

FluoroSeal



2 PIECE TRUNNION BALL VALVES

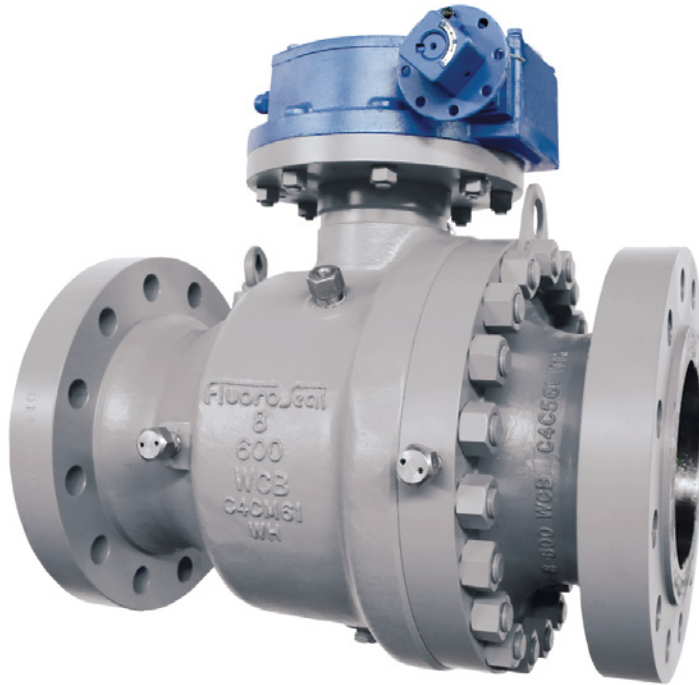
API 6D
CAST STEEL BODY
Class 150, 300, 600, 900 & 1500

PRODUCT OVERVIEW



For over 30 years, FluoroSeal has been manufacturing and customizing a wide range of valves and accessories for many industries including Oil & Gas, Petrochemical, Chemical, Mining, Power Generation, Pharmaceutical, and Marine. Our two piece trunnion mounted ball valves are designed and manufactured according to API, ANSI, and ASME standards to meet the most stringent industry requirements.

In addition, they are available with inner or outer trunnion body designs to provide a reliable and long lasting service life in a broad range of high pressure and high temperature applications. FluoroSeal two piece trunnion mounted ball valves are available in a broad range of exotic alloys for use in upstream, midstream, and downstream applications.



FluoroSeal® Class 600, 2 Piece Trunnion Mounted Ball Valve

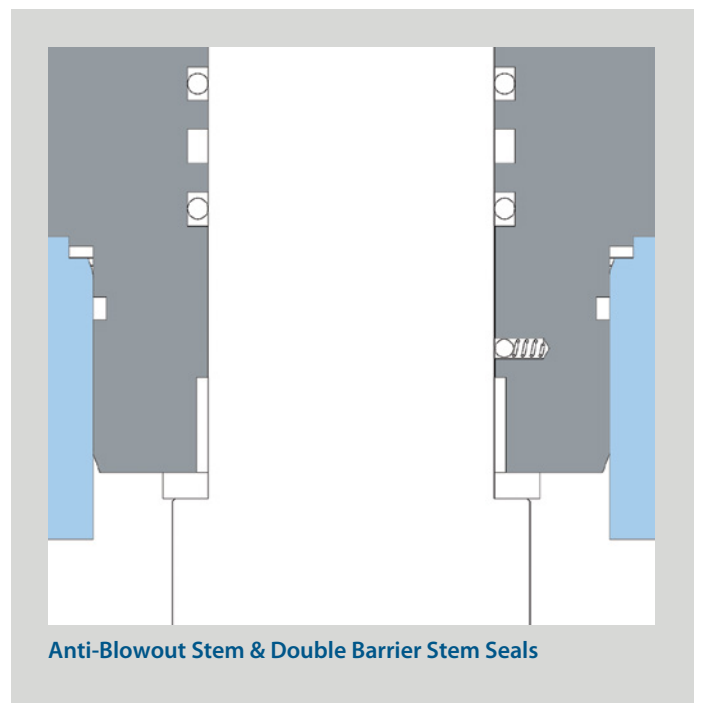
FluoroSeal® two piece trunnion mounted ball valves offer increased value by incorporating advanced design features

- **ANTI-BLOWOUT STEM & DOUBLE BARRIER STEM SEALS**

Two piece trunnion mounted ball valves utilize a blowout proof stem which is sealed by a combination of stem packing and double o-ring seals resulting in low fugitive emissions.

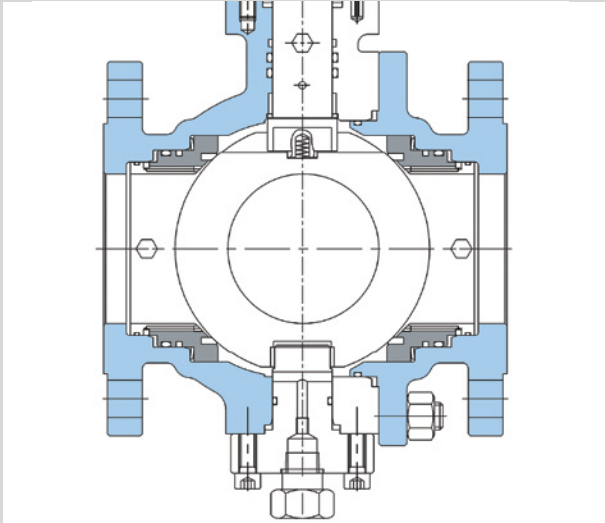
- **TRUNNION MOUNTED BALL**

The ball is fixed and the seat rings are floating, free to move along the valve axis. Side loads generated by pressure acting on the ball are absorbed by the metal bearings. PTFE impregnated washers help to reduce operating torques in high pressure applications. At low pressure the seat sealing action is achieved by the thrust of the springs acting on the seat rings. As the pressure increases, the line pressure pushes the seat rings against the ball.



- DOUBLE BLOCK AND BLEED**

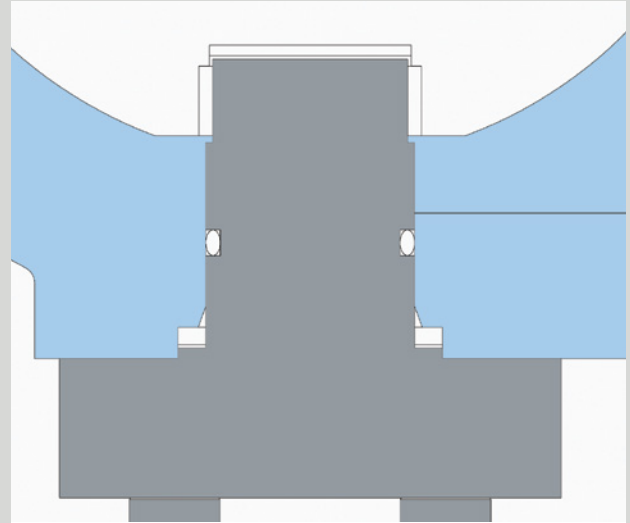
Valves with single piston or double piston seat design allow to bleed the body cavity through the drain plug/valve with the ball in either the fully closed or fully open position. This unique feature allows for seat integrity confirmation without the need to close the valve in a normally open application.



Double Block and Bleed

- SHORT COUPLED TRUNNIONS**

Short coupled trunnions minimize operating torque and reduce bearing loads for 2" to 4" sizes in pressure classes up to ASME 1500.



Short Coupled Trunnions

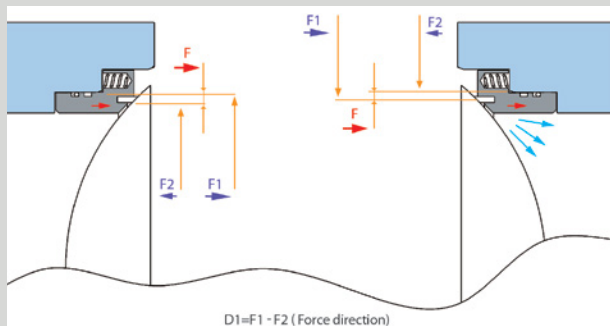
- SINGLE PISTON EFFECT**

In the standard design FluoroSeal® trunnion-mounted ball valves, each seat ring performs the "Single Piston" action. The pressure acting on the external and internal side of the seat ring results in a force compressing the seat against the ball.

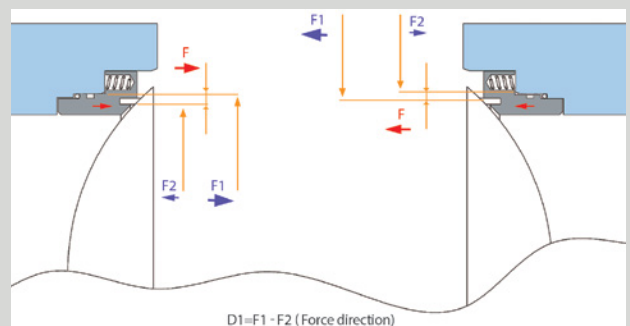
When the body cavity pressure exceeds the spring pressure, self-relieving seats vent the pressure to the process piping.

- DOUBLE PISTON EFFECT**

Upon request, the seat rings design may be modified to the "Double Piston" design. In this case, the pressure acting on both the external and internal side of the seat rings results in a force which pushes the seat against the ball. Each seat ring provides positive sealing when pressure is applied in the body cavity.



Single Piston Effect



Double Piston Effect

DESIGN FEATURES

- **ANTI-STATIC DESIGN**

Electrical continuity is assured through the use of a spring loaded contact and/or the valve bearings.

- **BODY SEALING**

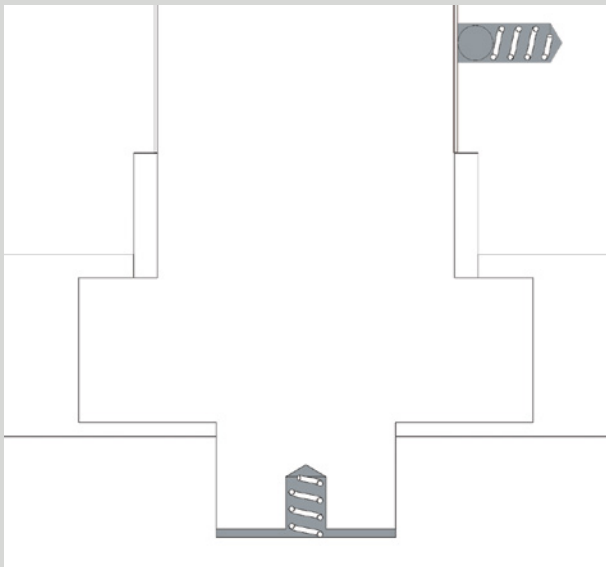
Sealing and fire-safe features are ensured by the use of the double sealing action of o-rings and graphite gaskets in all the body static joints.

- **EMERGENCY SEALANT INJECTION**

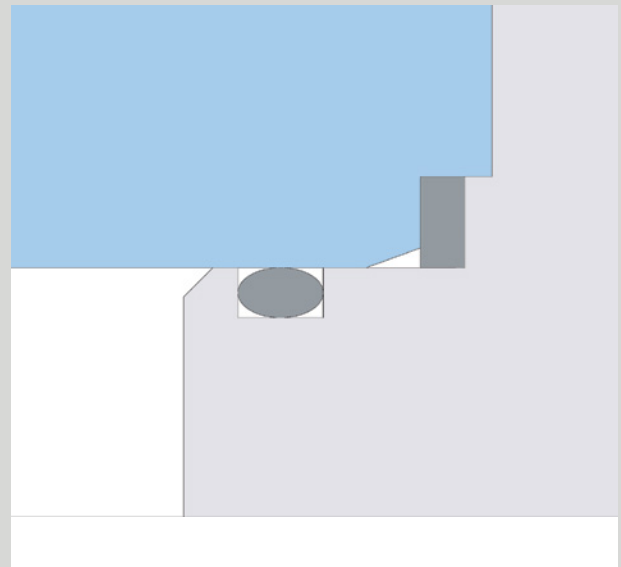
Optional emergency grease injection port at the seat sealing area is available upon request.

APPLICATIONS

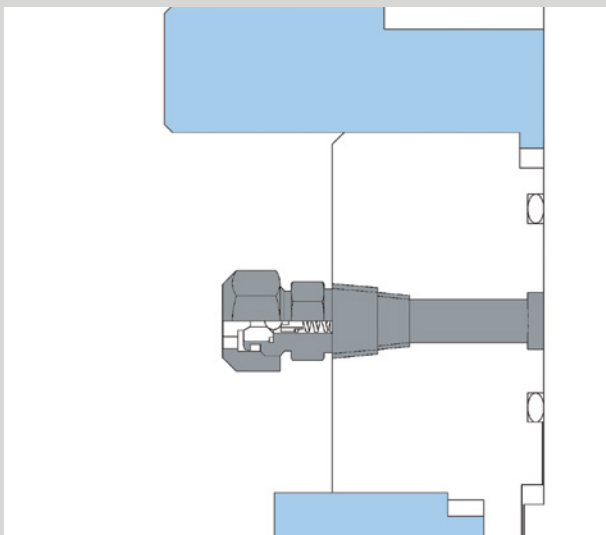
Due to their industry leading design features FluoroSeal two piece trunnion mounted ball valves can provide years of service in a wide variety of difficult and demanding applications. Consult factory for details on your application.



