FLOW-TEK

TRUNNION MOUNTED BALL VALVES

BRAY.COM/FLOW-TEK

Flow-Tek®
Subsidiary of BRAY INTERNATIONAL, Inc.

FEATURES AND BENEFITS

1 Emergency Stem Sealant Injection
This standard feature allows the valve's stem housing to be adapted with a grease fitting to inject sealant during emergency scenarios. By filling the cavity between the stem and stem housing, this secondary stem seal provides protection against unplanned spikes in operating conditions.

2 Emergency Seat Sealant Injection
This optional feature allows the valve's end connections to be adapted with a grease fitting to inject sealant. This creates a positive seal in the case of seat leakage due to service impurities or unplanned spikes in operating conditions.

3 Drain and Vent Ports
Drain ports located at the bottom of the valve allow for elimination of any fluid trapped in the body cavity of a closed valve. Vent ports located at the top of the body cavity allow for elimination of any gas trapped in the body cavity of a fully closed valve. Both play a key safety role in a double block and bleed and double isolation and bleed valve configurations.

4 Double Block and Bleed
This valve configuration provides the safety feature of eliminating any high pressure media that is trapped in the valve's body cavity. This pressure relief system is versatile, allowing the pressure buildup to be eliminated while the valve is in the fully closed position. Additionally, periodic seat integrity tests can be performed.

5 Firesafe Design
Secondary metal seat design provides a firesafe shut off per API 607. Additionally, secondary graphite body seals and flexible graphite packing prevents leakage through the body joints and stuffing box, respectively.

6 Internal Trunnion Design
Upper and lower bearing plates hold the ball in place. This compact design prevents the ball from floating axially, avoiding excess load on the seats. Additionally, external trunnion design available in certain sizes.

7 Pressure Energized Stem Packing
The proprietary energizer ring located above the primary o-ring stem seal provides insurance in the rare occasion the o-ring is damaged. The energizer ring would use the media pressure to create an upward compressive force on the packing. This upward force on the packing is combined with the downward compressive force created by tightening the packing gland. This results in a larger net compressive force on the packing and better seal than a typical packing design.

8 Double Seals on Body Joints
Primary elastomeric seals ensure zero leakage in standard operating conditions. Secondary graphite seals ensure proper body joint sealing per API 607 in extreme temperature scenarios.

9 Anti-Static Devices
Anti-static devices are provided as standard. These devices ensure electrical continuity between the ball, stem, and body, eliminating the possibility of static electrical charges creating sparks within the valve.

10 Valve Position Indication
Clear stamping on the outer diameter of the mounting flange identifies the open or closed position of the valve, based on the stem key orientation.

11 ISO 5211 Mounting Pad
Robust ISO 5211 mounting pad provides quick conversion between the valve and the automation package.

