

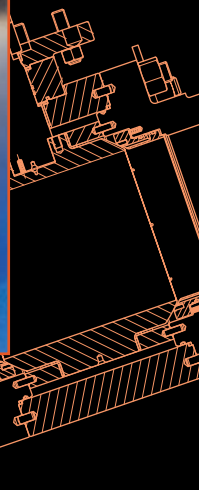
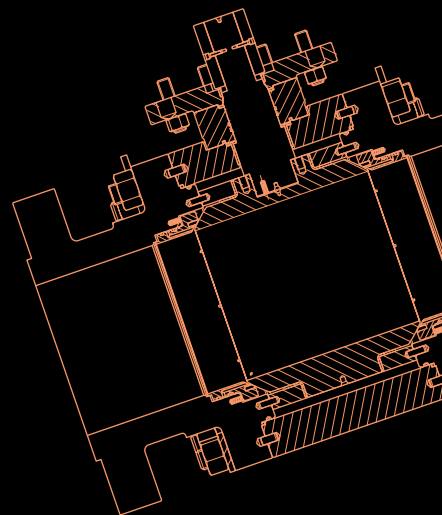
BVF100 SERIES FORGED TRUNNION BALL VALVE

OVERVIEW
BROCHURE



AUSTRALIAN
PIPELINE VALVE®

Joint Venture



API 6D - 1473
API Q1 - 2345
API QR - 2470 (9001)
API 6A - 0842

A GSL COMPANY - QUALITY ENDORSED



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BVF100 SERIES FORGED TRUNNION MOUNTED BALL VALVE

DESIGN FEATURES

- Manufactured and tested to API 6D/ISO 14313
- Double block & bleed capability
- Antistatic to API 6D
- 3 piece Side Entry type
- Full Bore - Full through conduit - piggable
- Manual operation
- Trunnion mounted
- Stem separate from the ball, anti-blow-out design
- No side load on the stem. Bearing blocks absorb the pressure load on the ball
- Large diameter, heavy duty trunnion & bearings
- Triple barrier stem seals.
- Anti blow-out stem configuration
- Metal seat retainer (secondary fire seal) complete with soft insert
- O-ring for static (body joints) and dynamic (seat rings and stem) seals
- Self-relieving (automatic cavity relief) seats
- Spring energised constrained seat design
- Body bolting design complies with ASME B16.34 & ASME VIII
- Emergency seat & stem sealant injection
- Fire safe certified DNV witness in accordance with ISO 10497 & API 607 5th/6th/7th Edition
- Fugitive emission certified ISO - EN 15848-1
- Equipped with cavity pressure bleed fitting
- Manufactured under quality system ISO 9001 and API 6D
- Body and seat hydrostatic and seat air test
- Material certification to EN 10204/ISO type 3.1.B
- 10 Year warranty



CHEVRON
APPROVED



BP APPROVED



SHELL TAT TAMAP
APPROVED



PETRONAS
APPROVED



PDO APPROVED



API 607 5th, 6th & 7th Ed.
ISO 10497 Firesafe Certified



ISO 15848-1 & API 641
Fugitive Emission Certified



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API Q1 - 2345
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SIL 3



