



FLOATING BALL VALVES

ENGINEERED FOR 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-Lüft 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.

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

FLOATING BALL VALVES



Microfinish floating ball valves are available in both reduced bore and full bore designs. Sizes range from 1/2" to 10" and pressure classes from ASME 150 to 2500. Body designs are one, two, and three piece. Ball valves are designed using the latest CAD software to achieve the highest level of performance, reliability, and safety as demanded by the user industries.

Design standards are to ASME B16.34. Fire-testing is certified by third party inspectors.

STANDARD DESIGN FEATURES

- Designed and manufactured to ASME B16.10, MSS SP-72
- Fire-tested to API 607 5th edition
- One, two, and three piece bodies
- Actuator mounting pads to ISO 5211
- Blow-out proof stem
- Anti-static feature
- Lever, gear, electric, pneumatic, hydraulic, gas, and gas over oil operation
- Bi-directional flow
- Cup and cone stem packing in most sizes
- B7M/2HM or B8M/8M fasteners
- Radiography as standard for 600, 900, 1500, and 2500 class valves
- Locking devices
- Stem sealing complies to TA-Lüft fugitive emission norms

OPTIONAL FEATURES

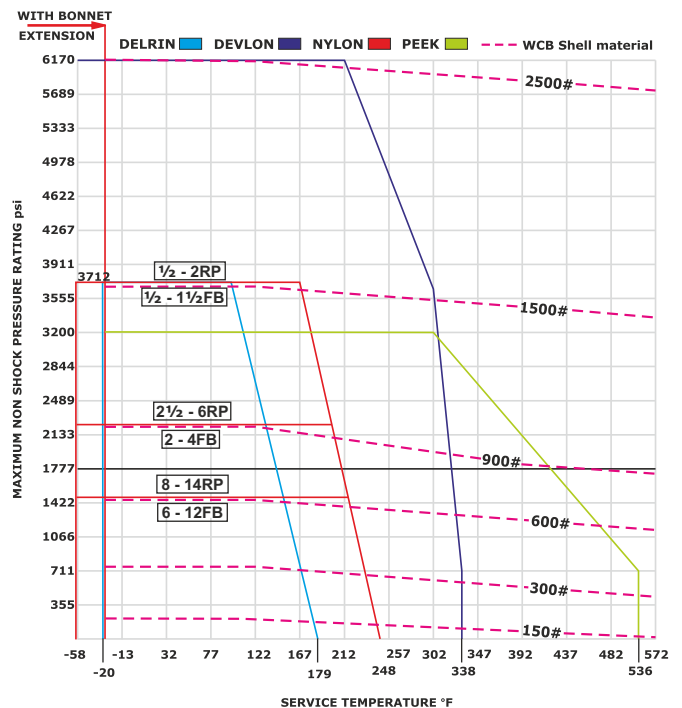
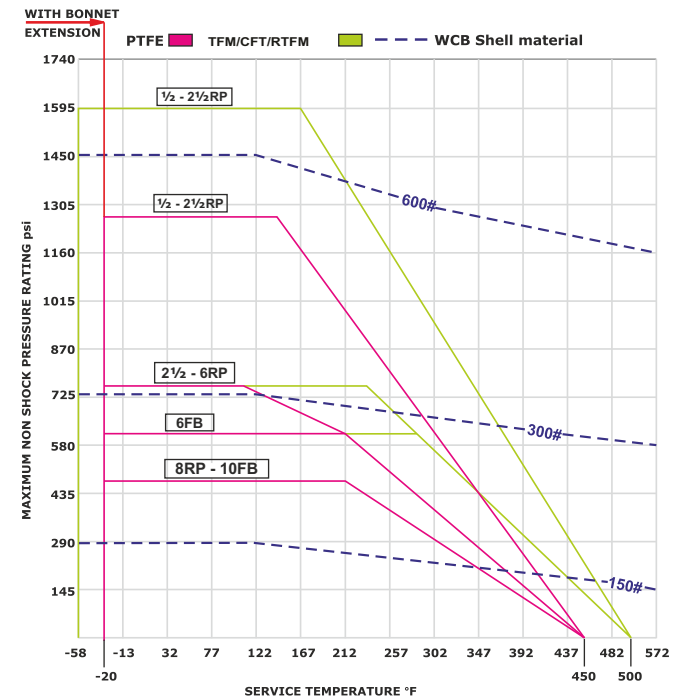
- Stem extensions and bonnet extensions
- Metal seats for high temperature and abrasive service to 1004°F
- Cryogenic service to BS 6364 to -321°F
- Compliant with NACE MR0175 and MR0103
- "PUPS" available on weld end valves
- Wide variety of materials
- Special testing available

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

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.



