TRUNNION MOUNTED BALL VALVES

ENGINEERED FOR HIGH PERFORMANCE AND LOW EMISSIONS

TÜV NORD ISO 9001

6D 0301

0045

SIL 3 IEC 61508

ATEX 94/9/EC

MICROFINISH

Pumps • Valves • Automation

INTRODUCTION TO THE COMPANY

THE MICROFINISH WAY

Microfinish group is a privately owned and managed organization specializing in industrial valves and pumps 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

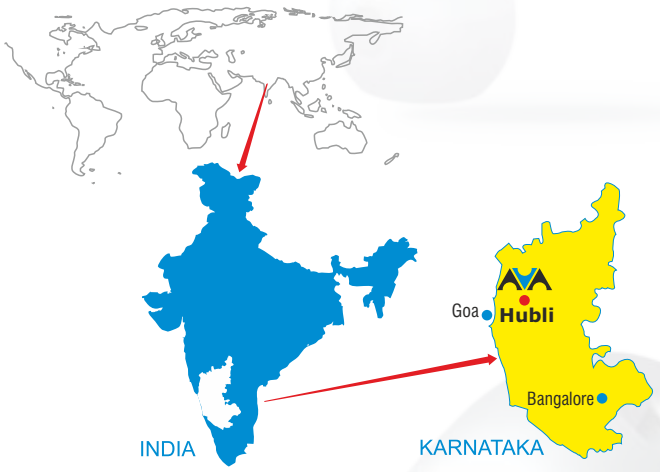
Microfinish group was established in 1971 to manufacture ball valves, bellows sealed globe valves, globe valves for chlorine service, gate, globe check valves, and knife edge gate valves. Other valves and pumps were added to the product range in later years. We have designed, developed, and supplied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

- Oil and gas facilities, hydrocarbon processing refineries, and petrochemical plants
- Fossil fuel, nuclear, and co-generation 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 and pumps for industry. Our wealth of experience has enabled Microfinish to become a prominent supplier of ball valves throughout the world, and of chemical process pumps in India.

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 Bangalore.



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 bodies, including three way and jacketed configurations, and special versions for cryogenic and high temperature services
- Bellows sealed globe valves
- Globe valves for chlorine service
- Butterfly valves
- Knife edge gate valves
- Gate, globe, and check valves in forged and cast versions
- Chemical process pumps in standard and specialty configurations
- Sanitary and slurry pumps

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

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 also had API 6D certification since February 1999 and PED certification since 2002.

In 1988 the International Labor Organization in Geneva gave Microfinish an award for good working conditions and environment as a result of the hard work of every employee and the commitment of management.

IN-HOUSE FACILITIES FOR QUALIFICATION TESTS

- Fire safe
- High temperature with superheated steam
- Low temperature for cryogenic valves
- Life cycle
- Fugitive emissions
- Pump performance and NPSH
- Noise and vibration

PRODUCTS

Microfinish Trunnion Mounted Ball Valves are available in both reduced bore and full bore designs in sizes from 50 to 1200 mm and pressure classes from ANSI 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 B 16.34
- Fire safe design to API 607 and API 6FA
- Bolted or fully welded body design
- Three alternative seating arrangements
- Double block and bleed
- Face to face dimensions to API 6D and ANSI 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

OPTIONAL FEATURES

- Compliant with NACE MR 0175 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

APPLICABLE STANDARDS

Design standard	API 6D, API 608, ASME B 16.34 BS EN ISO 17292
Testing standard	API 6D, API 598, BS EN 12266 ISO 5208, ASME B 16.34
Flange standard	ASME B 16.5
Welding ends	ASME B 16.25
Sour gas service	NACE MR 0175
Fire safe testing	API 607, API 6FA

