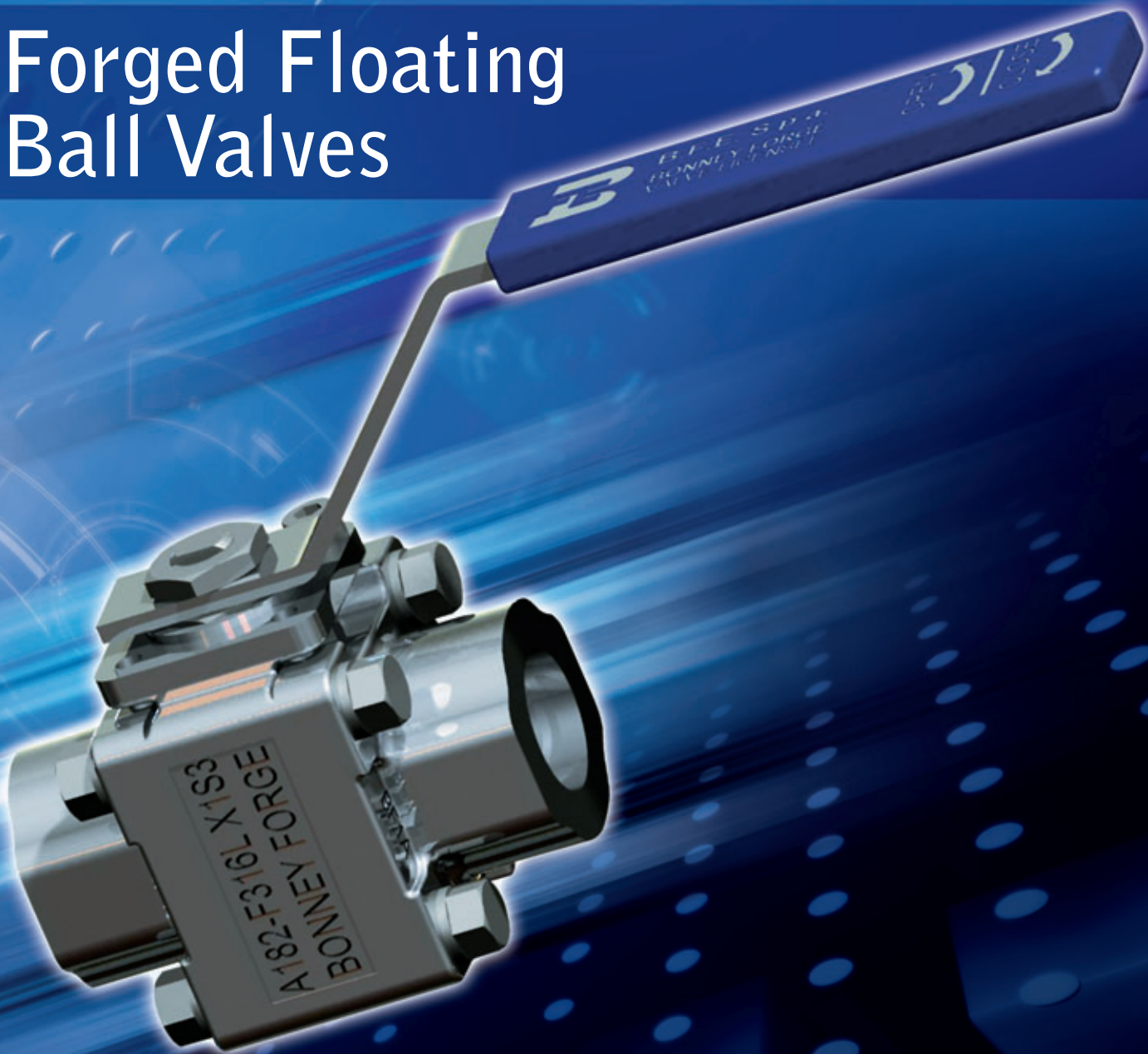


Forged Floating Ball Valves



B.F.E. SpA

BONNEY FORGE VALVE LICENSEE

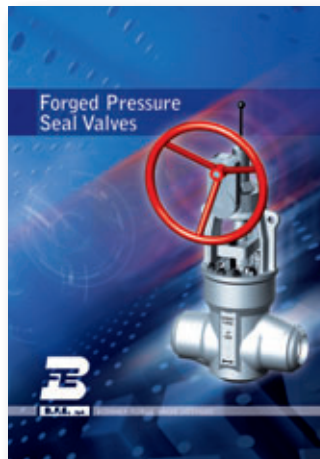
BFE AVAILABLE CATALOGUES



Forged Valves



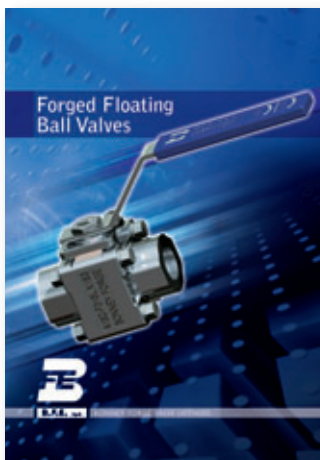
Cast Steel Valves



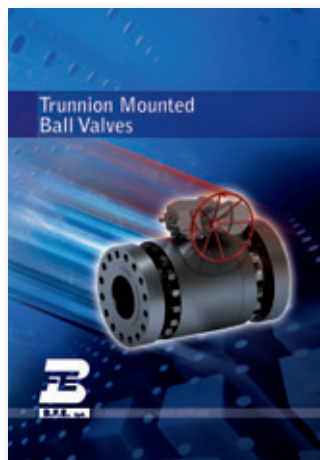
Forged Pressure Seal Valves



API 6A Valves



Forged Floating Ball Valves



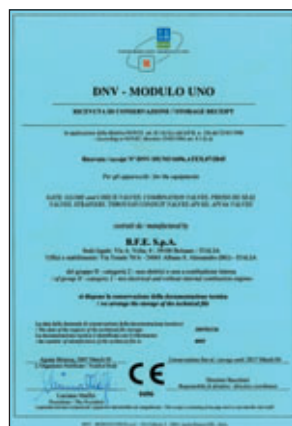
Trunnion Mounted Ball Valves



**Double Block & Bleed
Combination Valves**



Global quality. Total reliability. Two recurrent claims in present-day corporate strategies. But the transition from words to actions demands tangible measures. Specialization and organization underlie what amounts to a “quality culture” at B.F.E., not in the abstract but as a set of specific rules governing every stage of production. An operating model that is good to have in a partner who bears the responsibility of supplying valves that are essential to plant safety and regulation.



DESIGN, CONSTRUCTION, MARKING FOR FLOATING BALL VALVES

PRODUCT OVERVIEW

BFE manufactures the most complete line of quality ball valves, and can provide the exact ball valves and actuators to meet the most demanding application requirements.

Our Floating Ball Valves are available in an extensive range of designs, materials, sizes and pressure classes and are in full conformance with ANSI, API and NACE specifications. All ball valves are designed in accordance with ASME B16.34 and where applicable with API 6D or BS EN ISO 17292.

The BFE family of floating ball valves provides positive shut-off of fluids and gases under extreme service conditions.

BFE uses only high-quality materials inspected & tested to International Standards and utilizes advanced manufacturing technology with special emphasis on safety, quality, and long service life of our products, to ensure that our clients receive the "best in class" products available from us at a competitive price and delivered on time.