12 Blowout-proof Stem Design
Valves are designed with stem/body connection preventing stem blowout under line pressure.

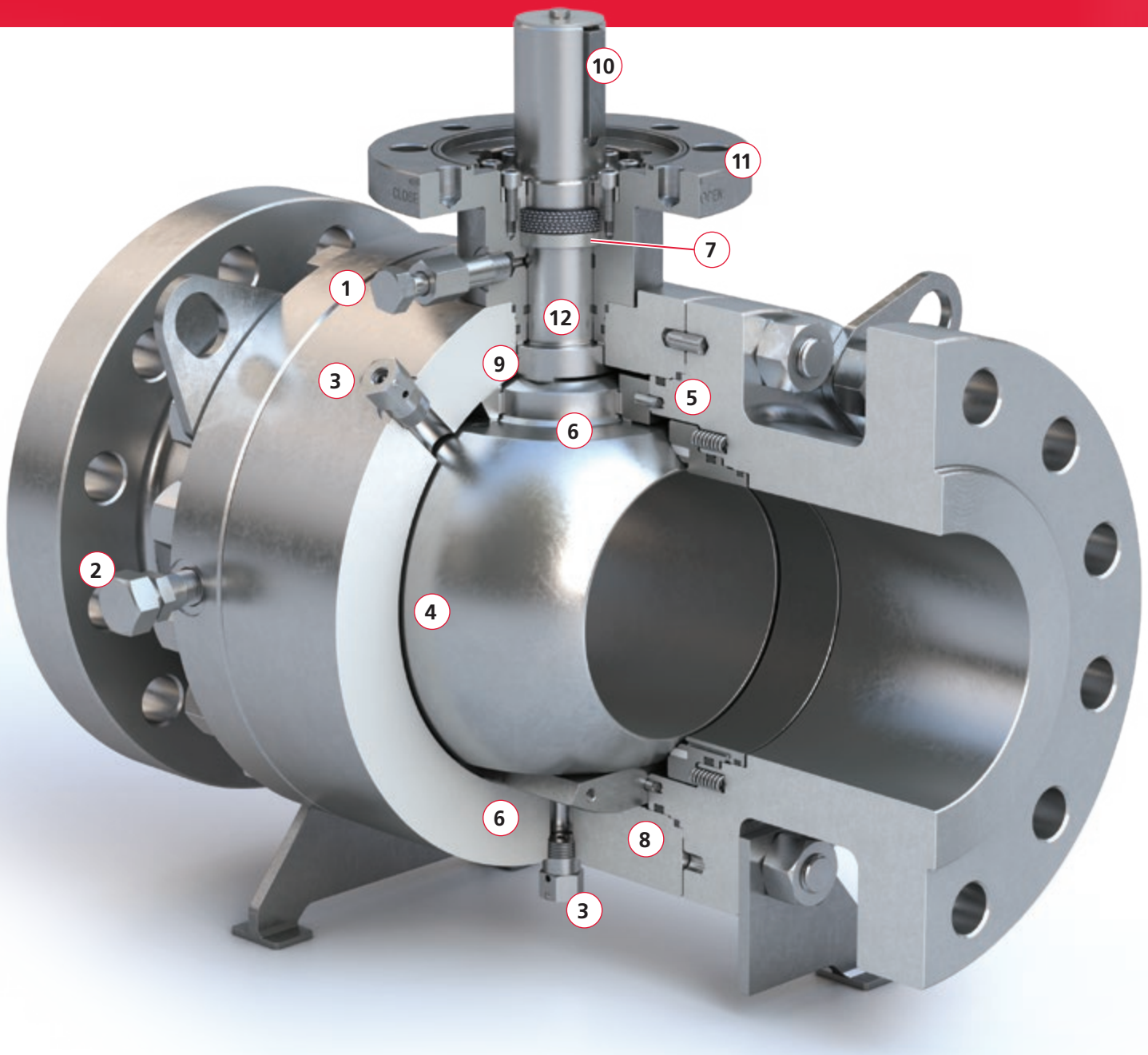
TECHNICAL SPECIFICATIONS

Size Range*	2" - 24" (50mm - 600mm)
Class Rating*	ASME Class 150, 300, 600
Temperature Range	-50 to 600°F (-45 to 315°C)
Port	Full
Construction	2 piece, 3 piece
Body Material*	ASTM A105 ASTM A350 Gr. LF2 ASTM A182 Gr F316
Ball Material*	ASTM A105 w/ENP ASTM A350 Gr. LF2 w/ENP ASTM A182 Gr F316
Seat Material*	RPTFE PEEK Nylon Tek-Fil Devlon TFM
End Connections	Flanged, Butt Weld

*Additional sizes, pressure classes, and materials available upon request

STANDARDS & CERTIFICATIONS

Design Standard	API 6D, ASME B16.34, PED 2014/68/EU
Flanges	ASME B16.5
BW Ends	ASME B16.25
Testing	API 6D
Fire Safety	API 607
NACE	MR-0175 Compatible
Fugitive Emissions	ISO 15848-1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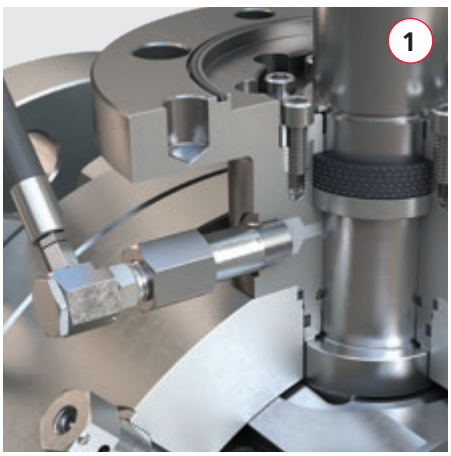
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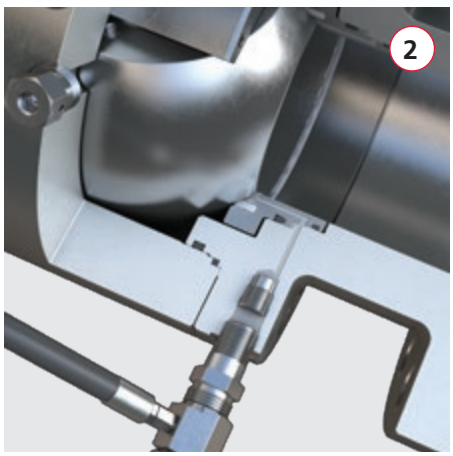
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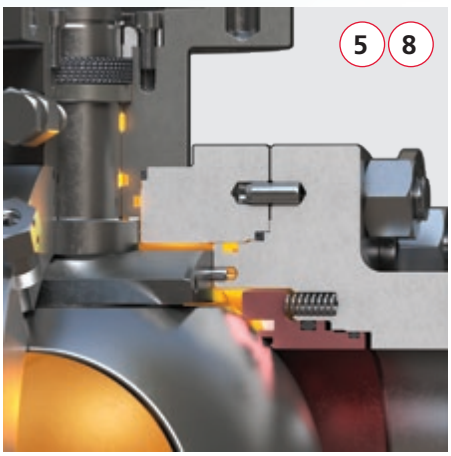
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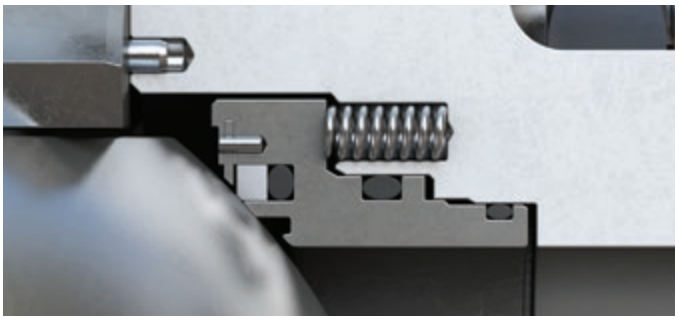
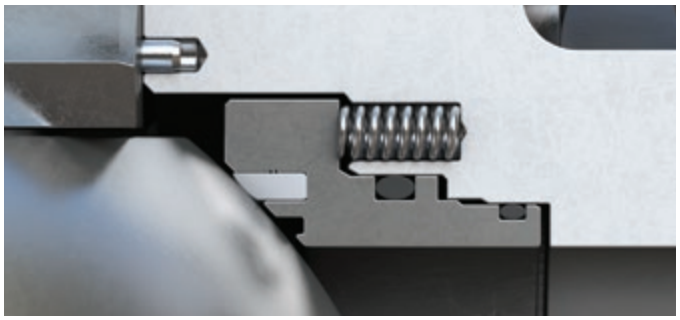
SEAT CONFIGURATION

