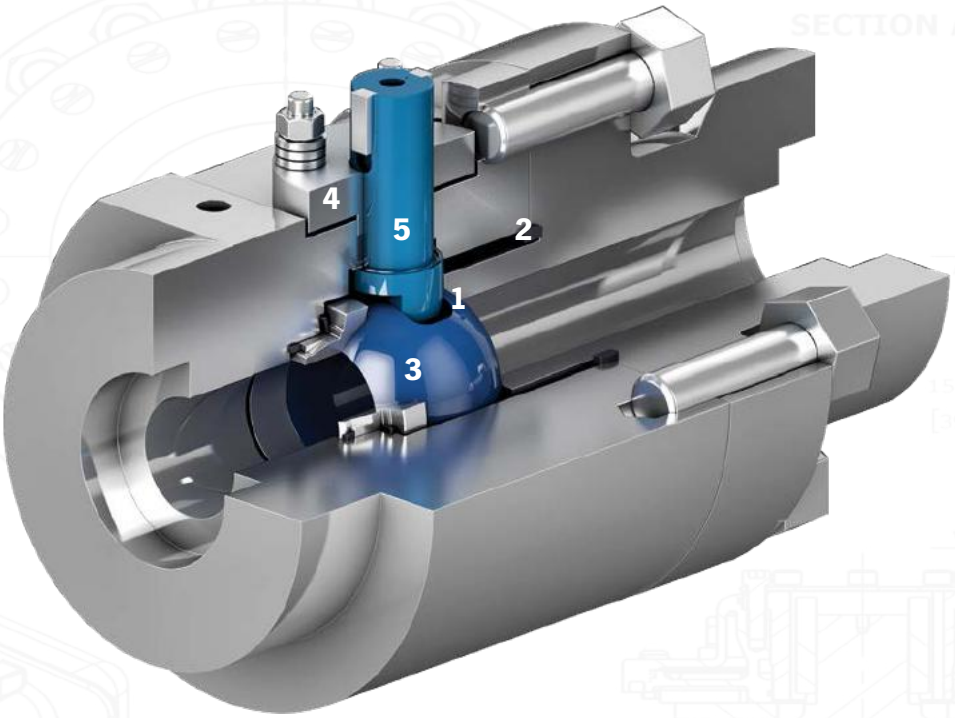
The flagship of the ValvTechnologies' product line

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 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.

ValvTechnologies' design features are the implementation of extensive industry experience.



4. Live-loaded gland area
The V Series' 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 one-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.

V1-1

Forged, high-pressure valves
Four-year, zero-leakage warranty*

- **1/4 - 4“**
- **ANSI/ASME Class 900 - 4500**

V1-2

Flanged, low-pressure valves

- **1/2 - 36“**
- **ANSI/ASME Class 150 - 600**

V1-3

Small bore, low and intermediate pressure investment cast valves
Four-year, zero-leakage warranty*