The forging material can ensure the best rigidity and strength under maximum rated operation pressure without inherent flaw of cast. Other properties found in forging include greater impact resistance, resistance to fatigue cracking, particularly when cycling at either high or cryogenic temperature. Overdesigned wall thickness and adaptation of high strength tie bolts are convenient for valve maintenance and sufficient to bear the stress of pipe.

The internal parts of valve are carefully designed and selected to ensure reliability under all kinds of work condition.

Since a variety of materials are available, BFE valves can be used with various fluids and gases including petroleum based oils and some water glycols.

The design of BFE ball valves is based on the "floating ball" principle which allows the ball to turn freely between the ball seals.

A positive seal is attained by fluid pressure act-

ing on the upstream surface of the ball and producing a constant uniform contact between the downstream ball seal and the ball.

The ball is operated by a sealed spindle with a projecting square end to which the control handle or optional actuator is attached.

Ball valves are intended to be used as on/off flow control devices and are not to be used to throttle fluid flow. The valves should always be either fully open or closed.

BFE Floating Ball Valve design is developed using the latest software based analysis tools.

At the design stage, all projects are analysed using 3D solid modeling tools. Benefits include reduction of development time and cost, improved product quality, and ability to solve field problems for customers. Product flexibility and accuracy is assured.

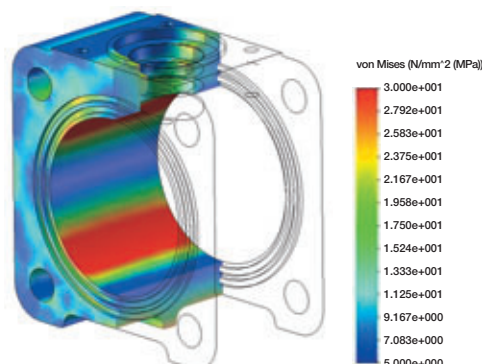
Finite Element Analysis (FEA) is a very important step at the development stage to ensure the best possible performance requirements. Valves operational problems, pressure/temperature-related deformations and flow-related forces within a valve can be evaluated.

B.F.E. S.p.A. uses the FEA for predicting failure due to unknown stresses by showing problem areas in a material and allowing designers to see all of the theoretical stresses within. This method of product design and testing is far superior to the manufacturing costs which would accrue if each sample was actually built and tested.

During any analysis project, it is the responsibility of the B.F.E. analyst to verify that analysis results conform to the physics of the problem under study. Understanding the response of a structure or manufactured product allows effective design decisions to be made in developing structures and products that are functional, meet all engineering requirements, and can be manufactured and assembled.

Computational Fluid Dynamics (CFD) is used to simulate operating flow conditions. Evaluation of Valve CV coefficient and convective

heat transfer coefficient takes place at the design stage.



MAIN FEATURES

FIRE-SAFE TEST APPROVED

BFE floating ball valves are designed in accordance with API 607 & API SPEC 6FA. When non-metal seats are destroyed in a fire, the upstream medium pressure push the ball into the downstream metal seat lip to cut off the line fluid and prevent internal leakage due to a secondary metal-to-metal seals. When the first soft seal is damaged, body/gland/stem-gasket can reach sealing function and prevent external fluid leakage.

DOUBLE BODY GASKET

All BFE floating ball valves are equipped with two body gasket. The first body gasket is in soft material and the second in graphite (if not otherwise required), this combination assures the best seal characteristic in whatever corrosive service as well give fire safe design.

ANTIC-STATIC DEVICE

In order to prevent static electricity which may light the fluid, static-conduction spring is set between the stem and the ball.

ANTI BLOW-OUT PROOF STEM

The stem is designed with integral T-Type shoulder to provide blow-out proof effectively. The design assures that the stem can not be blown out of the body in the case of the gland being removed while the valve is under pressure.

CONTROLLED STEM & STUFFING BOX FINISH

Stem and stuffing box finish machining is a key point of control. The stem is made by cold rolling and stem surface finish is controlled by $Ra=0.4$, which can reduce friction for stem moving and ensure the seal. The stuffing box surface is controlled within $Ra=1.6$ for better sealing performance.

SOLID BALL

The solid ball used by BFE provides straight-through flow and real full-port performance characteristics. Hollow ball or cored cavity ball are not used for BFE products.

LONGEVITY OF LIFE

Special consideration was devoted to the attainment of enhanced life and operation of our valve throughout design, development, testing and manufacturing stages. Valve designs combined with the selection of advanced materials are such that long periods of inactivity should not affect the operations of efficiency.

LOW TORQUE OUTPUT

Seat designs, stem-bearing system and stem

seal arrangements ensure consistent minimal torque values.

FLOW CAPACITY

Valve design allows for high flow capacity in liquid or gas services regardless of whether the media is clean or dirty. Full port valves allow for pigging and ensure maximum flow capacity.

FIELD REPAIRABLE

Simple user friendly design allows for quick and easy part replacement requiring minimal "Down Time".

ISO FLANGE INTEGRATED IN THE BODY DESIGN

ISO 5211 mounting always integrated in the forged body as standard design.

INSPECTION AND TESTING

Every valve is subjected on routine base to different non-destructive testing, like the dye penetrant test on butt weld ends, on all hard faced and cladding areas.

Non-destructive test are also carried out on the critical areas as defined by ANSI B.16.34.

Optional examinations like:

Radiographic

Magnetic particles

Ultrasonic

Helium leak test

Personal performing NDT are trained and qualified to EN 473/ ASNT-SNT-TC-1A.

Every valve is subject to a pressure test in accordance with the standard API 598 or BS 6755 Part.1.

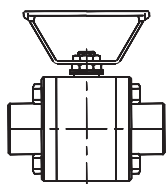
The rated pressure for the applicable pressure class is in accordance with ANSI B.16.34 / EN 12516-1-2.

MARKING AND IDENTIFICATION

Each valve is identified on proper name plate and on valve body as required by MSS- SP 25, B 16.34 Name plate carries all information on rating, size, valve body and trim material, customer tags.

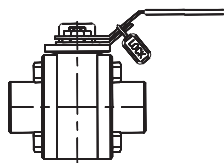
On body, marking includes material designations (per ASTM) and heat code and of course the trade mark.

AVAILABLE OPTIONS



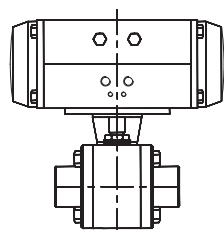
OVAL SAFETY HANDLE

Oval safety handwheels are used where the standard lever can be accidentally bumped open or closed. The oval safety handle can be either carbon steel or stainless steel.



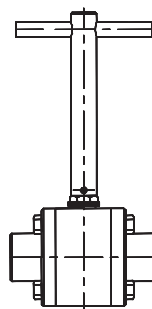
LOCKING DEVICE

Locking device is supplied as option in order to prevent unauthorized opening/closing. BFE locking device can lock the valve in either the open or closed position and cannot be branched by removing the lever.



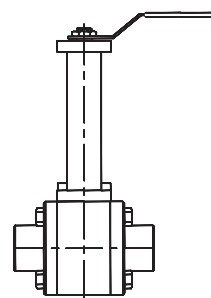
EASY AUTOMATION - PNEUMATIC ACTUATOR

BFE floating ball valves are available with pre-assembled valve/pneumatic actuator packages. In any case BFE standard design allows users to direct mount most brands of valve actuators with the need of an additional bracket always available in the factory.



