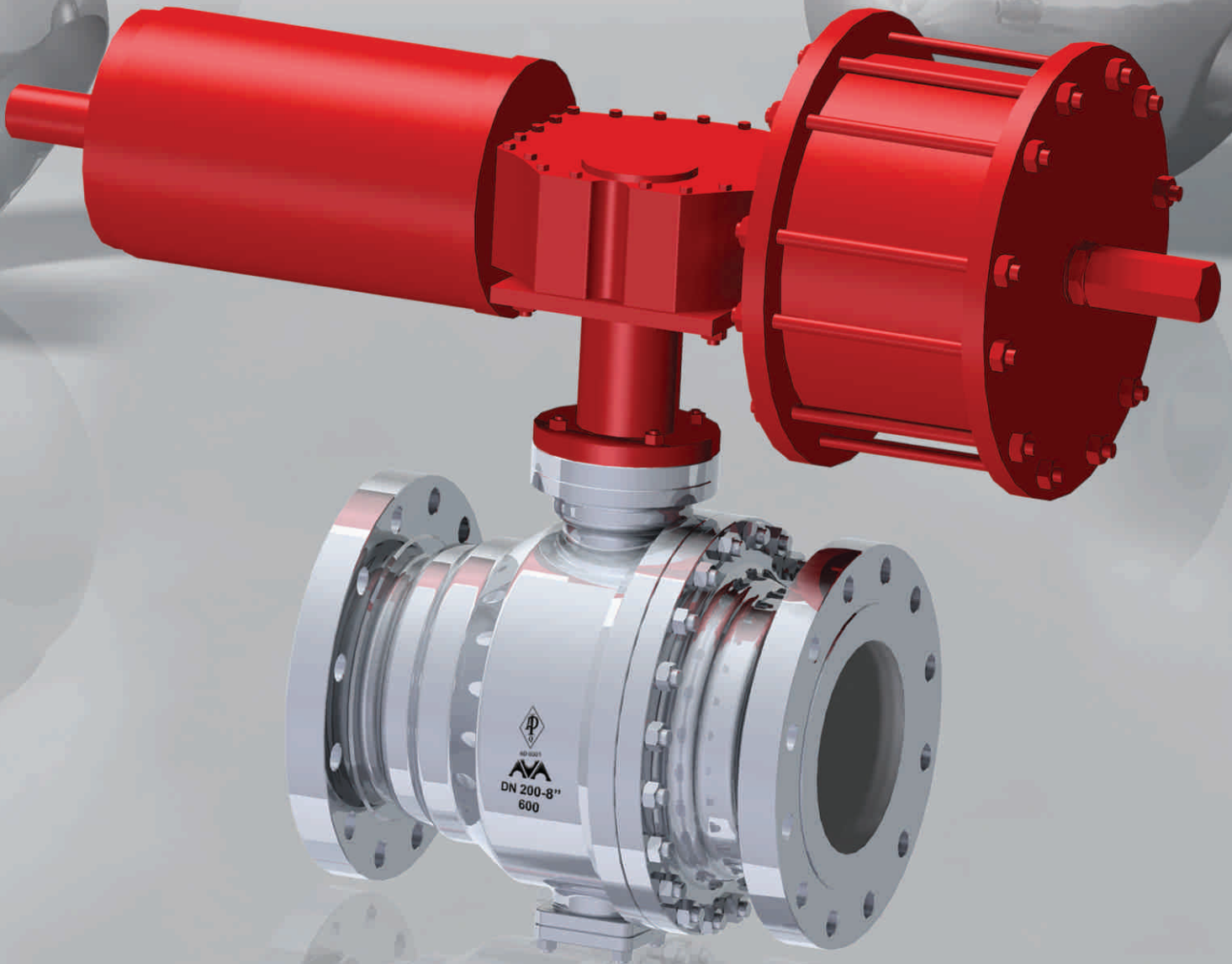




# TRUNNION MOUNTED BALL VALVES

ENGINEERED FOR HIGH PERFORMANCE AND LOW EMISSIONS



6D 0301



0045



SIL 3 IEC 61508



ATEX 94/9/EC

**MICROFINISH VALVES, INC.** 

a wholly owned subsidiary of

**MICROFINISH VALVES PVT. LTD.** 



## THE MICROFINISH WAY

Microfinish group is a privately owned and managed organization specializing in industrial valves and automation for energy, process, and natural resource industries. The guiding principles of Microfinish are:

- Personal commitment to our customers
- Top quality in everything we do
- Best available technology for all our products and services

## INTRODUCTION

Microfinish group was established in 1971 to manufacture ball valves, bellows sealed globe valves, globe valves for chlorine service, gate globe check valves, and knife edge gate valves. Other valves were added to the product range in later years. For the last 40 years we have designed, developed, and supplied our products to:

- Oil and gas facilities, hydrocarbon processing, refineries, and petrochemical plants
- Fossil fuel, nuclear, and combined cycle power plants
- Fertilizer, chemical, and pharmaceutical industries
- Food and beverage plants
- Mining, minerals processing, and steel sectors
- Pulp and paper mills

We are recognized as a quality manufacturer of reliable valves for industry. Our wealth of experience has enabled Microfinish to become a prominent supplier of ball valves throughout the world.

Industrial technology is progressing at a remarkable rate, so we have established a research and development department equipped with modern test facilities.

Our manufacturing facilities are located in separate and well laid-out buildings with ample scope for future expansion. The industrial estate in Hubli is one of the biggest and fastest developing manufacturing zones in the state of Karnataka. The city of Hubli is well served by air, rail, and road connections; it is situated on the national highway NH 4 between Mumbai and Bengaluru.

In 1994 our organization was the first in India to receive the prestigious ISO 9001 certificate (1994 edition) from RWTÜV in Germany. Microfinish ball valves have had: API 6D certification since February 1999; PED certification since 2002; SIL 3 certification since 2009; ATEX, GOST, and TA-Luft certification since 2010.

## MICROFINISH VALVES, INC.

We launched Microfinish Valves, Inc. in Houston, Texas in July 2010 to bring our portfolio of specialized industrial valves to the key region of the Americas. We provide sales, technical support and a full array of inventory to our core regional markets. In a time when outsourcing of manufacturing and design control has become common, we believe our business model of quality assurance through design ownership and in-house manufacturing control in India will be a winning combination with end users who want to know the company behind the product, as well as behind the sale.

## PRODUCTS

We manufacture the following products in various materials including carbon steel, stainless steel, duplex, and high nickel alloys:

- Ball valves in floating and trunnion mounted designs, with cast and forged construction, including three way and jacketed configurations, and special versions for cryogenic and high temperature services
- Bellows sealed globe valves
- Globe valves for chlorine service
- Knife edge gate valves
- Forged gate, globe, and check valves

Microfinish is committed to total quality. Stringent and efficient quality assurance and control systems have been implemented in accordance with ISO 9001: 2000.

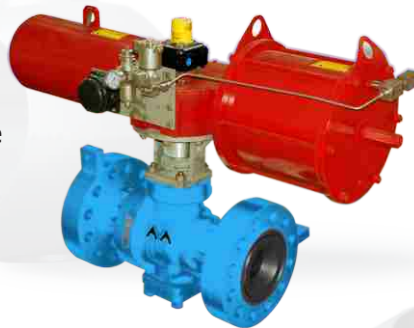
## VALVE AUTOMATION

Microfinish has expertise in valve automation technology and can offer complete systems. Our wide range of actuators, controls and accessories enables Microfinish to be a single source for integrated automated valve systems. Microfinish valves are available in a variety of automation packages that include:

- Pneumatic, electric, hydraulic, and electro hydraulic actuated valves and systems
- Gas, and gas over oil automation systems
- On-off remotely operated valves with automation systems
- Emergency shutdown(ESD) valves with automation systems
- Vertical actuators for special applications
- Flame proof enclosures for actuators and accessories

## PRODUCTS

Microfinish Trunnion Mounted Ball Valves are available in both reduced bore and full bore designs in sizes from 2" to 36" and pressure classes from ASME 150 to 2500. Ball valves are designed using the latest CAD software to achieve the highest levels of performance, reliability, and safety as required by the user industries.