Type A
Primary Seat – Metal
Secondary Seat – Soft Material
Generally suited for larger valve sizes, services containing light solids, and critical service requiring double seal assurance.



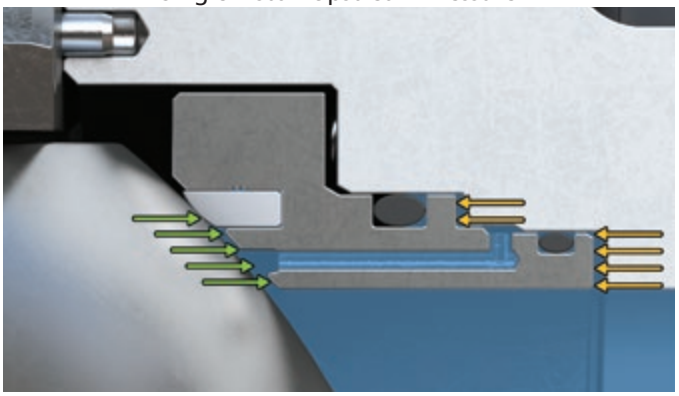
Type B
Primary Seat – Soft Material
Standard style typically suited for smaller valve sizes and general services.



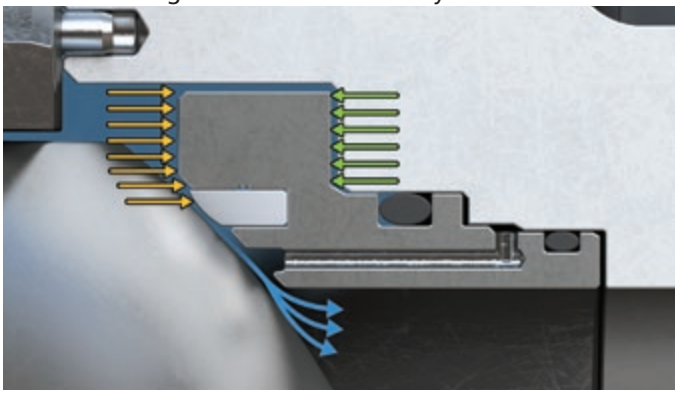
DESIGN FEATURES

Single Piston Effect
With this design, pressurized media upstream of the seat results in a force pushing the seat toward the ball. As temperatures rise, media trapped inside the body cavity builds up excessive pressure. This pressure pushes the seat away from the ball, compresses the seat springs, and allows the media to relieve past the seat. This self-relieving seat design allows for safe operation without the need for dedicated bleed lines.

Single Piston Upstream Pressure

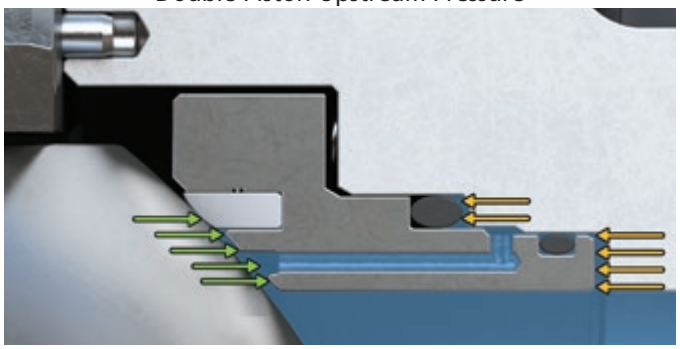


Single Piston Internal Cavity Pressure

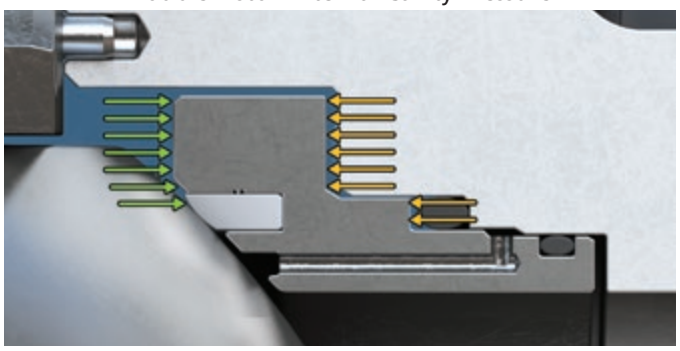


Double Piston Effect
This seat design uses pressure on both sides of the seat to assist sealing. As seen below, pressurized media upstream of the seat results in a force pushing the seat toward the ball. Similarly, when the pressurized media is inside the body cavity, the resulting force pushes the seat toward the ball. This sealing effect doesn't allow for self-relieving of cavity pressure and, in turn, requires a bleed line be installed within the body cavity. This type of valve configuration is valuable in applications where two redundant seals are required in the same direction (e.g. when repairs are being made downstream in a toxic service line). If media were to get past the upstream seal, dangerous flow toward the technician would be blocked by the downstream seal and evacuated by the bleed line.