"T"-HANDLE

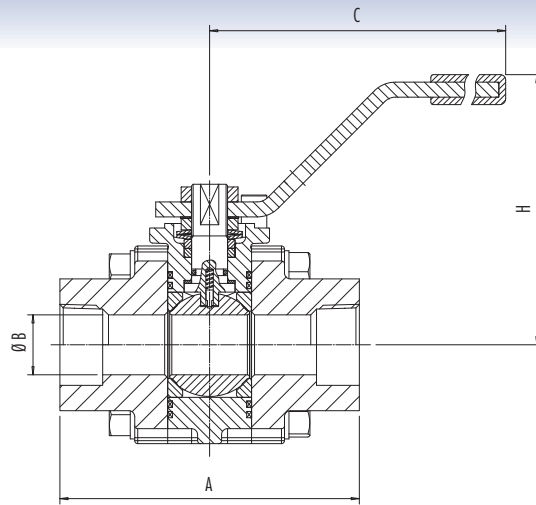
"T"-handle is usually used where access to the valve is limited and can be supplied for vertical or horizontal valve installation. The "T"-handle can be either carbon steel or stainless steel.



EXTENDED BONNET FOR INSULATION

BFE floating ball valve can be supplied with an extended bonnet to allow insulation up to 3 inches (76mm) thick. The insulation can be installed all around the valve without blocking access to the valve or other operator.

SWING OUT FLOATING BALL VALVE - ASME CLASS 800



Product Features:

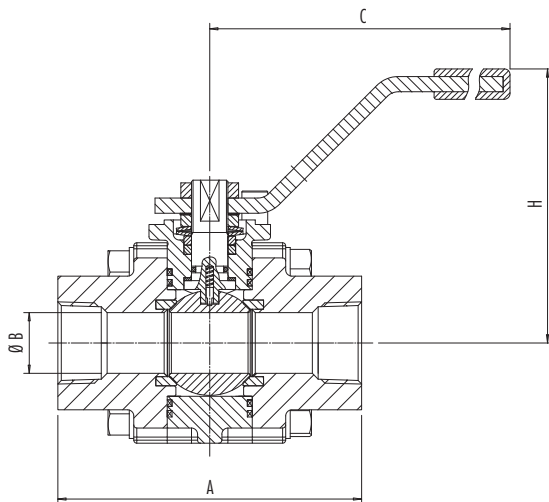
- Standard design available with Threaded/Socked-Weld/Butt-Welding ends.
- Swing Out Body Design.
- Full or reduced port available.
- Live Loaded Stem Seal.
- Phosphate coated carbon steel valve body (standard).
- ISO 5211 mounting always integrated in the forged body.
- Anti-static Electricity.
- Blow-out Proof stem.
- Fire-Safe.

STANDARD DIMENSION

SIZE	Inch	#800 FULL BORE						#800 REDUCED BORE					
		3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
A		75	80	100	110	120	140	75	80	100	110	120	140
B		11	14	20	25,4	32	38	11	14	20	25,4	32	38
C		160	160	195	195	260	260	160	160	195	195	260	260
H		73	76	108	111	125	130	73	76	108	111	125	130
Weight Kg		1	1,3	2,4	3,1	4,5	6,8	1	1,3	2,4	3,1	4,5	6,8
Figure N°		HN 702	HN 703	HN 704	HN 705	HN 706	HN 707	HLN 703	HLN 704	HLN 705	HLN 706	HLN 707	HLN 708

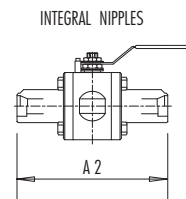
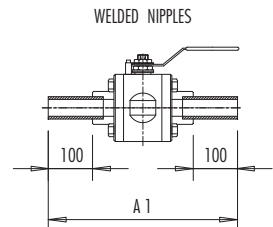
WARNING: IN CASE OF WELDING ENDS (SOCKED WELD ENDS OR BUTT WELDING ENDS) THE VALVE MUST BE DISASSEMBLED BEFORE ANY WELD OPERATION

FLOATING BALL VALVE - ASME CLASS UP TO 900



Product Features:

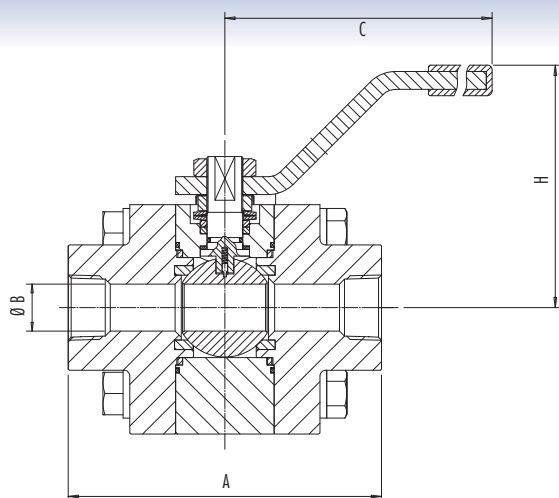
- Standard design available with threaded ends. Socked-weld and butt-welding ends are available only with nipple.
- Encapsulated Seat Design.
- Full or reduced port available.
- Live Loaded Stem Seal.
- Phosphate coated carbon steel valve body (standard).
- ISO 5211 mounting always integrated in the forged body.
- Anti-static Electricity.
- Blow-out Proof stem.
- Fire-Safe.



STANDARD DIMENSION

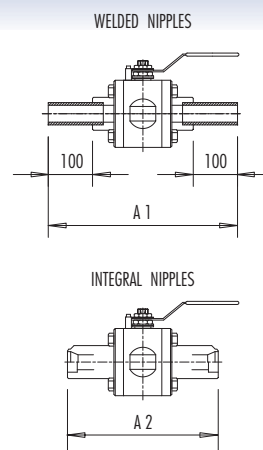
SIZE	Inch	#900 FULL BORE						#600 FULL BORE			#900 REDUCED BORE						#600 REDUCED BORE		
		3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
A		75	80	100	110	120	140	150	170	300	75	80	100	110	120	140	150	170	300
A 1		275	280	300	310	320	340	350	—	—	275	280	300	310	320	340	350	—	—
A 2		236	239	250	261	270	279	298	300	300	236	239	250	261	270	279	298	300	300
B		11	14	20	25,4	32	38	49	62	76	11	14	20	25,4	32	38	49	62	76
C		160	160	195	195	260	260	260	360	450	160	160	195	195	260	260	260	360	450
H		73	76	108	111	125	130	137	170	184	73	76	108	111	125	130	137	170	184
Weight Kg		1	1,3	2,4	3,1	4,5	6,8	8,5	14	26	1	1,3	2,4	3,1	4,5	6,8	8,5	12,5	24
Figure N°		90H 702	90H 703	90H 704	90H 705	90H 706	90H 707	6-708	6-709	6-710	90HL 703	90HL 704	90HL 705	90HL 706	90HL 707	90HL 708	L6-709	L6-710	L6-711

FLOATING BALL VALVE - ASME CLASS 1500/2500



Product Features:

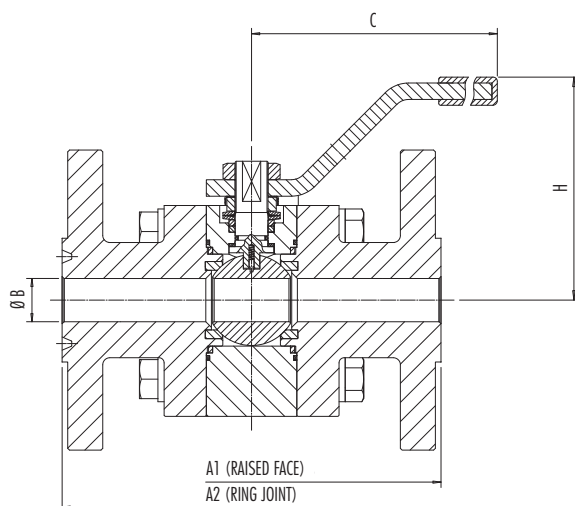
- Standard design available with threaded ends. Socked-weld and butt-welding ends are available only with nipple.
- Live Loaded Stem Seal.
- Phosphate coated carbon steel valve body (standard).
- ISO 5211 mounting always integrated in the forged body.
- Anti-static Electricity.
- Blow-out Proof stem.
- Fire-Safe.