Design standards are API 6D and ASME B16.34.

Fire safe testing is certified by third party inspectors.

## STANDARD DESIGN FEATURES

- Designed and manufactured to API 6D
- Minimum shell thickness to ASME B16.34
- Fire safe design to API 607 and API 6FA
- Bolted or fully welded body design
- Three alternative seating arrangements
- Double block and bleed function
- Face to face dimensions to API 6D and ASME B16.10
- Flanged and welding ends with or without transition pups
- Actuator mounting flange to ISO 5211
- Lever, gear, electric, pneumatic, hydraulic, gas, and gas over oil operation
- Bidirectional fluid flow

## APPLICABLE STANDARDS

Design standard API 6D, API 608, ASME B16.34  
BS EN ISO 17292

Testing standard API 6D, API 598, BS EN 12266  
ISO 5208, ASME B16.34

Flange standard ASME B16.5

Welding ends ASME B16.25

Sour gas service NACE MR0175 and MR0103

Fire safe testing API 607, API 6FA

## OPTIONAL FEATURES

- Compliant with NACE MR0175 and MR0103 for sour gas service
- Emergency sealant injection
- Stem extension for underground installations
- Double piston seat effect
- Metal seated ball valves
- High temperature ball valves
- Cryogenic ball valves
- Special overlay on balls and seats for abrasive services
- Special coatings on valve bodies and fasteners

## TEST PRESSURES

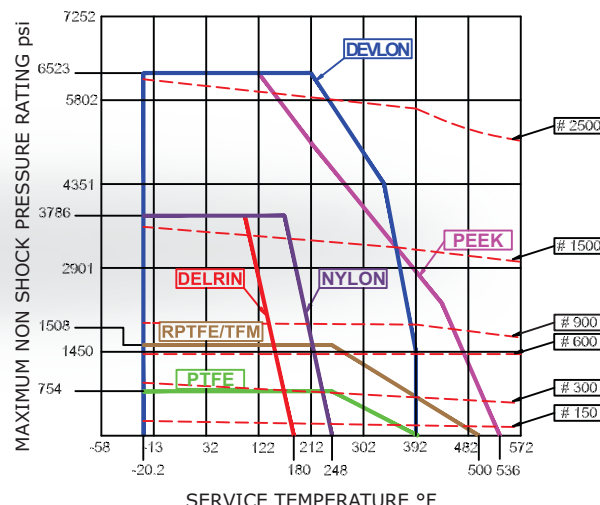
Valve Rating	Test Pressure - psi		
Pressure Class	Hydro Shell*	Hydro Seat*	Air Seat
150	430	315	100
300	1110	815	100
600	2220	1630	100
900	3330	2445	100
1500	5560	4080	100
2500	9255	6790	100

\*Applicable for WCB material

## PRESSURE TEMPERATURE RATING OF SEAT

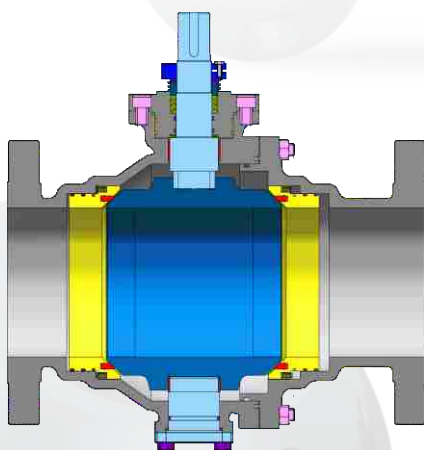
The pressure temperature rating of a ball valve is determined by either the body or the seat limits. Materials of construction, fluid properties, and operating parameters are also influential factors. The ratings in the graph should therefore be used only as a guide. For temperatures below -20°F consult Microfinish.

The dotted lines indicate pressure temperature ratings for metal seated ball valves with 316 SS trim. Ratings may vary with other trim materials.





