



SECTION A-A

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.



- 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

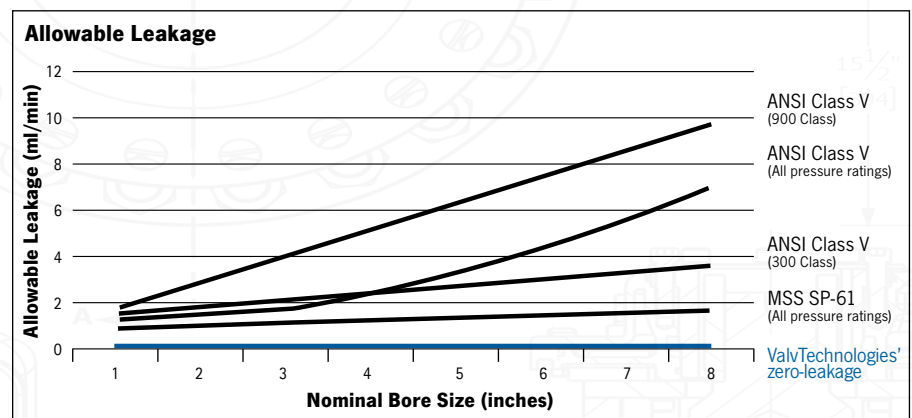
ValvTechnologies provides zero-leakage solutions for vent, drain, isolation and control applications in nuclear generation:

- ASME Section III 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

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

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.

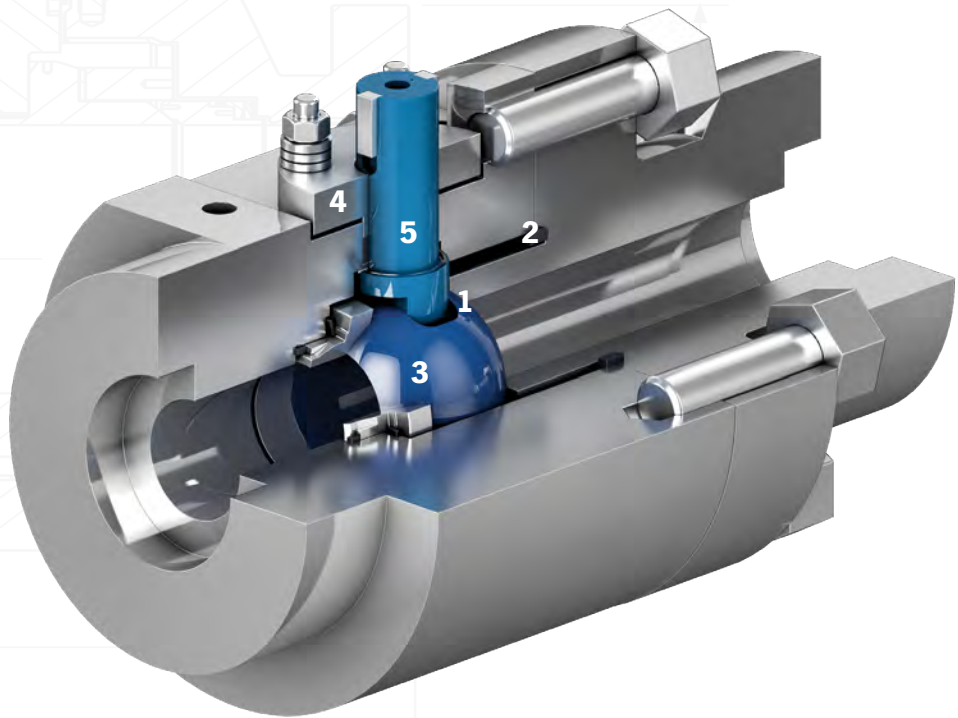
2. Body seal ring

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.

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.

Technical Data	
Sizes	4 - 36"
Pressure Classes	ASME / ANSI Class 600 - 4500
Materials of Construction	Carbon steel Alloy steel Stainless steel Duplex steel Exotic alloys
In Compliance	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
Warranty	Four year zero-leakage warranty* + delamination guarantee



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

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

ERV - Electronic relief operated system

ValvTechnologies' ERV fulfills the need for a zero-leakage, pilot-operated relief valve. The ERV package combines ValvTechnologies' zero-leakage isolation valve with electronic controls to monitor and regulate system pressure. Whether in a capacity relieving function requiring the ASME V-Stamp or simply an overpressure protection application, the ERV provides reliable protection for standard safety valves in many industries.