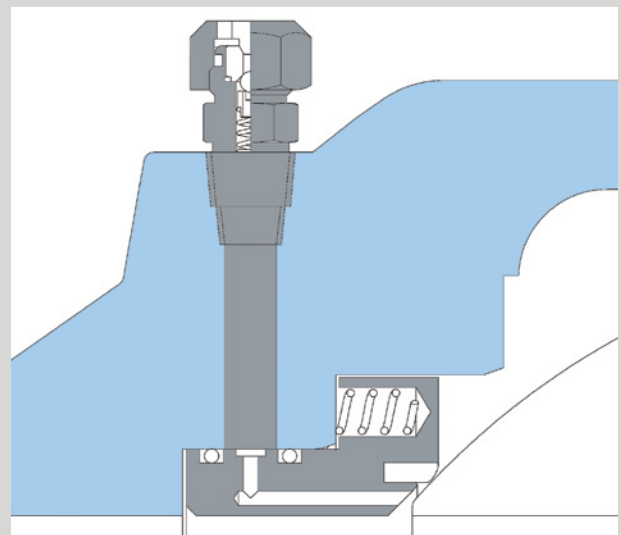
Anti-Static Design



Body Sealing



Emergency Sealant Injection - View A



Emergency Sealant Injection - View B

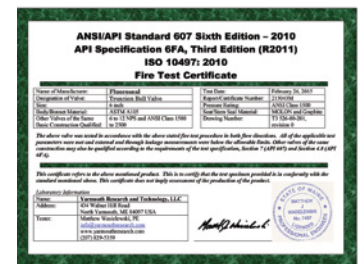
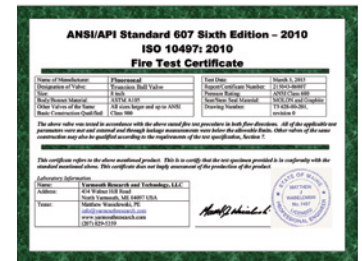
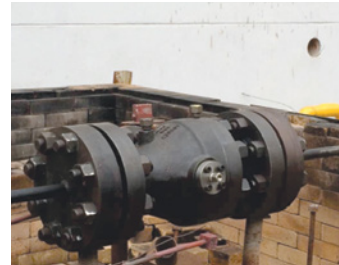
APPLICABLE STANDARDS

- API 6D, ISO 14313, API SPEC Q1
Specification for Pipeline Valves
- API 6A, ISO 10423
Valves design
- ANSI B16.10, API 6D
Face-to-Face and End-to-End Dimensions of Valves
- ANSI B16.34
Valves, Flanged and Butt Weld End
- API 6FA, API 607
Specification for Fire Test for Valves
- NACE MR0175/ISO 15156
Sulphide Stress Cracking Resistant Metallic Material for Oilfield Equipment
- ANSI B16.5
2" – 24" Pipe Flanged and Flanged Fittings
- MSS SP-55
Quality Standard for Steel Castings for Valves
- ANSI B16.25
Butt Weld Ends
- API 6A, API 6D, API 598
Testing
- ASTM / ANSI
Materials

QUALITY ASSURANCE

FluoroSeal Valves are designed with the best features presently available on the market. They are inspected throughout the manufacturing process to assure high quality and consistency in every unit.

Fire Safe Testing



API-6D



Plug Valves and Ball Valves

API Spec Q1

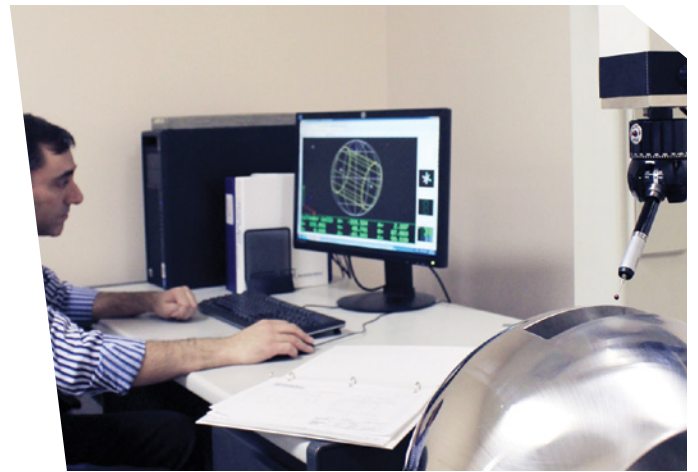


Design and Manufacture of Pipeline Industrial Valves

ISO 9001: 2008



Design and Manufacture of Pipeline Industrial Valves



At FluoroSeal, we are inspired and committed to developing innovative flow control solutions for every industry we serve.



For over 30 years, FluoroSeal has been manufacturing and customizing a wide range of valves, parts, and accessories for various industries such as Oil & Gas, Chemical, Petrochemical, Power, Pharmaceutical, and Mining. Our client-oriented culture allows us to understand complex industry needs and meet the highest quality standards - that is why our manufacturing processes are ISO 9001:2008, PED 2014/68/EU, and API SPEC Q1 certified.

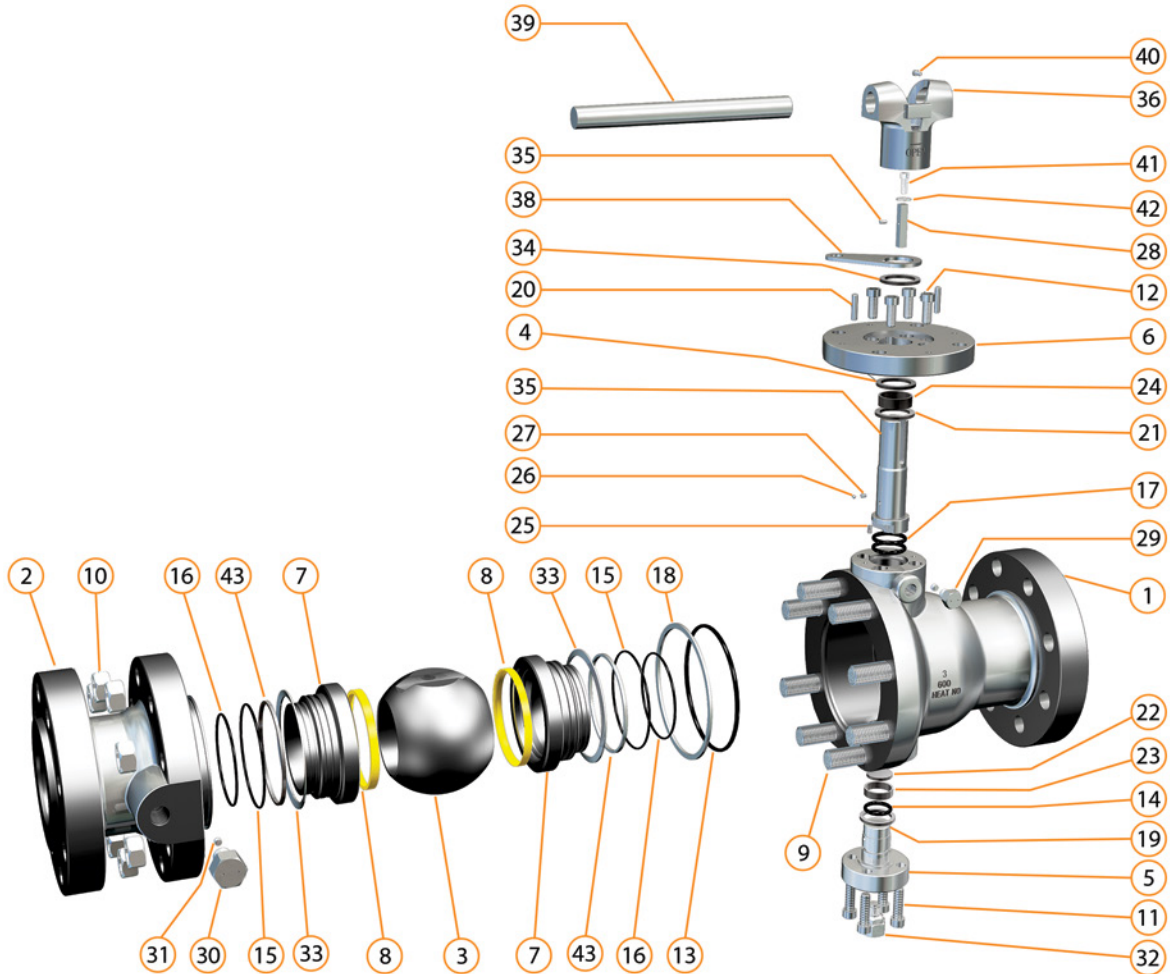
Our foundries and manufacturing plants in Canada and China enhance our capability to offer an extensive range of high quality valves at competitive prices in a wide range of exotic alloys on demand. With its large network of warehouses, distributors, and representatives, FluoroSeal is capable of delivering valve products, technical support, and complementary services worldwide and is able to support its customers with quick deliveries in case of emergencies and unscheduled shutdowns.

Our product offering is continuously evolving thanks to our team of highly skilled designers, engineers, and metallurgists who ensure the application of the latest technologies in CAD software, production methods, machinery, quality control procedures, and product testing to all of our products.

2 CAST STEEL OUTER TRUNNION MOUNTED BALL VALVE - TYPE A

Class 150, 300: 2" to 4"

TYPE A
MODEL

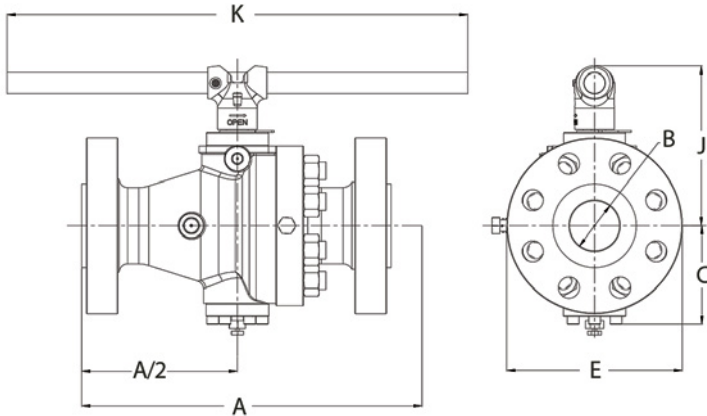


No.	Description/Part
1	Body
2	Adapter
3	Ball
4	Stem
5	Trunnion
6	Mountain Retainer
7	Seat Retainer
8	Seat Insert
9	Body Bolt
10	Body Nut
11	Trunnion Screws
12	Mountain Plate Screws
13	Adapter o-ring
14	Trunnion o-ring
15	Seat o-ring
16	Seat o-ring
17	Stem o-ring

No.	Description/Part
18	Adapter Gasket
19	Trunnion Gasket
20	Mountain Plate Gasket
21	Thrust Washer
22	Washer
23	Trunnion Bearing
24	Stem Bearing
25	Anti-static Spring
26	Anti-static Spring
27	Anti-static Ball
28	Squace Key
29	Stem Injection Valve
30	Seat Injection Valve
31	Check Valve
32	Drain Valve
33	Seat Spring
34	Mountain Plate Pin

No.	Description/Part
35	Squace Key Pin
36	Wrench
37	Locking Plate
38	Washer
39	Washer Pipe
40	Washer Screws
41	Washer Screws
42	Washer
43	Packing

TYPE A
MODEL



**2 CAST STEEL OUTER TRUNNION MOUNTED BALL VALVE - TYPE A
ANSI CLASS 150**

SIZE 2" to 4"
Wrench or Enclosed Gear Operated
Actuators Optional on All Sizes
Face-to-Face Dimensions to API 6D and ANSI B16.10
Flanged End Dimensions to ANSI B16.5 and ANSI B16.47 Series A
Butt Weld End Dimensions to ANSI B16.25

ANSI CLASS 150

Size		B		A (RF)		C		D*		E		F*		G*		H*		I*		J	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
2"	50	2	49	7	178	4.4	113	7.3	186.0	5.9	150	1.8	45.0	1.4	35	5.8	148	2.9	75	7.2	185
3"	80	3	76	8	203	5.4	137	8.9	225.0	7.5	190	2.5	63.0	1.7	43	8.5	215	3.9	100	9.0	230
4"	100	4	100	9	229	6.7	170	11.4	288.5	9.0	230	3.0	77.5	2.0	52	9.0	229	3.9	100	11.4	290

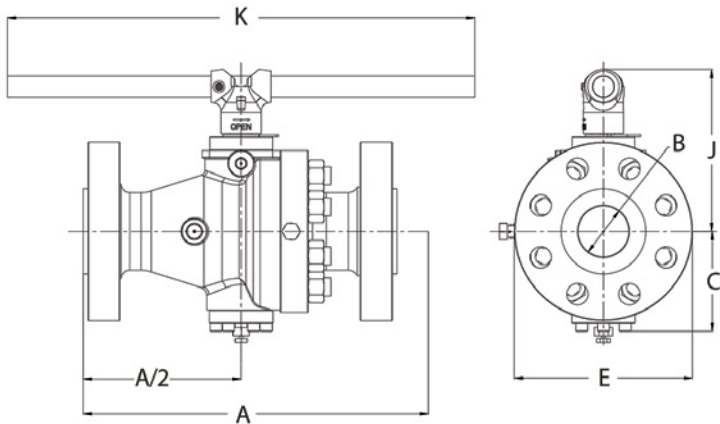
ANSI CLASS 150

Size		K		Valve Weight		Gearbox Weight	
in	mm	in	mm	lb	kg	lb	kg
2"	50	13.8	350	22.0	10	9.9	4.5
3"	80	15.7	400	46.3	21	26.4	12
4"	100	17.7	450	66.1	30	33	15