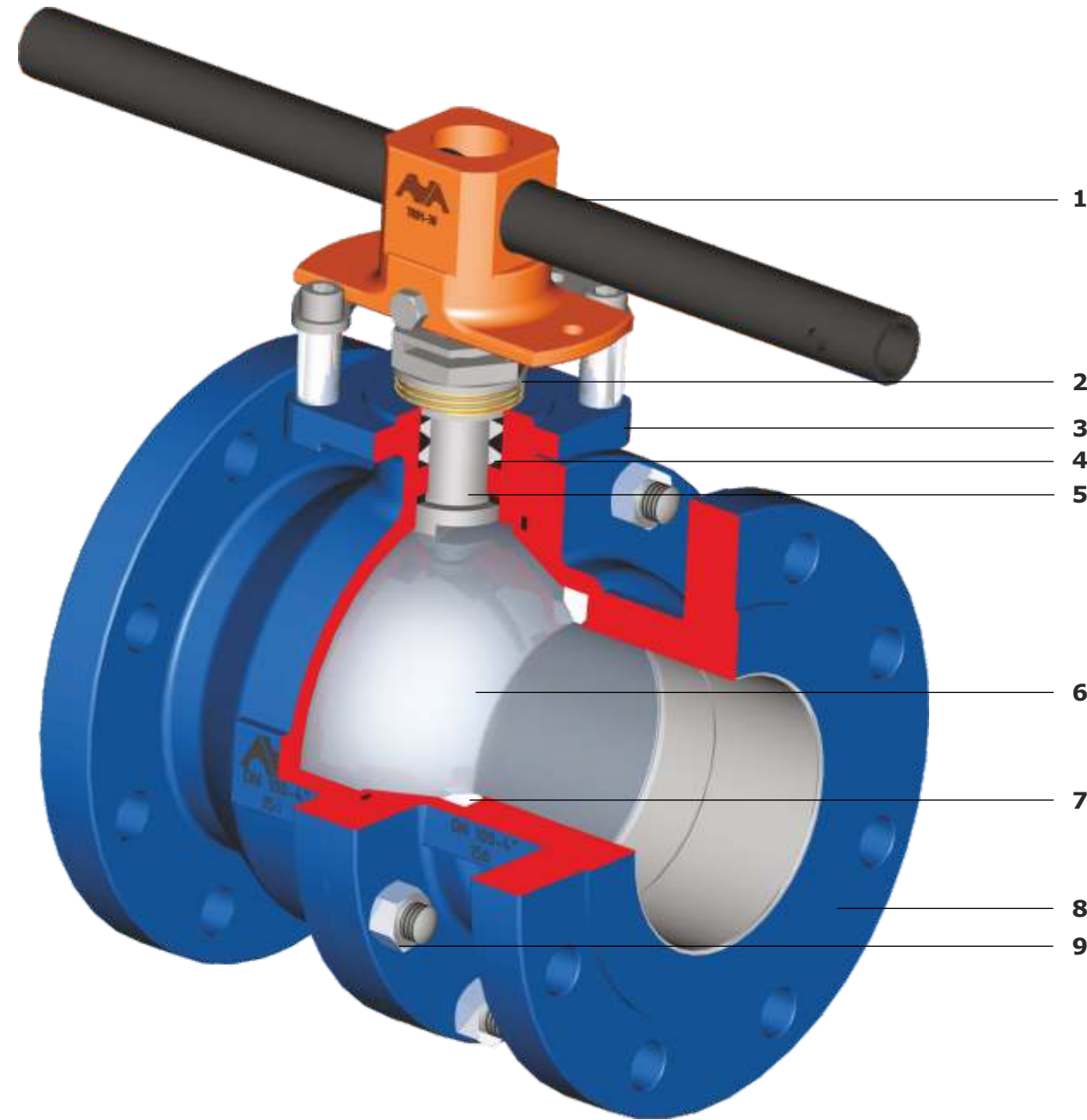
MICROFINISH BALL VALVES PROVIDE PROVEN PERFORMANCE AND WORRY FREE OPERATION

MICROFINISH ball valves built for reliability and performance offer a **THREE YEAR WARRANTY** as standard. Built and tested to the most stringent industry standards, Microfinish is the answer to your most demanding valve applications.

Proven performance as **MICROFINISH** holds SIL-3 certification for reliability and TA-Lüft certification for emission control.

WHY MICROFINISH?

- We are the manufacturer with over 40 years of experience
- We offer a 3 year warranty
- Proven stem seal design with easy adjustment
- Wide range of materials and options
- Pressure classes from 150-2500
- We machine our own balls and seats to achieve smooth operation and lower torque
- Locking device as standard
- We hold the following certifications
 - ISO 9001
 - PED
 - SIL-3
 - ATEX
 - GOST
 - TA-Lüft
 - API 6D



Microfinish high quality ball valves have been successfully serving industry for over 40 years. They are available in a wide variety of sizes, pressure classes and configurations. They have many features built into the design as standard to provide operational safety, long service life and low stem seal emissions.

- 1) Lever**
Sturdy lever. Locking device as standard
- 2) Gland nut**
Easily adjustable gland nut permits adjustment without disassembly of valve
- 3) Actuator mounting pad**
Industry standard ISO 5211 mounting flange for simple actuator mounting
- 4) Stem seal**
Standard cup and cone packing in most sizes, along with spring disc, increases life cycle capability and compensates for temperature fluctuations and normal wear. Standard stem seal meets the emission norms of TA-Lüft
- 5) Stem**
Anti-blowout proof stem with 32RMS surface finish for low friction and reduced stem seal wear
- 6) Ball**
Mirror finished ball with less than 8RMS surface finish provides smooth operation and low torque
- 7) Seats**
Improved design for long life and bubble tight shut off. Available in a variety of materials to provide a wide application range. Seats are field replaceable



QUALITY BUILT INTO EVERY VALVE

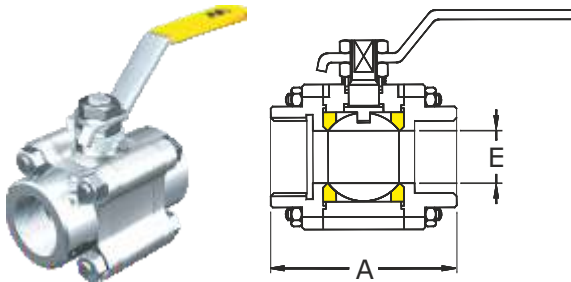
- 100% of castings and forgings in 600, 900, 1500, and 2500 class valves have X-ray or ultrasonic testing of critical areas
- Random X-rays or ultrasonic testing of castings and forgings in classes 150 and 300
- 100% of valves are serialized for full traceability

THREE PIECE BALL VALVES



Series: 81R3/81F3 Class 800

Ends: Threaded, socket weld, and butt weld ends



RB : Reduced bore

FB : Full bore

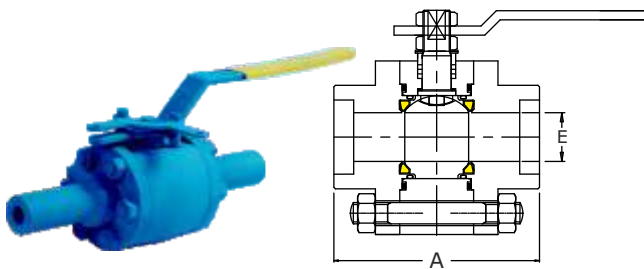
Dimensions are in inches. Approximate weights in lb

SIZE	A		E		WEIGHTS	
	RB	FB	RB	FB	RB	FB
1/2	2.52	2.52	0.51	0.51	1.5	2.2
3/4	2.75	2.95	0.51	0.75	1.9	3.3
1	3.46	3.62	0.75	1.00	3.3	4.4
1 1/4	4.13	4.20	1.00	1.25	4.4	7.3
1 1/2	4.48	4.33	1.25	1.49	7.3	9.5
2	5.12	5.12	1.50	2.00	9.7	19.8

Series: 90R3/F3 Class 1500

91R3/F3 Class 2500

Ends: Threaded, socket weld, and butt weld ends



RB : Reduced bore

FB : Full bore

Dimensions are in inches. Approximate weights in lb

SIZE	A		E		WEIGHTS	
	RB	FB	RB	FB	RB	FB
1/2	3.35	3.35	0.51	0.51	6.6	6.6
3/4	3.35	4.25	0.51	0.75	6.6	13.2
1	4.25	4.76	0.75	0.98	10.8	18.3
1 1/4	4.76	5.20	0.98	1.26	13.0	29.7
1 1/2	5.20	6.14	1.26	1.50	23.1	42.2
2	6.14	-	1.50	-	31.9	79.0