TEST PRESSURES

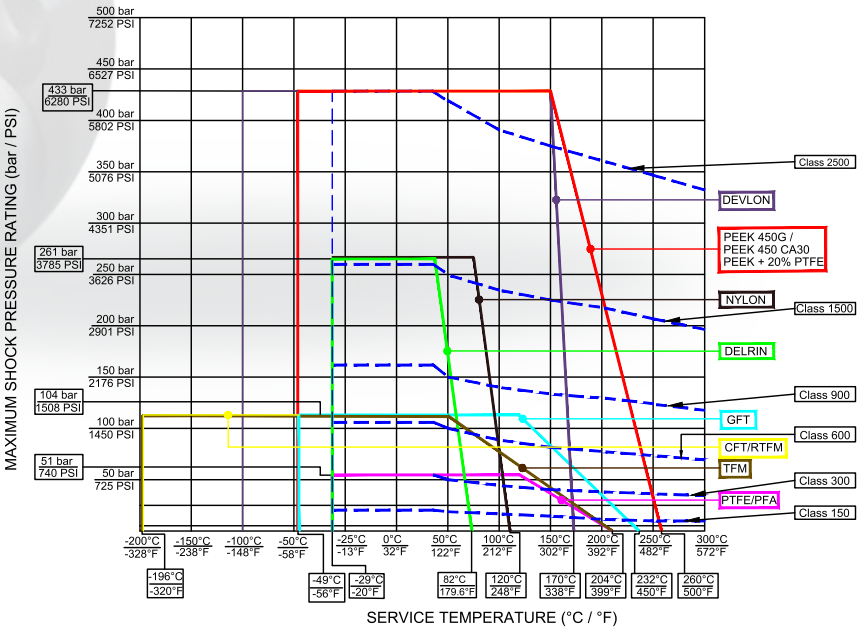
Pressure Class	Test Pressure - bar		
	Hydrostatic Shell*	Hydrostatic Seat*	Air Seat
150	29	22	7
300	77	57	7
600	154	113	7
800	205	150	7
900	230	169	7
1500	383	281	7
2500	638	469	7

*Applicable for WCB material

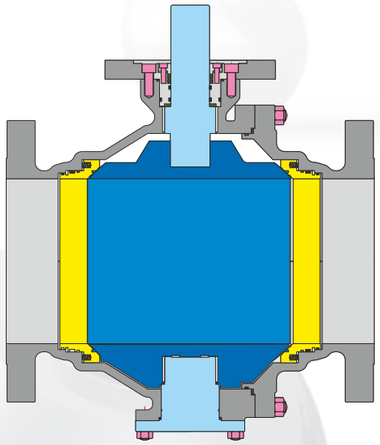
PRESSURE TEMPERATURE RATING OF SEAT

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 -30°C consult Microfinish.

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



DESIGN FEATURES FOR CRITICAL APPLICATIONS



Bolted design

VALVE DESIGN

Microfinish valves conform to and exceed the design requirements of API 6D and ASME B 16.34. All valves are fire safe designs. Pressure temperature ratings and flange dimensions conform to ASME B16.34 and 16.5.

The two 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.

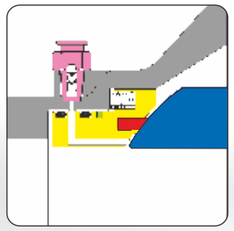
STANDARD SEAT FEATURES

- **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.

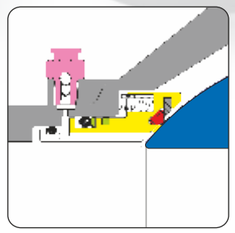
- **Cavity Relief:** This seating system is designed to vent automatically any excess pressure in the body cavity. The floating seat design allows for relief of excess pressure to the downstream side.

- **Double Block and Bleed:** 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 with out removing the valve from the pipeline.

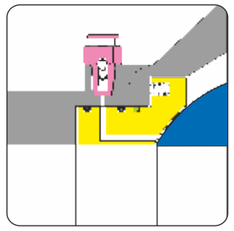
- **Optional Double Sealing Feature:** This is achieved by a seat design with double piston effect. If the upstream seat fails, the down stream seat will seal effectively. This seat design does not provide self body cavity relief unless a relief valve is fitted to the body.