STANDARD DIMENSION

	#1500/2500 FULL BORE							#2500 FULL BORE			
SIZE Inch	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	3/8"	1/2"	3/4"	1"
A	100	100	125	140	170	170	200	100	100	125	140
A 1	300	300	325	340	370	370	400	300	300	325	340
A 2	216	216	229	254	279	305	368	216	216	229	254
B	11,1	11,1	15,5	21	34	34	43	11,1	11,1	15,5	21
C	195	195	195	260	360	360	360	195	195	195	260
H	100	100	107	121	154	154	162	100	100	107	105
Weight Kg	3	3	4,8	7,7	14	14	19,3	3	3	4,8	7,7
Figure N°	15H 702	15H 703	15H 704	15H 705	15H 706	15H 707	15H 708	25H 702	25H 703	25H 704	25H 705

FLANGED ENDS FLOATING BALL VALVE - ASME CLASS 1500/2500



Product Features:

- Live Loaded Stem Seal.
- Phosphate coated carbon steel valve body (standard).
- ISO 5211 mounting always integrated in the forged body.
- Anti-static Electricity.
- Blow-out Proof stem.
- Fire-Safe.

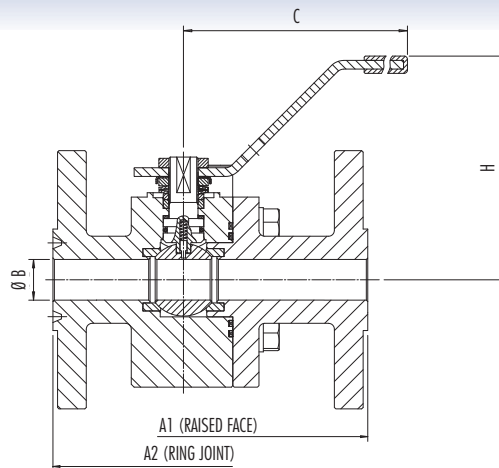
STANDARD DIMENSION

SIZE	Inch	#1500 FULL BORE						#2500 FULL BORE		
		1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	1/2"	3/4"	1"
A 1		216	229	254	279	305	368	264	273	308
A 2		216	229	254	279	305	371	264	273	308
B		11,1	15,5	21	34	34	43	11,1	15,5	21
C		195	195	260	360	360	360	195	195	260
H		100	107	121	154	154	162	100	107	121
Weight Kg		7,1	10,5	17,5	25,5	29	38	10	14	22
Figure N°		15H 703	15H 704	15H 705	15H 706	15H 707	15H 708	25H 703	25H 704	25H 705

FLANGED ENDS FLOATING BALL VALVE - ASME CLASS 150

Product Features:

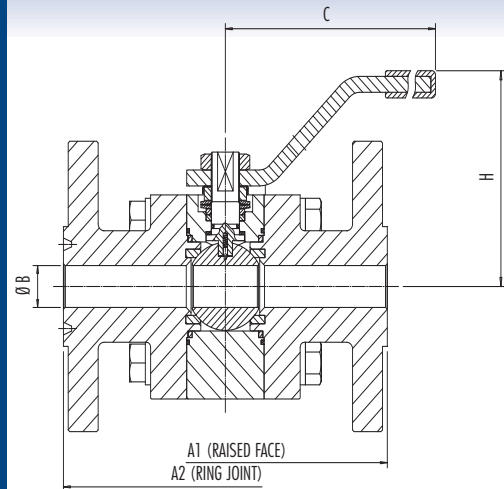
- Live Loaded Stem Seal.
- Phosphate coated carbon steel valve body (standard).
- ISO 5211 mounting always integrated in the forged body.
- Anti-static Electricity.
- Blow-out Proof stem.
- Fire-Safe.



STANDARD DIMENSION

SIZE	Inch	#150 FULL BORE							
		1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
A 1		108,5	117,5	127	140	165	178	191	203
A 2		N. A.	N. A.	140	153	178	191	203	216
B		14	20	25,4	32	38	49	62	76
C		160	195	195	260	260	260	360	450
H		76	108	111	125	130	137	170	184
Weight Kg		2	3,2	4,6	6,2	8,2	11,3	15,9	21,5
Figure N°		1-703	1-704	1-705	1-706	1-707	1-708	1-709	1-710

• 2-Pieces Design



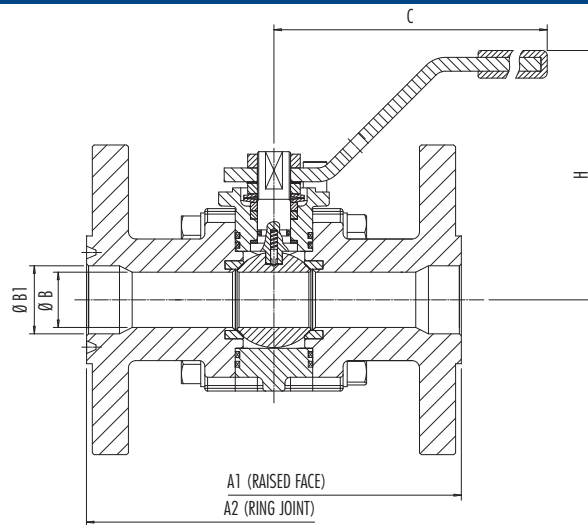
STANDARD DIMENSION

SIZE	Inch	#150 FULL BORE	
		4"	6"
A 1		229	394
A 2		242	407
B		100	150
C		450	750
H		203	253
Weight Kg		52	83
Figure N°		1-711	1-713

• 3-Pieces Design

Product Features:

- Live Loaded Stem Seal.
- Phosphate coated carbon steel valve body (standard).
- ISO 5211 mounting always integrated in the forged body.
- Anti-static Electricity.
- Blow-out Proof stem.
- Fire-Safe.