Materials of construction for Series: 81, 90, and 91 R3/F3

Body and tail piece	Casting: CF8, CF8M, CF3, CF3M, CD4MCu, CN7M, CD3MN, CN3MN, CW6M and N7M, and other alloys Forging: A105, LF2, F304, and F316, and other alloys
Ball	410, 304, 316, 304L, 316L, CD4MCu, CN7M, CD3MN, CN3MN, CW6M, N7M, and other alloys
Stem and gland	410, 304, 316, 17-4PH, Nitronic 50, A20, 31803, and other alloys
Seat	TFM, PTFE, RPTFE, nylon, Delrin, PEEK, Devlon, metal
Stem washer	RPTFE
Stem seal	Grafoil, PTFE
Body seal	Grafoil, spiral wound with Grafoil filler
Body stud	B7, L7, B8, B8M
Body nut	2H, 2HM, 8, 8M

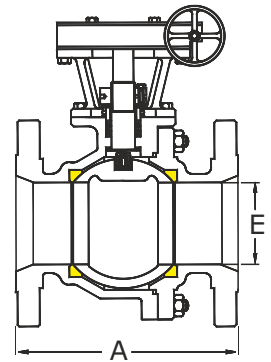
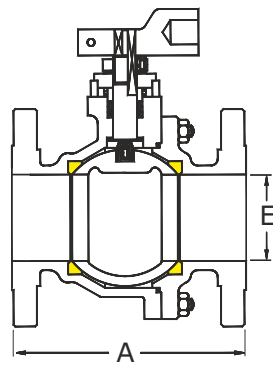
TWO PIECE BALL VALVES



Series:

84R2/84F2 Class 150
85R2/85F2 Class 300
87R2/87F2 Class 600
89R2/89F2 Class 900
90R2/90F2 Class 1500
91R2/91F2 Class 2500

Ends: Flanged and butt weld ends



RB : Reduced bore

FB : Full bore

Dimensions are in inches. Approximate weights in lb

SIZE	A						E					
	Class						Class 150/300/600		Class 900/1500		Class 2500	
	150	300	600	900	1500	2500	RB	FB	RB	FB	RB	FB
1/2	4.25	5.50	6.50	8.50	8.50	10.38	0.50	0.50	0.50	0.50	0.44	0.44
3/4	4.62	6.00	7.50	9.00	9.00	10.75	0.50	0.75	0.50	0.69	0.44	0.56
1	5.00	6.50	8.50	10.00	10.00	12.12	0.75	1.00	0.69	0.87	0.56	0.75
1 1/4	5.50	7.00	9.00	11.00	11.00	-	1.00	1.25	0.87	1.12	-	-
1 1/2	6.50	7.50	9.50	12.00	12.00	-	1.25	1.50	1.12	1.37	-	-
2	7.00	8.50	11.50	14.50	14.50	-	1.50	2.00	1.37	1.87	-	-
2 1/2	7.50	9.50	13.00	16.50	-	-	2.00	2.50	1.87	2.25	-	-
3	8.00	11.12	14.00	15.00	-	-	2.28	3.00	2.25	2.87	-	-
4	9.00	12.00	17.00	-	-	-	3.00	4.00	-	-	-	-
6	15.50	15.88	-	-	-	-	4.00	6.00	-	-	-	-
8	18.00	19.75	-	-	-	-	6.00	8.00	-	-	-	-
10	21.00	22.38	-	-	-	-	8.00	10.00	-	-	-	-

SIZE	WEIGHTS											
	Class 150		Class 300		Class 600		Class 900		Class 1500		Class 2500	
	RB	FB	RB	FB	RB	FB	RB	FB	RB	FB	RB	FB
1/2	3.5	3.5	4.8	4.8	7.3	7.3	18.7	18.7	18.7	18.7	20.9	20.9
3/4	4.4	5.1	6.8	7.7	9.9	11.0	22.0	24.2	22.0	24.2	26.4	28.6
1	5.9	6.6	9.9	11.0	14.3	17.6	33.0	37.4	33.0	37.4	39.6	68.0*
1 1/4	8.1	10.1	11.7	15.4	18.5	26.4	37.4	55.0	37.4	55.0	-	-
1 1/2	11.4	13.6	18.7	20.9	28.6	34.1	57.0	73.0	57.0	73.0	-	-
2	17.2	20.5	23.8	29.7	39.6	53.0	77.0	106.0	77.0	132.0*	-	-
2 1/2	27.5	34.3	30.8	48.4	62.0	75.0	119.0	174.0*	-	-	-	-
3	36.1	43.1	55.0	68.0	79.0	136.0*	187.0*	257.0*	-	-	-	-
4	55.0	75.0	90.0	121.0	172.0*	227.0*	-	-	-	-	-	-
6	99.0	178.0*	163.0	262.0*	-	-	-	-	-	-	-	-
8	196.0*	286.0*	299.0*	447.0*	-	-	-	-	-	-	-	-
10	288.0*	469.0*	460.0*	689.0*	-	-	-	-	-	-	-	-

Refer to page 14 for materials of construction

* Weights with gearbox

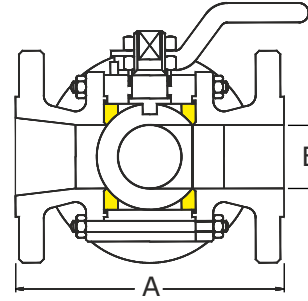
Note: 6" to 10" valves can be Supplied on request having short pattern face to face dimension

TWO AND THREE PIECE THREE WAY BALL VALVES



Series: 71R3/71F3 Class 150
74R3/74F3 Class 300

Ends: Flanged, threaded, socket weld,
 and butt weld ends



RB : Reduced bore

FB : Full bore

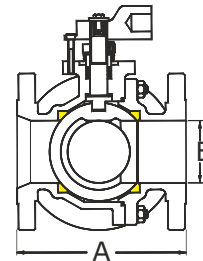
Dimensions are in inches. Approximate weights in lb

