

VALV TECHNOLOGIES

Valves for the Nuclear Industry

Critical Service Solutions



Critical Service Valve Applications

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



ValvTechnologies provides zero-leakage solutions for vent, drain, isolation and control applications in nuclear generation:

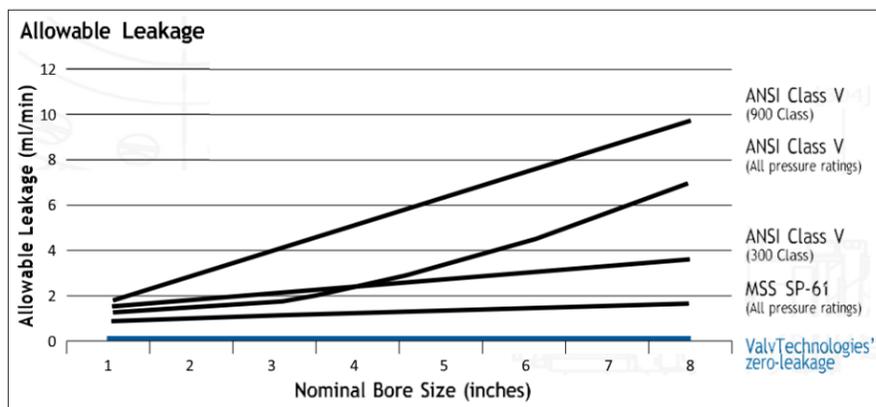
- ASME Section III Division 1 Class 1, 2 and 3 valves
- 10CFR50 Appendix B Safety Related Program
- NUPIC audited supplier
- NIAC member
- ASME/ANSI Class 150 - 2500, ½ - 36"
- End connections SW/BW/flanged/special
- Primary, secondary, and auxiliary systems
- Applicable to all BWR, PWR and CANDU designs
- ASME Section III Division 5

- 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
- Radwaste 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

What is Zero-Leakage?

ValvTechnologies defines zero-leakage as no detectable leakage of gas or a liquid for a period of three minutes or greater. The valve must not leak after multiple cycles and must exhibit zero-leakage at various pressure conditions—from vacuum to full-rated pressure.

More traditional valve manufacturers have published acceptable leakage rates, even when brand new. At ValvTechnologies, we will not ship a valve unless it shuts off completely. We test every valve made according to ASME/ANSI standards (MSS SP-61, ANSI Class V), then we toughen the standard to 100% shut-off (zero-leakage) and attach our signed and witnessed test report to every valve we ship. With this kind of quality control, ValvTechnologies' valves improve plant performance, last longer and reduce maintenance and operation costs.



All ValvTechnologies' valves manufactured for the nuclear industry are stringently tested to meet the zero-leakage testing criteria and are backed by a four-year, zero-leakage guarantee. In addition, every valve we manufacture for nuclear generation comes with extensive documentation and full materials traceability which include:

- CMTR – certified materials test report
- Certificate of compliance
- Valve test report
- Design report
- Drawings

Zero-Leakage V Series Metal Seated Ball Valves

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.