# DESIGN FEATURES FOR O



Bolted design

## STANDARD SEAT FEATURES

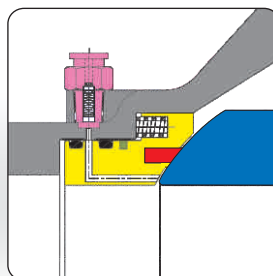
- **Single Seat:** Cavity relief combined with a block and bleed trunnion ball and floating seat guarantees a tight shut-off. Two independent spring loaded seat rings are always in contact with the ball to provide a tight and effective seal at low differential pressures. At higher differential pressures the upstream seat ring becomes pressure energized against the ball to form a tight seal, while the downstream seat remains spring loaded. Springs are fully confined to avoid fluid contact and build up of debris.
- **Cavity Relief:** This seating system is designed to vent automatically any excess pressure in the body cavity. The floating seat design allows for relief of excess pressure to the downstream side.
- **Double Block and Bleed Function:** The floating seats provide a double block and bleed function when a drain plug or a bleed valve is mounted on the body. The cavity can be relieved through vent or drain connections. The independent upstream and downstream sealing ensures tight shut-off at the body cavity in the fully open or closed position. This feature prevents fluid contamination and detects seat leakage without removing the valve from the pipeline.
- **Optional Double Sealing Feature:** This is achieved by a seat design with double piston effect. If the upstream seat fails, the downstream seat will seal effectively. This seat design does not provide self body cavity relief unless a relief valve is fitted to the body.

## VALVE DESIGN

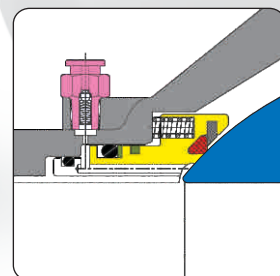
Microfinish valves conform to and exceed the design requirements of API 6D and ASME B16.34. All valves are fire safe designs. Pressure temperature ratings and flange dimensions conform to ASME B16.34 and ASME B16.5.

The two piece and three piece bolted construction provides maximum rigidity to withstand pipeline forces and facilitates maintenance on site. A fully welded body design is also available.

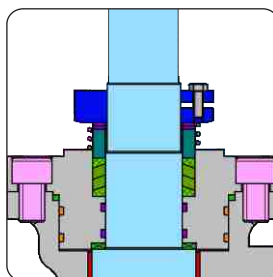
Both reduced bore and full bore configurations are available. End connections may be welding ends or flanged with either raised face or ring type joints.



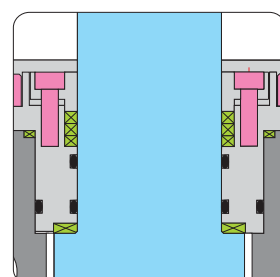
Metal to metal seating with non metallic insert



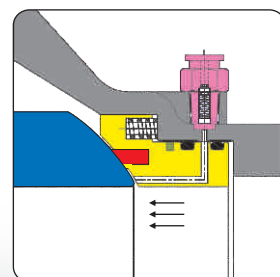
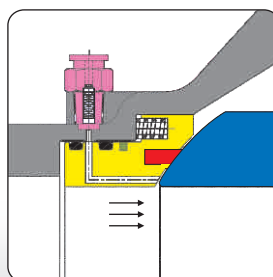
Metal to metal seating with o-ring insert



Adjustable low emission stem sealing - 2 piece design



Low emission stem sealing - 3 piece design



Double block and bleed function

# RITICAL APPLICATIONS



Fully welded design

## LOW EMISSION STEM SEALING

A double o-ring system provides excellent stem sealing in normal operating conditions. A secondary graphite seal is retained by a gland for fire safety. The blowout proof stem design allows replacement of stem seals under pressure when the valve is in either the fully closed or the fully open position, and the pressure in the cavity has been completely released. These valves meet the latest fugitive emission requirements.

## SEALANT INJECTION

Microfinish ball valves are designed and manufactured to provide tight shut-off. A sealant injection system can be provided on request. In the event of contaminants causing damage to the seat insert or stem seal, an emergency seal can be formed using the sealant injection system.

## DOUBLE SEALING

The body joints are furnished with double sealing arrangements for maximum security.