SIZE	A		E		WEIGHTS			
	Class		RB	FB	Class 150		Class 300	
	150	300			RB	FB	RB	FB
1/2	4.25	5.50	0.50	0.50	4.4	4.4	7.7	7.7
3/4	4.62	6.00	0.50	0.75	5.3	6.6	8.8	10.1
1	5.00	6.50	0.75	1.00	7.3	7.9	11.9	14.3
1 1/4	5.50	7.00	1.00	1.25	10.1	12.1	13.9	18.7
1 1/2	6.50	7.50	1.25	1.50	14.3	16.5	22.0	26.4
2	7.00	8.50	1.50	-	21.1	-	28.6	-

Refer to page 14 for materials of construction

Series: 71R2/71F2 Class 150
74R2/74F2 Class 300

Ends: Flanged and butt weld ends



RB : Reduced bore

FB : Full bore

Dimensions are in inches. Approximate weights in lb

SIZE	A			E		WEIGHTS			
	Class 150		Class 300	RB	FB	Class 150		Class 300	
	Two seats	Three seats	Two/Three seats			RB	FB	RB	FB
2	7.00	8.00	8.50	-	2.00	-	31.0	-	41.8
2 1/2	7.50	8.74	9.50	2.00	2.50	37.4	53.0	39.6	64.0
3	8.00	9.50	11.14	2.28	3.00	57.0	64.0	73.0	88.0
4	9.00	12.00	12.00	3.00	3.86	84.0	110.0	117.0	150.0
6	10.50	15.50	15.88	4.02	5.83	121.0	213.0*	200.0	299.0*
8	18.00	18.00	19.75	5.83	7.80	229.0*	337.0*	396.0*	528.0*
10	21.00	21.00	22.38	7.36	9.76	370.0*	550.0*	594.0*	836.0*

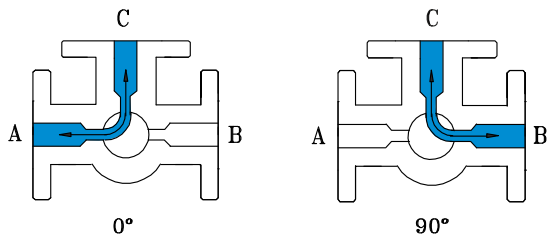
Refer to page 14 for materials of construction

* Weights with gearbox

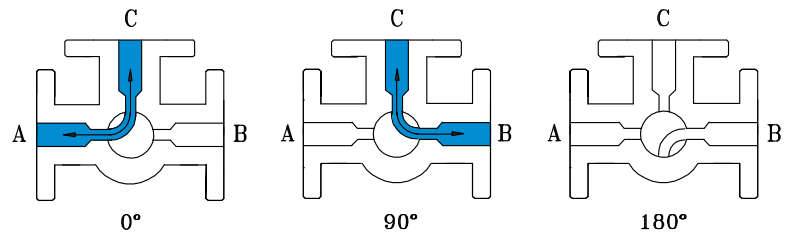
THREE WAY FLOW PATTERNS



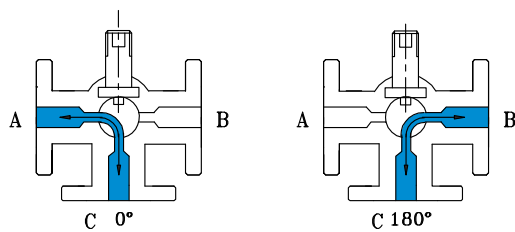
Two seats, side 'L' port
Style: 71LL, 74LL



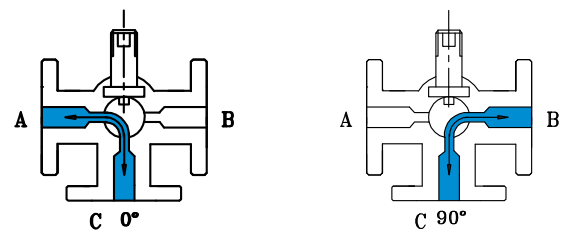
Three seats, side 'L' port
Style: 71LS, 74LS



Two seats, bottom 'L' port
Style: 71LB, 74LB

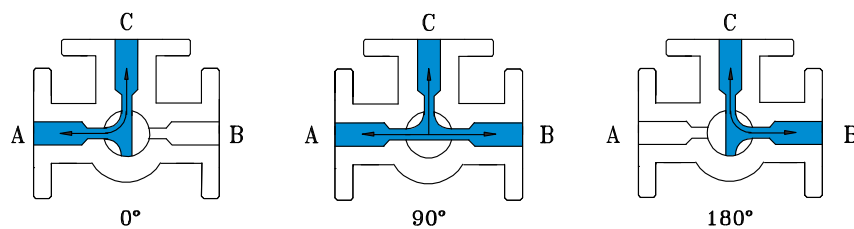


Two seats, bottom 'L' port
Style: 71LD, 74LD

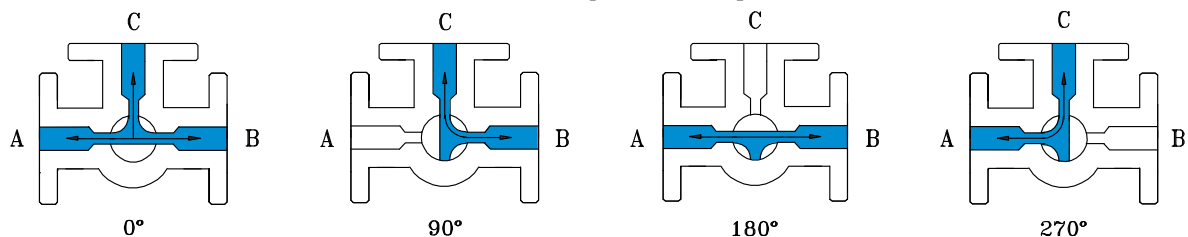


Note: Additional port provided at 90° to outlet

Two seats, side 'T' port Style: 71TT, 74TT



Three seats, side 'T' port Style: 71T3, 74T3



CRYOGENIC TWO PIECE BALL VALVES



Typically valves in service below -58°F are defined as CRYOGENIC valves. Care must be taken when selecting materials for these valves in "cold" service.

Microfinish cryogenic ball valves perform consistently under harshest environments of temperatures from -58°F to -321°F. The specially designed bonnet extension results in optimum heat transfer and minimum energy loss. Proven sealing technology and design expertise result in valve reliability. Castings are cryogenically treated for stability at ambient and cryogenic temperatures.

Valves are supplied with non cold box length of 10in. extended bonnet as per BS 6364. Bonnet extension length as per cold box are available as

an option. Standard valve construction includes ball with hole on the upstream side to relieve cavity pressure due to thermal expansion, which makes the valve unidirectional.