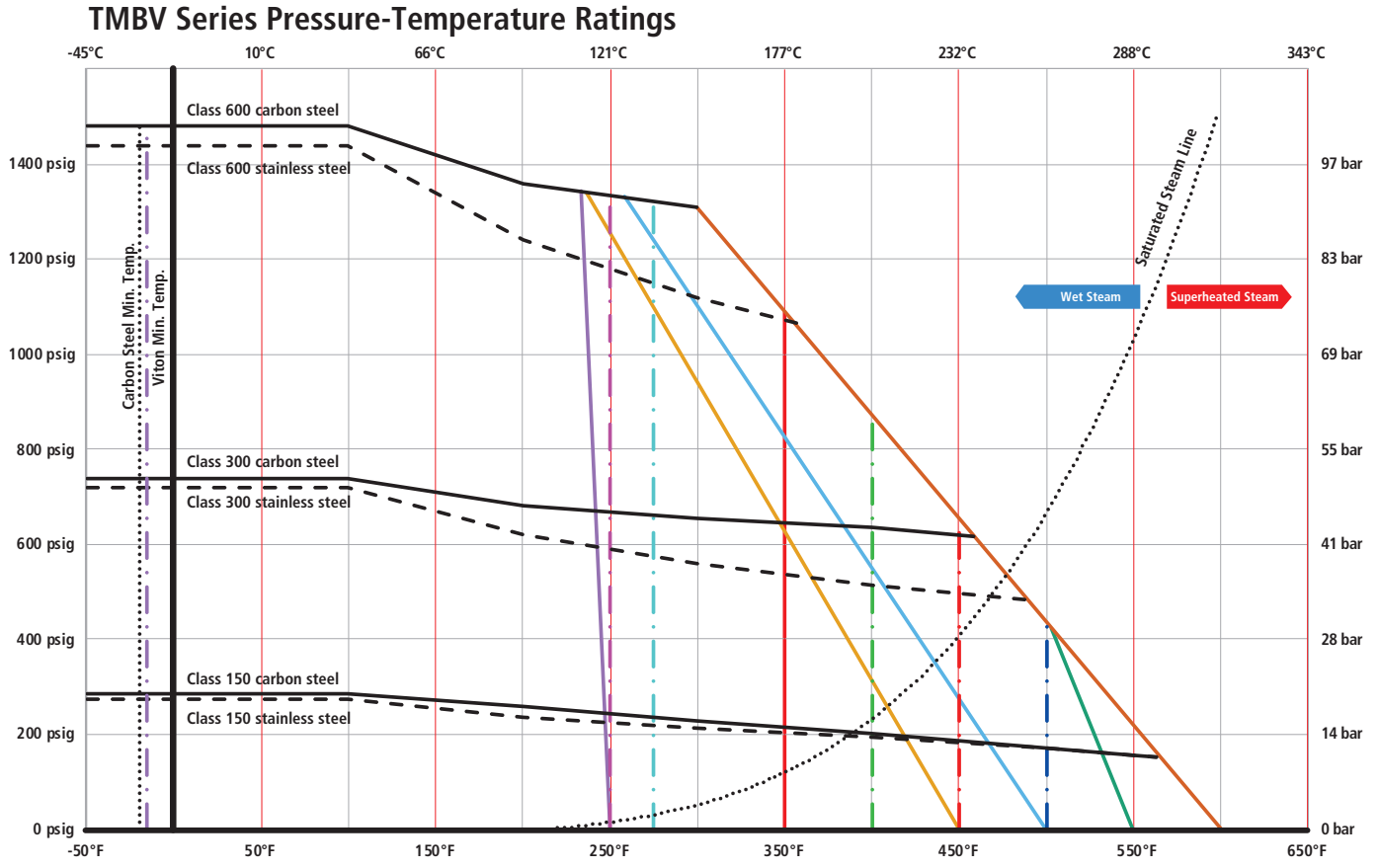
Double Piston Upstream Pressure



Double Piston Internal Cavity Pressure



PRESSURE TEMPERATURE CHART



Seat Materials

Nylon	Devlon	RPTFE	TFM	PEEK	Tek-Fil

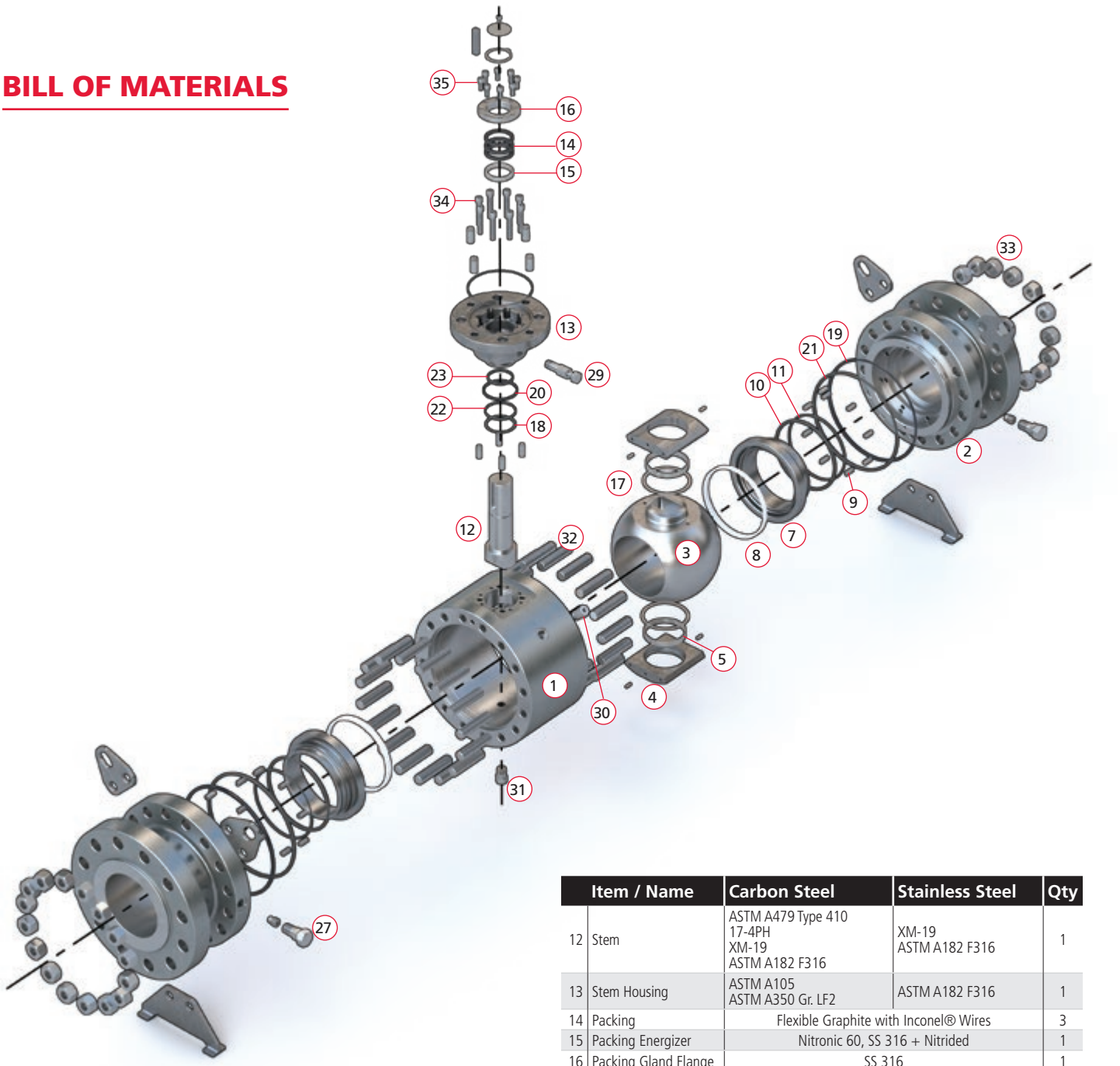
O-Ring Materials

EPDM	Buna N (NBR)	Viton A (FKM)	Aflas (FEPM)	FFKM
Not recommended for steam service	Not recommended for steam service	Not recommended for steam service	400°F max for steam service	480°F max for steam service

APPLICATIONS

- Oil and Gas Pipeline
- Offshore Platforms
- Onshore Terminals
- Emergency Shutdown
- Suction and Discharge Isolation
- Block and Bypass
- Pumping, Compression and Reinjection Units
- Metering Stations
- Pig Traps
- Surge-Relief Skids
- Decoking Isolation
- Buried Services
- Produced Water (Brine) Services

BILL OF MATERIALS