## TRUNNION MOUNTED BALL

Our standard design includes a trunnion mounted ball. Forces acting on the ball are transmitted to the valve body through the stem and trunnion. Steel backed PTFE impregnated bearings support rotation of the stem and trunnion, thus minimizing friction caused by the side thrust resulting from the action of fluid pressure on the ball. The result is a lower operating torque and the bearings are maintenance free.

## ANTISTATIC FEATURE

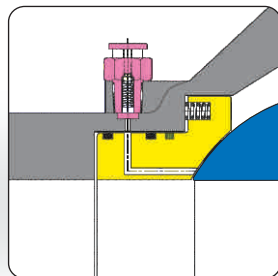
To meet antistatic requirements all valves are provided with stainless steel springs which ensure electrical continuity between ball and stem, and between stem and body.

## FIRE SAFE DESIGN

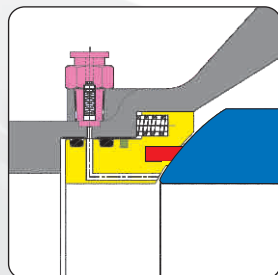
Microfinish trunnion mounted ball valves have been designed to meet the fire safety standards of API 607 and API 6FA. Valves are fire safe tested, witnessed, and certified by an independent third party.

## STEM EXTENSION FOR UNDERGROUND INSTALLATIONS

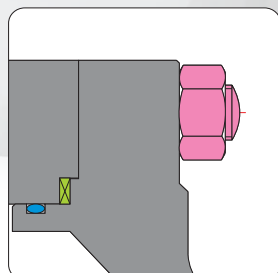
Microfinish supplies valves with suitable stem extensions. All drain, vent, and emergency sealant lines are extended and all pipes are firmly attached to the stem extension.



Metal to metal seating



Sealant injection

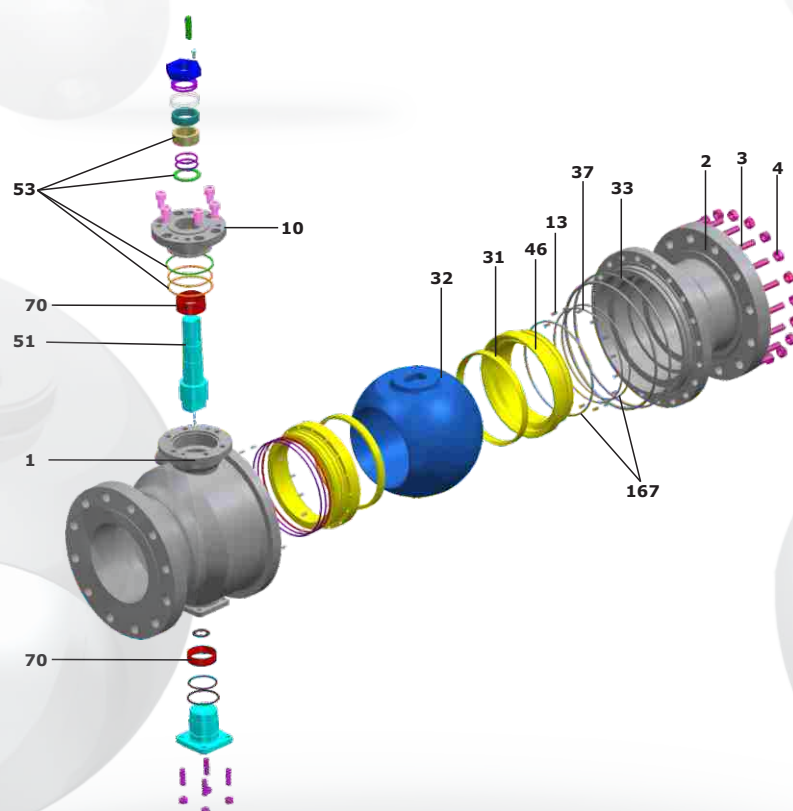


Double sealing on body joints



Stem extension for underground installations

# TWO PIECE CAST VALVE COMPONENTS

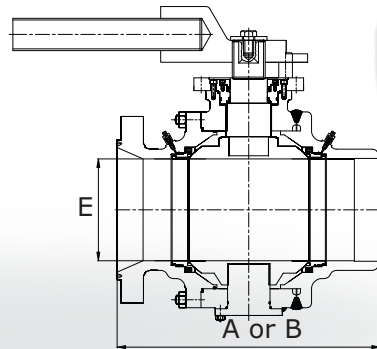
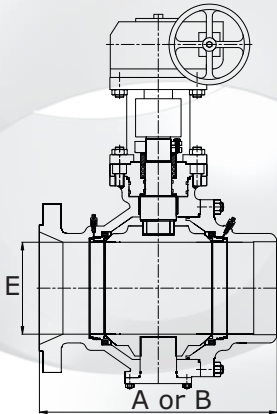