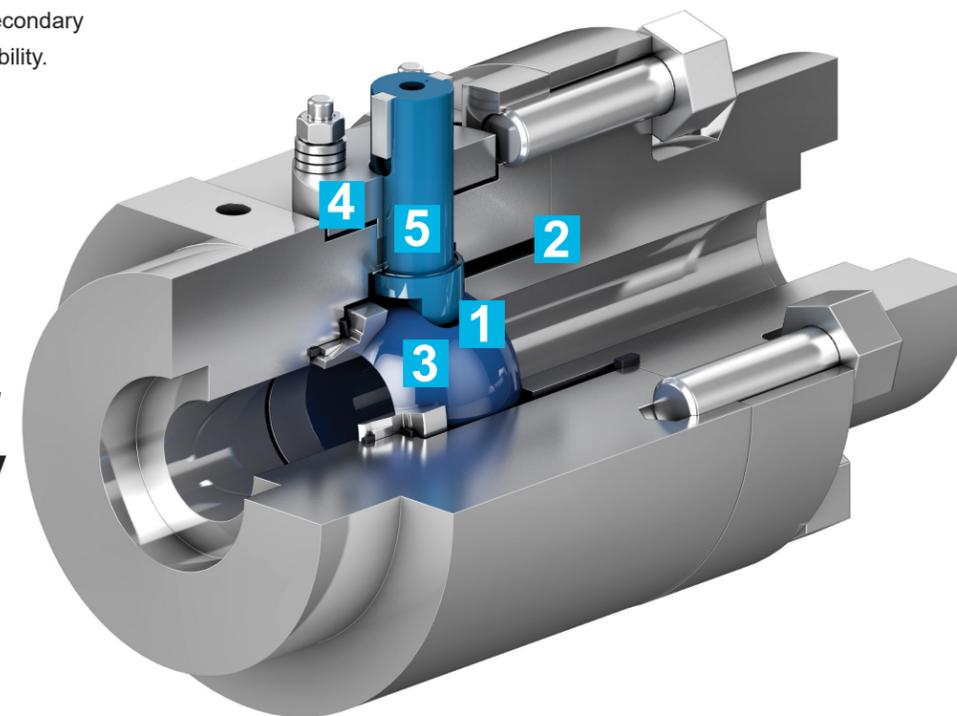
2. Body seal ring

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.

V Series Metal Seated Ball Valves

Engineered and proven to be Zero Leakage.

The flagship of the ValvTechnologies' product line, the V1-1, is the valve by which all other severe service metal-seated ball valves are measured. The V1-1 design includes integral seats, RiTech® hard coatings, blowout-proof stem and live-loaded packing. Primarily used in severe service applications, V1-1 valves are manufactured to each customer's unique specifications.

The V Series' proven seat supported design provides improved performance, far beyond the capability of linear operated valves which feature obstructed and torturous flow paths. ValvTechnologies' design and construction delivers the extra safety margin so crucial to maintaining productivity: customers benefit by realizing increased security, less downtime and lower maintenance.



V1-1

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

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



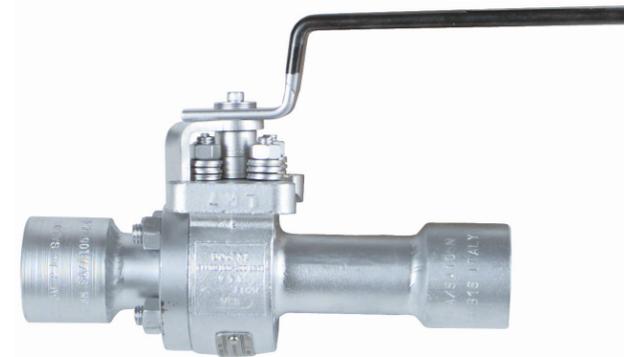
V1-2

Get outstanding flexibility and reliability in the lower pressure class range. ValvTechnologies' V1-2 flanged valves come in more sizes and virtually any cast or forged material, ensuring superior performance and long life. Specify them with special end connections, purge ports, cavity fillers, cryogenic stem extensions, fugitive emission bonnets...all these options can be added to the valves that feature HVOF RiTech® hard coatings as standard – and absolute zero-leakage guarantee.

- Flanged, low-pressure valves
- 1/2 - 36"
- ANSI/ASME Class 150 - 600

V1-1's are engineered to be leak-free, maximize flow and reduce the overall cost of ownership. So confident of their performance, only ValvTechnologies' V1-1 valves are backed by the best zero-leakage warranty in the industry.

The V Series' proven seat design provides improved performance, far beyond the capability of linear operated valves – which feature obstructed and torturous flow paths. V Series valves are engineered to be leak-free, maximizing flow and reducing the overall cost of ownership. ValvTechnologies' design and construction delivers the extra safety margin so crucial to maintaining productivity.



V1-3

ValvTechnologies' investment cast version of the V1-1 severe service isolation valves pay off in low-pressure applications with the elimination the typical highmaintenance linear valves and allows the customer to take advantage of the benefits that come standard with the zero-leakage guarantee, ensuring long service life. The V1-3 is available in both full and reduced-port models and, like all of our V series products and just as important, our HVOF RiTech® hard coatings enables the same critical mate lapped sealing surfaces, making the valve impervious to erosive, corrosive and abrasive services.