* Enclosed Gear Operated

**2 CAST STEEL OUTER TRUNNION MOUNTED BALL VALVE - TYPE A
ANSI CLASS 300**

SIZE 2" to 4"
Wrench or Enclosed Gear Operated
Actuators Optional on All Sizes
Face-to-Face Dimensions to API 6D and ANSI B16.10
Flanged End Dimensions to ANSI B16.5 and ANSI B16.47 Series A
Butt Weld End Dimensions to ANSI B16.25



ANSI CLASS 300

Size		B		A (RF)		C		D*		E		F*		G*		H*		I*		J	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
2"	50	2	49	8.5	216	4.4	113	7.3	186.0	6.5	165	1.8	45.0	1.4	35	5.8	148	2.9	75	7.3	185
3"	80	3	76	11.0	283	5.4	137	8.9	225.0	8.8	210	2.5	63.0	1.7	43	8.5	215	3.9	100	9.0	230
4"	100	4	100	12.0	305	6.7	170	11.4	288.5	10.0	255	3.0	77.5	2.0	52	9.0	229	5.9	150	11.4	290

ANSI CLASS 300

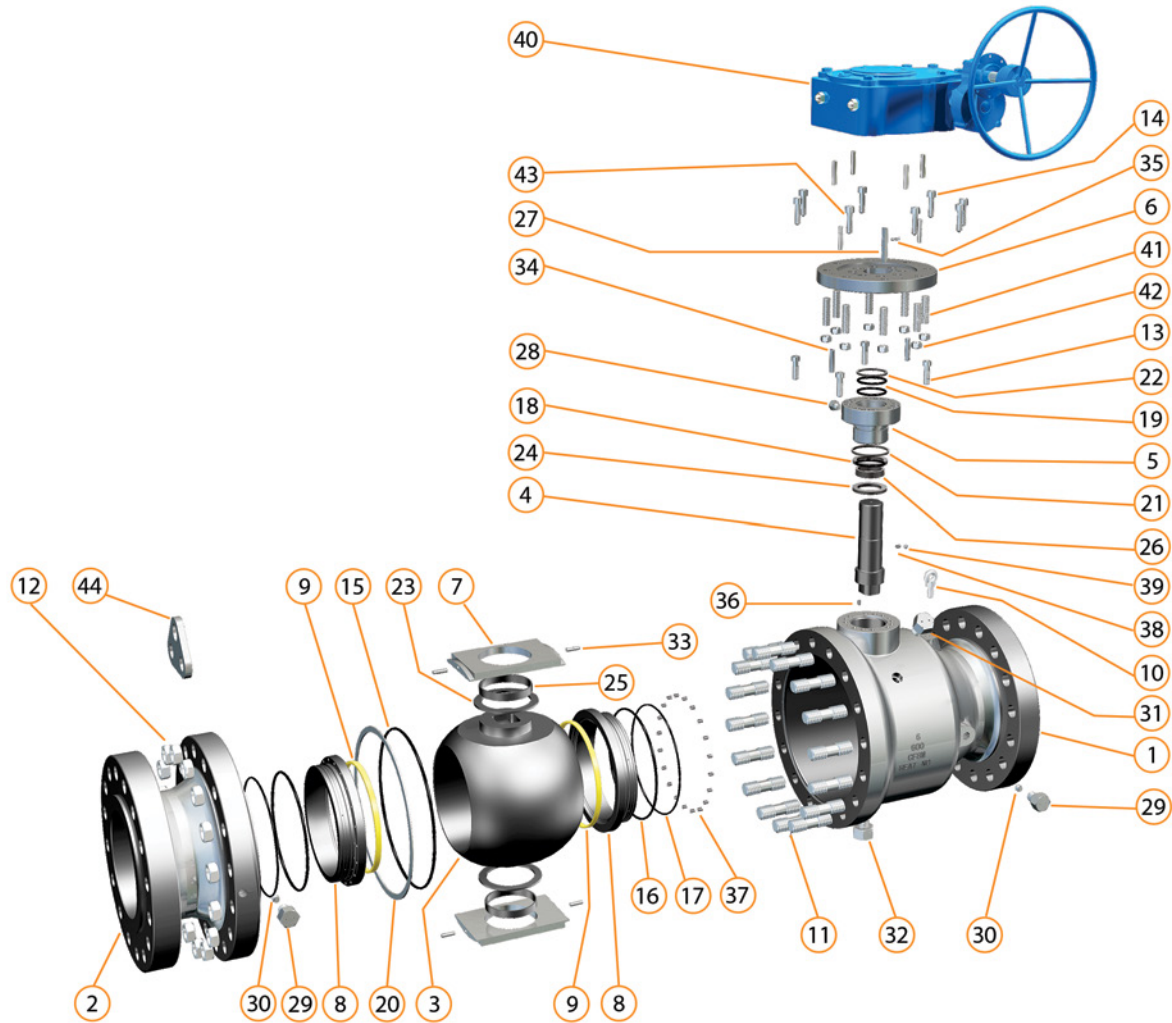
Size		K		Valve Weight		Gearbox Weight	
in	mm	in	mm	lb	kg	lb	kg
2"	50	15.7	400	39.6	18	9.9	4.5
3"	80	17.7	450	68.3	31	26.4	12.0
4"	100	23.6	600	99.1	45	33.0	15.0

* Enclosed Gear Operated

2 CAST STEEL INNER TRUNNION MOUNTED BALL VALVE -TYPE B

Class 600, 900, 1500: 2" to 4"

TYPE B
MODEL

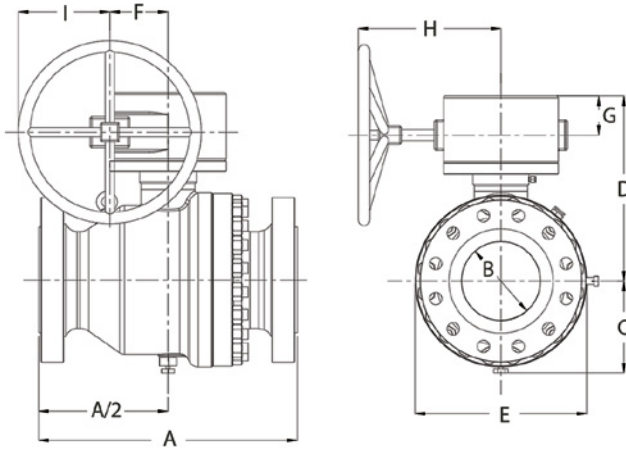


No.	Description/Part	No.	Description/Part	No.	Description/Part
1	Body	18	Bonnet o-ring	35	Square Key Pin
2	Adapter	19	Stem o-ring	36	Anti-static Spring
3	Ball	20	Adapter Gasket	37	Seat Spring
4	Stem	21	Bonnet Gasket	38	Anti-static Spring
5	Bonnet	22	Mountain Plate Screw	39	Anti-static Ball
6	Mountain Plate	23	Washer	40	Gear
7	Trunnion Plate	24	Thrust Washer	41	Gear Bolt
8	Seat Retainer	25	Ball Bearing	42	Gear Nut
9	Seat Insert	26	Washer	43	Gear Pin
10	Life Eye	27	Stem Square Valve	44	Lifting Lugs
11	Body Bolt	28	Stem Injection Valve		
12	Body Nut	29	Seat Injection Valve		
13	Bonnet Screw	30	Seat Check Valve		
14	Mountain Plate Screw	31	Vent Valve		
15	Adapter o-ring	32	Drain Plug		
16	Seat o-ring	33	Trunnion Plate Pin		
17	Grease Seal o-ring	34	Bonnet Pin		

DIMENSIONS & WEIGHTS



TYPE B
MODEL



2 CAST STEEL INNER TRUNNION MOUNTED BALL VALVE - TYPE B ANSI CLASS 600

SIZE 2" to 4"
Wrench or Enclosed Gear Operated
Actuators Optional on All Sizes
Face-to-Face Dimensions to API 6D and ANSI B16.10
Flanged End Dimensions to ANSI B16.5 and ANSI B16.47 Series A
Butt Weld End Dimensions to ANSI B16.25

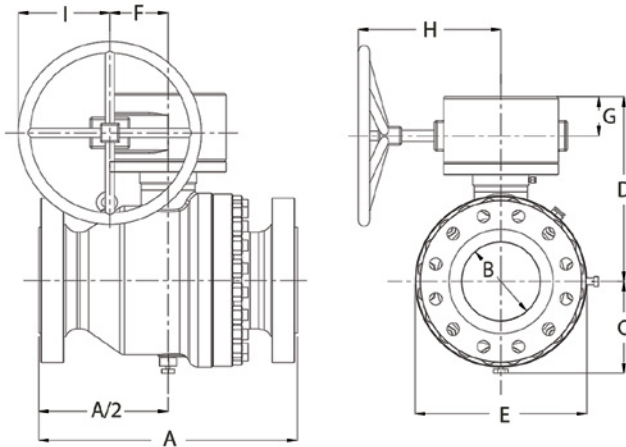
ANSI CLASS 600

Size		B		A (RF)		A (RTJ)		C		D		E		F		G		H		I	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
2"	50	2	50	11.5	292	11.6	295	5.3	135	8.1	208	6.5	165	2.5	63.0	1.7	43	8.5	215	3.9	100
3"	80	3	76	14.0	356	14.1	359	5.5	140	8.8	225	8.3	210	2.5	63.0	1.7	43	8.5	215	5.9	150
4"	100	4	100	17.0	432	17.1	435	6.7	170	11.5	294	10.8	275	3.0	77.5	2.0	52	9.0	229	7.5	190

ANSI CLASS 600

Size		J**		K**		Valve Weight		Gearbox Weight	
in	mm	in	mm	in	mm	lb	kg	lb	kg
2"	50	8.3	210	19.7	500	59.5	27	26.4	12
3"	80	9.1	230	21.6	550	110.1	50	26.4	12
4"	100	11.6	295	27.6	700	209.3	95	33.0	15

** Wrench Operated



2 CAST STEEL INNER TRUNNION MOUNTED BALL VALVE - TYPE B ANSI CLASS 900

SIZE 2" to 4"
Wrench or Enclosed Gear Operated
Actuators Optional on All Sizes
Face-to-Face Dimensions to API 6D and ANSI B16.10
Flanged End Dimensions to ANSI B16.5 and ANSI B16.47 Series A
Butt Weld End Dimensions to ANSI B16.25

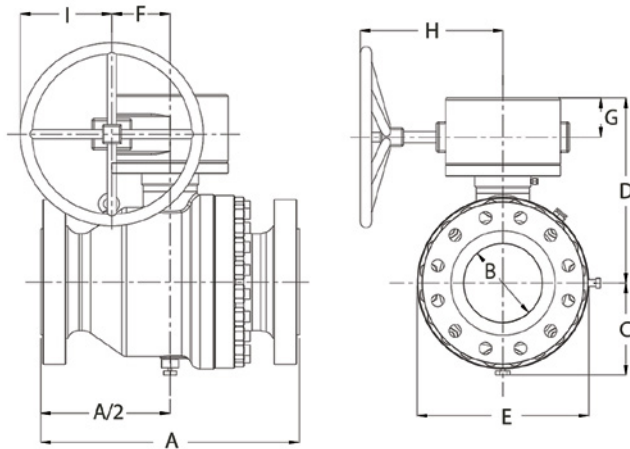
ANSI CLASS 900

Size		B		A (RF)		A (RTJ)		C		D		E		F		G		H		I	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
2"	50	2	50	14.5	368	14.6	371	5.3	135	8.1	208	8.4	215	2.5	63	1.7	43	8.4	215	5.9	150
3"	80	3	76	15.0	381	15.1	384	6.5	165	9.8	249	9.4	240	3.0	77.5	2.0	52	9.0	229	7.5	190
4"	100	4	100	18.0	457	18.1	460	6.9	177	11.5	294	11.4	290	3.0	77.5	2.0	52	9.0	229	8.9	227

ANSI CLASS 900

Size		J**		K**		Valve Weight		Gearbox Weight	
in	mm	in	mm	in	mm	lb	kg	lb	kg
2"	50	8.3	210	23.6	600	85.9	39	26.4	12
3"	80	9.8	250	27.5	700	154.2	70	33.0	15
4"	100	11.6	295	31.5	800	273.1	124	33.0	15

** Wrench Operated



2 CAST STEEL INNER TRUNNION MOUNTED BALL VALVE - TYPE B ANSI CLASS 1500

SIZE 2" to 4"

Wrench or Enclosed Gear Operated
Actuators Optional on All Sizes

Face-to-Face Dimensions to API 6D and
ANSI B16.10

Flanged End Dimensions to ANSI B16.5 and
ANSI B16.47 Series A

Butt Weld End Dimensions to ANSI B16.25

TYPE B
MODEL

ANSI CLASS 1500																					
Size		B		A (RF)		A (RTJ)		C		D		E		F		G		H		I	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
2"	50	2	50	14.5	368	14.6	371	5.3	135	8.2	208	8.5	215	2.5	63.0	1.7	43	8.5	215	5.9	150
3"	80	3	76	19	470	18.6	473	6.5	165	9.8	249	10.4	265	3.0	77.5	2.0	52	9.0	229	8.9	227
4"	100	4	100	21	546	21.6	549	7.0	177	11.9	303	12.2	310	3.5	90.0	2.0	52	14.2	360	9.8	250

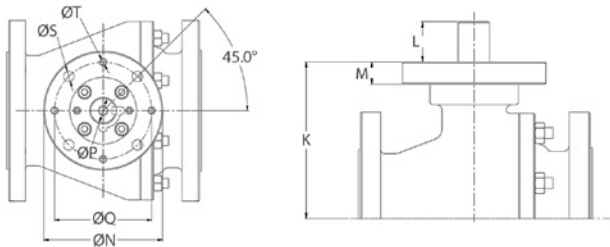
ANSI CLASS 1500									
Size		J**		K**		Valve Weight		Gearbox Weight	
in	mm	in	mm	in	mm	lb	kg	lb	kg
2"	50	8.3	210	23.6	600	85.9	39	26.4	12
3"	80	9.8	250	27.6	700	275.3	125	33.0	15
4"	100	12.0	304	31.5	800	451.5	205	48.5	22

** Wrench Operated

NOTES:

1. The information on this catalog is provided for general informational purposes only.
2. Customization for specific applications is available upon request.
3. For all technical parameters of the product please contact your local FluoroSeal sales office or authorized representative.
4. We reserve the right to make changes without prior notice.