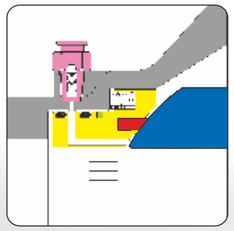
Metal to metal seating with non metallic insert

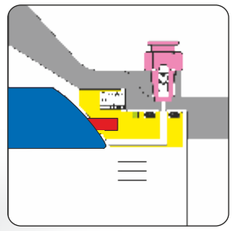


Metal to metal seating with o-ring insert



Metal to metal seating

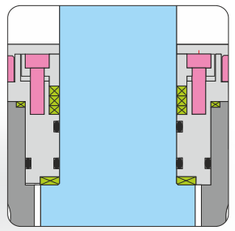




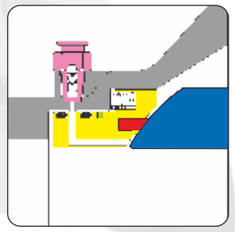
Double block and bleed design

Fully welded design

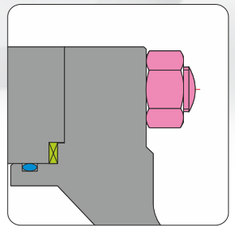
Stem extension for underground installations



Low emission stem sealing



Sealant injection



Double sealing on body joints

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.

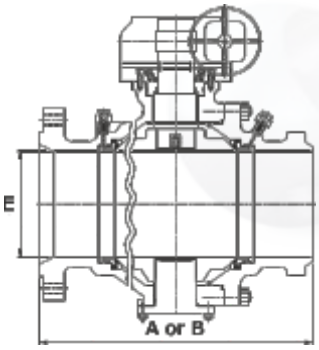
FIRE SAFE DESIGN

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 independant third party.

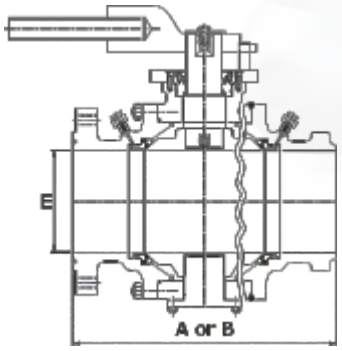
STEM EXTENSION FOR UNDERGROUND INSTALLATIONS

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.

DIMENSIONS



- 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 (mm)		A - (Flanged Ends - raised face) Valve Length			B - (Welding Ends) Valve Length			E - Bore Diameter	
FB	RB	Class 150	Class 300	Class 600	Class 150	Class 300	Class 600	FB	RB
50		178	216	292	216	216	292	49	
80	80x50	203	283	356	283	283	356	74	49
100	100x80	229	305	432	305	305	432	100	74
150	150x100	394	403	559	457	457	559	150	100
200	200x150	457	502	660	521	521	660	201	150
250	250x200	533	568	787	559	559	787	252	201
300	300x250	610	648	838	635	635	838	303	201
350	350x250	686	762	889	762	762	889	334	252
400	400x300	762	838	991	838	838	991	385	303
450	450x350	864	914	1092	914	914	1092	436	334
500	500x400	914	991	1194	991	991	1194	487	385
550	550x450	991*	1092	1295	1092*	1092	1295	538	436
600	600x500	1067	1143	1397	1143	1143	1397	589	487
650	650x550	1143	1245	1448	1245	1245	1448	633	538
700	700x600	1245	1346	1549	1346	1346	1549	684	589
750	750x600	1295	1397	1651	1397	1397	1651	735	589
800	800x650	1372	1524	1778	1524	1524	1778	779	633
850	850x700	1473	1626	1930	1626	1626	1930	830	684
900	900x750	1524	1727	2083	1727	1727	2083	874	735
950	950x800	1700*	1900*	2085*	1750*	1900*	2175*	925	779
1000	1000x850	1702*	1905*	2337*	1950*	1950*	2175*	976	830
1050	1050x900	1860*	1930*	2387*	2015*	2015*	2175*	1020	874
1200	1200x1050	2235*	2235*	2667*	2220*	2220*	2220*	1166	1020