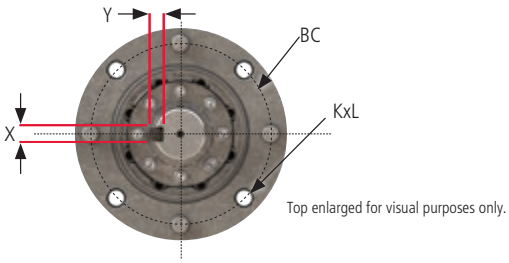
	Item / Name	Carbon Steel	Stainless Steel	Qty
1	Body	ASTM A105 ASTM A350 Gr. LF2	ASTM A182 F316	1
2	End Connection	ASTM A105 ASTM A350 Gr. LF2	ASTM A182 F316	1 or 2
3	Ball	ASTM A105 w/ENP ASTM A350 Gr. LF2 w/ENP ASTM A182 Gr. F316 ASTM A182 Gr. F316 w/ENP	ASTM A182 F316 ASTM A182 F316 w/ENP	1
4	Bearing Retainer	ASTM A516 Gr.70 ASTM A216 Gr WCB ASTM A352 Gr.LCB	ASTM A240 Gr. 316 ASTM A351 Gr. CF8M	2
5	Bearing (Ball Trunnion)	Steel Backed Composite	Stainless Steel Backed Composite	2
7	Seat Holder	ASTM A105 w/ENP ASTM A350 Gr. LF2 w/ENP ASTM A182 Gr. F316 ASTM A182 Gr. F316 w/ENP	ASTM A182 F316 ASTM A182 F316 w/ENP	2
8	Seat Insert	RPTFE, Nylon, Devlon, PEEK, Tek-Fil, TFM		2
9	Spring (Seat Holder)	Inconel X750		*
10	O-Ring (Seat Holder)	NBR, Viton		2
11	O-Ring (Seat Holder)	NBR, Viton		2