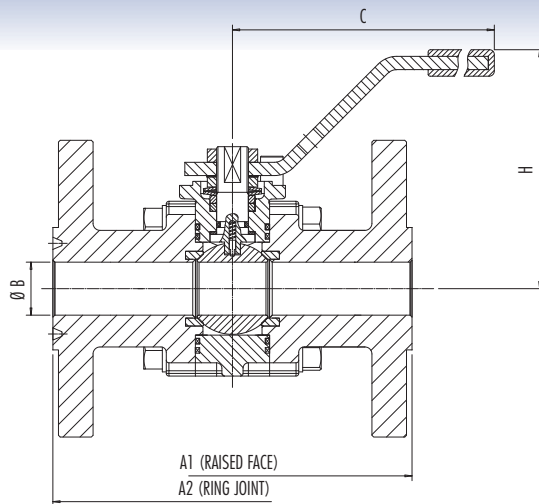
STANDARD DIMENSION

SIZE	Inch	#150 REDUCED BORE										
		1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"
A 1		108,5	117,5	127	140	165	178	191	203	229	394	457
A 2		N. A.	N. A.	140	153	178	191	203	216	242	407	470
B		11	14	20	25,4	32	38	49	62	76	100	150
B 1		14	20	25,4	32	38	49	62	76	100	150	200
C		160	160	195	195	260	260	260	360	450	450	750
H		73	76	108	111	125	130	137	170	184	203	253
Weight Kg		2,7	3,3	4,5	6,3	8,8	11,6	16,2	22,2	29,3	64	98
Figure N°		L1-703	L1-704	L1-705	L1-706	L1-707	L1-708	L1-709	L1-710	L1-711	L1-713	L1-714

FLANGED ENDS FLOATING BALL VALVE - ASME CLASS 300

Product Features:

- Live Loaded Stem Seal.
- Phosphate coated carbon steel valve body (standard).
- ISO 5211 mounting always integrated in the forged body.
- Anti-static Electricity.
- Blow-out Proof stem.
- Fire-Safe.

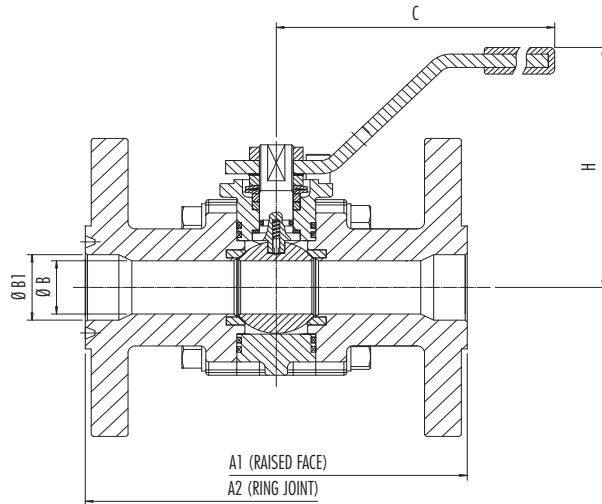


STANDARD DIMENSION

	#300 FULL BORE									
SIZE	Inch	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
A 1		140	152	165	178	191	216	241	282	305
A 2		151	165	178	191	203	232	257	298	321
B		14	20	25,4	32	38	49	62	76	100
C		160	195	195	260	260	260	360	450	450
H		76	108	111	125	130	137	170	184	203
Weight Kg		3,5	5	7	10,5	13,5	18,8	25,2	39	68
Figure N°		3-703	3-704	3-705	3-706	3-707	3-708	3-709	3-710	3-711

Product Features:

- Live Loaded Stem Seal.
- Phosphate coated carbon steel valve body (standard).
- ISO 5211 mounting always integrated in the forged body.
- Anti-static Electricity.
- Blow-out Proof stem.
- Fire-Safe.



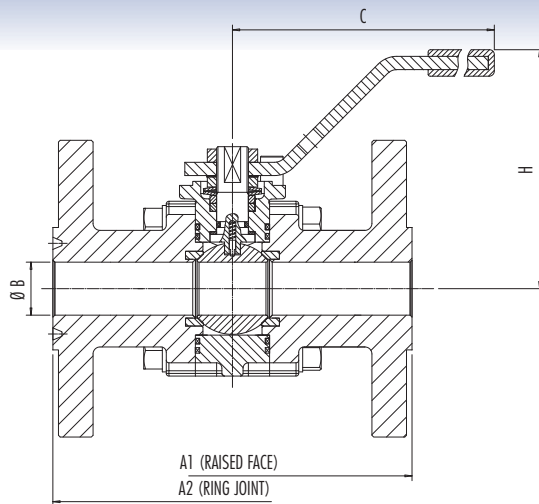
STANDARD DIMENSION

	#300 REDUCED BORE										
SIZE	Inch	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"
A 1		140	152	165	178	191	216	241	282	305	403
A 2		151	165	178	191	203	232	257	298	321	419
B		11	14	20	25,4	32	38	49	62	76	100
B 1		14	20	25,4	32	38	49	62	76	100	150
C		160	160	195	195	260	260	260	360	450	450
H		73	76	108	111	125	130	137	170	184	203
Weight Kg		3	4	6	8,2	11,6	14,8	20	27	41	85
Figure N°		L3-703	L3-704	L3-705	L3-706	L3-707	L3-708	L3-709	L3-710	L3-711	L3-713

FLANGED ENDS FLOATING BALL VALVE - ASME CLASS 600

Product Features:

- Live Loaded Stem Seal.
- Phosphate coated carbon steel valve body (standard).
- ISO 5211 mounting always integrated in the forged body.
- Anti-static Electricity.
- Blow-out Proof stem.
- Fire-Safe.

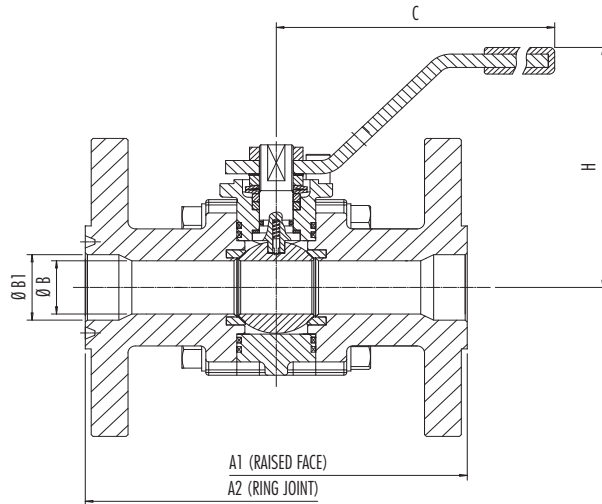


STANDARD DIMENSION

SIZE	Inch	#600 FULL BORE							
		1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
A 1		165	191	216	229	241	292	330	356
A 2		163	191	216	229	241	295	333	359
B		14	20	25,4	32	38	49	62	76
C		160	195	195	260	260	260	360	450
H		76	108	111	125	130	137	170	184
Weight Kg		4,5	6	8	12	16	22	29	45
Figure N°		6-703	6-704	6-705	6-706	6-707	6-708	6-709	6-710

Product Features:

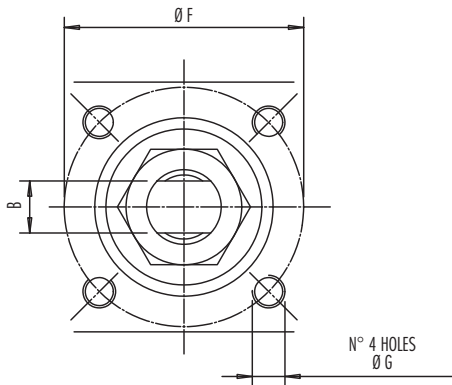
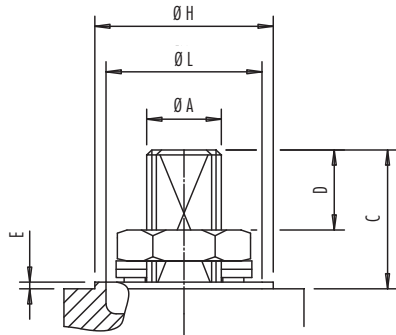
- Live Loaded Stem Seal.
- Phosphate coated carbon steel valve body (standard).
- ISO 5211 mounting always integrated in the forged body.
- Anti-static Electricity.
- Blow-out Proof stem.
- Fire-Safe.