Microfinish has a long history of supplying valves for cryogenic service. We have our own test loop and have tested valves down to -321°F per BS 6364. These tests have been witnessed and approved by Lloyds, Moodi International, TÜV, Engineers India Ltd (EIL).

A typical cryogenic service valve configuration chart is shown below, but as always, the customer has the final decision on valve materials and specifications, based on needs and past experience.

TYPICAL CRYOGENIC VALVE CONFIGURATION*				
Temperature range	Body material	Bonnet extension	Seat material	Valve testing
0 to -21°F	WCB, SS		PTFE/TFM	API598, ISO 5208, BS EN 12266
-22 to -58 °F	LCB, LF2 SS	4in.	RPTFE/TFM Metal	API 598, ISO 5208, BS EN 12266. Prototype test certificate
-58°F to -321°F	SS	10in.	PCTFE Metal	API 598, ISO 5208, BS EN 12266. Prototype test certificate

* Cryogenic ball valves are also available in trunnion mounted design

Materials of construction for Series: C84, C85, and C87

Body and tail piece	LCB, LCC, CF8, CF8M, CF3, CF3M, and other alloy
Ball	CF8, CF8M, CF3, CF3M, and other alloys
Stem and gland	304, 316, 17-4PH, Nitronic50, A20, 31803, Inconel, and other alloys
Seat	TFM, PTFE, RPTFE, PCTFE, PEEK, RTFM metal
Stem washer	RPTFE
Stem seal	Grafoil, PTFE
Body seal	Grafoil, spiral wound with Grafoil filler
Body stud	L7, B8, B8M
Body nut	2HM, 8, 8M



Cryogenic test rig



Ball valve cryogenic test

CRYOGENIC TWO PIECE BALL VALVES



Series:

C84R2/C84F2 Class 150
C85R2/C85F2 Class 300
C87R2/C87F2 Class 600

Ends: Flanged, threaded, socket weld, and butt weld ends



RB : Reduced bore

FB : Full bore

Dimensions are in inches. Approximate weights in lb

SIZE	A			E	
	Class			Class 150/300/600	
	150	300	600	RB	FB
1/2	4.25	5.50	6.50	0.50	0.50
3/4	4.62	6.00	7.50	0.50	0.75
1	5.00	6.50	8.50	0.75	1.00
1 1/4	5.50	7.00	9.00	1.00	1.25
1 1/2	6.50	7.50	9.50	1.25	1.50
2	7.00	8.50	11.50	1.50	2.00
2 1/2	7.50	9.50	13.00	2.00	2.50
3	8.00	11.12	14.00	2.28	3.00
4	9.00	12.00	17.00	3.00	4.00
6	15.50	15.88	-	4.00	6.00
8	18.00	19.75	-	6.00	8.00
10	21.00	22.38	-	8.00	10.00

SIZE	WEIGHTS					
	Class 150		Class 300		Class 600	
	RB	FB	RB	FB	RB	FB
1/2	8.2	8.2	9.5	9.5	14.3	14.3
3/4	9.1	12.4	11.5	15.0	16.9	22.0
1	13.3	14.2	17.2	18.6	25.3	29.0
1 1/4	15.7	22.0	19.3	27.3	29.9	44.2
1 1/2	23.3	25.5	30.6	32.8	46.4	52.0
2	29.1	38.7	35.7	47.9	58.0	108.0*
2 1/2	45.7	66.0	49.0	80.0	119.0*	154.0*
3	68.0	75.0	87.0	100.0	159.0*	192.0*
4	110.0*	150.0*	146.0*	201.0*	227.0*	306.0*
6	174.0*	258.0*	242.0*	348.0*	-	-
8	273.0*	421.0*	412.0*	590.0*	-	-
10	425.0*	636.0*	603.0*	872.0*	* Weights with gearbox	

Note: 6" to 10" valves can be Supplied on request having short pattern face to face dimension

METAL SEATED FLOATING BALL VALVES



Microfinish offers our complete line of floating ball valves with metal seats for a wide range of industry applications. The standard metal seat design is suited for high temperature applications in non-abrasive services. Optional ball and seat materials, as well as coatings such as Stellite, tungsten carbide, and nickel boron expand the service capabilities to handle abrasive services and slurries.

Standard shut-off classification is ASME class V, however ASME class VI shut-off is available upon request.

Applications for Microfinish metal seated valves are high temperature steam, natural gas production and distribution, ash handling, black liquor in pulp mills, and molten sulphur.

PRODUCT RANGE

SERIES	SIZES (in.)	SERIES	SIZES (in.)	BORE	PRESSURE CLASS	END CONNECTIONS
TWO PIECE CONSTRUCTION		THREE PIECE CONSTRUCTION				
		M81R3, M81F3	½-2	RB, FB	600, 800	SE, SWE, BWE
M84R2, M84F2	½-10			RB, FB	150	FE, BWE
M85R2, M85F2	½-10			RB, FB	300	FE, BWE
M87R2, M87F2	½-4			RB, FB	600	FE, BWE
M89R2, M89F2	½-3	M89R3, M89F3	½-2	RB, FB	900	SE, SWE, BWE, FE
M90R2, M90F2	½-2	M90R3, M90F3	½-2	RB, FB	1500	SE, SWE, BWE, FE
M91R2, M91F2	½-1	M91R3, M91F3	½-1	RB, FB	2500	SE, SWE, BWE, FE

RB = Reduced bore. FB = Full bore. SE = Threaded ends. SWE = Socket weld ends.
BWE = Butt weld ends. FE = Flanged ends.

STANDARD SPECIFICATIONS

Design standard	API 6D, API 608, ASME B16.34, BS EN ISO 17292
Testing standard	API 6D, API 598, ASME B16.34, BS EN 12266, ISO 5208
Leak tightness	ISO 5208 Rate A/B/C, ANSI/FCI 70-2 Class V/VI
Fire safe testing	API 6FA
Temperature range	-321°F to 1004°F
Material test certificate	EN 10204 3.1

MATERIALS OF CONSTRUCTION

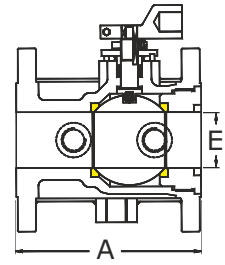
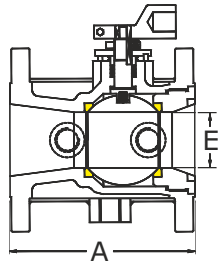
Body	Forged	A105, LF2, F304, F316
	Cast	WCB, LCB, WC6, C5, C9, CF8, CF8M, and other alloys
Ball	Forged	A105, LF2, F6A, F304, F316
	Cast	WCB, LCB, CA15, CF8, CF8M, and other alloys
Ball coating	All	ENP, Stellite, tungsten carbide, and nickel boron
Seats	All	Heat treated or coated to suit service conditions
Stem	All	4140, 410, 17-4PH, Nitronic 50, Inconel, and other alloys
Springs	All	Inconel X-750