- Small bore, low and intermediate pressure investment cast valves
- 1/2 - 2"
- ANSI/ASME 150 - 600



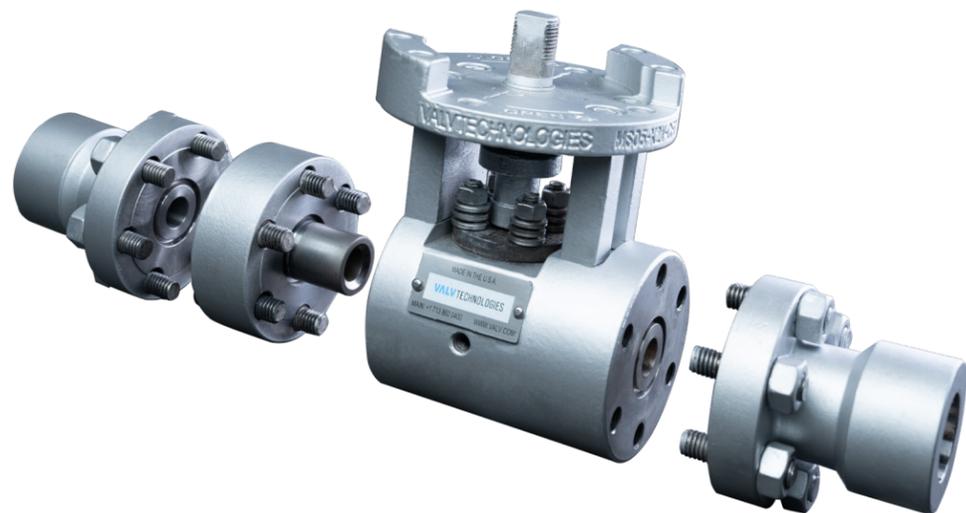
V1-4

ValvTechnologies' V1-4 severe service metal seated ball valve extends our core design concepts to large diameter and higher pressure applications. This valve is the result of the evolution of the latest in manufacturing techniques and hard coating technologies, expanding of all of the features and benefits of the V1-1 design in large-diameters for oil and gas applications worldwide.

This valve is designed for critical isolation applications in industries requiring high-performance solutions. All ValvTechnologies' valves can be custom designed to meet the demands of your specific application. This large, robust bore is ready when the pressure is on. Our absolute zero-leakage guarantee and proven low cost of ownership are second to none.

- Large bore, high pressure valves
- 4 - 36"
- ANSI/ASME Class 900 - 4500

V1-R®



FEATURES	BENEFITS
Simplicity of design: 4-piece valve assembly designed for ease of removal while connections remain inline. Field testable after repair, prior to insertion	Field Serviceable Increased efficiencies Ease of use Reduced maintenance costs
Through conduit design: no tortuous flow path. When open it has the highest possible Cv's	Minimized wear & tear Reduced vibration Reduced maintenance
Fixed position – quarter turn: no seating torques required.	Minimized stem wear Lower cost of ownership
Hardened blowout proof stem: One piece, inserted through the body & shouldered	Improved safety
Metallic body seal ring: Increases body integrity by eliminating external leakage.	Improved reliability Zero leakage
Live load packing gland: Minimum four bolt configuration with shallow stuffing box. Ensures consistent torque at variable pressures & temperatures	Increased reliability
Hard coated & mate lapped seats: High Velocity Hydrogen Fuel (HVHF) chrome carbide hard coating with Rockwell C of up to 72. Mate-lapped seats.	Wear & corrosion resistant Increased reliability Zero-leakage
Seat designs: Hard coated, both ball and integral downstream seat to the end-cap to eliminate a potential leak path	Increased reliability
Stringent testing: every valve is tested, documented, and serialized	Increased reliability Increase safety Total traceability
Four-year warranty: the very best in the industry. Covers internal seat leakage as well as external through the packing &/or body seal.	Lower cost of ownership Increased reliability

IsoTech®

Seat protected valves

The IsoTech® addresses the need for true in-line repairability in large diameter, high-energy piping systems. Specifically designed for steam and feedwater applications, the IsoTech® provides bi-directional, zero-leakage shutoff using our HVOF RiTech® coating process.