STANDARD DIMENSION

SIZE	Inch	#600 REDUCED BORE								
		1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
A 1		165	191	216	229	241	292	330	356	432
A 2		163	191	216	229	241	295	333	359	435
B		11	14	20	25,4	32	38	49	62	76
B 1		14	20	25,4	32	38	49	62	76	100
C		160	160	195	195	260	260	260	360	450
H		73	76	108	111	125	130	137	170	184
Weight Kg		3,8	5	7	9	13,1	17,2	23,5	31	48
Figure N°		L6-703	L6-704	L6-705	L6-706	L6-707	L6-708	L6-709	L6-710	L6-711

TOP MOUNTING

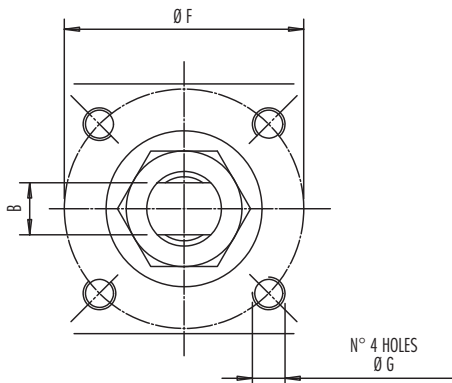
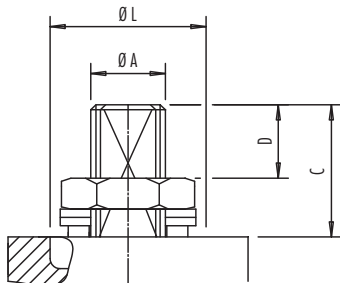


ASME CLASS UP TO 800 EXCLUDED ASME 150 FLANGED

FB	RB	A	B	C	D	E	F	G	H	L	ISO
3/8"	1/2"	M10x1	5,4	9,5	6,5	1,5	36	M5x7	25	21	F03
1/2"	3/4"	M10x1	5,4	10	6,5	1,5	36	M5x7	25	21	F03
3/4"	1"	M12x1,25	7,5	15	10,5	1,5	42	M5x7	30	24	F04
1"	1.1/4"	M12x1,25	7,5	20,5	12,5	1,5	42	M5x10	30	24	F04
1.1/4"	1.1/2"	M16x1,5	10	29	17	1,5	50	M6x11	35	31	F05
1.1/2"	2"	M16x1,5	10	27,5	17	1,5	50	M6x11	35	31	F05
2"	2.1/2"	M16x1,5	10	23	17	1,5	50	M6x11	35	31	F05
2.1/2"	3"	M22x1,5	16	41	24,5	1,5	70	M8x13	55	48	F07
3"	4"	M27x2	18	39,5	25	1,5	70	M8x13	55	48	F07
4"	6"	M27x2	18	39,5	25	1,5	70	M8x13	55	48	F07

ASME CLASS 150 FLANGED ONLY

FB	RB	A	B	C	D	E	F	G	H	L	ISO
1/2"	3/4"	M10x1	5,4	14	6,5	1,5	36	M5x10	25	21	F03
3/4"	1"	M12x1,25	7,5	19	10,5	1,5	42	M5x10	30	24	F04
1"	1.1/4"	M12x1,25	7,5	20,5	12,5	1,5	42	M5x10	30	24	F04
1.1/4"	1.1/2"	M16x1,5	10	29	17	1,5	50	M6x11	35	31	F05
1.1/2"	2"	M16x1,5	10	27,5	17	1,5	50	M6x11	35	31	F05
2"	2.1/2"	M16x1,5	10	24,5	17	1,5	50	M6x11	35	31	F05
2.1/2"	3"	M22x1,5	16	41	24,5	1,5	70	M8x13	55	48	F07
3"	4"	M27x2	18	39,5	25	1,5	70	M8x13	55	48	F07
4"	6"	M27x2	18	39,5	25	1,5	70	M8x13	55	48	F07
6"	8"	M36x2	26	50,5	27	1,5	102	M10x17	70	65	F10



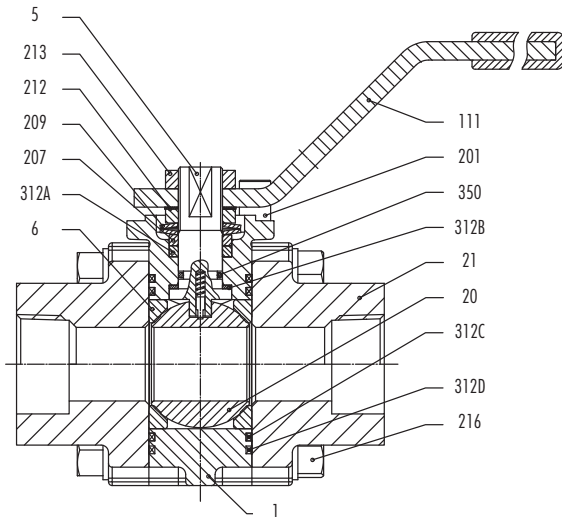
ASME CLASS 1500 - 2500

	A	B	C	D	E	F	G	H	L	ISO
1/2"	M12x1,25	7,5	11,5	9	—	36	M5x10	—	24	F03
3/4"	M12x1,25	7,5	14,5	11	—	42	M5x10	—	24	F04
1"	M16x1,5	10	21,5	17	—	50	M6x11	—	31	F05
1.1/4"	M22x1,5	16	35	21,5	—	70	M8x13	—	40	F07
1.1/2"	M22x1,5	16	35	21,5	—	70	M8x13	—	40	F07
2"	M22x1,5	16	33,5	21,5	—	70	M8x13	—	40	F07