JACKETED AND SINGLE PIECE BALL VALVES



Series: 84R1J/84F1J Class 150
85R1J/85F1J Class 300

Ends: Flanged ends



RB : Reduced bore

FB : Full bore

Dimensions are in inches. Approximate weights in lb

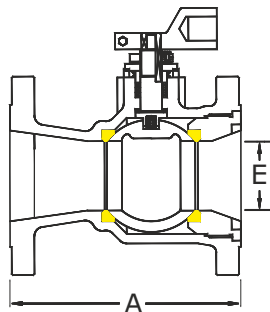
SIZE	A		E		WEIGHTS			
	Class		RB	FB	Class 150		Class 300	
	150	300			RB	FB	RB	FB
1/2 x 1	4.25	5.50	0.50	0.50	6.6	6.6	9.9	9.9
3/4 x 1 1/4	4.62	6.00	0.50	0.75	8.8	9.9	12.1	13.2
1 x 1 1/2	5.00	6.50	0.75	1.00	12.1	13.2	19.8	21.1
1 1/4 x 2	5.50	7.00	1.00	1.25	19.8	22.0	24.2	28.6
1 1/2 x 2 1/2	6.50	7.50	1.25	1.52	28.6	30.8	39.6	41.8
2 x 3	7.00	8.50	1.50	2.00	37.4	41.8	51.0	57.0
2 1/2 x 4	7.50	9.50	2.00	2.50	55.0	62.0	77.0	95.0
3 x 6	8.00	11.12	2.28	3.00	77.0	88.0	128.0	141.0
4 x 6	9.00	12.00	3.00	4.00	92.0	132.0	154.0	185.0
6 x 10	15.50	15.88	4.00	6.00	200.0	277.0*	334.0	433.0*
8 x 12	18.00	19.75	6.00	8.00	339.0*	431.0*	519.0*	667.0*
10 x 14	21.00	-	8.00	10.00	475.0*	656.0*	755.0*	983.0*

Refer to page 14 for materials of construction

* Weights with gearbox

Series: 84R1 Class 150
85R1 Class 300

Ends: Flanged ends



RB : Reduced bore

Dimensions are in inches. Approximate weights in lb

SIZE	A		E	WEIGHTS	
	150	300		150	300
1/2	4.25	5.50	0.50	3.5	6.2
3/4	4.62	6.00	0.50	4.4	8.6
1	5.00	6.50	0.75	6.4	11.0
1 1/4	5.50	7.00	1.00	8.4	14.3
1 1/2	6.50	7.50	1.25	13.2	22.0
2	7.00	8.50	1.50	18.7	26.4
2 1/2	7.50	9.50	2.00	29.7	39.6
3	8.00	11.12	2.28	37.4	59.0
4	9.00	12.00	3.00	57.0	92.0
6	15.5	15.88	4.00	92.0	167.0
8	18.0	19.75	6.00	189.0*	297.0*
10	21.0	22.38	8.00	284.0*	455.0*

Refer to page 14 for materials of construction

* Weights with gearbox

Note: 6" to 10" valves can be Supplied on request having short pattern face to face dimension



Materials of construction for Series : 84R1, 85R1, 84 to 91 R2/F2, 84 and 85 R1J/F1J, 71R3/F3, 74R3/F3, 71R2/F2, 74R2/F2

Body and tail piece	WCB, WCC, LCB, LCC, CF8, CF8M, CF3, CF3M, CD4MCu, CN7M, CD3MN, CN3MN, CW6M and N7M, and other alloys
Ball	WCB with ENP, LCB with ENP, CA15, CF8, CF8M, CF3, CF3M, CD4MCu, CN7M, CD3MN, CN3MN, CW6M, N7M, and other alloys
Stem and gland	410, 304, 316, A20, 31803, Inconel, and other alloys
Seat	TFM, PTFE, RPTFE, nylon, Delrin, PEEK, Devlon, metal
Stem washer	RPTFE
Stem seal	Grafoil, PTFE
Body seal	Grafoil, spiral wound with Grafoil filler
Body stud	B7, L7, B8, B8M
Body nut	2H, 2HM, 8, 8M

VALVE TESTING

100% of valves manufactured by Microfinish are tested in excess of API 6D requirements and in accordance with API 598 standard prior to shipping.

MAXIMUM ALLOWABLE LEAKAGE RATES AS PER API 598

Valve Size	Resilient Seated Valves	Liquid test (Drops per minute)	Gas Test* (Bubbles per minute)
≤ 2	0	0	0
2½ - 6	0	12	24
8 - 12	0	20	40
≥ 14	0	28	56

MAXIMUM ALLOWABLE LEAKAGE RATES AS PER BS EN 12266 AND ISO 5208

Test Fluid	Unit leakage rates	Rate A	Rate B	Rate C	Rate D	Rate E	Rate F	Rate G
Liquid	mm ³ /s	0	0.01 x DN	0.03 x DN	0.1 x DN	0.3 x DN	1 x DN	2 x DN
Gas*	mm ³ /s	0	0.3 x DN	3 x DN	30 x DN	300 x DN	3000 x DN	6000 x DN

* Gas closure test at 6bar

STANDARD PERFORMANCE TESTS

- Visual and dimensional check
- High-pressure hydrostatic shell test
- High-pressure hydrostatic seat test
- Low-pressure air seat test
- Torque check for actuated valves