RB = Reduced bore		Class 900 and class 1500						FB = Full bore	
SIZE (mm)		A - (Flanged Ends - ring joints)Valve Length		B - (Welding Ends) Valve Length		E - Bore Diameter			
						Class 900		Class 1500	
FB	RB	Class 900	Class 1500	Class 900	Class 1500	FB	RB	FB	RB
25		254*	254*	254*	254*	25		25	
32	32x25	280*	280*	280*	280*	32	25	32	25
40	40x32	305*	305*	305*	305*	38	32	38	32
50	50x40	368	368	368	368	49	38	49	38
80	80x50	381	470	381	470	74	49	74	49
100	100x80	457	546	457	546	100	74	100	74
150	150x100	610	705	610	705	150	100	144	100
200	200x150	737	832	737	832	201	150	192	144
250	250x200	838	991	838	991	252	201	239	192
300	300x250	965	1130	965	1130	303	252	287	239
350	350x250	1029	1257	1029	1257	322	252	315	239
400	400x300	1130	1384	1130	1384	373	303	360	287
450	450x350	1219	1559	1219	1537*	423	322	406	315
500	500x400	1321	1686	1321	1664*	471	373	454	360
550	550x450	1422*	1829*	1422*	1801*	522	423	500	406
600	600x500	1549	1972	1549	1943*	570	471	546	454

RB = Reduced bore — Class 900 and class 1500 — FB = Full bore

SIZE (mm)		A - (Flanged Ends - ring joints)Valve Length		B - (Welding Ends) Valve Length		E - Bore Diameter			
		Class 900	Class 1500	Class 900	Class 1500	Class 900		Class 1500	
FB	RB					FB	RB	FB	RB
650	650x550	1673	2077*	1625*	2048*	617	522	594	500
700	700x600	1749*	2176*	1727*	2148*	665	570	641	546
750	750x600	1902	2281*	1803*	2251*	712	570	686	546
800	800x650	1927*	2380*	1905*	2346*	760	617	730	594
850	850x700	2060*	2454*	2032*	2450*	808	665	775	641
900	900x750	2315	2590*	2182*	2556*	855	712	819	686
950	950x800	2377*	2726*	2296*	2662*	904	760	863*	730
1000	1000x850	2438*	2862*	2410*	2768*	956	808	907*	775
1050	1050x900	2541*	2998*	2516*	2874*	1006	855	951*	819
1200	1200x1050	2850*	3406*	2834*	3192*	1149	1006	1083*	951*

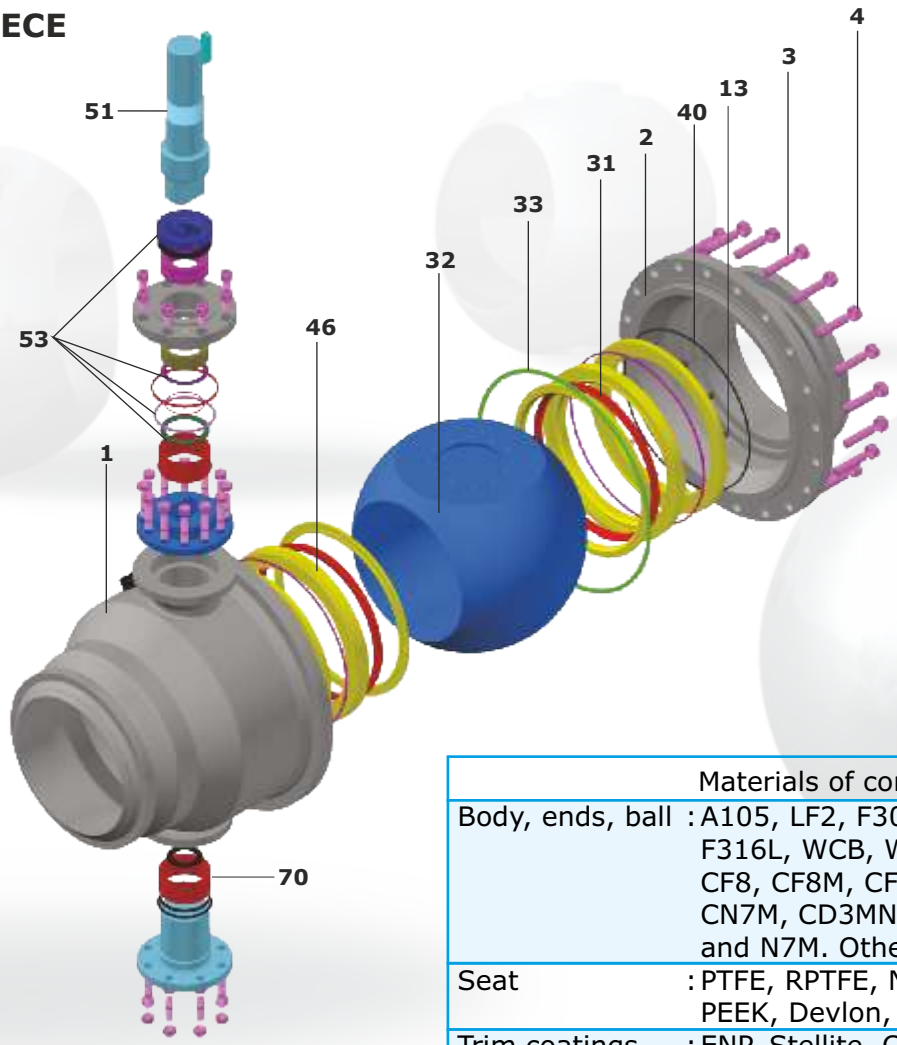
RB = Reduced bore — Class 2500 — FB = Full bore