LLOYDS
FZV - CE/PED
2014/68/EU

BVF100 SERIES - TECHNICAL OVERVIEW



 AUSTRALIAN PIPELINE VALVE®		TECHNICAL OVERVIEW SHEET	
		PROJECT	Stock Order
		PURCHASER	Australian Pipeline Valve
		END USER	Australia
LINE		SPECIFICATIONS	
1	VALVE DESCRIPTION	3-Piece Ball Side Entry Trunnion Bolted Bonnet	
2	VALVE MODEL NO.	BVF100 Series Ball Valve Side Entry	
3			
4			
5			
6	PRESSURE CLASS	Refer to drawing	
7	BORE (FULL/REDUCED)	Refer to drawing	
8	END CONNECTIONS	Refer to drawing	
9	OPERATION (MANUAL/ACTUATED)	Refer to drawing	
10	GEARBOX (WHERE APPLICABLE)	Diamond Gear	
11	SEAT CONFIGURATION	Self-Relieving	
12	ANTI BLOWOUT STEM DESIGN (YES/NO)	Yes	
13	ANTI STATIC DEVICE (YES/NO)	Yes	
14	VENT/DRAIN FITTING	NPT Plug and Bleed Valve - as per API 6D	
15	FIRE SAFE DESIGN & TESTING (YES/NO - SPEC)	Yes - ISO 10497 / API607	
16			
17	VALVE MATERIALS OF CONSTRUCTION		
18	BODY	Refer to drawing	
19	CLOSURE	Refer to drawing	
20	STEM	Refer to drawing	
21	BALL	Refer to drawing	
22	SEATS	Refer to drawing	
23	SEAT INSERT	Refer to drawing	
24	SEAT SPRINGS	INCONEL X750	
25	OTHER SEALS	Graphite/Viton AED	
26	BOLTING	Refer to drawing	
27	STEM GREASE FITTING	Yes	
28	SEAT SEALANT INJECTION FITTING	Yes	
29			
30			
31	VALVE DESIGN LIMITS		
32	TEMPERATURE	Refer to drawing	
33	PRESSURE	Refer to drawing	
34	DIFFERENTIAL PRESSURE (MAX.)	Refer to drawing	
35			
36	TESTING		
37	REFERENCED SPECIFICATION	API6D (ISO 5208 Rate A)	
38	OTHER TEST/INSPECTION CONDUCTED	APV Representative Witness	
39	SPECIAL TESTS	PMI/CT/MPI where specified	
40	CERTIFICATION		
41	PRESSURE RETAINING PARTS		
42	- BODY, BONNET, CLOSURE	EN 10204 3.1	
43	- STEM	EN 10204 3.1	
44	- BOLTING†	EN 10204 3.1	
45	PRESSURE CONTROLLING PARTS		
46	- SEATS	EN 10204 3.1	
47	- BALL	EN 10204 3.1	
48			
49	†ALL B7, B7M, L7, L7M BOLTING IS GALVANISED.		
50	CLARIFICATIONS/QUALIFICATIONS:		
51			
52	1) All valves are provided with locking devices on their individual operators.		
53	2) Valves are designed with capability for double block and bleed operation/function.		
54	3) Vent and drain connections include bleed valve.		
55	4) Valve body cavity pressure can be released during open and close position.		
56	5) Gear box's cover screw shall be accessible from the top.		
57	6) All external fixtures, i.e. seal injection, drain & bleed plug are full 316SS.		
58			
59			
60			
PREPARED BY		CHECKED BY	REV. NO.
BT		AS	02

BVF100 SERIES BALL VALVE DESIGN FEATURES OVERVIEW



FIRESAFE CERTIFIED API 607 5TH, 6TH & 7TH EDITION AND API 6FA 3RD EDITION

SUPER FIRESAFE DESIGN

When non-metal sealing materials are decomposed or deteriorated by a plant fire, the edge of the metal seat retainer preloaded by the seat spring comes into contact with the ball to provide metal to metal shut off of the line fluid to minimise internal leakage through the valve bore. APV ball valves are also antistatic design

EXTERNAL LEAKAGE PREVENTION

Leakage from the valve stem area is prevented by double sealing with 2 O-rings and a graphite gland gasket. Leakage through the valve body joint is also prevented by double sealing with elastomer O-ring and graphite body gasket. After a fire has deteriorated the O-rings, the graphite gland gasket, body gasket and stem seals are the measure that prevents external fluid leakage.

INTERNAL LEAKAGE PREVENTION

When non-metal materials such as O-ring, seat insert and spacer are decomposed or deteriorated by fire, the edge of the metal seat preloaded by the seat spring comes into contact with the Ball to shut off the line fluid to minimise internal leakage through the valve bore. Also the fire safe flexible graphite seat area packing will be compressed by the seat spring to prevent fluid leakage between the valve body and the seat.