SEAT MATERIAL	TEMPERATURE RANGE °F	APPLICATION
VIRGIN PTFE	-20 to 400	Virgin PTFE (polytetrafluoroethylene) is the most commonly used seat material. It has excellent chemical resistance and is suitable for almost all liquids
TFM (SUPER PTFE)	-58 to 420	This is modified PTFE, with improved mechanical properties. It has lower porosity and permeability, and reduced cold flow
REINFORCED PTFE (RPTFE)	- 58 to 400	PTFE reinforced with carbon. It is harder than PTFE. Excellent for steam and hot oil applications
RTFM	-58 to 420	TFM reinforced with carbon. It is harder than TFM
NYLON	-58 to 248	Nylon (polyamide resin) suitable for high pressure, with limited temperature capability. Lower corrosion resistance than PTFE. Not suitable for steam service
DELTRIN	-20 to 180	Delrin (acetal polymer) suitable for high pressure, with limited temperature capability. Lower corrosion resistance than PTFE. Not suitable for oxygen and steam service
DEVLON	-148 to 338	Devlon (polyamide family resin) has outstanding pressure capability. Good resistance for temperatures up to 338°F
PEEK	-148 to 536	PEEK (polyetheretherketone resin) is a high performance thermoplastic. Excellent choice for high pressure and high temperature service. Excellent for abrasive and corrosive service. Suitable for hot water and steam service. Not suitable for sulphuric and other strong oxidizing acids
PCTFE (Kel-F)	- 328 to 392	PCTFE (polychlorotrifluoroethylene). Excellent performance down to -328°F. Perfect resistance to oxygen
METAL	- 328 to 1004	Recommended for abrasive and high temperature service. ENP, Stellite, tungsten carbide and other coatings are available for different applications. Metal seats are lapped with the ball individually as a matched sets, assuring tight shut off. Metal seated valves are available with class IV, V, and VI leakage class



Seat height inspection



Stem surface finish inspection

BALL VALVE TORQUES



Torque values are results of factory break away tests using clean water at ambient temperatures. Apply appropriate correction factors for other applications.

Break away torque values in in-lb. at full working pressure								
ΔP-psi	Class 150		Class 300		Class 600		Class 800	
	285		740		1480		1975	
Size-in.	RB	FB	RB	FB	RB	FB	RB	FB
½		30		35		133		159
¾	30	62	36	71	133	160	159	221
1	58	71	71	102	160	222	221	443
1¼	76	133	107	186			443	620
1½	133	186	142	221	310	443	620	752
2	177	310	213	443	443	1328	752	1770
2½	327	593	549	850	1328	1593		
3	443	824	779	1062	1593	2213		
4	779	1372	1062	1637	2213	3275		
6	1416	3186	1859	4824				
8	2213	4071	5753	9735				
10	5310	9293	9735	9293*				

* Torque value at 285psi

Break away torque values in in-lb. at full working pressure						
ΔP-psi	Class 900		Class 1500		Class 2500	
	2220		3705		6170	
Size-in.	RB	FB	RB	FB	RB	FB
½		222		310		620
¾	222	328	310	487	620	885
1	328	620	487	1062	885	2036
1¼						
1½	620	1062	1062	1859		
2	1062	1992	1859	2744		
3	1992	3983				

Torque values are factory test results using clean water at room temperature with PTFE seats for class 150 and 300, CFT seats for class 600, Nylon seats for class 900 and 1500, and Devlon seats for class 2500. For other seat materials consult factory.

PRESSURE TESTING AS PER ASME B16.34

Pressure Class	Test Pressure - psi		
	Hydro Shell*	Hydro Seat*	Air Seat
150	430	315	100
300	1110	815	100
600	2220	1630	100
800	2965	2175	100
900	3330	2445	100
1500	5560	4080	100
2500	9255	6790	100

*Applicable for WCB material

SOUR SERVICE

A wide range of materials is available depending on service conditions. These valves meet the material requirement of NACE MR 0175 or MR 0103 when specified and will have controlled hardness with B7M or B8M fasteners. Xylon coated fasteners are available on request.

CHLORINE SERVICE

All valves are manufactured to meet the Chlorine Institute Pamphlet-6 and also comply with Euro Chlor standard. Valves are supplied having low emission packing.

The body cavity is positively released to the upstream side through a drilled hole in the ball. Chlorine valves are unidirectional so must be installed as indicated by the arrow on the body. Valves are thoroughly cleaned to chlorine practice and are packed in individual polyethylene bags.

Standard material for body is WCB or A105 with either Monel or Hastelloy trim.

VACUUM SERVICE

Standard Microfinish valves are suitable for use in vacuum service down to 20 microns. Standard low emission packings are used down to 1×10^{-2} Torr. For high vacuum service special low emission packings are used and all these valves will be tested and certified.

OXYGEN SERVICE

Flow passages of these valves are either machined or ground to remove all high spots. Valves are supplied having low emission packing. Valves for oxygen service are unidirectional so must be installed as indicated by the arrow on the body. Valves are thoroughly cleaned to oxygen practice and are packed in individual polyethylene bags.

AMMONIA SERVICE

Ammonia is toxic and flammable. Both carbon steel and stainless steel materials are suitable. Valves are supplied having low emission packing. Valves for ammonia service are cleaned for safe operation and packed in individual polyethylene bags.

VALVE OPERATORS

Ball valves can be fitted with one of the following operators

- Standard lever for sizes ½ " to 2"
- Oval handle for sizes ½ " to 2"
- Lever adapter with pipe for sizes 2" to 6"
- Lever with limit switches
- Spring return lever (dead man lever) for sizes ½ " to 2"
- Manual gear operator
- Varieties of pneumatic actuators
- Varieties of electric actuators
- Accessories for pneumatic and electric actuators