TOP WORKS - DIMENSIONS TYPE A & B



NOTES:

1. For all technical parameters of the product please contact your local FluoroSeal sales office or authorized representative.

ANSI CLASS 150

Size		K		L		M		N		P		Q		Orientation	S		T	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No. of holes	in	mm	in	mm
2"	50	4.4	111	1.2	30	0.6	16	4.9	125	0.8	20	4.0	102	4 Holes	0.4	11	0.2	6
3"	80	5.5	140	1.4	36	0.8	20	4.9	125	1.1	28	4.0	102	4 Holes	0.4	11	0.2	6
4"	100	7.1	181	1.5	38	1.0	25	6.9	175	1.3	34	5.5	140	4 Holes	0.7	18	0.4	10

ANSI CLASS 300

Size		K		L		M		N		P		Q		Orientation	S		T	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No. of holes	in	mm	in	mm
2"	50	4.5	115	1.2	30	0.6	16	4.9	125	0.8	20	4.0	102	4 Holes	0.4	11	0.2	6
3"	80	5.4	138	1.4	36	0.8	20	4.9	125	1.1	28	4.0	102	4 Holes	0.4	11	0.2	6
4"	100	7.1	181	1.5	38	1.0	25	6.9	175	1.3	34	5.5	140	4 Holes	0.7	18	0.4	10

ANSI CLASS 600

Size		K		L		M		N		P		Q		Orientation	S		T	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No. of holes	in	mm	in	mm
2"	50	4.8	123	1.4	36	0.8	20	4.9	125	1.1	28	4.0	102	4 Holes	0.5	11	0.2	6
3"	80	5.5	140	1.4	36	0.8	20	5.9	150	1.1	28	4.9	125	4 Holes	0.5	13	0.2	6
4"	100	7.4	187	1.5	38	1.0	25	8.3	210	1.3	34	6.5	165	4 Holes	0.9	22	0.4	10

ANSI CLASS 900

Size		K		L		M		N		P		Q		Orientation	S		T	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No. of holes	in	mm	in	mm
2"	50	4.8	121	1.4	36	0.8	20	4.9	125	1.1	28	4.0	102	4 Holes	0.4	11	0.2	6
3"	80	7.9	201	1.5	37	0.8	21	5.9	150	1.3	34	5.5	140	4 Holes	0.5	13	0.2	6
4"	100	7.4	187	1.5	38	1.0	25	8.3	210	1.5	38	6.5	165	4 Holes	0.9	22	0.4	10

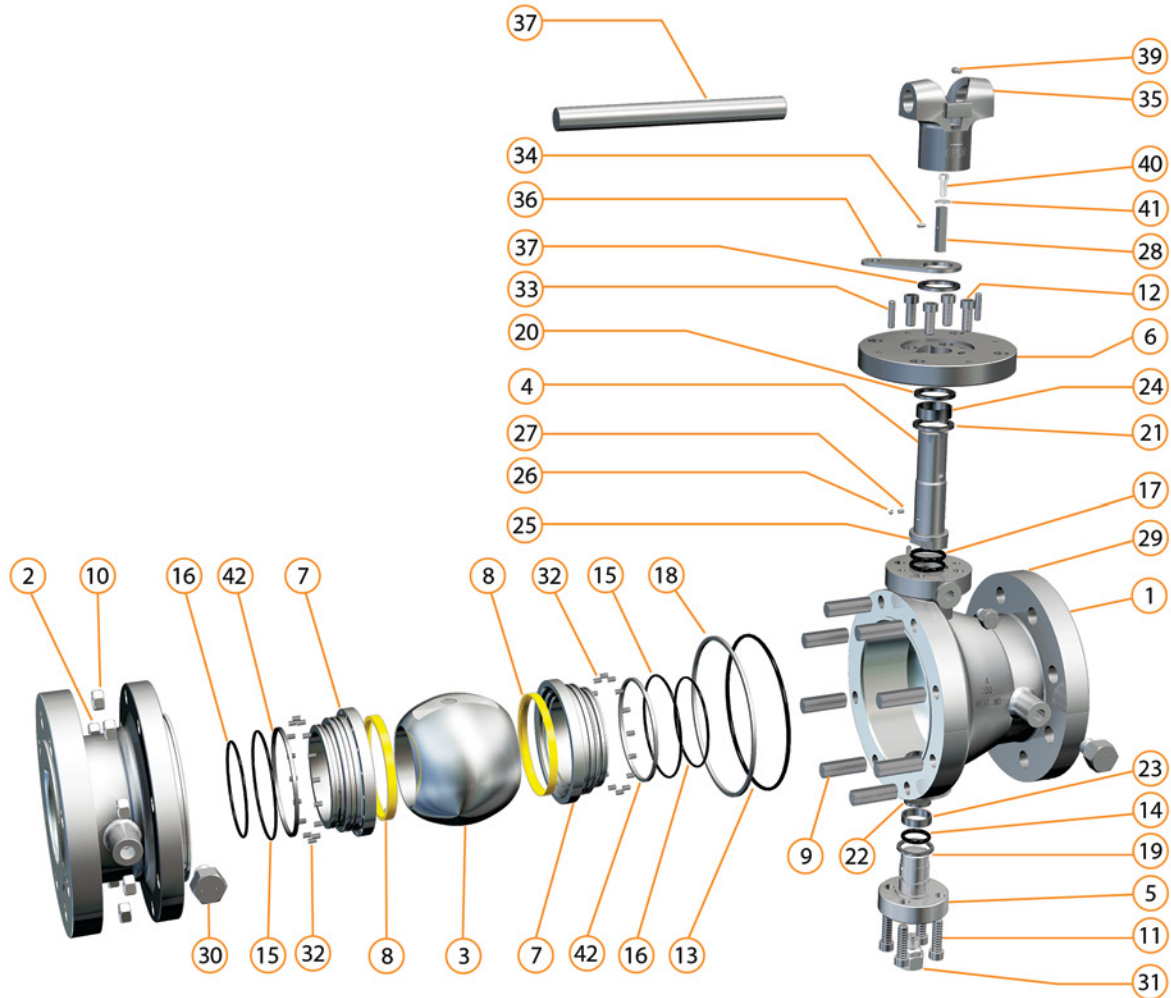
ANSI CLASS 1500

Size		K		L		M		N		P		Q		Orientation	S		T	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No. of holes	in	mm	in	mm
2"	50	4.9	123	1.4	36	0.8	20	4.9	125	1.1	28	4.0	102	4 Holes	0.4	11	0.2	6
3"	80	5.6	142	1.5	37	0.8	21	6.9	175	1.3	34	4.0	102	4 Holes	0.4	11	0.2	6
4"	100	7.7	196	1.6	41	1.0	25	8.3	210	1.5	38	5.5	140	4 Holes	0.7	18	0.4	10

2 CAST STEEL OUTER TRUNNION MOUNTED BALL VALVE - TYPE C

Class 150, 300, 600: 6" to 24" / Class 900 and 1500: 6" to 16"

TYPE C
MODEL

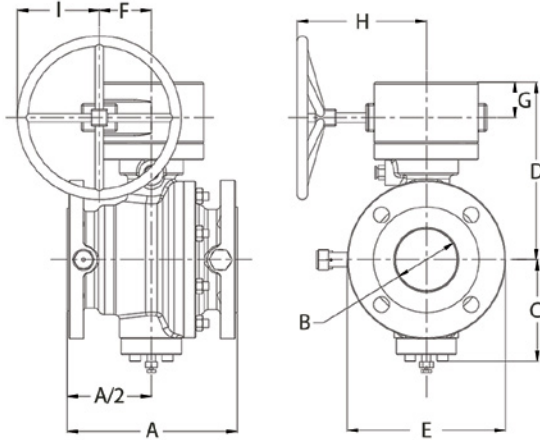


No.	Description/Part	No.	Description/Part	No.	Description/Part
1	Body	18	Adapter Gasket	35	Wrench
2	Adapter	19	Trunnion Gasket	36	Locking Plate
3	Ball	20	Mountain Plate Gasket	37	Washer
4	Stem	21	Thrust Washer	38	Washer Pipe
5	Trunnion	22	Washer	39	Washer Screws
6	Mountain Plate	23	Trunnion Bearing	40	Washer Screws
7	Seat Retainer	24	Stem Bearing	41	Washer
8	Seat Insert	25	Anti-static Spring	42	Packing
9	Body Bolt	26	Anti-static Spring		
10	Body Nut	27	Anti-static Ball		
11	Trunnion Screws	28	Square Key		
12	Mountain Plate Screws	29	Stem Injection Valve		
13	Adapter o-ring	30	Seat Injection Valve		
14	Trunnion o-ring	31	Drain Plug		
15	Seat o-ring	32	Seat Spring		
16	Seat o-ring	33	Mountain Plate Pin		
17	Stem o-ring	34	Square Key Pin		

DIMENSIONS & WEIGHTS



TYPE C
MODEL



2 CAST STEEL OUTER TRUNNION MOUNTED BALL VALVE - TYPE C ANSI CLASS 150

SIZE 6" to 24"

Wrench or Enclosed Gear Operated

Actuators Optional on All Sizes

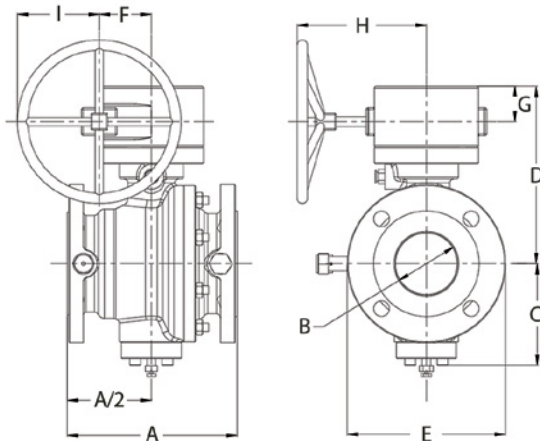
Face-to-Face Dimensions to API 6D and
ANSI B16.10

Flanged End Dimensions to ANSI B16.5 and
ANSI B16.47 Series A

Butt Weld End Dimensions to ANSI B16.25

ANSI CLASS 150

Size		B		A(RF)		C		D		E		F		G		H		I		Weight	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg
6"	150	6.0	150	15.5	394	7.6	194	13.6	344	11.0	279	3.0	77.5	2.0	52	9.0	229	7.1	180	264	120
8"	200	8.0	203	18.0	457	8.6	220	15.0	381	13.5	343	3.0	77.5	2.0	52	9.0	229	9.0	227	418	190
10"	250	10.0	254	21.0	533	10.1	256	16.7	424	16.0	405	5.0	126	2.0	52	15.8	402	9.8	250	683	310
12"	300	12.0	305	24.0	610	11.6	295	18.7	475	19.1	485	5.0	126	2.0	52	15.8	402	11.8	300	793	360
14"	350	13.1	334	27.0	686	12.8	325	23.4	594	21.1	535	5.0	126	5.0	128	20.2	513	11.8	300	1,322	600
16"	400	15.2	385	30.0	762	14.0	355	26.8	680	23.4	595	5.4	138	6.6	168	21.4	544	14.8	375	2,015	915
18"	450	17.2	436	34.0	864	16.1	410	28.3	720	25.0	635	5.4	138	6.6	168	21.4	544	14.8	375	2,687	1,220
20"	500	19.2	487	36.0	914	17.7	450	30.1	765	27.5	699	5.4	138	6.6	168	21.4	544	14.8	375	3,601	1,635
24"	600	23.2	589	42.0	1067	20.5	520	33.7	855	32.0	813	7.0	178	7.2	183	23.0	586	14.8	375	5,760	2,615



2 CAST STEEL OUTER TRUNNION MOUNTED BALL VALVE - TYPE C ANSI CLASS 300

SIZE 6" to 24"