ANTI BLOW-OUT STEM

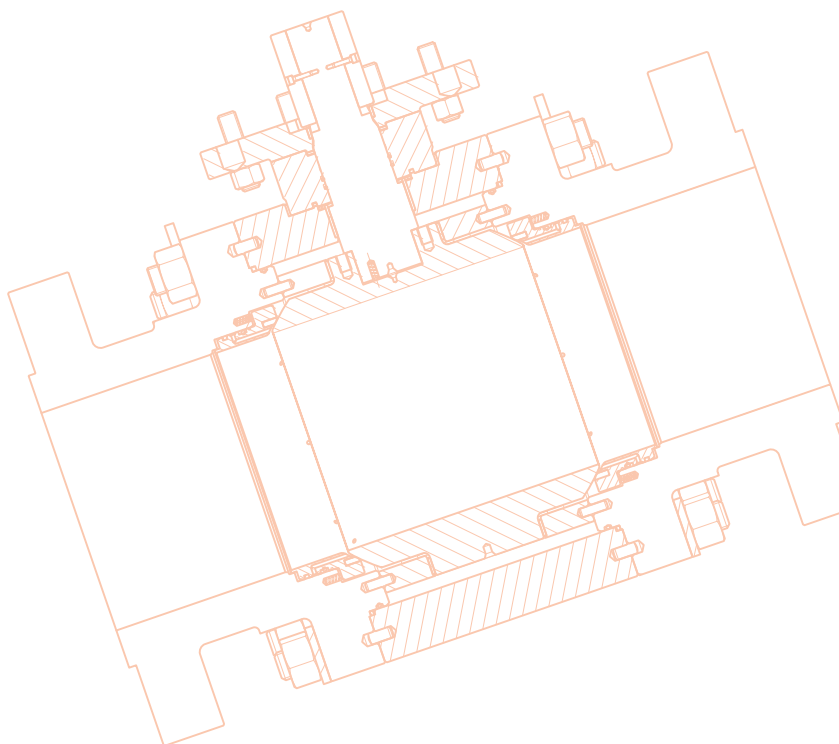
The stem is separate from the ball. The lower end of the stem is designed with an integral collar to be blowout-proof.

ANTI-STATIC DEVICE

Antistatic device is a standard feature of APV ball valve. A spring-loaded pin assures the electrical continuity, between ball, stem and body, so as to avoid sparks during turning of the stem to open and close the valve, which could be dangerous in case of hazardous area installation.

MANUFACTURING SPECIFICATIONS

Specification	Standards
General design standard	API 6D
Pressure-temperature rating	ASME B16.34
Face to face dimensions	ASME B16.10
Flange type and dimensions	ASTM B16.5
Butt-weld ends	ASME B16.25



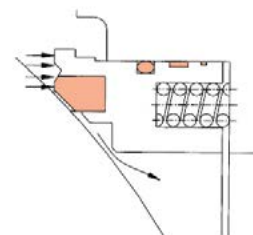
BVF100 SERIES BALL VALVE DESIGN FEATURES OVERVIEW (Continued)

AUTOMATIC RELIEF OF THE CAVITY

Independent floating spring loaded seats are always in contact with the ball to provide an effective tight seal even at low differential pressures. Independent upstream and downstream seat permit draining of fluid from the body cavity, allowing double block and bleed operation.

With the standard 'single sealing' feature, when the valve is closed there is an automatic body cavity release of over pressure to the line through the downstream (or upstream) seat. The pre-tightened seat springs are preset to automatically relieve excess cavity pressure caused by thermal expansion back downstream (or upstream). Once pressure exceeds the API6D (6.8) maximum (1.33 times the valve maximum pressure rating at 38°C at the time of publishing).

'Double sealing' feature (available on request), maintains the sealing capacity of the valve even in the case of failure of the upstream seat. Body cavity over pressure in this case can be released through a relief valve to atmosphere or flare, or can be recycled back upstream. A combination of double sealing features on the downstream side and single sealing on the upstream seat is available on request. This configuration maintains the sealing capacity of the valve in case of failure of the upstream seat and release of the body cavity over pressure through the upstream seat.



FULL BORE OR REDUCED BORE

Full bore and reduced bore are available in all sizes. Full bore is full through conduit bore size to API 6D to facilitate pigging.

SEALANT INJECTION SYSTEM

When the seat and/or stem sealing system is damaged, the grease injection valve can inject sealant into the valve for temporary sealing. Under normal circumstances Australian Pipeline Valve valves require no lubrication.

STEM SEALING SYSTEM

Two O-rings are utilised in the stem area for reliable performance, as well as graphite fireseal.