Item no.	Item description	Pressure class	Sizes	Materials of construction
1	Body	All	All	WCB*, WCC, LCB, LCC, CF8, CF8M*, CF3, CF3M, CD4MCu, CN7M, duplex, nickel, and other alloys
2	Tail piece			
10	Stuffing box			
46	Seat retainer			
32	Ball	All	All	WCB+ ENP*, LCB+ENP, 304, 304L, 316*, 316L, CD4MCu, CN7M, and other alloys
51	Stem		All	410*, 316*, 17-4PH*, Nitronic 50*, 304, 4140, and other alloys
-	Trim coatings		All	ENP, Stellite, tungsten carbide, nickel boron
3, 4	Body stud/ nuts	All	All	B7M/2HM*, B8M/8M*, B7/2H, B8/8, B16/16
31	Seat	150 to 600	2" to 6"	TFM*, PTFE, RPTFE, Nylon, Delrin, PEEK, Devlon, PCTFE, and metal
		150 to 600	8"and larger	Nylon*, Delrin, PEEK, Devlon, PCTFE, and metal
		900, 1500	All	Nylon*, Delrin, PEEK, Devlon, PCTFE, and metal
		2500	All	Devlon*, PEEK, and metal
13	Spring	All	All	Inconel X-750
33	Body seal	All	All	Spiral wound with Grafoil filler
37	Seat seal	All	All	Grafoil
53	Stem seal	All	All	Grafoil, Viton, other elastomers available
70	Bearing	All	All	PTFE backed steel or SS
167	Seat retainer O-ring	150 to 2500	All	Viton, HNBR, and other elastomers

\* Indicate standard materials

# PRODUCT CONFIGURAT

Series	Series (in)	Series	Series (in)	Bore	Pressure Class	End Connections
Two Piece Construction		Three Piece Construction				
T84R2, F2	2-36	T84R3	2-36	RB, FB	150	FE, WE
T85R2, F2	2-36	T85R3	2-36	RB, FB	300	FE, WE
T87R2, F2	2-36	T87R3	2-36	RB, FB	600	FE, WE
T89R2, F2	1-24	T89R3	1-24	RB, FB	900	FE, WE
T90R2, F2	1-24	T90R3	1-24	RB, FB	1500	FE, WE
T91R2, F2	1-12	T91R3	1-12	RB, FB	2500	FE, WE
RB = Reduced bore. FB = Full bore. FE = Flanged ends. WE = Welding ends.						



- 2-piece design with bolted cast body
- Raised face flanged or welding ends
- Gear operated
- 3-piece design with bolted or welded forged body
- Ring joint flanged or welding ends
- Lever operated