Wrench or Enclosed Gear Operated

Actuators Optional on All Sizes

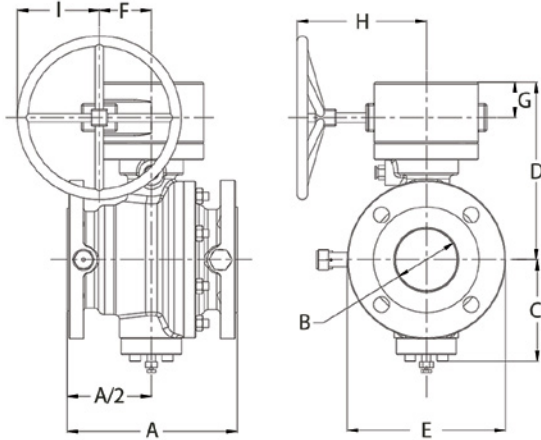
Face-to-Face Dimensions to API 6D and
ANSI B16.10

Flanged End Dimensions to ANSI B16.5 and
ANSI B16.47 Series A

Butt Weld End Dimensions to ANSI B16.25

ANSI CLASS 300

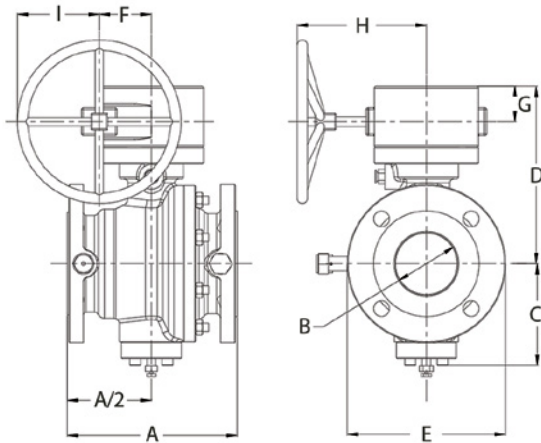
Size		B		A(RF)		C		D		E		F		G		H		I		Weight	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg
6"	150	6.0	150	15.8	403	7.6	194	14.0	355	12.5	317	3.5	90	2.0	52	14.2	360	7.1	180	286	130
8"	200	8.0	203	20.0	502	8.7	221	15.6	396	15.0	380	5.0	126	2.0	52	15.8	402	9.8	250	474	215
10"	250	10.0	254	22.0	568	10.1	256	17.1	434	17.5	445	5.0	126	2.0	52	15.8	402	11.8	300	749	340
12"	300	12.0	305	26.0	648	11.6	295	19.1	486	20.5	520	5.0	126	2.0	52	15.8	402	11.8	300	1,277	580
14"	350	13.1	334	30.0	762	12.8	325	23.4	594	23.0	584	5.0	126	5.0	128	20.2	513	11.8	300	1,432	650
16"	400	15.2	385	33.0	838	14.0	355	26.8	680	25.5	648	5.4	138	6.6	168	21.4	544	14.7	375	2,357	1,070
18"	450	17.2	436	36.0	914	16.1	410	28.3	720	28.0	711	5.4	138	6.6	168	21.4	544	14.7	375	3,546	1,610
20"	500	19.2	487	39.0	991	17.7	450	30.8	783	30.5	775	7.0	178	7.2	183	23.1	586	14.7	375	4,537	2,060
24"	600	23.2	589	45.0	1,143	20.5	520	34.2	869	36.0	914	9.0	230	7.5	190	25.3	642	14.7	375	6,718	3,050



**2 CAST STEEL OUTER TRUNNION MOUNTED BALL VALVE - TYPE C
ANSI CLASS 600**

SIZE 6" to 24"
Wrench or Enclosed Gear Operated
Actuators Optional on All Sizes
Face-to-Face Dimensions to API 6D and ANSI B16.10
Flanged End Dimensions to ANSI B16.5 and ANSI B16.47 Series A
Butt Weld End Dimensions to ANSI B16.25

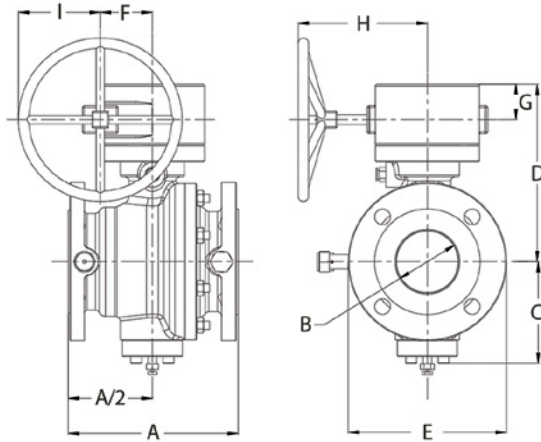
ANSI CLASS 600																							
Size		B		A(RF)		A (RTJ)		C		D		E		F		G		H		I		Weight	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg
6"	150	6.0	150	22	559	22.1	562	6.7	170	14.5	369	14.0	356	3.5	90	2.0	52	14.2	360	9.9	250	352	160
8"	200	8.0	203	26	660	26.1	664	8.7	222	16.2	411	16.5	419	5.0	126	2.0	52	15.8	402	11.8	300	749	340
10"	250	10.0	254	31	787	31.1	791	10.5	268	23.4	595	20.0	508	5.4	138	6.6	168	21.4	544	14.8	375	1,233	560
12"	300	12.0	305	33	838	33.1	841	12.4	315	25.3	643	22.0	560	5.4	138	6.6	168	21.4	544	14.8	375	1,894	860
14"	350	13.1	334	35	889	35.1	892	13.0	330	25.2	641	23.9	605	5.4	138	6.6	168	21.4	544	14.8	375	2,247	1,020
16"	400	15.2	385	39	991	39.1	994	14.6	370	28.0	710	23.9	605	5.4	138	6.6	168	21.4	544	14.8	375	2,918	1,325
18"	450	17.2	436	43	1,092	43.1	1,095	16.3	415	30.2	768	29.3	745	7.0	178	7.2	183	23.1	586	14.8	375	4,670	2,120
20"	500	19.2	487	47	1,194	47.2	1,200	18.0	455	32.4	822	32.0	813	9.0	230	7.5	190	25.3	642	14.8	375	5,121	2,325
24"	600	23.2	589	55	1,397	55.4	1,407	20.9	530	35.8	907	37.0	940	9.0	230	7.5	190	25.3	642	14.8	375	8,260	3,750



**2 CAST STEEL OUTER TRUNNION MOUNTED BALL VALVE - TYPE C
ANSI CLASS 900**

SIZE 6" to 16"
Wrench or Enclosed Gear Operated
Actuators Optional on All Sizes
Face-to-Face Dimensions to API 6D and ANSI B16.10
Flanged End Dimensions to ANSI B16.5 and ANSI B16.47 Series A
Butt Weld End Dimensions to ANSI B16.25

ANSI CLASS 900																							
Size		B		A(RF)		A (RTJ)		C		D		E		F		G		H		I		Weight	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg
6"	150	6.0	150	24	610	24.1	613	6.9	175	14.5	369	15.0	380	5.0	126	2.0	52	15.9	402	11.8	300	573	260
8"	200	8.0	203	29	737	29.1	740	8.9	225	16.2	411	18.5	470	5.0	126	2.0	52	15.9	402	11.8	300	991	450
10"	250	10.0	254	33	838	33.1	841	10.6	270	23.5	598	21.5	546	5.4	138	6.6	168	21.4	544	14.8	375	1,652	750
12"	300	12.0	305	38	965	38.1	968	12.6	320	25.3	643	24.0	610	5.4	138	6.6	168	21.4	544	14.8	375	2,203	1,000
14"	350	12.7	322	41	1,029	40.9	1,038	13.6	345	26.1	664	25.2	640	5.4	138	6.6	168	21.4	544	14.8	375	2,918	1,325
16"	400	14.7	373	44	1,130	44.9	1,140	15.1	385	29.2	743	27.8	705	7.0	178	7.2	183	23.1	586	14.8	375	3,546	1,610



**2 CAST STEEL OUTER TRUNNION MOUNTED BALL VALVE - TYPE C
ANSI CLASS 1500**

SIZE 6" to 12"

Wrench or Enclosed Gear Operated
Actuators Optional on All Sizes

Face-to-Face Dimensions to API 6D and
ANSI B16.10

Flanged End Dimensions to ANSI B16.5 and
ANSI B16.47 Series A

Butt Weld End Dimensions to ANSI B16.25

ANSI CLASS 1500

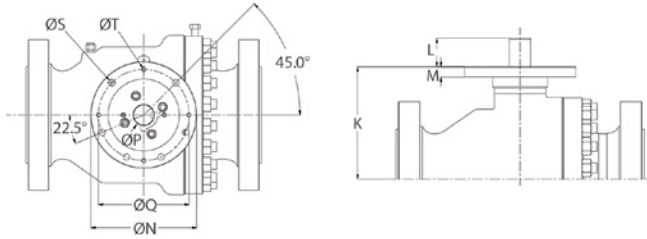
Size		B		A(RF)		A (RTJ)		C		D		E		F		G		H		I		Weight	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg
6"	150	6	144	27.7	705	28.0	711	7.8	198	16.1	408	15.5	395	5.0	126	2.0	52	15.8	402	11.8	300	881	400
8"	200	8	192	33.0	832	33.1	841	9.8	250	24.4	620	19.1	485	5.4	138	6.6	168	21.4	544	14.8	375	991	450
10"	250	9	239	39.0	991	39.4	1,000	11.8	300	25.4	645	23.0	585	5.4	138	6.6	168	21.4	544	14.8	375	2,643	1,200
12"	300	11	287	44.0	1,130	45.1	1,146	13.8	350	27.7	704	26.6	675	7.0	178	7.2	183	23.8	586	14.8	375	3,018	1,370

TYPE C
MODEL

NOTES:

1. The information on this catalog is provided for general informational purposes only.
2. Customization for specific applications is available upon request.

3. For all technical parameters of the product please contact your local FluoroSeal sales office or authorized representative.
4. We reserve the right to make changes without prior notice.



NOTES:

1. For all technical parameters of the product please contact your local FluoroSeal sales office or authorized representative.

ANSI CLASS 150																		
Size		K		L		M		N		P		Q		Orientation	S		T	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No. of holes	in	mm	in	mm
6"	150	9.3	237	2.6	65	1.0	26	8.3	210	1.6	40	6.5	165	4 Holes	0.9	22	0.4	10
8"	200	10.8	274	2.6	65	1.0	26	8.3	210	1.6	40	6.5	165	4 Holes	0.9	22	0.4	10
10"	250	12.5	317	3.2	82	1.2	30	8.3	210	2.3	58	6.5	165	4 Holes	0.9	22	0.4	10
12"	300	14.5	368	3.3	83	1.2	30	8.3	210	2.3	58	6.5	165	4 Holes	0.9	22	0.4	10
14"	350	15.6	396	3.8	97	1.3	32	11.8	300	3.1	78	10.0	254	8 Holes	0.7	18	0.4	10
16"	400	17.1	435	3.8	97	1.5	38	11.8	300	3.3	85	10.0	254	8 Holes	0.7	18	0.4	10
18"	450	18.7	475	5.4	137	1.5	38	11.8	300	3.3	85	10.0	254	8 Holes	0.7	18	0.5	12
20"	500	20.5	520	5.5	140	1.5	38	11.8	300	3.9	98	10.0	254	8 Holes	0.7	18	0.5	12
24"	600	23.3	592	5.6	142	1.5	38	13.8	350	4.2	108	11.7	298	8 Holes	0.8	22	0.6	16

ANSI CLASS 300																		
Size		K		L		M		N		P		Q		Orientation	S		T	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No. of holes	in	mm	in	mm
6"	150	9.8	248	2.6	65	1.0	26	8.3	210	1.6	40	6.5	165	4 Holes	0.9	22	0.4	10
8"	200	11.4	289	3.1	80	1.1	28	8.3	210	1.8	45	6.5	165	4 Holes	0.9	22	0.4	10
10"	250	12.9	327	3.2	82	1.2	30	8.3	210	2.3	58	6.5	165	4 Holes	0.9	22	0.4	10
12"	300	14.9	379	3.3	83	1.2	30	8.3	210	2.3	58	6.5	165	4 Holes	0.9	22	0.4	10
14"	350	15.6	396	3.8	97	1.3	32	11.8	300	3.1	78	10.0	254	8 Holes	0.7	18	0.4	10
16"	400	17.1	435	3.8	97	1.5	38	11.8	300	3.3	85	10.0	254	8 Holes	0.7	18	0.4	10
18"	450	18.7	475	5.4	137	1.5	38	11.8	300	3.3	85	10.0	254	8 Holes	0.7	18	0.5	12
20"	500	20.5	520	5.5	140	1.5	38	11.8	300	3.9	98	10.0	254	8 Holes	0.7	18	0.5	12
24"	600	23.3	592	5.6	142	1.5	38	13.8	350	4.2	108	11.7	298	8 Holes	0.8	22	0.6	16