FLEXIBLE OPERATION

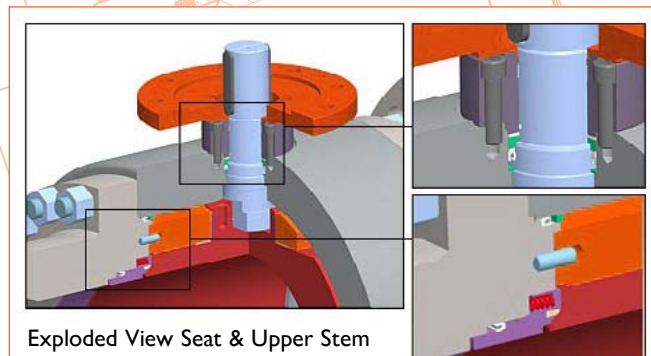
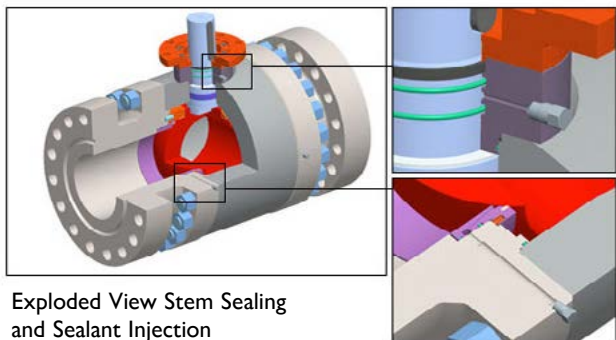
The seat and stem bearing has a Teflon coating which is low friction and self-lubricates to reduce the valve operation torque.

OPERATORS

The valve may be operated by hand, pneumatic operator, motor, hydro-pneumatic operator and hydraulic operator, etc.

NACE

The full range of APV valves can meet NACE standard MR-01-75, latest edition if necessary.

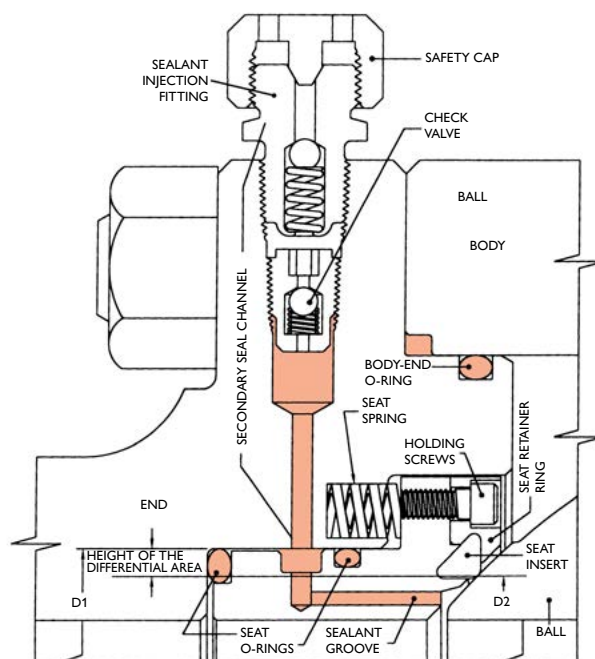


BVF100 SERIES BALL VALVE DESIGN FEATURES SEAT & STEM SEALING

SEAT DESIGN

APV piston-action seats are floating type & allow the automatic relief of excess pressure from the body to the pipeline. The helical seat springs that provide a uniform initial low pressure seat sealing load against the ball are fully enclosed in individual housings. Independent floating spring loaded seats are always in contact with ball to provide an effective tight seal even at low differential pressures. Independent upstream & downstream seats permit draining of fluid from the body cavity, allowing double block & bleed operation. With the single sealing feature, when the valve is closed there is an automatic body cavity release of over pressure to the line through the downstream seat. The pre-tightened seat springs are preset to automatically relieve excess cavity pressure caused by thermal expansion down stream once pressure exceeds the API 6D (6.8) maximum (1.33 times the valve pressure rating at 38°C at the time of publishing this catalogue)

A combination of double sealing features on the downstream side and single sealing on the upstream seat is available on request. This configuration maintains the sealing capacity of the valve in case of failure of the up stream seat and release of the body cavity over pressure through the up stream seat.



Cross-Section Seat Sealant Injection System
(design varies according to size and class)

PISTON-ACTION SEATS

As line pressure increases the seat reacts to the force of the pressure to form an effective seal. In the absence of line pressure, coil springs around the seat unit provide a tight seal by keeping the seat in contact with the ball.