SIZE (mm)		A - (Flanged Ends - ring joints) Valve Length	B - (Welding Ends) Valve Length	E - Bore Diameter	
FB	RB	Class 2500	Class 2500	FB	RB
25	25x20	308*	305*	25	19
40	40x32	384*	381*	38	32
50	50x40	454	451	42	38
80	80x50	584	578	62	42
100	100x80	683	673	87	62
150	150x100	927	914	131	87
200	200x150	1038	1022	179	131
250	250x200	1292	1270	223	179
300	300x250	1445	1422	265	223
350	350x250	1569*	1540*	292	223
400	400x300	1596*	1567*	333	265

1. All dimensions are in mm.
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 the API 6D Standard. They are as per Microfinish standard.
6. The following configurations are available on request: fully welded construction; forged steel design; flange drilling other than ANSI.
7. Operators available are: Lever, gear, electrical, pneumatic, hydraulic, electro hydraulic, gas, and gas over oil actuators.

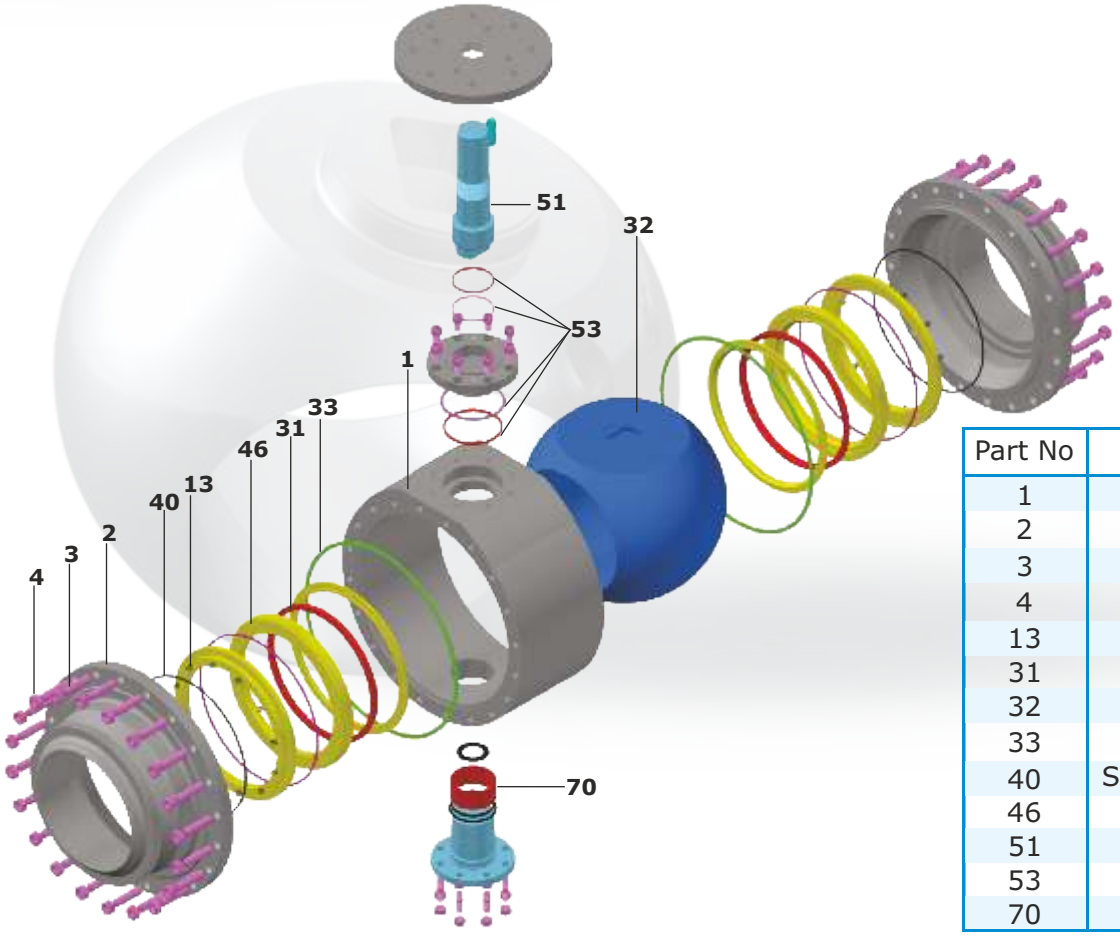
PARTS NUMBERS

TWO PIECE



Materials of construction	
Body, ends, ball	: A105, LF2, F304, F316, F304L, F316L, WCB, WCC, LCB, LCC, CF8, CF8M, CF3, CF3M CD4MCu, CN7M, CD3MN, CN3MN, CW6M and N7M. Other materials on request.