	Item / Name	Carbon Steel	Stainless Steel	Qty
12	Stem	ASTM A479 Type 410 17-4PH XM-19 ASTM A182 F316	XM-19 ASTM A182 F316	1
13	Stem Housing	ASTM A105 ASTM A350 Gr. LF2	ASTM A182 F316	1
14	Packing	Flexible Graphite with Inconel® Wires		3
15	Packing Energizer	Nitronic 60, SS 316 + Nitrided		1
16	Packing Gland Flange	SS 316		1
17	Thrust Washer (Ball)	Steel Backed Composite	Stainless Steel Backed Composite	2
18	Thrust Washer (Stem)	Steel Backed Composite	Stainless Steel Backed Composite	1
19	Seal (Body)	Graphite		*
20	Seal (Stem Housing)	Graphite		1
21	O-Ring (End Connection)	NBR, Viton		*
22	O-Ring (Stem Housing)	NBR, Viton		1
23	O-Ring (Stem)	NBR, Viton		1
27	Sealant Injector (End Connection)	Stainless Steel	Carbon Steel	*
29	Sealant Injector (Stem Housing)	Stainless Steel	Carbon Steel	1
30	Vent Plug	Stainless Steel	Carbon Steel	2
31	Drain Plug	Stainless Steel	Carbon Steel	1
32	Stud - Body	ASTM A193 Gr B7/B7M	ASTM A193 Gr B8M	*
33	Nut - Body	ASTM A194 Gr 2H/2HM	ASTM A194 Gr 8M	*
34	Socket Head Cap Screw (Stem Housing)	ASTM A193 Gr B7/B7M	ASTM A193 Gr B8M	*
35	Socket Head Cap Screw (Gland)	ASTM A193 Gr B7/B7M	ASTM A193 Gr B8M	*

Additional materials (including cast metals) available on request.
*Quantity depends on valve size.

DIMENSIONS

Size: 2"-4"



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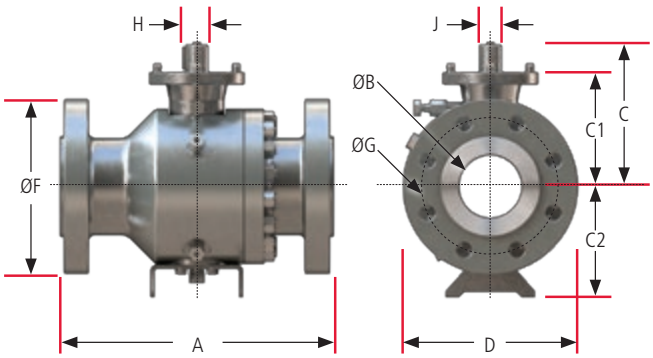
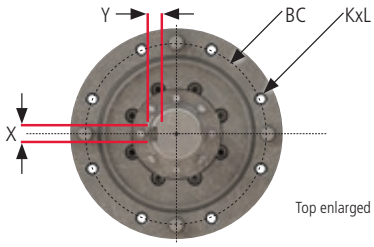


Size: 6"-24"



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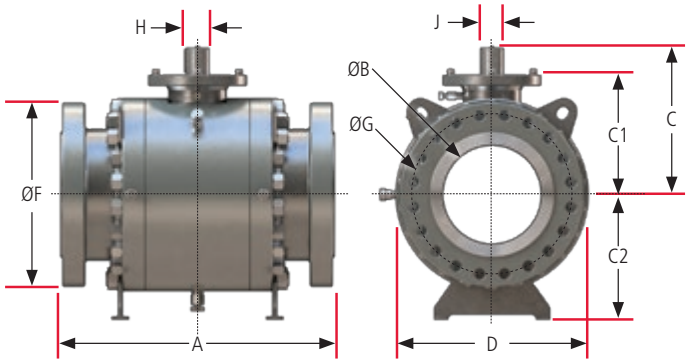

CLASS 150 VALVE DIMENSIONS (in/mm)