SEALANT INJECTION

APV ball valves ordinarily require no lubrication. Configuration shows a secondary temporary sealing mechanism to inject sealant directly to the seats in case the seats are ever damaged by foreign matters or in event of an accident.



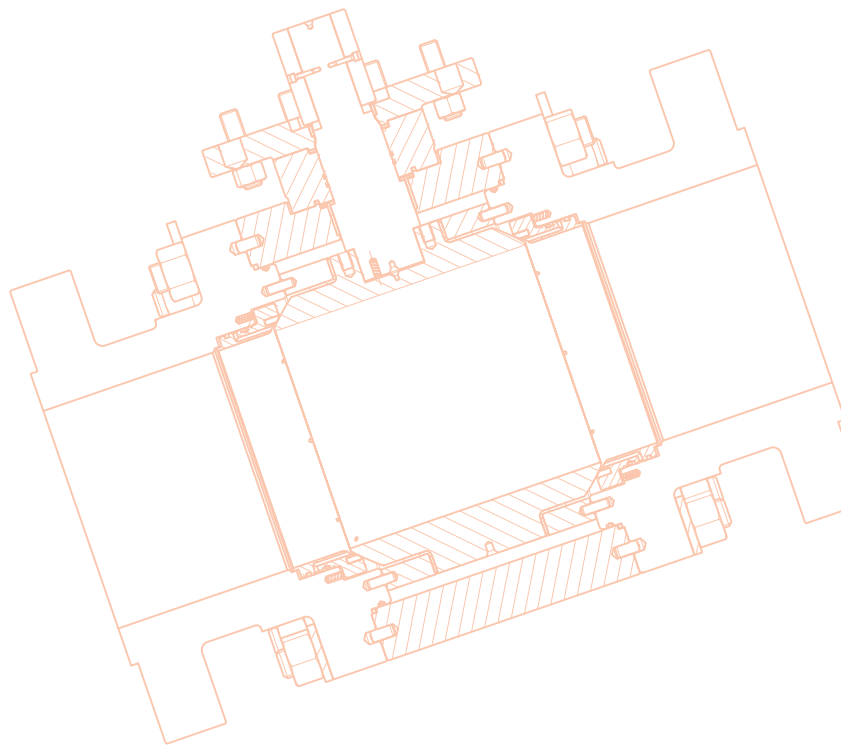
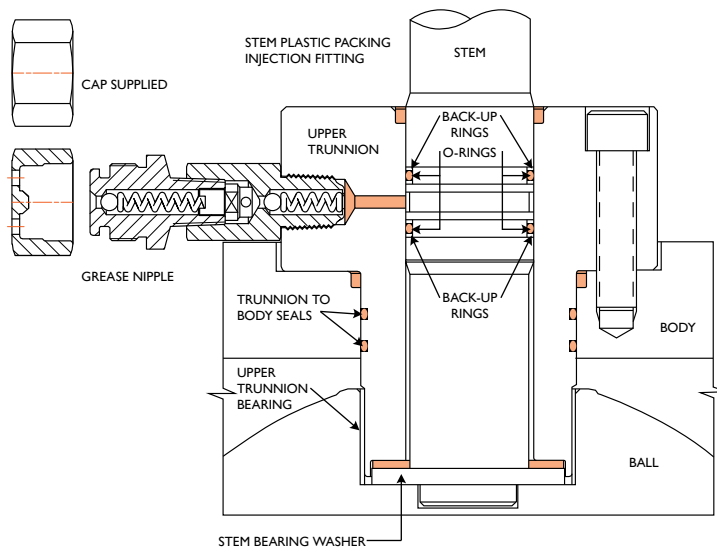
BVF100 SERIES BALL VALVE DESIGN FEATURES STEM SEALING (Continued)

CHARACTERISTICS OF THE STEM SEAL

The main stem seal is formed using two O-rings protected by two back-up rings to avoid extrusion. The design of the stem seal allows for the injection of plastic packing or grease sealant to form an emergency seal.

The stem bearing washer and the upper and lower trunnion bearings are made from reinforced teflon with a stainless steel backing. This assures a low friction coefficient and high corrosion resistance.