ANSI CLASS 600																		
Size		K		L		M		N		P		Q		Orientation	S		T	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No. of holes	in	mm	in	mm
6"	150	10.3	262	3.1	80	1.1	28	8.3	210	1.8	45	6.5	165	4 Holes	0.9	22	0.4	10
8"	200	11.9	304	3.1	80	1.1	28	11.8	300	2.3	58	10.0	254	8 Holes	0.7	18	0.4	10
10"	250	13.8	350	3.2	82	1.2	30	11.8	300	2.7	68	10.0	254	8 Holes	0.7	18	0.4	10
12"	300	15.7	398	4.3	110	1.2	30	11.8	300	2.7	68	10.0	254	8 Holes	0.7	18	0.4	10
14"	350	15.7	396	4.4	112	1.3	32	11.8	300	3.1	78	10.0	254	8 Holes	0.7	18	0.4	10
16"	400	18.3	465	4.4	112	1.5	38	11.8	300	3.3	85	10.0	254	8 Holes	0.7	18	0.5	12
18"	450	19.9	505	5.4	137	1.5	38	13.8	350	3.9	98	11.7	298	8 Holes	0.8	22	0.5	12
20"	500	21.5	545	5.5	140	1.5	38	13.8	350	3.9	98	11.7	298	8 Holes	0.8	22	0.5	12
24"	600	24.8	630	5.6	142	1.7	43	18.7	475	4.7	120	16.0	406	8 Holes	1.5	39	0.6	16

ANSI CLASS 900																		
Size		K		L		M		N		P		Q		Orientation	S		T	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No. of holes	in	mm	in	mm
6"	150	10.3	262	3.1	80	1.1	28	11.8	300	1.8	45	10.0	254	8 Holes	0.7	18	0.4	10
8"	200	12.0	304	3.1	80	1.1	28	11.8	300	2.3	58	10.0	254	8 Holes	0.7	18	0.4	10
10"	250	13.9	353	4.3	110	1.2	30	11.8	300	2.7	68	10.0	254	8 Holes	0.7	18	0.4	10
12"	300	15.7	398	4.3	110	1.2	30	11.8	300	2.7	68	10.0	254	8 Holes	0.7	18	0.4	10
14"	350	15.7	396	4.4	112	1.3	32	11.8	300	3.1	78	10.0	254	8 Holes	0.7	18	0.4	10
16"	400	18.9	480	5.4	137	1.5	38	13.8	350	3.3	85	11.8	298	8 Holes	0.9	22	0.5	12

ANSI CLASS 1500																		
Size		K		L		M		N		P		Q		Orientation	S		T	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No. of holes	in	mm	in	mm
6"	150	11.9	301	3.7	95	1.6	40	11.8	300	2.2	55	10	254	8 Holes	0.7	18	0.5	12
8"	200	14.8	375	5.3	135	1.9	49	11.8	300	3.1	78	10	254	8 Holes	0.7	18	0.4	10
10"	250	15.7	400	5.3	135	1.9	49	11.8	300	3.3	85	10	254	8 Holes	0.7	18	0.4	10
12"	300	17.4	441	5.3	135	1.9	49	11.8	300	3.3	85	10	254	8 Holes	0.7	18	0.4	10

FLOW COEFFICIENT - FULL PORT

Size		Cv				
in	mm	Class 150	Class 300	Class 600	Class 900	Class 1500
2"	50	420	420	360	325	325
3"	75	1,050	1,050	925	892	815
4"	100	2,175	2,065	1,775	1,720	1,595
6"	150	5,075	5,075	4,575	4,380	4,080
8"	200	10,100	10,100	8,950	8,476	7,980
10"	250	17,037	17,037	14,324	13,884	13,020
12"	300	26,165	26,165	22,730	21,186	19,600
14"	350	32,600	30,900	28,600	26,600	-
16"	400	44,700	42,600	39,250	36,600	-
18"	450	58,500	56,450	52,000	-	-
20"	500	76,000	72,700	70,500	-	-
24"	600	113,500	109,450	99,000	-	-
30"	750	145,000	144,000	144,000	-	-

Consult your local FluoroSeal sales office or authorized representative to obtain precise data.

CALCULATION FORMULAS

• **For Gas**

$$Q_g = 962 \times C_v \sqrt{P_1^2 - P_2^2 / T \times S_g}$$

when $P_1 < 2 P_2$: Sub Critical flow

$$Q_g = 816 \times C_v \times P_1 \sqrt{1 / T \times S_g}$$

when $P_1 > 2 P_2$: Choked flow

P_1 = Inlet pressure (psia)

P_2 = Outlet pressure (psia)

T = Absolute Temp. (°F + 460)

S_g = Specific gravity of Gas (air at atmosphere 60°F = 1)

C_v = Flow coefficient

Q_g = Flow Rate (SCFH)

• **For Liquid**

$$Q_L = C_v \times \sqrt{P_1 - P_2 / S_g}$$

Q_L = Flow Rate (GPM)

P_1 = Inlet pressure (psia)

P_2 = Outlet pressure (psia)

C_v = Flow coefficient

S_g = Specific gravity of Fluid (water at temperature 60°F=1)

VALVE OPERATING TORQUES - FULL PORT

Size		Class 150		Class 300		Class 600		Class 900		Class 1500	
in	mm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
2"	50	646	73	876	99	1,195	135	1,487	168	1,903	215
3"	75	1,425	161	1,938	219	3,505	396	4,425	500	5,930	670
4"	100	2,317	238	3,009	340	5,496	621	7,001	791	10,125	1,144
6"	150	3,850	435	5,310	600	8,585	970	11,860	1,340	23,508	2,656
8"	200	6,417	725	10,621	1,200	17,940	2,027	21,481	2,427	37,713	4,261
10"	250	10,311	1,165	14,736	1,665	26,172	2,957	37,173	4,200	59,574	6,731
12"	300	12,834	1,450	19,472	2,200	40,005	4,520	60,079	6,788	94,774	10,708
14"	350	16,813	1,900	31,013	3,504	57,468	6,493	78,108	8,825	-	-
16"	400	22,017	2,488	40,582	4,585	73,231	8,274	119,706	13,525	-	-
18"	450	34,964	3,950	65,542	7,405	118,688	13,410	-	-	-	-
20"	500	48,962	5,532	94,823	10,714	166,660	18,830	-	-	-	-
24"	600	68,356	7,723	134,429	15,188	273,045	30,850	-	-	-	-

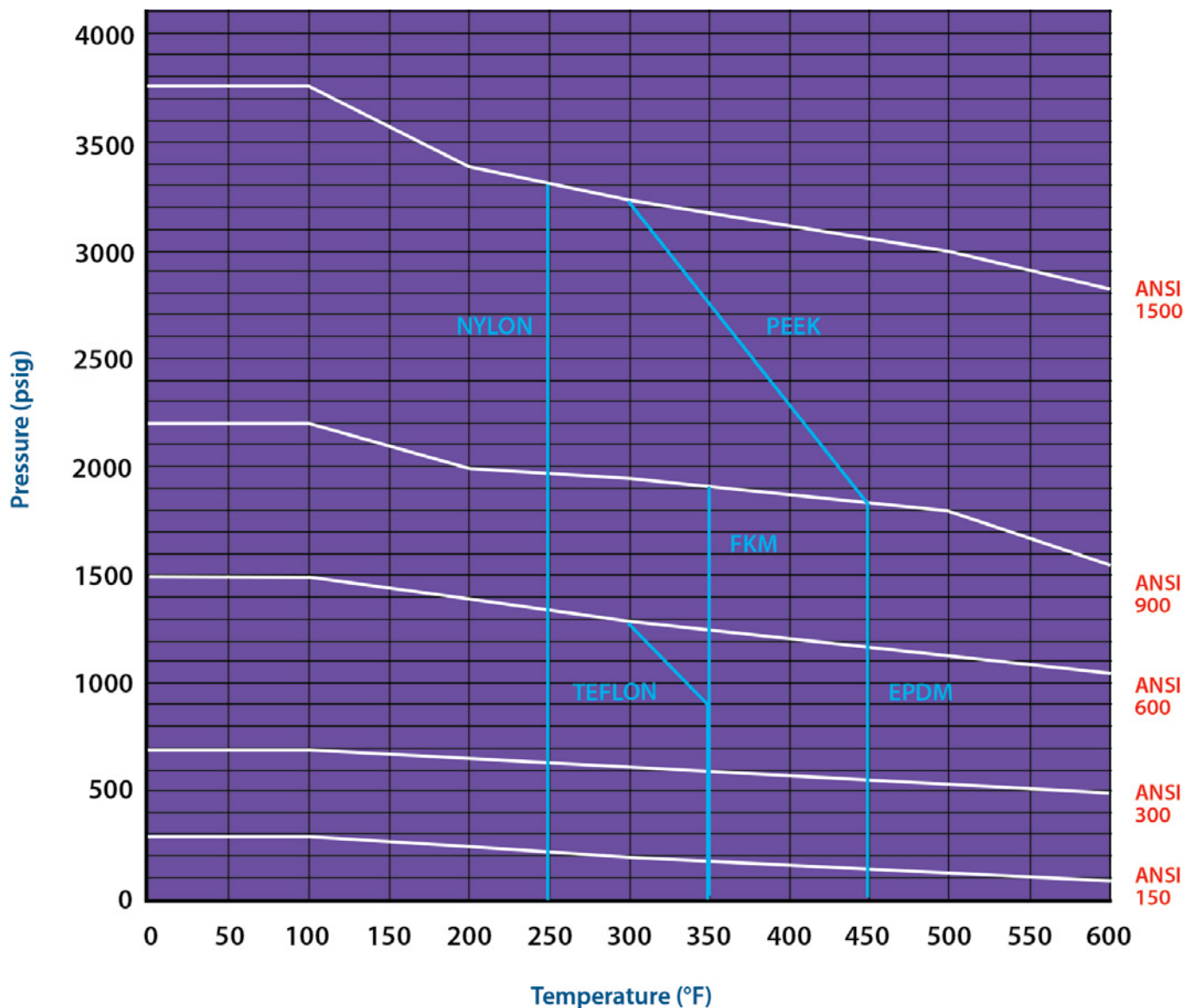
LOW TEMPERATURE LIMITS

Body Material	°F	°C
WBC (WCC)	-20	-28.9
LCB (LCC)	-50	-45.6
CF8M	-321	-196.0

Seat Material	°F	°C
DEVLON	-50	-45.6
TEFLON	166	110.0
PEEK	50	45.6
NYLON	50	45.6
PCTFE	-321	-196.0

Seal Material	°F	°C
Viton AED	-15	-26.8
HNBR	-40	-40.0
EPDM	-50	-45.6
Buna M	-30	-34.4
Aflas	32	0
Low temp. Buna N	-50	-45.6

SEAT PRESSURE-TEMPERATURE CHART



NOTES:

1. The information on this catalog is provided for general informational purposes only.
2. For all technical parameters of the product please contact your local FluoroSeal sales office or authorized representative.
3. Customization for specific applications is available upon request.
4. We reserve the right to make changes without prior notice.

2 CAST STEEL OUTER TRUNNION MOUNTED BALL VALVE - TYPE A

Item	Description	Carbon Steel (NACE)	Carbon x Stainless Steel (NACE)
1	Body	ASTM A216 WCB/ASTM A352 LCB	ASTM A216 WCB/ASTM A352 LCB
2	End Cap	ASTM A216 WCB/ASTM A352 LCB	ASTM A216 WCB/ASTM A352 LCB
3	Ball	ASTM A105/A350 LF2 +3 MIL ENP	ASTM A351 CF8M/ASTM A182 F316/F51
4	Stem	ASTM A322 4140 +3 MIL ENP	ASTM A182 F316/F51/A564 GR630(17-4PH)
5	Trunnion	ASTM A105/A350 LF2 +3 MIL ENP	ASTM A182 F316/F51/A564 GR630(17-4PH)
6	Mounting Plate	ASTM A105/A350 LF2	ASTM A105/A350 LF2
7	Seat Retainer	ASTM A105/A350 LF2 +3 MIL ENP	ASTM A182 F316/F51
8	Seat	DEVLON	DEVLON
9	Body Bolt	ASTM A193 B7M/ASTM A320 L7M	ASTM A193 B7M/ASTM A320 L7M
10	Body Nut	ASTM A194 2HM/ASTM A194 7M	ASTM A194 2HM/ASTM A194 7M
11	Trunnion Screws	ASTM A193 B7M/ASTM A320 L7M	ASTM A193 B7M/ASTM A320 L7M
12	Mounting Plate Screws	ASTM A193 B7M/ASTM A320 L7M	ASTM A193 B7M/ASTM A320 L7M
13	End Cap o-ring	Viton /HNBR	Viton /HNBR
14	Trunnion o-ring	Viton /HNBR	Viton /HNBR
15	Seat Retainer o-ring	Viton /HNBR	Viton /HNBR
16	Seat Retainer o-ring	Viton /HNBR	Viton /HNBR
17	Stem o-ring	Viton /HNBR	Viton /HNBR
18	End Cap Gasket	Graphite	Graphite
19	Trunnion Gasket	Graphite	Graphite
20	Mounting Plate Gasket	Graphite	Graphite
21	Thrust Washer	PEEK	PEEK
22	Washer	PTFE	PTFE
23	Trunnion Bearing	ASTMA516 70+PTFE	ASTM A182 F304+PTFE
24	Stem Bearing	ASTMA516 70+PTFE	ASTM A182 F304+PTFE
25	Anti-static Spring	ASTM A313 316	ASTM A313 316
26	Anti-static Spring	ASTM A313 316	ASTM A313 316
27	Anti-static Ball	ASTM A276 304	ASTM A276 304
28	Square Key	ASTM A29 Gr.1045	ASTM A29 Gr.1045
29	Stem Injection Valve	ASTM A105/A350 LF2+Zn	ASTM A105/A350 LF2+Zn
30	Seat Injection Valve	ASTM A105/A350 LF2+Zn	ASTM A105/A350 LF2+Zn
31	Drain Plug	ASTM A105/A350 LF2+Zn	ASTM A105/A350 LF2+Zn
32	Seat Spring	Inconel X-750	Inconel X-750
33	Mounting Plate Pin	ASTM A29 Gr.1566	ASTM A29 Gr.1566
34	Square Key Pin	ASTM A29 Gr.1566	ASTM A29 Gr.1566
35	Wrench Adapter	ASTM A216 Gr.WCB	ASTM A216 Gr.WCB
36	Locking Plate	ASTM A182 Gr.F304	ASTM A182 Gr.F304
37	Washer	NYLON	NYLON
38	Wrench Pipe	ASTM A29 Gr.1020	ASTM A29 Gr.1020
39	Wrench Screws	ASTM A193 Gr.B8	ASTM A193 Gr.B8
40	Wrench Screws	ASTM A193 Gr.B8	ASTM A193 Gr.B8
41	Washer	ASTM A182 Gr.F316	ASTM A182 Gr.F316
42	Packing	Braided Graphite	Braided Graphite