Receive in-line valve repairability in large-diameter, high-energy piping systems with the ValvTechnologies' IsoTech®. Proven precisely right for steam and feedwater applications, the IsoTech® offers our rigorous four-year zero-leakage warranty in steam and water applications, against leakage and low-cost maintainability, in addition to the ValvTechnologies' Delamination Guarantee.



Bonnet Area

- Sufficient mechanical bolting to ensure the seal does not relax during periods when the system is not pressurized
- High seal reliability
- The bonnet does not have to be forced into the valve bonnet throat to allow for the segment rings to be removed

Gland Area Packing

- The stem and gland are hard faced and polished
- The packing has 316SS woven wire mesh anti-extrusion rings top and bottom and Grafoil® center ring
- Proven, superior, multiple Belleville® spring stacks
- Live-loaded stuffing box

Disc and Seat Area

- Discs and seats have been overlaid with the same carbide overlay (68-72 RC) as its counterpart, the ValvTechnologies' metal-seated ball valve
- Seats are several magnitudes harder than Stellite VI, typically (34-38 RC)
- Lapped to achieve a zero-leakage seal under all pressure conditions, including vacuum
- The large spring load ensures a high initial seal, and the line pressure increases the sealing

Back Seat Area

- The back seat is coated with chrome carbide (typical hardness 68-72 RC) and polished to achieve a zero-leakage seal

Technical Data	
Sizes	4 - 36"
Pressure Classes	ASME / ANSI Class 600 - 4500
Materials of Construction	<ul style="list-style-type: none"> • Carbon steel • Alloy steel • Stainless steel • Duplex steel • Exotic alloys
In Compliance	<ul style="list-style-type: none"> • ASME B16.34 • PED • Nuclear ASME III Class 1, 2 and 3 • Nuclear Safety Related – 10CFR50 Appendix B • SIL
End Connections	Buttweld - standard
Options	Various bypass configurations, actuator mounting

*Standard four-year, zero-leakage warranty in steam and water applications available in addition to the ValvTechnologies' Delamination Guarantee.

Non-slam Axial Check Valves by DFT Inc.

Axial check valves for nuclear applications and licensed manufacturer of ASME Section III and Safety Related check valves.

Technical Data



Sizes	1/4 - 24"
Pressure Classes	ASME / ANSI Class 150 - 2500

Designed to prevent “water hammer”

The spring-assisted, in-line design featured in all DFT® check valves ensures that as the forward flow in a pipeline decreases, the disc begins moving closer to the seat. By the time the flow stops, the disc is closed against the seat preventing flow reversal. This prevents the valve from slamming closed causing “water hammer” and the resultant noise and damage to piping system.



ALC® (ASME/ANSI Class 150-300)

The ALC® is an in-line, spring assisted, single guided “wafer” check valve designed to prevent “water hammer” and “reverse” flow. The lightweight compact design fits between mating flanges and meets API 594 face-to-face dimensions.



PDC® (ASME/ANSI Class 150-1500)

The DFT® Model PDC® silent check valve is specially designed for use on the discharge side of reciprocating air or gas compressors. It includes a pulse damping chamber to maintain the disc in the open position during the momentary reductions in flow associated with each cycle of a reciprocating compressor.

Basic-Check (450-6000 CWP)

The DFT® basic check valve is a versatile all-purpose, spring-assisted, in-line check valve that provides reliable, low maintenance service for a wide range of liquids and gases at various pressure and temperature combinations.



SCV® (750-3600 CWP)

The DFT® Model SCV® is a corrosion resistant, dependable, versatile, and economical spring-assisted, in-line check valve for a wide range of applications.

Excalibur® (ASME/ANSI Class 150-1500)

Excalibur® check valves are available in a wide range of sizes and pressure ratings and in a variety of metals to meet most check valve requirements.

GLC® (ASME/ANSI Class 150 - 2500)

The GLC® silent check valve consists of a body, seat, spring, disc with stem and guide bushing. The DFT® GLC® check valve has the advantage of minimum pressure loss with silent, non-slam operation.



WLC® (ASME/ANSI Class 150-2500)

The WLC® “wafer” style silent check valve is a lightweight, spring-assisted, center guided, in-line check valve. The joint between the seat ring and body is sealed by the flange gasket upon installation preventing any leakage through the joint when the valve is in service.

VALV TECHNOLOGIES

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