Modern 120,000 sq.ft. factory in Hubli, Karnataka



BALL VALVE ORDERING CODE



STANDARD ASME B16.34 and API 6D FLOATING BALL VALVES

Size	Model	Class	Port Size construction	Body material	Ball material	Seat	Stem material	Stem seal	Specifications	End connection	Operator	Special option	Ball Treatment/Coating	Seat Treatment/Coating	Stem Treatment/Coating
1/2" thru 10"	BLANK= SOFT SEAT	81= 600# (BWE)	R1= REDUCED PORT ONE PIECE*	0= CN7M or B462	0= CN7M or B462	0= PTFE	0= 410SS*	0= PTFE CUP & CONE*	F= API 607 FIRESAFE	K= BUTTWELD	B= BARE STEM	1= NONE	0= NONE	0= NONE	0= NONE
	A= BONNET EXTENSION (4" OR 10" STD.)	81= 800# (SWE, NPT) *	R1S= REDUCED PORT ONE PIECE SHORT PATTERN*	1= WCB* or A105*	1= WCB or A105	1= TFM*	1= 4140	1= GRAFOIL RINGS	O= API 6FA FIRESAFE (Metal Seated Valves)	M= NPT X SWE	E= ELECTRIC ACTUATOR	A= PUPS	E= ENP	E= ENP	E= ENP
	C = CRYOGENIC BS 6364	84= 150# *	R2= REDUCED PORT TWO PIECE*	2= CF8 or F304	2= CF8 or F304	2= RPTFE	2= CF8 or F304	2= GRAFOIL CUP & CONE*	N= NON NACE, NON FIRESAFE	N= NPT	G= GEAR	C= SPECIAL CLEANING	H= HARDENED	H= HARDENED	H= HARDENED
	E= STEM EXTENSION	85= 300# *	R2S= REDUCED PORT TWO PIECE SHORT PATTERN*	3= CF8M* or F316	3= CF8M* or F316	3= DEVLON	3= CF8M* or F316	3= PTFE RINGS	Q= NACE + API 607 FS*	R= RAISED FACE FLANGE	P= PNEUMATIC ACTUATOR	H= SPECIAL TESTING	S= STELLITE	S= STELLITE	S= STELLITE
	M= METAL SEATED	87= 600# *	R3= REDUCED PORT THREE PIECE	4= LCB, LCC or LF2	4= LCB, LCC or LF2	4= PEEK	4= 17-4PH*	X= OTHER	U= NACE+API 6FA FS (Metal Seated Valves)	S= SOCKETWELD	L= LOCKING LEVER	J= FULL JACKET	T= TUNGSTEN CARBIDE	T= TUNGSTEN CARBIDE	T= TUNGSTEN CARBIDE
	AM= BONNET EXTENSION with METAL SEAT	89= 900#	F2= FULL PORT TWO PIECE*	5= CD4MCu	5= CD4MCu	5= Nylon	5= XM-19		V= NACE, NON-FIRESAFE*	T= RTJ	O= OVAL HANDWHEEL	M = MODIFIED STANDARD VALVE	C= CHROMIUM CARBIDE	C= CHROMIUM CARBIDE	C= CHROMIUM CARBIDE
	CM= CRYOGENIC with METAL SEAT	90= 1500#	F2S= FULL PORT TWO PIECE SHORT PATTERN	6= CD3MN or F51	6= CD3MN or F51	6= PCTFE	6= AISI 4130		Y= NON-FIRESAFE	Z= FLAT FACE FLANGE	H= HYDRAULIC ACTUATOR	P= PARTIAL JACKET			
	CM= CRYOGENIC with BONNET EXTENSION & METAL SEAT	91= 2500#	F3= FULL PORT THREE PIECE*	7=CD3MWCuN or F55	7=CD3MWCuN or F55	7= 75% PTFE 25% Graphite	7= ALLOY 20		X= OTHER	X= OTHER	X= OTHER	S= STAINLESS STEEL LEVER OPERATOR			
				8= CF3 or F304L	8= CF3 or F304L	8= CF3 or F304L	8= LCB, LCC or LF2 + ENP					Z= ZERO CAVITY			
				9= CF3M or F316L	9= CF3M or F316L	9= CF3M or F316L	9= CF3M or F316L					W= WELDED BODY			
				A= A890 4A or A182 F60	A= A890 4A or A182 F60	A= LCB, LCC or LF2	A= A890 4A or A182 F60					6= CLASS VI METAL SEALING			
				B= HASTELLOY B	B= HASTELLOY B	B= CD4MCu	B= HASTELLOY B					X= OTHER			
				C= HASTELLOY C	C= HASTELLOY C	C= CD3MN	C= HASTELLOY C								

*** Normally stocked materials**

Examples :	Model	Description
	2" 85R2-13130VRL1	2" 300# reduced port, two piece floating ball valve, with A105 body, 316SS ball, TFM seat, 316SS stem, PTFE cup and cone packing, NACE non-firesafe, raised face flange, lever operated
	3" M87F2-37740UTLD	3" 600# full port, metal seated two piece floating ball valve, with CF8M body, CF8M+ Stellite ball, CF8M + Stellite seat, 17-4PH stem, PTFE cup and cone packing, NACE and API 6FA, RTJ ring joint flange, locking lever operated, bonnet extension

Notes :	Notes
	1. 800# 3 piece valves available in 1/2" through 2" sizes in soft and metal seats
	2. 150# and 300# flanged valves available in 1/2" through 10" sizes in soft, metal seats and cryogenic service
	3. 600# flanged valves available in 1/2" through 4" sizes in soft, metal seats and cryogenic service
	4. 900# flanged valves available in 1/2" through 3" sizes in soft and metal seats. Cryogenic service not available

Notes :	Notes
	5. 1500# flanged valves available in 1/2" through 2" sizes in soft and metal seats. Cryogenic service not available
	6. 2500# flanged valves available in 1/2" through 1" sizes in soft and metal seats. Cryogenic service not available
	7. 3-Way flanged valves available in 1/2" through 10" sizes, 150# and 300#, in soft and metal seats. Cryogenic service not available
	8. Jacketed flanged valves available in 1/2" through 10" sizes, in 150# and 300#, in soft and metal seats. Cryogenic service not available

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.

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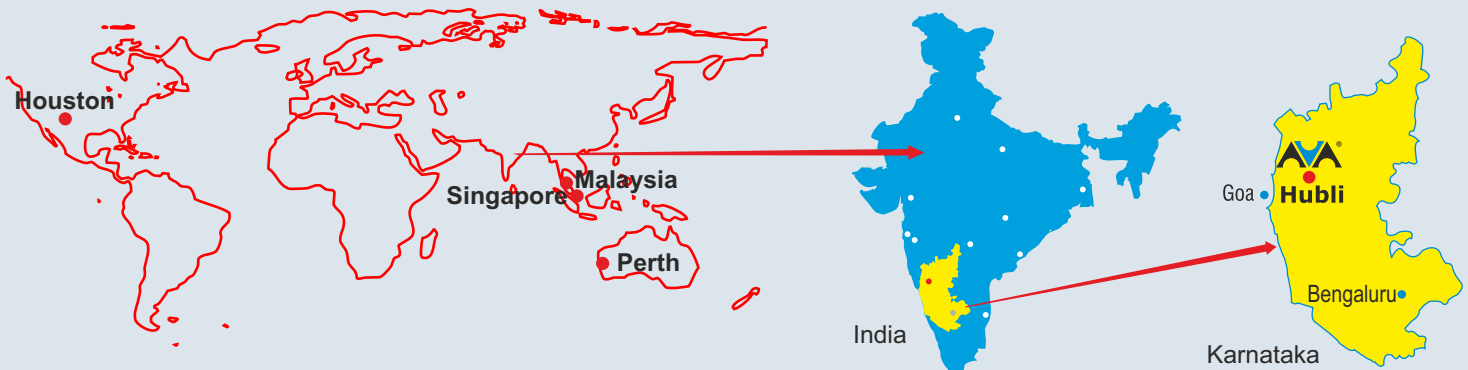
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