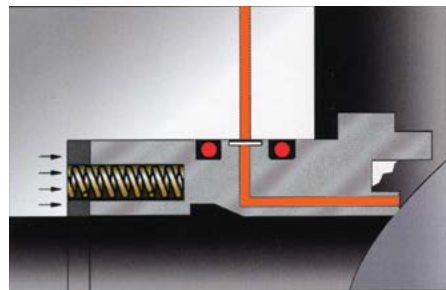
Cross-Section Stem Sealant Injection System



BVF100 SERIES BALL VALVE DESIGN FEATURES SEAT DESIGN AND STEM SEALING

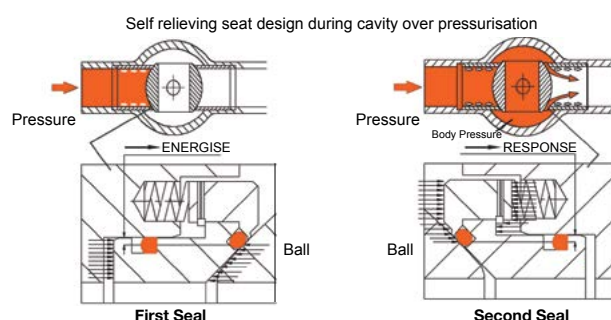
PISTON-ACTION SEATS

As line pressure increases the seat reacts to the force of the pressure to form an effective seal. In the absence of line pressure, coil springs behind the seat provide a tight seal by keeping the seat in contact with the ball surface. Independent floating spring loaded seats are always in contact with the ball to provide an effective tight seal even at low differential pressure. Independent upstream and downstream seats permit draining of fluid from the body cavity, so allowing double block and bleed operation (closed position only). With the optional single sealing feature, there is automatic body cavity release of over pressure to the line through the downstream seat.



SELF RELIEVING SEATS (STANDARD)

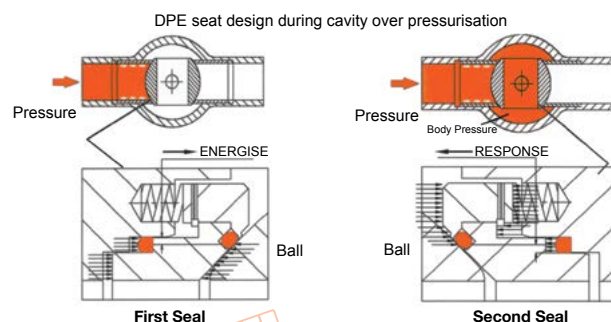
In self relieving condition, excessive internal cavity pressure is automatically relieved both upstream and downstream into the line by excessive pressure forcing the seats away from the ball.



DOUBLE PISTON EFFECT (DPE) SEATS

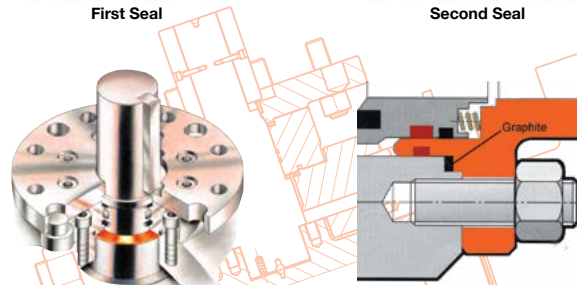
With the 'DPE' seat option, if a leakage occurs in the upstream seat, the pressure entering the body cavity pushes the downstream seat against the ball and the valve seals. Line pressure forces a seal against the floating seat.

An external body relief valve is installed to protect the body cavity from excess pressure which can be vented to atmosphere or recycled back to the downstream side of the valve or to flare.



TRIPLE BARRIER STEM SEAL DESIGN

Leakage from the stem area is prevented by double barrier sealing with O-rings as well as graphite fire seals. Leakage through the valve body joint is also protected by double sealing with an O-ring and a flexible graphite gasket. After a fire has deteriorated the O-rings, graphite packing and secondary seal ensure prevention of external fluid leakage.