2 CAST STEEL OUTER TRUNNION MOUNTED BALL VALVE - TYPE A

Item	Description	Stainless Steel (NACE)	Exotic Alloy Steel (NACE)
1	Body	ASTM A351 Gr.CF8M	ASTM A351 Gr. CK3MCUN/A995 GR.6A
2	End Cap	ASTM A351 Gr.CF8M	ASTM A351 Gr. CK3MCUN/A995 GR.6A
3	Ball	ASTM A351 Gr. CF8M/ASTMA182 Gr. F316/F51	ASTM A182 Gr.F904L/F44/F55/A995 GR.6A
4	Stem	ASTM A182 F316/F51/A564 -630 (17-4PH)	ASTM A182 Gr. F904L/F44/F55
5	Trunnion	ASTM A182 F316/F51/A564 -630 (17-4PH)	ASTM A182 Gr. F904L/F44/F55
6	Mounting Plate	ASTM A182 Gr. F304	ASTM A182 Gr. F304
7	Seat Retainer	ASTM A182 Gr. F316/F51	ASTM A182 Gr. F904L/F44/F55
8	Seat	DEVLON	DEVLON
9	Body Bolt	ASTM A193 Gr. B8M	ASTM A193 Gr. B8M
10	Body Nut	ASTM A194 Gr. 8M	ASTM A194 Gr. 8M
11	Trunnion Screws	ASTM A193 Gr. B8M	ASTM A193 Gr. B8M
12	Mounting Plate Screws	ASTM A193 Gr. B8M	ASTM A193 Gr. B8M
13	End Cap o-ring	Viton /HNBR	Viton /HNBR
14	Trunnion o-ring	Viton /HNBR	Viton /HNBR
15	Seat Retainer o-ring	Viton /HNBR	Viton /HNBR
16	Seat Retainer o-ring	Viton /HNBR	Viton /HNBR
17	Stem o-ring	Viton /HNBR	Viton /HNBR
18	End Cap Gasket	Graphite	Graphite
19	Trunnion Gasket	Graphite	Graphite
20	Mounting Plate Gasket	Graphite	Graphite
21	Thrust Washer	PEEK	PEEK
22	Washer	PTFE	PTFE
23	Trunnion Bearing	ASTM A240 316+PTFE	PEEK
24	Stem Bearing	ASTM A240 316+PTFE	PEEK
25	Anti-static Spring	ASTM A316 316	Inconel X-750
26	Anti-static Spring	ASTM A316 316	Inconel X-750
27	Anti-static Ball	ASTM A276 316	Monel
28	Square Key	ASTM A29 Gr.1045	ASTM A29 Gr.1045
29	Stem Injection Valve	ASTM A182 Gr.F316	ASTM A182 Gr.F55
30	Seat Injection Valve	ASTM A182 Gr.F316	ASTM A182 Gr.F55
31	Drain Plug	ASTM A182 Gr.F316	ASTM A182 Gr.F55
32	Seat Spring	Inconel X-750	Inconel X-750
33	Mounting Plate Pin	ASTM A29 Gr.1566	ASTM A29 Gr.1566
34	Square Key Pin	ASTM A29 Gr.1566	ASTM A29 Gr.1566
35	Wrench Adapter	ASTM A216 Gr. WCB	ASTM A216 Gr. WCB
36	Locking Plate	ASTM A182 Gr.F304	ASTM A182 Gr.F304
37	Washer	NYLON	NYLON
38	Wrench Pipe	ASTM A29 Gr.1020	ASTM A29 Gr.1020
39	Wrench Screws	ASTM A193 Gr.B8	ASTM A193 Gr.B8
40	Wrench Screws	ASTM A193 Gr.B8	ASTM A193 Gr.B8
41	Washer	ASTM A182 Gr.F316	ASTM A182 Gr.F316
42	Packing	Braided Graphite	Braided Graphite

2 CAST STEEL INNER TRUNNION MOUNTED BALL VALVE - TYPE B

Item	Description	Carbon Steel (NACE)	Carbon x Stainless Steel (NACE)
1	Body	ASTM A216 WCB/ASTM A352 LCB	ASTM A216 WCB/ASTM A352 LCB
2	End Cap	ASTM A216 WCB/ASTM A352 LCB	ASTM A216 WCB/ASTM A352 LCB
3	Ball	ASTM A105/A350 LF2 +3 MIL ENP	ASTM A351 CF8M/ASTM A182 F316/F51
4	Stem	ASTM A322 4140 +3 MIL ENP	ASTM A182 F316/F51/A564 GR630(17-4PH)
5	Trunnion	ASTM A105/A350 LF2 +3 MIL ENP	ASTM A182 F316/F51/A564 GR630(17-4PH)
6	Mounting Plate	ASTM A105/A350 LF2	ASTM A105/A350 LF2
7	Seat Retainer	ASTM A105/A350 LF2 +3 MIL ENP	ASTM A182 F316/F51
8	Seat	DEVLON	DEVLON
9	Body Bolt	ASTM A193 B7M/ASTM A320 L7M	ASTM A193 B7M/ASTM A320 L7M
10	Body Nut	ASTM A194 2HM/ASTM A194 7M	ASTM A194 2HM/ASTMA194 7M
11	Trunnion Screws	ASTM A193 B7M/ASTM A320 L7M	ASTM A193 B7M/ASTM A320 L7M
12	Mounting Plate Screws	ASTM A193 B7M/ASTM A320 L7M	ASTM A193 B7M/ASTM A320 L7M
13	End Cap o-ring	Viton /HNBR	Viton /HNBR
14	Trunnion o-ring	Viton /HNBR	Viton /HNBR
15	Seat Retainer o-ring	Viton /HNBR	Viton /HNBR
16	Seat Retainer o-ring	Viton /HNBR	Viton /HNBR
17	Stem o-ring	Viton /HNBR	Viton /HNBR
18	End Cap Gasket	Graphite	Graphite
19	Trunnion Gasket	Graphite	Graphite
20	Mounting Plate Gasket	Graphite	Graphite
21	Thrust Washer	PEEK	PEEK
22	Washer	PTFE	PTFE
23	Trunnion Bearing	ASTMA516 70+PTFE	ASTM A182 F304+PTFE
24	Stem Bearing	ASTMA516 70+PTFE	ASTM A182 F304+PTFE
25	Anti-static Spring	ASTM A313 316	ASTM A313 316
26	Anti-static Spring	ASTM A313 316	ASTM A313 316
27	Anti-static Ball	ASTM A276 304	ASTM A276 304
28	Square Key	ASTM A29 Gr.1045	ASTM A29 Gr.1045
29	Stem Injection Valve	ASTM A105/A350 LF2+Zn	ASTM A105/A350 LF2+Zn
30	Seat Injection Valve	ASTM A105/A350 LF2+Zn	ASTM A105/A350 LF2+Zn
31	Check Valve	ASTM A182 Gr.F304	ASTM A182 Gr.F304
32	Drain Plug	ASTM A105/A350 LF2+Zn	ASTM A105/A350 LF2+Zn
33	Seat Spring	Inconel X-750	Inconel X-750
34	Mounting Plate Pin	ASTM A29 Gr.1566	ASTM A29 Gr.1566
35	Square Key Pin	ASTM A29 Gr.1566	ASTM A29 Gr.1566
36	Wrench Adapter	ASTM A216 Gr. WCB	ASTM A216 Gr. WCB
37	Locking Plate	ASTM A182 Gr.F304	ASTM A182 Gr.F304
38	Washer	NYLON	NYLON
39	Wrench Pipe	ASTM A29 Gr.1020	ASTM A29 Gr.1020
40	Wrench Screws	ASTM A193 Gr.B8	ASTM A193 Gr.B8
41	Wrench Screws	ASTM A193 Gr.B8	ASTM A193 Gr.B8
42	Washer	ASTM A182 Gr.F316	ASTM A182 Gr.F316
43	Packing	Braided Graphite	Braided Graphite

2 CAST STEEL INNER TRUNNION MOUNTED BALL VALVE - TYPE B

Item	Description	Stainless Steel (NACE)	Exotic Alloy Steel (NACE)
1	Body	ASTM A351 Gr.CF8M	ASTM A351 Gr. CK3MCUN/A995 GR.6A
2	End Cap	ASTM A351 Gr.CF8M	ASTM A351 Gr. CK3MCUN/A995 GR.6A
3	Ball	ASTM A351 Gr. CF8M/ASTMA182 Gr. F316/F51	ASTM A182 Gr.F904L/F44/F55/A995 GR.6A
4	Stem	ASTM A182 F316/F51/A564 -630 (17-4PH)	ASTM A182 Gr. F904L/F44/F55
5	Trunnion	ASTM A182 F316/F51/A564 -630 (17-4PH)	ASTM A182 Gr. F904L/F44/F55
6	Mounting Plate	ASTM A182 Gr. F304	ASTM A182 Gr. F304
7	Seat Retainer	ASTM A182 Gr. F316/F51	ASTM A182 Gr. F904L/F44/F55
8	Seat	DEVLON	DEVLON
9	Body Bolt	ASTM A193 Gr. B8M	ASTM A193 Gr. B8M
10	Body Nut	ASTM A194 Gr. 8M	ASTM A194 Gr. 8M
11	Trunnion Screws	ASTM A193 Gr. B8M	ASTM A193 Gr. B8M
12	Mounting Plate Screws	ASTM A193 Gr. B8M	ASTM A193 Gr. B8M
13	End Cap o-ring	Viton /HNBR	Viton /HNBR
14	Trunnion o-ring	Viton /HNBR	Viton /HNBR
15	Seat Retainer o-ring	Viton /HNBR	Viton /HNBR
16	Seat Retainer o-ring	Viton /HNBR	Viton /HNBR
17	Stem o-ring	Viton /HNBR	Viton /HNBR
18	End Cap Gasket	Graphite	Graphite
19	Trunnion Gasket	Graphite	Graphite
20	Mounting Plate Gasket	Graphite	Graphite
21	Thrust Washer	PEEK	PEEK
22	Washer	PTFE	PTFE
23	Trunnion Bearing	ASTM A240 316+PTFE	PEEK
24	Stem Bearing	ASTM A240 316+PTFE	PEEK
25	Anti-static Spring	ASTM A316 316	Inconel X-750
26	Anti-static Spring	ASTM A316 316	Inconel X-750
27	Anti-static Ball	ASTM A276 316	Monel
28	Square Key	ASTM A29 Gr.1045	ASTM A29 Gr.1045
29	Stem Injection Valve	ASTM A182 Gr.F316	ASTM A182 Gr.F55
30	Seat Injection Valve	ASTM A182 Gr.F316	ASTM A182 Gr.F55
31	Check Valve	ASTM A182 Gr.F316	ASTM A182 Gr.F55
32	Drain Plug	ASTM A182 Gr.F316	ASTM A182 Gr.F55
33	Seat Spring	Inconel X-750	Inconel X-750
34	Mounting Plate Pin	ASTM A29 Gr.1566	ASTM A29 Gr.1566
35	Square Key Pin	ASTM A29 Gr.1566	ASTM A29 Gr.1566
36	Wrench Adapter	ASTM A216 Gr.WCB	ASTM A216 Gr.WCB
37	Locking Plate	ASTM A182 Gr.F304	ASTM A182 Gr.F304
38	Washer	NYLON	NYLON
39	Wrench Pipe	ASTM A29 Gr.1020	ASTM A29 Gr.1020
40	Wrench Screws	ASTM A193 Gr.B8	ASTM A193 Gr.B8
41	Wrench Screws	ASTM A193 Gr.B8	ASTM A193 Gr.B8
42	Washer	ASTM A182 Gr.F316	ASTM A182 Gr.F316
43	Packing	Braided Graphite	Braided Graphite