RB = Reduced bore

Class 150, class 300, and class 600

FB = Full bore

Size (in)		A (Flanged ends - raised face)			B (Welding ends)			E	
		150	300	600	150	300	600	150,300,600	
RB	FB							RB	FB
	2	7.00	8.50	11.50	8.50	8.50	11.50		1.93
3x2	3	8.00	11.12	14.00	11.12	11.12	14.00	1.93	2.91
4x3	4	9.00	12.00	17.00	12.00	12.00	17.00	2.91	3.94
6x4	6	15.50	15.88	22.00	18.00	18.00	22.00	3.94	5.91
8x6	8	18.00	19.75	26.00	20.50	20.50	26.00	5.91	7.91
10x8	10	21.00	22.38	31.00	22.00	22.00	31.00	7.91	9.92
12x10	12	24.00	25.50	33.00	25.00	25.00	33.00	9.92	11.93
14x10	14	27.00	30.00	35.00	30.00	30.00	35.00	9.92	13.15
16x12	16	30.00	33.00	39.00	33.00	33.00	39.00	11.93	15.16
18x14	18	34.00	36.00	43.00	36.00	36.00	43.00	13.15	17.17
20x16	20	36.00	39.00	47.00	39.00	39.00	47.00	15.16	19.17
22x18	22	40.00*	43.00	51.00	43.00*	43.00	51.00	17.17	21.18
24x20	24	42.00	45.00	55.00	45.00	45.00	55.00	19.17	23.19
26x22	26	45.00	49.00	57.00	49.00	49.00	57.00	21.18	24.92
28x24	28	49.00	53.00	61.00	53.00	53.00	61.00	23.19	26.93
30x24	30	51.00	55.00	65.00	55.00	55.00	65.00	23.19	28.94
32x26	32	54.00	60.00	70.00	60.00	60.00	70.00	24.92	30.67
34x28	34	58.00	64.00	76.00	64.00	64.00	76.00	26.93	32.68
36x30	36	60.00	68.00	82.00	68.00	68.00	82.00	28.94	34.41



# IONS AND DIMENSIONS



RB = Reduced bore

Class 900 and class 1500

FB = Full bore

Size (in)		A (Flanged ends - ring joint)		B (Welding ends)		E			
		900	1500	900	1500	900		1500	
RB	FB					RB	FB	RB	FB
	1	10.00	10.00 *	10.00 *	10.00 *		0.98		0.98
1¼x1	1¼	11.00	11.00 *	11.00 *	11.00 *	0.98	1.26	0.98	1.26
1½x1¼	1½	12.00	12.00 *	12.00 *	12.00 *	1.26	1.50	1.26	1.50
2X1½	2	14.62	14.62	14.50	14.50	1.50	1.97	1.50	1.93
3X2	3	15.12	18.62	15.00	18.50	1.97	2.99	1.93	2.91
4X3	4	18.12	21.62	18.00	21.50	2.99	4.02	2.91	3.94
6X4	6	24.12	28.00	24.00	27.75	4.02	5.91	3.94	5.67
8X6	8	29.12	33.13	29.00	32.75	5.91	7.99	5.67	7.56
10X8	10	33.12	39.38	33.00	39.00	7.99	10.00	7.56	9.41
12X10	12	38.12	45.12	38.00	44.50	10.00	12.01	9.41	11.30
14X10	14	40.88	50.25	40.50	49.50	10.00	12.76	9.41	12.40
16X12	16	44.88	55.38	44.50	54.50	12.01	14.69	11.30	14.17
18X14	18	48.50	61.39 *	48.00	60.51	12.76	16.65	12.40	15.98
20X16	20	52.50	66.39 *	52.00	65.51	14.69	18.54	14.17	17.87
24X20	24	61.75	77.62 *	61.00	76.50	18.54	22.48	17.87	21.50