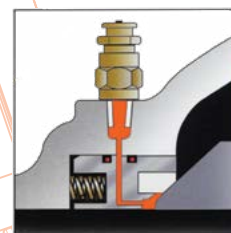


DOUBLE BLOCK AND BLEED

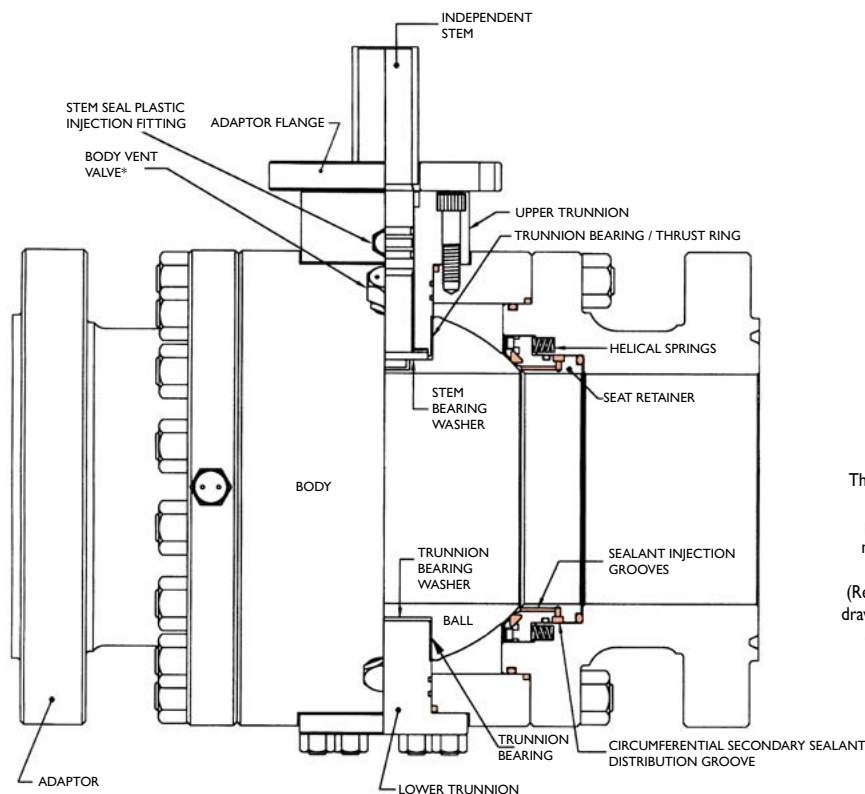
Whether in the open or closed position, pressure on each side of the ball is blocked from the body cavity by the seat ring. The cavity can be blown down or drained (only in the closed position) through the body port to indicate line isolation is effective.

EMERGENCY SEALING FUNCTION

In case of fluid leaks from the seat or stem sealing area, a sealant can be supplied through the injection fitting to temporarily prevent leakage.



BVF100 SERIES MATERIAL SPECIFICATIONS



This drawing is general and for indicative purposes only and may vary according to size and class. (Refer to actual as built drawing if more accurate detail is required.)