Seat	: PTFE, RPTFE, Nylon, Delrin, PEEK, Devlon, metal
Trim coatings	: ENP, Stellite, Carbide, or Nickel Boron

THREE PIECE



Part No	Name of the Part
1	Body
2	Tailpiece
3	Body Stud
4	Body Nut
13	Spring
31	Seat
32	Ball
33	Body Seal
40	Seat Retainer 'O' Ring
46	Seat Retainer
51	Stem
53	Stem Seal
70	Bearing

PRODUCT RANGE						
SERIES	SIZES-mm	SERIES	SIZES-mm	BORE	PRESSURE CLASS	END CONNECTIONS
TWO PIECE CONSTRUCTION		THREE PIECE CONSTRUCTION				
T84R2	50-1200	T84R3	50-1200	RB	150	FE, WE
T84F2	50-1200	T84F3	50-1200	FB	150	FE, WE
T85R2	50-1200	T85R3	50-1200	RB	300	FE, WE
T85F2	50-1200	T85F3	50-1200	FB	300	FE, WE
T87R2	50-1200	T87R3	50-1200	RB	600	FE, WE
T87F2	50-1200	T87F3	50-1200	FB	600	FE, WE
T89R2	25-1200	T89R3	25-1200	RB	900	FE, WE
T89F2	25-1200	T89F3	25-1200	FB	900	FE, WE
T90R2	25-1200	T90R3	25-1200	RB	1500	FE, WE
T90F2	25-1200	T90F3	25-1200	FB	1500	FE, WE
T91R2	25-400	T91R3	25-400	RB	2500	FE, WE
T91F2	25-400	T91F3	25-400	FB	2500	FE, WE
RB = Reduced bore. FB = Full bore. FE = Flanged ends. WE = Welding ends.						

SALES OFFICES

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