RB = Reduced bore

Class 2500

FB = Full bore

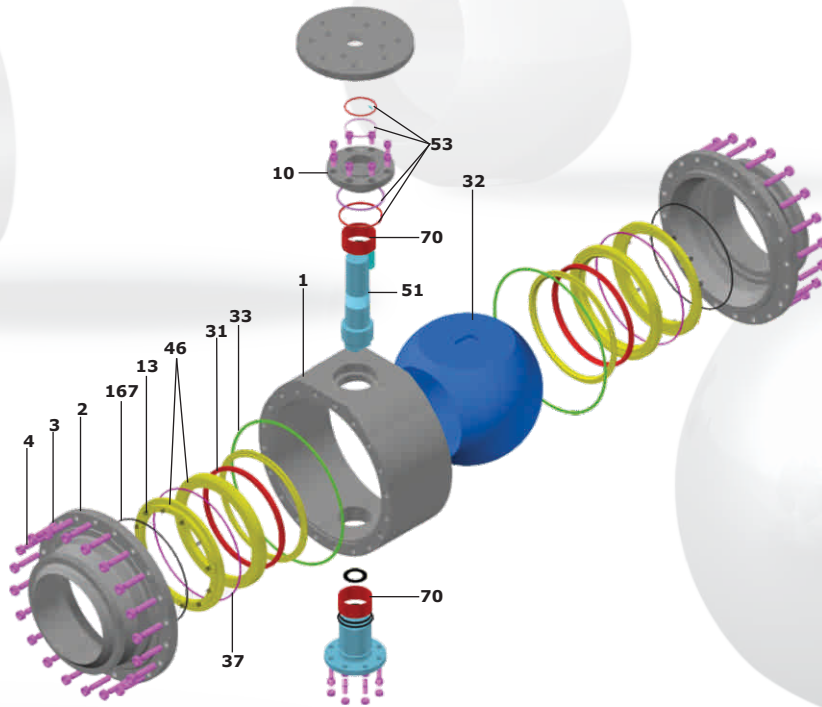
Size (in)		A (Flanged ends - ring joint)	B (Welding ends)	RB	FB
		2500		E	
RB	FB			RB	FB
	1	12.13 *	12.13 *		0.98
1½X1	1.5	15.24 *	15.12 *	0.98	1.50
2X1½	2	17.37	17.75	1.50	1.65
3X2	3	23.00	22.75	1.65	2.44
4X3	4	26.88	26.50	2.44	3.43
6X4	6	36.50	36.00	3.43	5.16
8X6	8	40.87	40.25	5.16	7.05
10X8	10	50.88	50.00	7.05	8.78
12X10	12	56.88	56.00	8.78	10.43

1. All dimensions are in inches.
2. Dimensions "A" and "B" are certified and others are indicative.
3. Reduced bore valves are also available with one, two, and three size smaller bores.
4. Weights of valves and other dimensions are available on request.
5. \* These dimensions are not listed in API 6D standard, and they are as per BS EN 558.
6. The following configurations are available on request: fully welded construction; forged steel design; flange drilling other than ASME.
7. Operators available: lever, gear, electrical, pneumatic, hydraulic, gas, and gas over oil.

NOTE: In keeping with our policy of continuous improvement, we reserve the right to institute changes in design, material, dimensions, or specifications without notice and without incurring any obligation to make such changes and modifications on product previously or subsequently sold. All dimensions are approximate and for illustration purposes only. For exact dimensions, please request a certified drawing.



# THREE PIECE FORGED VALVE COMPONENTS



Item no.	Item description	Pressure class	Sizes	Materials of construction
1	Body	All	All	A105*, LF2, F316*, F316L, F304, F304L, and other alloys
2	Tail piece			
10	Stuffing box			
46	Seat retainer			
32	Ball	All	All	WCB+ ENP*, LCB+ENP, 304, 304L, 316*, 316L, CD4MCu, CN7M, and other alloys
51	Stem	All	All	410*, 316*, 17-4PH*, Nitronic 50*, 304, 4140, and other alloys
-	Trim coatings	All	All	ENP, Stellite, tungsten carbide, nickel boron
3, 4	Body stud/ nuts	All	All	B7M/2HM*, B8M/8M*, B7/2H, B8/8, B16/16
31	Seat	150 to 600	2" to 6"	TFM*, PTFE, RPTFE, Nylon, Delrin, PEEK, Devlon, PCTFE, and metal
		150 to 600	8"and larger	Nylon*, Delrin, PEEK, Devlon, PCTFE, and metal
		900, 1500	All	Nylon*, Delrin, PEEK, Devlon, PCTFE, and metal
		2500	All	Devlon*, PEEK, and metal
13	Spring	All	All	Inconel X-750
33	Body seal	All	All	Spiral wound with Grafoil filler
37	Seat seal	All	All	Grafoil
53	Stem seal	All	All	Grafoil, Viton, other elastomers available
70	Bearing	All	All	PTFE backed steel or SS
167	Seat retainer O-ring	150 to 2500	All	Viton, HNBR, and other elastomers

\* Indicate standard materials

# GLOBAL SALES OFFICES

**HEADQUARTERS AND 12 SALES OFFICES IN INDIA**  
**Authorized representatives in Australia, Malaysia and Singapore**

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**Sales of specialized industrial valves, technical support,  
and a full array of inventory**



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TMBV 02: Feb. 2011