BILL OF MATERIALS

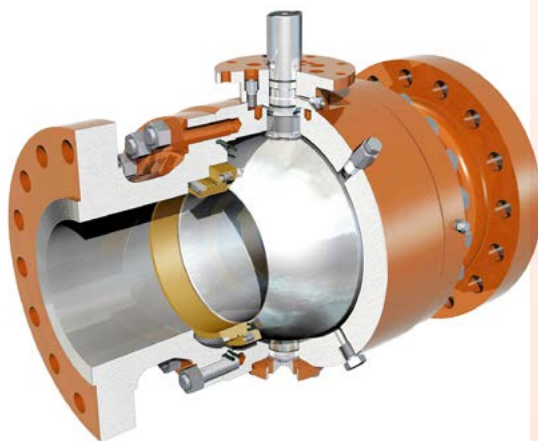
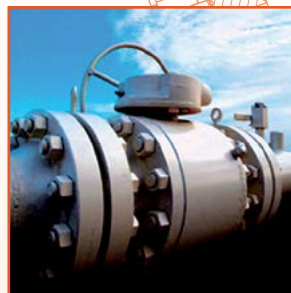
No.	Part Name	Material			
		Low Temp	Carbon Steel	Stainless Steel	Duplex Steel
1 & 2	Body & Closure	ASTM A350 LF2	ASTM A105N	ASTM A182 F316	ASTM A182 F51/F53/F55
3 & 4	Stem & Seat Ring	ASTM A350 LF2 + ENP / A182 F6a / F304 / F316 / F51	ASTM A105N + ENP / 4140 + ENP / A182 F6a / F304 / F316 / 17-4PH	ASTM A182 F316/F51	ASTM A182 F51/F53/F55
5	Ball	ASTM A350 LF2 + ENP / A182 F6a / F304 / F316 / F51	ASTM A105N + ENP / A694 F60 + ENP / A182 F6a / F316 / F51	ASTM A182 F316/F51	ASTM A182 F51/F53/F55
6	Seat Insert	PTFE / RPTFE / Nylon / Devlon / PEEK			
7	Trunnion Mounting	LF2 + ENP / F51	ASTM A105 + ENP / 4140 + ENP	ASTM A182 F316/F51	ASTM A182 F51/F53/F55
7-1	Trunnion Block	LF2 + ENP / F51	ASTM A105 + ENP / 4140 + ENP	ASTM A182 F316/F51	ASTM A182 F51/F53/F55
7-2	Trunnion Block Pin	SS410 / SS304 / SS316		SS316	SS316 / S31803 / S32205
8	Stuffing Box	LF2 + ENP	ASTM A105 + ENP	ASTM A182 F316	ASTM A182 F51/F53/F55
9	Connection Plate	LF2 + ENP	ASTM A105 + ENP	ASTM A182 F316	ASTM A182 F51/F53/F55
10 & 11	Stem O-Ring	Viton-B / Viton AED / Viton GLT / Aflas / Elast-o-lion 985®			
12	Gland O-Ring	Viton-B / Viton AED / Viton GLT / Aflas / Elast-o-lion 985®			
13	Seat O-Ring	Viton-B / Viton AED / Viton GLT / Aflas / Elast-o-lion 985®			
14	Seat Subseal	Viton-B / Viton AED / Viton GLT / Aflas / Elast-o-lion 985® / Graphite			
15	Closure O-Ring	Viton-B / Viton AED / Viton GLT / Aflas / Elast-o-lion 985®			
16	Trunnion O-Ring	Viton-B / Viton AED / Viton GLT / Aflas / Elast-o-lion 985®			
17	Backup Ring	PTFE / Nylon / PEEK			
18	Gland Gasket	SS + Graphite / SS + PTFE			
19	Closure Gasket	SS + Graphite / SS + PTFE			
20	Trunnion O-Ring	Viton-B / Viton AED / Viton GLT / Aflas / Elast-o-lion 985®			
21	Stem Packing	PTFE / Graphite			
22	Seat Spring	17-4 / Inconel X 750			
23	Bearing	SS + PTFE / SS + Nitriding			
24	Thrust Washer	PTFE / RPTFE / Devlon / PEEK			
25	Sealant Fitting	Stainless Steel			
26 & 27	Screw	ASTM A320 L7 / L7M + ZP	ASTM A193 B7(M) + ZP	ASTM A193 B8(M) CL 1/2	
28	Stud	ASTM A320 L7 / L7M + ZP	ASTM A193 B7(M) + ZP	ASTM A193 B8(M) CL 1/2	
29	Nut	ASTM A194 7L / 7ML + ZP	ASTM A194 2H(M) + ZP	ASTM A194 8(M) CL 1/2	
30	Grounding Ball	Stainless Steel			Duplex Steel
31	Grounding Spring	Stainless Steel			Duplex Steel
32	Stem Key	AISI 1045			S31803 / S32205
33	Positioning Pin	316 Stainless Steel			Duplex Steel
34 & 35	Vent Plug & Drain Plug	316 Stainless Steel			Duplex Steel
36	Connection Plate	LF2 / ASTM A105N	ASTM A105N	ASTM A182 F316	ASTM A182 F51
37 & 38	Gear & Handwheel	Ductile Iron, Carbon Steel Assembly			

1500LB and 2500LB refer to drawing. O-ring and backing rings specified in larger sizes.

The above specifications are general in nature and subject to change without notice.



AUSTRALIAN PIPELINE VALVE®



www.australianpipelinevalve.com.au

LOCAL DISTRIBUTOR



QUALITY ASSURANCE AND CERTIFICATION

We are continually improving all facets of quality assurance. Full metallurgical and test certificates are always supplied for all pressure retaining parts, we also provide it on all major trim components.

This brochure is a general overview only, individual drawings and data sheets can be furnished on request.

If you have any requirement in the field of valves, please contact us for a prompt response. Continuous development of Australian Pipeline Valve products may necessitate changes in the design or manufacturing processes. Australian Pipeline Valve reserves the right to effect any such changes without prior notice.