Size NPS DN	Valve						Valve Flange			Top Works								Weight lb kg	Cv Full Open	Valve Torque Max** Lb-in Nm
	A	ØB	C	C1	C2	D	ØF	ØG	N No Of Holes	H With Key	J	BC	K	L No Of Holes	Mtg Code	X* Key	Y* Key			
2 50	7.01 178	1.93 49	6.61 168	5.31 135	4.57 116	6.38 162	6.02 153	4.75 120.7	4	0.63 16	0.87 22	4.02 102	0.43 11	4	F10	- -	- -	49 22	462	682 77
3 80	7.99 203	2.91 74	7.52 191	5.55 141	5.12 130	7.48 190	7.48 190	6.00 152.4	4	0.87 22	1.18 30	4.02 102	0.43 11	4	F10	- -	- -	73 33	1107	1620 183
4 100	9.02 229	3.94 100	9.25 235	7.09 180	6.10 155	9.45 240	9.06 230	7.50 190.5	8	1.54 39.2	1.38 35	4.92 125	0.51 13	4	F12	0.39 10	0.39 10	123 56	2091	2522 285
6 150	15.51 394	5.91 150	11.57 294	9.25 235	8.35 212	12.52 318	11.02 280	9.50 241.3	8	1.91 48.5	1.77 45	6.50 165	0.83 21	4	F16	0.55 14	0.35 9	227 103	4918	5195 587
8 200	17.99 457	7.91 201	13.66 347	10.63 270	10.12 257	15.63 397	13.58 345	11.75 298.5	8	2.13 54.1	1.97 50	6.50 165	0.83 21	4	F16	0.47 12	0.39 10	562 255	9105	8001 904
10 250	20.98 533	9.92 252	15.20 386	12.17 309	12.83 326	18.58 472	15.94 405	14.25 362.0	12	2.13 54.1	1.97 50	6.50 165	0.83 21	4	F16	0.47 12	0.39 10	869 394	14645	11683 1320
12 300	24.02 610	11.93 303	16.69 424	13.58 345	14.72 374	21.77 553	19.09 485	17.00 431.8	12	2.44 62.0	2.28 58	6.50 165	0.83 21	4	F16	0.63 16	0.39 10	1325 601	21566	16604 1876
14 350	27.01 686	13.15 334	17.76 451	14.65 372	15.75 400	23.70 602	21.06 535	18.75 476.3	12	2.44 62.0	2.28 58	6.50 165	0.83 21	4	F16	0.63 16	0.39 10	1691 767	26458	24455 2763
16 400	30.00 762	15.16 385	20.20 513	16.65 423	17.28 439	27.01 686	23.43 595	21.25 539.8	16	2.76 70.2	2.50 63.5	10.00 254	0.67 17	8	F25	0.63 15.88	0.63 15.88	2425 1100	35644	34518 3900
18 450	34.02 864	17.17 436	21.46 545	17.95 456	18.74 476	30.08 764	25.00 635	22.75 577.9	16	2.93 74.5	2.76 70	10.00 254	0.67 17	8	F25	0.79 20	0.47 12	3192 1448	46262	44873 5070
20 500	35.98 914	19.17 487	24.21 615	19.92 506	20.51 521	33.23 844	27.56 700	25.00 635.0	20	3.32 84.4	3.00 76.2	10.00 254	0.67 17	8	F25	0.75 19.05	0.75 19.05	4193 1902	58328	58645 6626
24 600	42.01 1067	23.19 589	28.46 723	23.23 590	23.23 590	39.29 998	32.09 815	29.50 749.3	20	4.31 109.4	4.00 101.6	11.73 298	0.83 21	8	F30	1.00 25.4	0.75 19.05	6609 2998	86853	88906 10045

Dimensions provided are for reference. Please contact factory for additional or more specific information

*Valve sizes without key dimensions shown in the table utilize a double "D" style stem. Please contact factory for detailed dimensions.

**Valve torques mentioned above do not contain a safety factor and are not applicable to PEEK seated valves. Please refer to Technical Bulletin 1005 for more detailed information.

CLASS 300 VALVE DIMENSIONS (in/mm)

Size NPS DN	Valve						Valve Flange			Top Works								Weight lb kg	Cv Full Open	Valve Torque Max** Lb-in Nm
	A	ØB	C	C1	C2	D	ØF	ØG	N No Of Holes	H With Key	J	BC	K	L No Of Holes	Mtg Code	X* Key	Y* Key			
2	8.50	1.93	7.05	5.08	5.04	6.50	6.50	5.00	8	0.87	1.18	4.02	0.43	4	F10	-	-	57	462	903
50	216	49	179	129	128	165	165	127		22	30	102	11			-	-	26		102
3	11.14	2.91	8.43	6.30	5.71	8.27	8.27	6.63	8	1.54	1.38	4.92	0.51	4	F12	0.39	0.39	104	1107	2177
80	283	74	214	160	145	210	210	168.3		39.2	35	125	13			10	10	47		246
4	12.01	3.94	8.98	7.09	6.10	10.04	10.04	7.87	8	1.54	1.38	4.92	0.51	4	F12	0.39	0.39	159	2091	3452
100	305	100	228	180	155	255	255	200		39.2	35	125	13			10	10	72		390
6	15.87	5.91	11.57	9.25	8.39	12.60	12.60	10.63	12	1.91	1.77	6.50	0.83	4	F16	0.55	0.35	359	4918	7638
150	403	150	294	235	213	320	320	269.9		48.5	45	165	21			14	9	163		863
8	19.76	7.91	13.66	10.63	10.28	15.63	14.96	13.00	12	2.13	1.97	6.50	0.83	4	F16	0.47	0.39	622	9105	12258
200	502	201	347	270	261	397	380	330.2		54.1	50	165	21			12	10	282		1385
10	22.36	9.92	15.28	12.17	12.99	18.90	17.52	15.25	16	2.44	2.28	6.50	0.83	4	F16	0.63	0.39	1008	14645	17533
250	568	252	388	309	330	480	445	387.4		62	58	165	21			16	10	457		1981
12	25.51	11.93	17.64	14.09	14.69	22.13	20.47	17.75	16	2.76	2.50	10.00	0.67	8	F25	0.63	0.63	1493	21566	23915
300	648	303	448	358	373	562	520	450.8		70.2	63.5	254	17			15.88	15.88	677		2702
14	30.00	13.15	18.31	14.84	15.63	24.06	23.03	20.25	20	2.93	2.76	10.00	0.67	8	F25	0.79	0.47	2081	26458	36200
350	762	334	465	377	397	611	585	514.4		74.5	70	254	17			20	12	944		4090
16	32.99	15.16	21.18	16.93	17.36	27.40	25.59	22.50	20	3.32	3.00	10.00	0.67	8	F25	0.75	0.75	2934	35644	54875
400	838	385	538	430	441	696	650	571.5		84.4	76.2	254	17			19.05	19.05	1331		6200
18	35.98	17.17	23.50	18.54	19.13	30.79	27.95	24.75	24	3.75	3.50	11.73	0.83	8	F30	0.88	0.63	3931	46262	74045
450	914	436	597	471	486	782	710	628.6		95.3	88.9	298	21			22.23	15.88	1783		8366
20	39.02	19.17	25.24	20.12	20.67	33.82	30.51	27.00	24	4.31	4.00	11.73	0.83	8	F30	1.00	0.75	4996	58328	100279
500	991	487	641	511	525	859	775	685.8		109.4	101.6	298	21			25.4	19.05	2266		11330
24	45.00	23.19	31.30	24.72	23.94	40.47	36.02	32.00	24	4.82	4.50	14.02	1.22	8	F35	1.00	0.75	8428	86853	141939
600	1143	589	795	628	608	1028	915	812.8		122.4	114.3	356	31			25.4	19.05	3823		16037