Technical Data	
Sizes	2 1/2 - 4" and larger
Pressure Classes	ASME / ANSI Class up to 4500
Materials of Construction	Carbon steel Alloy steel Stainless steel Duplex steel Exotic alloys
In Compliance	ASME B16.34 PED Nuclear ASME III Class 1, 2 and 3 Nuclear Safety Related – 10CFR50 Appendix B SIL
End Connections	Buttweld, raised-face flange - standard



Features

- Repeatable tight shut-off, high precision reliability
- Zero-leakage guarantee comes standard
- The optional integrated isolation valve eliminates the need for a costly field weld
- Specially engineered for easy adaptation to existing control suites

Xactrol® Control Valves

From simple, minimum or normal flow control to a full rangeability over a wide range of pressure drops and conditions, we have the solution for you. The Xactrol® Mark I is designed for minimum or normal flow control conditions as required in a large number of flow control applications. In addition to normal flow control the Mark II design has a second flow port which is designed to handle continuous flow conditions. For applications where high-pressure drops are required, the Mark III design comes with a series of upstream pressure reducing plates to meet the toughest of applications.

Technical Data	
Sizes	1/2 - 36"
Pressure Classes	ASME / ANSI Class 150 - 4500
Materials of Construction	Carbon steel Alloy steel Stainless steel Duplex steel Exotic alloys
In Compliance	ASME B16.34 PED Nuclear ASME III Class 1, 2 and 3 Nuclear Safety Related – 10CFR50 Appendix B SIL
End Connections	Socketweld, buttweld, raised-face flange - standard
Options	Single stage pressure drop, continuous blowdown, multi-stage pressure drop, actuator mounting



Features

- Tight shut-off, high-pressure let-down combination
- MSS-SP-61 or better
- Reduces velocity
- Liquids - eliminates cavitation and flashing
- Gases - eliminates erosion and vibration/noise
- Smaller envelope than comparable globe valve
- Higher Cv than comparable globe valve

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.



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.



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.

Rhinoite® Hardfacing

The Rhinoite® process uses a specially formulated tungsten carbide pellet made to a predetermined chemistry. It is applied by a patented metal inert gas (MIG) welding process onto a large variety of base metals using various types of weld wires. The process is a two layer application.

The process can be adapted to all service environments, in any wear application: erosion, corrosion, adhesion and high-temperature applications (2200°F). Rhinoite® hardfacing has been a proven leader of hard metal overlay on elbows, t-sections and choke tubes in chemical plants and refineries for a decade with zero failures. The Rhinoite® hardfacing weld process focuses on minimizing loss of production time by wearing five to seven times longer than bare metal. Rhinoite® hardfacing overlays can be completely refurbished after years of service, reducing overall material and maintenance costs.



ValvTechnologies' Valve Specifications



ValvTechnologies' Ball Valves

Body design

- Should be split body, in-line repairable

Seats

- The downstream, main sealing seat is integral to the end cap
- High velocity oxygen fuel HVOF RiTech® overlay or equivalent
- The Rc hardness of the seat must be a minimum of 68 at service temperature

Ball

- 410 SS with HVOF RiTech® overlay or equivalent
- The Rc hardness of the ball must be a minimum of 68 at service temperature

Stem

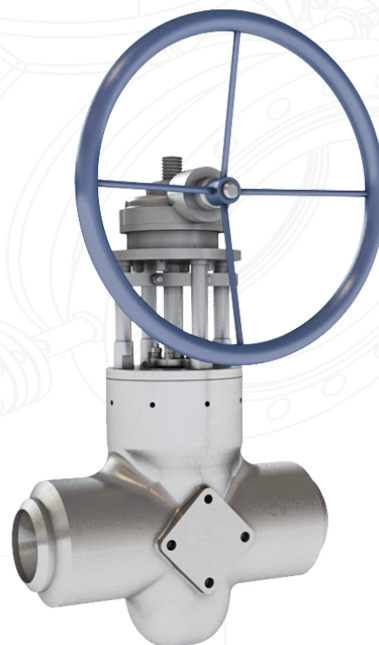
- The stem should be true blow-out proof, no pins or pinned stem designs acceptable
- Material A638, grade 660 or equivalent
- The Rc hard facing must be a minimum of 68 at service temperature

Fasteners

- Must conform to B16.34 2017 and ASME Section VIII stress value

Packing

- Live-loaded design, containing a four stud and six Belleville® washer configuration



ValvTechnologies' Gate Valves

Allowable leakage rates

- Must exceed FCI 70-2 Class V and VI and B16.34 2017; the leakage criteria to be zero-leakage and drops over a three minute period on all tests

Stem

- The stem should be a tee slot design, no threads to hanger, HVOF RiTech® coated and polished

Seats and guides

- The seats and guides are integral to the valve body
- HVOF RiTech® overlay or equivalent
- Protected seats in the open position, the flow through-conduit positioned precisely between the seats, eliminating turbulence and flow impingement on the seats

Discs/gates

- Tee slot configuration no threaded hanger, parallel in the range of travel, fully open and in the closed position
- HVOF RiTech® overlay or equivalent

Packing

- Live-loaded design, four stud and six Belleville® washer configuration

Zero-leakage Valve Solutions



SECTION A-A

Worldwide Office Locations

Australia

Brazil

Canada

Chile

China

Colombia

India

Japan

Kazakhstan

Malaysia

Poland

Saudi Arabia

Singapore

South Korea

Spain

Thailand

Turkey

United Arab Emirates

United Kingdom

United States

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