* ONLY CLASS 1500

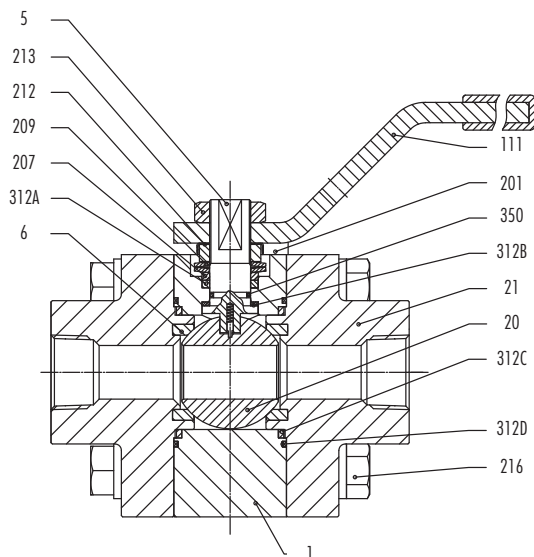
STANDARD MATERIALS

STANDARD BILL OF MATERIAL FOR ASME CLASSES UP TO 900



ITEM	DESCRIPTION	ASTM A105N - TRIM 316	ASTM A350 LF2 - TRIM 316	ASTM A182 F316-L - TRIM 316
1	BODY	ASTM A105N	ASTM A350 LF2	ASTM A182 F316-L
5	STEM	ASTM A479 316	ASTM A479 316	ASTM A479 316
6	SEAT	RPTFE C-GRAPHITE	RPTFE C-GRAPHITE	RPTFE C-GRAPHITE
20	BALL	ASTM A479 316	ASTM A479 316	ASTM A479 316
21	END CONNECTION	ASTM A105N	ASTM A350 LF2	ASTM A182 F316-L
N.A.	NAMEPLATE	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL
111	HANDLE	ZINC PLATED C-STEEL	ZINC PLATED C-STEEL	ZINC PLATED C-STEEL
201	STOP PIN	ASTM A194 GR.8	ASTM A194 GR.8	ASTM A194 GR.8
207	GLAND	ASTM A479 316	ASTM A479 316	ASTM A479 316
209	SPRING WASHER	AISI 316	AISI 316	AISI 316
212	STOP WASHER	AISI 316	AISI 316	AISI 316
213	HANDLE NUT	ASTM A307 GR.B	ASTM A307 GR.B	ASTM A307 GR.B
216	BOLT	ASTM A193 L7M	ASTM A193 L7M	ASTM A193 B8M
312A	FIRESAFE STEM GASKET	GRAPHITE	GRAPHITE	GRAPHITE
312B	THRUST WASHER	RPTFE C-GRAPHITE	RPTFE C-GRAPHITE	RPTFE C-GRAPHITE
312C	FIRST BODY GASKET	RPTFE C-GRAPHITE	RPTFE C-GRAPHITE	RPTFE C-GRAPHITE
312D	FIRESAFE BODY GASKET	GRAPHITE	GRAPHITE	GRAPHITE
350	O-RING	VITON	VITON	VITON

STANDARD BILL OF MATERIAL FOR ASME CLASSES 1500 - 2500

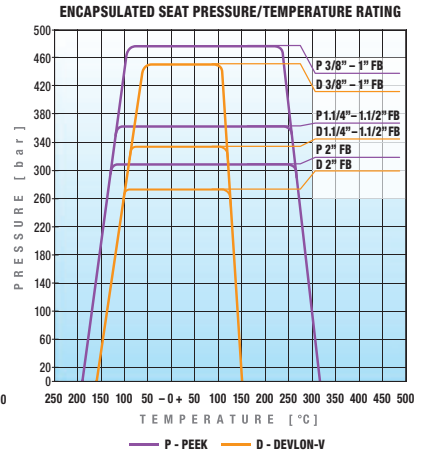
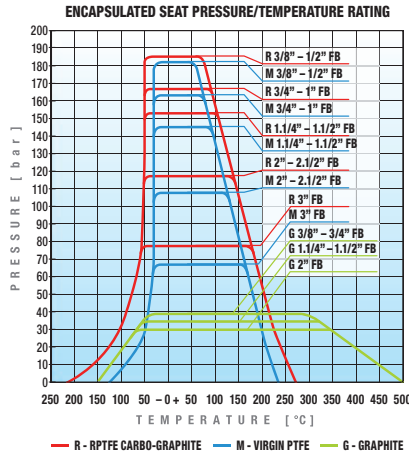
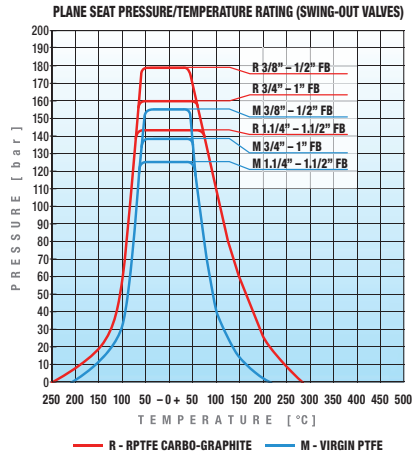


ITEM	DESCRIPTION	ASTM A105N - TRIM 316	ASTM A350 LF2 - TRIM 316	ASTM A182 F316-L - TRIM 316
1	BODY	ASTM A105N	ASTM A350 LF2	ASTM A182 F316-L
5	STEM	ASTM A479 316	ASTM A479 316	ASTM A479 316
6	SEAT	DEVLON-V	DEVLON-V	DEVLON-V
20	BALL	ASTM A479 316	ASTM A479 316	ASTM A479 316
21	END CONNECTION	ASTM A105N	ASTM A350 LF2	ASTM A182 F316-L
N.A.	NAMEPLATE	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL
111	HANDLE	ZINC PLATED C-STEEL	ZINC PLATED C-STEEL	ZINC PLATED C-STEEL
201	STOP PIN	ASTM A194 GR.8	ASTM A194 GR.8	ASTM A194 GR.8
207	GLAND	ASTM A479 316	ASTM A479 316	ASTM A479 316
209	SPRING WASHER	AISI 316	AISI 316	AISI 316
212	STOP WASHER	AISI 316	AISI 316	AISI 316
213	HANDLE NUT	ASTM A307 GR.B	ASTM A307 GR.B	ASTM A307 GR.B
216	BOLT	ASTM A193 L7M	ASTM A193 L7M	ASTM A193 B8M
312A	FIRESAFE STEM GASKET	GRAPHITE	GRAPHITE	GRAPHITE
312B	THRUST WASHER	RPTFE C-GRAPHITE	RPTFE C-GRAPHITE	RPTFE C-GRAPHITE
312C	FIRST BODY GASKET	VITON	VITON	VITON
312D	FIRESAFE BODY GASKET	GRAPHITE	GRAPHITE	GRAPHITE
350	O-RING	VITON	VITON	VITON

VALVE SEAT & GASKET MATERIAL SELECTION GUIDE

Choosing the right seat material is the most important decision in ball valve selection. Use the Pressure/Temperature rating chart for the most common seat materials and ask us in case of special material or applications.

PLEASE NOTE THAT THE FOLLOWING RATINGS ARE REFERRED TO THE VALVE SEATS. DO NOT USE THIS RATINGS FOR THE VALVE CLASS SELECTION.



The BFE SEAL CODE (3 digits) is designed to cover essential features of BFE seats and gasket material, the code is marked on the valve nameplate in order to easy allow customers to identify the internal soft material.

DIGIT-1 — INSERT SEAT MATERIAL

DIGIT-2 — EMERGENCY BODY SEAL

DIGIT-3 — FIRST BODY SEAL

Example: SEAL CODE "RGR":
 INSERT SEAT MATERIAL = RPTFE CARBO-GRAPHITE
 EMERGENCY BODY SEAL = GRAPHITE
 FIRST BODY SEAL = RPTFE CARBO-GRAPHITE.

The following table shows the most used materials, their characteristics, application (seat or gasket) and the BFE ID.