CLASS 600 VALVE DIMENSIONS (in/mm)

Size NPS DN	Valve						Valve Flange			Top Works								Weight lb kg	Cv Full Open	Valve Torque Max** Lb-in Nm
	A	ØB	C	C1	C2	D	ØF	ØG	N No Of Holes	H With Key	J	BC	K	L No Of Holes	Mtg Code	X* Key	Y* Key			
2	11.50	1.93	7.05	5.08	5.04	6.50	6.50	5.00	8	0.87	1.18	4.02	0.43	4	F10	-	-	64	462	1221
50	292	49	179	129	128	165	165	127		22	30	102	11			-	-	29		138
3	14.13	2.91	8.43	6.30	5.71	8.27	8.27	6.63	8	1.54	1.38	4.92	0.51	4	F12	0.39	0.39	123	1107	3054
80	359	74	214	160	145	210	210	168.3		39.2	35	125	13			10	10	56		345
4	17.01	3.94	9.02	7.09	6.50	10.83	10.83	8.50	8	1.54	1.38	4.92	0.51	4	F12	0.39	0.39	223	2091	4248
100	432	100	229	180	165	275	275	215.9		39.2	35	125	13			10	10	101		480
6	22.01	5.91	12.48	9.45	9.02	13.98	13.98	11.50	12	2.13	1.97	6.50	0.83	8	F16	0.47	0.39	569	4918	12099
150	559	150	317	240	229	355	355	292.1		54.1	50	165	21			12	10	258		1367
8	25.98	7.91	14.21	11.02	10.83	16.61	16.54	13.75	12	2.44	2.28	6.50	0.83	8	F16	0.63	0.39	933	9105	18551
200	660	201	361	280	275	422	420	349.2		62	58	165	21			16	10	423		2096
10	30.98	9.92	16.54	12.99	13.74	20.08	20.08	17.00	16	2.76	2.50	10.00	0.67	8	F25	0.63	0.63	1581	14645	27703
250	787	252	420	330	349	510	510	431.8		70.2	63.5	254	17			15.88	15.88	717		3130
12	32.99	11.93	17.83	14.37	15.00	23.15	22.05	19.25	20	2.93	2.76	10.00	0.67	4	F25	0.79	0.47	2172	21566	38032
300	838	303	453	365	381	588	560	489		74.5	70	254	17			20	12	985		4297
14	35.00	13.15	20.16	15.91	16.46	25.43	23.82	20.75	20	3.32	3.00	10.00	0.67	4	F25	0.75	0.75	2793	26458	57158
350	889	334	512	404	418	646	605	527		84.4	76.2	254	17			19.05	19.05	1267		6458
16	39.02	15.16	22.64	17.68	17.95	28.82	26.97	23.75	20	3.75	3.50	11.73	0.83	8	F30	0.88	0.63	3929	35644	87799
400	991	385	575	449	456	732	685	603.2		95.3	88.9	298	21			22.23	15.88	1782		9920
18	42.99	17.17	24.53	19.41	20.00	32.60	29.33	25.75	20	4.31	4.00	11.73	0.83	8	F30	1.00	0.75	5463	46262	120813
450	1092	436	623	493	508	828	745	654		109.4	101.6	298	21			25.4	19.05	2478		13650
20	47.01	19.17	28.78	22.20	21.18	35.63	32.09	28.50	24	4.82	4.50	14.02	1.22	8	F35	1.00	0.75	6850	58328	167456
500	1194	487	731	564	538	905	815	723.9		122.4	114.3	356	31			25.4	19.05	3107		18920
24	55.00	23.19	32.95	25.98	26.46	42.52	37.01	33.00	24	5.35	5.00	14.02	1.22	8	F35	1.13	0.88	11356	86853	224119
600	1397	589	837	660	672	1080	940	838.2		135.9	127	356	31			31.75	22.23	5151		25322

Dimensions provided are for reference. Please contact factory for additional or more specific information.
*Valve sizes without key dimensions shown in the table utilize a double "D" style stem. Please contact factory for detailed dimensions.
**Valve torques mentioned above do not contain a safety factor and are not applicable to PEEK seated valves. Please refer to Technical Bulletin 1005 for more detailed information.

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