- **1/2 - 2“**
- **ANSI/ASME 150 - 600**

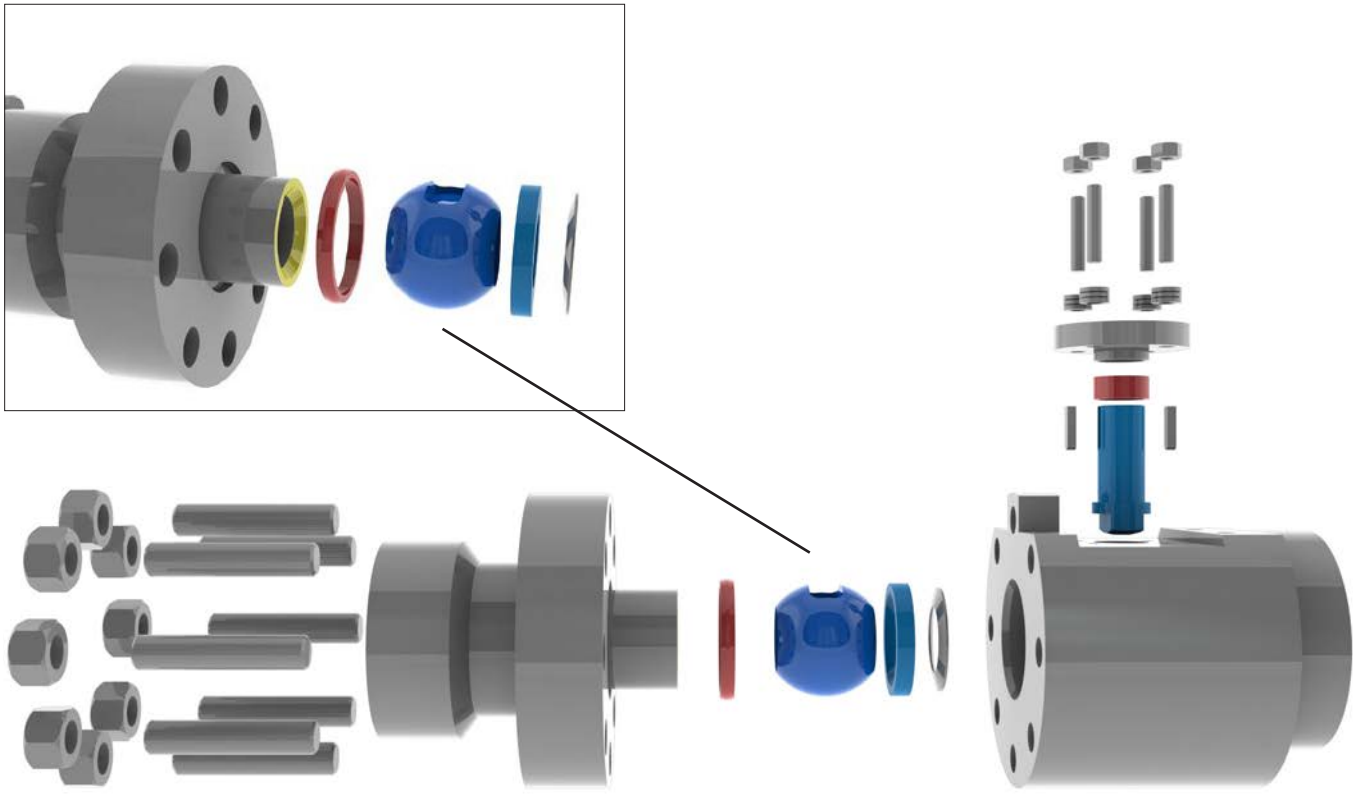
V1-4

Large bore, high-pressure valves

- **4 - 36“**
- **ANSI/ASME Class 900 - 4500**

*Four-year warranty in steam and water applications

V Series Key Performance Features and Benefits	
Features	Benefits
Guaranteed tight shut-off	Enhanced process safety
Quarter turn operation - readily automated	Increased safety, ease of operation, reduced space requirements
Low pressure drop - high Cv	Process efficiency
Custom engineered	Process optimization
Dimensions to ANSI B16.10	Interchangeable with equivalent valves
Low emission packing and seals	Reduced emissions
Single piece anti-blow-out stem design	Enhanced process safety
Resistant to solids	Reduced maintenance costs, minimum downtime
Certified to use in SIL-3 and SIL-4 loops	Enhanced process safety
Live-loaded gland system (four stud design)	Reduced emissions
Stem fugitive emissions per ISO 15848-1 Class B	Reduced emissions, enhanced process safety
Fire safe certification: API-607	Enhanced process safety



The Real Cost of Valve Leakage

The cost of leaking steam and process fluids is far greater than the total cost of a valve.

The cost of replacing or repairing a valve is small compared to the cost of lost heat-rate efficiency in power plants caused by leaking valves. Minor leaks will grow to major leakage, causing frequent equipment repair or replacement and costly unscheduled plant shutdowns. Valves can have severe leakage that is not visible to the eye as internal valve leakage can go undetected for long periods of time.

With zero-leakage severe service isolation valves, less fuel is burned to produce megawatts, which lowers emissions and overall costs of plant operations. ValvTechnologies' decades of engineering experience have designed a superior severe service isolation valve that exceeds industry standards when it comes to defining zero-leakage.

Zero-leakage is defined as no detectable leakage of gas or a liquid for a period of three minutes or greater.

Allowable leakage rates:

MSS SP-61, 4", ASME/ANSI Class 1500, reduced port:
Allowable leakage per hour = 0.010565 gallons
Allowable leakage per year = 92.5 gallons
Leakage over four years assuming constant leak path:

370 gallons

FCI-2 Class V, 4", ASME/ANSI Class 1500, reduced port:
Allowable leakage per hour = 0.069465 gallons
Allowable leakage per year = 608.5 gallons
Leakage over four years assuming constant leak path:

2,434 gallons

ValvTechnologies' allowable leakage = 0

Guaranteed

Would you specify a valve that will have a significant leak after one year in service? If not, then what specifications do you use? All ValvTechnologies' valves are guaranteed absolute zero-leakage for four-years in steam and power applications.

All other valves in the industry have a defined leakage rate. ValvTechnologies tests every valve according to ANSI procedures. However, we toughen the standard to zero-leakage on both water and gas. Our standard is zero drops and zero bubbles guaranteed.

Qualified

At ValvTechnologies, we are totally committed to quality. We measure our performance against the standards set in our Integrated Quality Program. Our Quality Assurance department diligently pursues opportunities for improvement, while the entire organization takes ownership of the quality program. In this way, we can improve our processes while increasing manufacturing efficiency.

Efficient

Cycle isolation eliminates energy losses attributable to poorly performing or leaking steam, water cycle isolation valves. ValvTechnologies encourages end users to apply the principles of asset management to their installed valve population. The ValvPerformance Testing™ program, or cycle isolation measurement, utilizes next generation acoustic monitoring instruments to help customers monitor valve performance. These tools allow predictive and preventative maintenance programs to be fine tuned for very large or very small valve populations. Providing cycle isolation services can be as simple as performing a valve survey, or as comprehensive as the management of all valve work during your next outage - from erecting scaffolds to repairing, installing, welding and stress relieving.

Benefits

- Plant efficiency improvement
- Economic payback in just months
- Improved decision making
- Reductions in overall valve maintenance spend
- Cost avoidance of unnecessary valve repairs or replacements

Zero-leakage Valve Solutions

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Maroc Sealing
FLUID CONTROL