SEAL MATERIAL	MATERIALS CHARACTERISTICS	BFE SYMBOL	AVAILABLE MATERIAL FOR SEAT	AVAILABLE MATERIAL FOR GASKET
			BFE SEAL CODE DIGIT 1	BFE SEAL CODE DIGIT 2/3
VIRGIN PTFE	Polytetrafluoroethylene is a Fluorocarbon-based polymer. This seating material has excellent chemical resistance and low coefficient of friction. PTFE is non-contaminating and accepted by FDA for use in food services. Not recommended for liquid alkalis and fluorine.	M	YES	YES
RPTFE 25% CARBO-GRAPHITE	PTFE's mechanical properties are enhanced by adding percentage of filler material to provide improved strength, stability and wear resistance.	R	YES	YES
RPTFE 60% BRONZE	This material exhibits a unique combination of heat resistance and low friction together with outstanding chemical and good electrical properties. No moisture absorption, high arc resistance, and is self lubricating with a low coefficient of friction.	B	YES	NO
DEVLON-V	Devlon-V (special Nylon produced by Devol Engineering Ltd) offers very good performances regarding the maximum allowable pressure and excellent elasticity.	D	YES	NO
KEL-F	PCFEE (Polychlorotrifluoroethylene) is a fluorocarbon based polymer. It offers a unique combination of physical and mechanical properties non-flammability, chemical resistance, and near zero moisture absorption. It is suitable for cryogenic applications.	K	YES	NO
PEEK	Polyetheretherketone high temperature semi rigid elastomer. Best suited for high pressure and temperature service. Also offers very good corrosion resistance.	P	YES	NO
UHMWP	Ultra-High Molecular Weight Polyethylene. Ideal for use in lowlevel radiation service. This seat also meets the requirements of the tobacco industry where TFE is prohibited and it offers an excellent resistance to abrasive media.	U	YES	YES
VITON	Standard material for O-RING	V	NO	YES
GRAPHITE	Hard carbon with excellent heat resistance. Not suitable as seat material when presence of oxidized service is expected.	G	YES	YES
TUNGSTEN CARBIDE COAT	For liquid or gas services with high presence of solids or in any case where extreme hardness and wear resistance is required. Tungsten carbide itself is practically inert and extremely strong. Any attack is usually on the binder. Not suitable when small presence of caustic soda is expected.	T	YES	N.A.
CHROME CARBIDE COAT	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.	C	YES	N.A.
OTHER	For other materials please ask to BFE.	-	-	-

CRYOGENIC CONFIGURATION



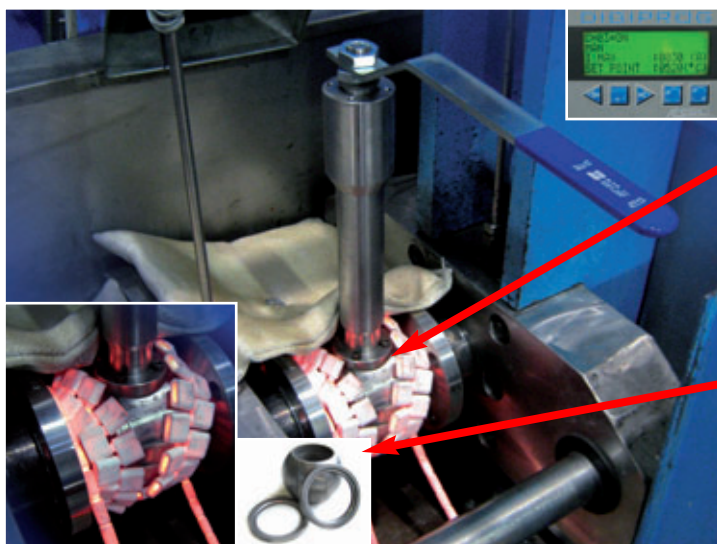
BFE floating ball valves designated for use in cryogenic temperatures to minus 196°C (320°F) offer superior service life in tough and demanding applications.

The design incorporates a vent hole drilled on the upstream side of the ball, eliminating the possibility of trapping liquid or gas in the cavity and thereby preventing dangerous overpressure due to thermal expansion.

The bonnet extension keeps heat transfer down, the packing frost free and the operational torque low.

Selection of materials of construction is optimized for the intended service. Extended bonnets are provided to ensure zero leakage.

METAL SEATED CONFIGURATION



BFE metal seated floating ball valves are designed for high temperature applications and for abrasive services:

- **HIGH TEMPERATURE:** BFE floating ball valves designated for high temperature operation offer superior service life for any kind of fluid compatible with graphite. BFE Metal to Metal seated ball valves employ a special spring loaded seat design, which would absorb the heat expansion of valve components, so that the valve would not get stuck due to the high temperature.
- **ABRASIVE SERVICE:** The valve is highly resistant to erosion, very effective in the handling of fluids containing abrasives and any dirty media and maintenance free. The valve is provided with Tungsten Carbide coated metal seats to avoid the erosion of soft seats. Soft seat must not be used for abrasive service.

OTHER SPECIAL SERVICES

SERVICE	DESCRIPTION & VALVE FEATURES
OXYGEN GAS	BFE floating ball valves designated for Oxygen Service are prepared and cleaned to standards required for the safe operation of Oxygen Service equipment and product purity. Acetal Resin (Delrin) seats and Nylatron seals must not be used in oxygen service.
VACUUM	BFE floating ball valves can be used with standard design in "Medium Vacuum" range (up to 0.001 Torr). Specially prepared and tested valves can be used through the "High Vacuum" range. Valves with reinforced TFE, carbon-graphite or metal seats are not recommended for vacuum service.
CHLORINE	BFE floating ball valves designated for Chlorine Service are in stainless steel material (Grade 304 or 316) or other alloys such as Monel or Hastelloy C. Reinforced PTFE can be used for the chlorine service. Due to the high coefficient of expansion the ball vent hole is required. They are prepared and cleaned to standards required.
ALIMENTARY	The BFE special "cavity filled" design (standard design for alimentary service valves) offer the best way to maintain the body cavity clean and empty from impurities. BFE floating ball valves designated for alimentary files Service are also prepared and cleaned to standards required.
SLURRY & MUD	The BFE special "cavity filled" design (standard design for slurry service valves) offer the best way to maintain the body cavity empty from slurry and safe from phase transition to the solid state (immobilizing the valve).
RUBBER POLYMERS	The BFE special "cavity filled" design (standard design for polymers service valves) offer the best way to maintain the body cavity empty from fluid and safe from possible polymerization in place (immobilizing the valve).
HYDROGEN PEROXIDE	Ball Valve are recommended for hydrogen peroxide service. The valve is nitrogen leak tested and prepared and cleaned to standards required. The ball vent hole is required.

GENERAL SALE CONDITIONS

QUOTATION VALIDITY

Unless otherwise agreed, quotations are valid for four weeks from date of issue.

The delivery terms are always "ex-works" unless otherwise stated.

Prices and sale conditions can be changed without any previous notice.

ORDERS ACCEPTANCE

Orders are considered accepted at our general sale conditions clearly mentioned on order acknowledgment.

GOODS DELIVERY

The Company does not accept any responsibility for delays in delivery which are always intended as indicative and not binding. Transport risks are at receiver's charge also in case of CIF delivery.

GUARANTEE

The Company warrants all its products, from material and/or manufacturing defects, to be used as recommended by standards, and in accordance with approved piping practice and technique, for a period of one year from shipping date, unless otherwise agreed.

The Company liability covers eventual "free of charge" replacements for defective parts or products, providing it has not failed in the observance of above mentioned conditions and in use in compliance with standards, and, anyway, after return of defective goods. Any other liability, neither objective nor subjective will be accepted.

CLAIMS AND ORDER CANCELLATIONS

Claims will be considered only if made within 10 days from goods receipt.

Partial or complete cancellations of order can be accepted only upon previous agreement or by written consent and, however, not later than 15 days from order date.

Any controversy will be handled by the Court of Milan.

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Dimensions on the catalogue are indicative.

BFE SPA reserves the right to make all necessary changes without notice.





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