2 CAST STEEL OUTER TRUNNION MOUNTED BALL VALVE - TYPE C

Item	Description	Carbon Steel (NACE)	Carbon x Stainless Steel (NACE)
1	Body	ASTM A216 WCB/ASTM A352 LCB	ASTM A216 WCB/ASTM A352 LCB
2	End Cap	ASTM A216 WCB/ASTM A352 LCB	ASTM A216 WCB/ASTM A352 LCB
3	Ball	ASTM A105/A350 LF2 +3 MIL ENP	ASTM A351 CF8M/ASTM A182 F316/F51
4	Stem	ASTM A322 4140 +3 MIL ENP	ASTM A182 F316/F51/A564 GR630(17-4PH)
5	Bonnet	ASTM A105/A350 LF2 +3 MIL ENP	ASTM A105/A350 LF2+3 MIL ENP
6	Mounting Plate	ASTM A105/A350 LF2	ASTM A105/A350 LF2
7	Trunnion Plate	ASTM A105/A350 LF2 +3 MIL ENP	ASTM A1B2 F316/F51
8	Seat Retainer	ASTM A105/A350 LF2 +3 MIL ENP	ASTM A1B2 F316/F51
9	Seat	DEVLON	DEVLON
10	Lifting lug	ASTM A29 1020	ASTM A36
11	Body Bolt	ASTM A193 B7M/ASTM A320 L7M	ASTM A193 B7M/ASTM A320 L7M
12	Body Nut	ASTM A194 7M/ASTM A320 7M	ASTM A194 7M/ASTM A320 7M
13	Bonnet Screws	ASTM A193 B7M/ASTM A320 L7M	ASTM A193 B7M/ASTM A320 L7M
14	Mounting Plate Screws	ASTM A193 B7M/ASTM A320 L7M	ASTM A193 B7M/ASTM A320 L7M
15	End Cap o-ring	Viton /HNBR	Viton /HNBR
16	Seat o-ring	Viton /HNBR	Viton /HNBR
17	Grease Seal o-ring	Viton /HNBR	Viton /HNBR
18	Bonnet o-ring	Viton /HNBR	Viton /HNBR
19	Stem o-ring	Viton /HNBR	Viton /HNBR
20	End Cap Gasket	Graphite	Graphite
21	Bonnet Gasket	Graphite	Graphite
22	Mounting Plate Gasket	Graphite	Graphite
23	Washer	PTFE	PTFE
24	Thrust Washer	PEEK	PEEK
25	Ball Bearing	ASTM A516 70+PTFE	ASTM A516 70+PTFE
26	Washer	PTFE	PTFE
27	Stem Square Key	ASTM A29 Gr.1045	ASTM A29 Gr.1045
28	Stem Injection Valve	ASTM A105/A350 LF2+Zn	ASTM A105/A350 LF2+Zn
29	Seat Injection Valve	ASTM A105/A350 LF2+Zn	ASTM A105/A350 LF2+Zn
30	Check Valve	ASTM A182 Gr.F304	ASTM A182 Gr.F304
31	Vent Valve	ASTM A105/A350 LF2+Zn	ASTM A105/A350 LF2+Zn
32	Drain Plug	ASTM A105/A350 LF2+Zn	ASTM A105/A350 LF2+Zn
33	Trunnion Plate Pin	ASTM A29 Gr.1020	ASTM A29 1Gr. 1020
34	Bonnet Pin	ASTM A29 Gr.1566	ASTM A29 Gr.1566
35	Square Key Pin	ASTM A29 Gr.1566	ASTM A29 Gr.1566
36	Anti-static Spring	ASTM A313 Gr.316	ASTM A313 Gr.316
37	Seat Spring	Inconel X-750	Inconel X-750
38	Anti-static Spring	ASTM A313 Gr.316	ASTM A313 Gr.316
39	Anti-static Ball	ASTM A276 Gr.304	ASTM A276 Gr.304
40	Gear	ASTM A48 No.35A	ASTM A48 No.35A
41	Gear Bolt	ASTM A193 B7M	ASTM A193 B7M
42	Gear Nut	ASTM A194 2HM	ASTM A194 2HM
43	Gear Pin	ASTM A29 Gr.1566	ASTM A29 Gr.1566
44	Lift eye	ASTM A36	ASTM A36

2 CAST STEEL OUTER TRUNNION MOUNTED BALL VALVE - TYPE C

Item	Description	Stainless Steel (NACE)	Exotic Alloy Steel (NACE)
1	Body	ASTM A351 CF8M	ASTM A351 Gr. CK3MCUN/A995 GR.6A
2	End Cap	ASTM A351 CF8M	ASTM A351 Gr. CK3MCUN/A995 GR.6A
3	Ball	ASTM A351 CF8M/A182 F316/F51	ASTM A182 Gr.F904L/F44/F55/A995 GR.6A
4	Stem	ASTM A182 F316/F51/A564 GR 630 (17-4PH)	ASTM A182 Gr. F904L/F44/F55
5	Bonnet	ASTM A182 Gr. F316	ASTM A182 Gr. F904L/F44/F55
6	Mounting Plate	ASTM A182 Gr. F316	ASTM A182 Gr. F304
7	Trunnion Plate	ASTM A182 Gr. F316	ASTM A182 Gr. F904L/F44/F55
8	Seat Retainer	ASTM A182 F316/F51	ASTM A182 Gr. F904L/F44/F55
9	Seat	DEVLON	DEVLON
10	Lift eye	Stainless Steel	Stainless Steel
11	Body Bolt	ASTM A193 Gr. B8M	ASTM A193 Gr. B8M
12	Body Nut	ASTM A194 Gr. 8M	ASTM A194 Gr. 8M
13	Bonnet Screws	ASTM A193 Gr. B8M	ASTM A193 Gr. B8M
14	Mounting Plate Screws	ASTM A193 Gr. B8M	ASTM A193 Gr. B8M
15	End Cap o-ring	Viton /HNBR	Viton /HNBR
16	Seat o-ring	Viton /HNBR	Viton /HNBR
17	Grease Seal o-ring	Viton /HNBR	Viton /HNBR
18	Bonnet o-ring	Viton /HNBR	Viton /HNBR
19	Stem o-ring	Viton /HNBR	Viton /HNBR
20	End Cap Gasket	Graphite	Graphite
21	Bonnet Gasket	Graphite	Graphite
22	Mounting Plate Gasket	Graphite	Graphite
23	Washer	PTFE	PTFE
24	Thrust Washer	PEEK	PEEK
25	Ball Bearing	ASTM A240 316+PTFE	PEEK
26	Washer	PTFE	PTFE
27	Stem Square Key	ASTM A29 Gr.1045	ASTM A29 Gr.1045
28	Stem Injection Valve	ASTM A182 Gr. F316	ASTM A182 Gr. F316
29	Seat Injection Valve	ASTM A182 Gr. F316	ASTM A182 Gr. F316
30	Check Valve	ASTM A182 Gr. F316	ASTM A182 Gr. F316
31	Vent Valve	ASTM A182 Gr. F316	ASTM A182 Gr. F316
32	Drain Plug	ASTM A182 Gr. F316	ASTM A182 Gr. F316
33	Trunnion Plate Pin	ASTM A29 Gr.1020	ASTM A29 1 Gr.1020
34	Bonnet Pin	ASTM A29 Gr.1566	ASTM A29 Gr.1566
35	Square Key Pin	ASTM A29 Gr.1566	ASTM A29 Gr.1566
36	Anti-static Spring	ASTM A313 Gr.316	ASTM A313 Gr.316
37	Seat Spring	Inconel X-750	Inconel X-750
38	Anti-static Spring	ASTM A313 Gr.316	ASTM A313 Gr.316
39	Anti-static Ball	ASTM A276 Gr.304	ASTM A276 Gr.304
40	Gear	ASTM A48 No.35A	ASTM A48 No.35A
41	Gear Bolt	ASTM A193 Gr. B8M	ASTM A193 Gr. B8M
42	Gear Nut	ASTM A194 Gr. 8M	ASTM A194 Gr. 8M
43	Gear Pin	ASTM A29 Gr.1566	ASTM A29 Gr.1566
44	Lift eye	Stainless Steel	Stainless Steel

ORDERING INSTRUCTIONS

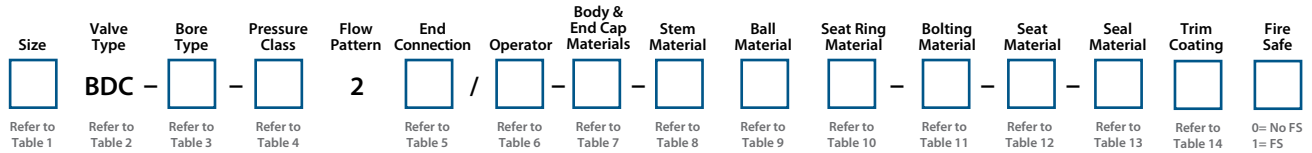


Table 1 - Size

Size Range

2" to 24" or DN50 to DN600

Table 2 - Valve Type

Code Type

BDC 2 Piece Trunnion Mounted Ball Valve API 6D

Table 3 - Bore Type

Code Type

F Full Bore
R Reduced Bore

Table 4 - Pressure Class

Code	15	30	60	90	51
Type	150	300	600	900	1500

Table 5 - End Connection

Code	FR	FJ	BW	FB	JB	X
Type	Flange Raised Face	Flange Ring-Type Joint	Butt Weld	FRxBW	FJxBW	Special

Table 6 - Operator

Code	W	WX	WL	T	EG	EL	EX
Type	Wrench	Wrench + Stem Extension	Wrench + Locking	T-Bar	Gear Operator	Gear Operator + Locking	Gear + Stem Extension
Code	B	A					
Type	Bare Stem	Actuated					

Table 7 - Body & End Cap Materials

Code	CS1	CS2	CS3	CS4	SS1	SS2	SS3	SS4	AL1	AL2	AL3	AL4	AL5	AL6	X
Type	WCB	WCC	LCB	LCC	CF8M	CF8	CF3M	F55	CN7M	CK3	CD3MN(4A)	CE3MN (5A)	CD3MWCuN(6A)	M35-1	Special

Table 8 - Stem Material

Code	0	1	2	3	4	5	6	7	8
Type	A105	LF2	F6A	CF8M/316	F51/4A	F53/5A	F55/6A	17-4 PH	A20/CN7M
Code	9	A	B	C	X				
Type	Monel K400	Monel K500	Inconel 625	4140	Special				

Table 9 - Ball Material

Code	0	1	2	3	4	5	6
Type	A105	LF2	F6A	CF8M/316	F51/4A	F53/5A	F55/6A
Code	7	8	9	A	B	C	X
Type	17-4 PH	A20/CN7M	Monel K400	Monel K500	Inconel 625	4140	Special

Table 10 - Seat Ring Material

Code	0	1	2	3	4	5	6
Type	A105	LF2	F6A	CF8M/316	F51/4A	F53/5A	F55/6A
Code	7	8	9	A	B	C	X
Type	17-4 PH	A20/CN7M	Monel K400	Monel K500	Inconel 625	4140	Special

Table 11 - Bolting Material

Code	0	1	2	3	4	5	6
Bolt/Nut	N/A	B7/2H	B7M/2HM	B8/8	B8M/8M	L7/7	L7M/7M

Table 12 - Seat Material

Code	P	R	N	M	K	D	C	X
Type	PTFE	RTFE	NYLON	MOLON	PEEK	DEVLON	PCTFE	Special

Table 13 - Seal Material

Code	0	1	2	3	4	5
Type	Viton	Viton AED	HNBR	HNBR AED	PTFE	EPDM
Code	6	7	8	X		
Type	Buna N	Aflas	Lip-seal	Special		

Table 14 - Trim Coating (Ball, Seat Ring, and Stem)**

Code	0	1	2	3	4	5	X
Type	None	0.05 ENP	0.075 ENP	CCC	TCC	STELLITE	Special

* 1mil ENP=0.025mmENP; Trim=Stem+Ball+Seat Ring.

MODEL SELECTION EXAMPLE

Example: 12"BDC-F302FR/EG-CS1-000-1-R-251

Description: FluoroSeal 12" 2PC Trunnion Mounted Ball Valve, Full Port, Class 300, Flange Raised Face, Gear Operated, Body and End Cap Material in ASTM A216 Gr. WCB, Stem, Ball, and Seat Material in ASTM A105+0.075ENP, ASTM A193 Gr. B7 Bolts, RTFE Seat Insert, Seal Material in HNBR, STELLITE coated trim*, and Fire Safe.

NOTES:

- For all technical parameters of the product please refer to this catalog, additional information can be obtained from your local FluoroSeal sales office or authorized representative.
- Customization for specific applications is available upon request.

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Orders covering special or non-standard products are not subject to cancellation except on such terms as FluoroSeal Inc. may specify on application.

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The amount of any sales, excise or other taxes, if any, applicable to the products, shall be added to the purchase price and shall be paid by Buyer unless Buyer provides FluoroSeal Inc. with an exemption certificate acceptable to the taxing authorities.

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Where the products, engineering design or fabrication is for nuclear plant applications, Buyer agrees (a) to take all necessary steps to add FluoroSeal Inc. as an insured supplier under the American Nuclear Insurers (ANI) pool and under the Mutual Atomic Energy Reinsurance Pool (MAERP) for property damage and liability insurance and if necessary steps could have been taken, but are not taken, Buyer shall hold FluoroSeal Inc. harmless against all such losses which could have been thus covered; (b) Buyer agrees to hold FluoroSeal Inc. harmless with respect to any personal injury or death, property damage or any other loss in a nuclear incident which is caused directly or indirectly by defective design, material, or workmanship, furnished by FluoroSeal Inc. and which is covered by insurance maintained by Buyer (or which could be so covered but with respect to which Buyer has elected to self-insure), and further agrees to waive subrogation by its carriers of such insurance against FluoroSeal Inc.; (c) as to nuclear hazards for which Buyer cannot obtain insurance coverage, the liability of FluoroSeal Inc. for any personal injury or death, property damage or any other loss directly caused by defective design, material, or workmanship furnished by FluoroSeal Inc. shall not exceed the value of the material furnished by FluoroSeal Inc. at the time of the loss occurrence.



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