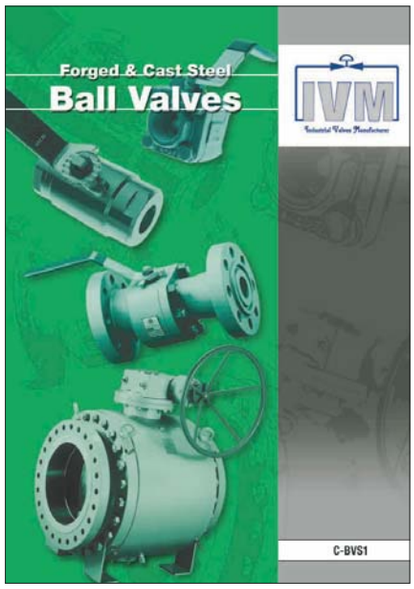
Forged & Cast Steel
Ball Valves

IVM
Industrial Valves Manufacturer

C-BVS1

PART OF WORLDWIDE NETWORK

INDUSTRIAL VALVE MANUFACTURER is a Saudi owned and operated company which machine, assemble and test valves in the second industrial city in Al-Dammam.
The company license the valves design and technology from OMB valves in Italy, with whom it has a strong industrial and commercial relationship since its founding: OMB valves group provide as well procuremenet and training supporting IVM to access the most reliable European suppliers of forgings and valve parts.



NEW CATALOG

This is the first version of our ball valves catalog following the introduction of the complete ball valves production range.

A licensed forged valve manufacturer in the Kingdom has acquired the speciality of one of the leading manufacturer of forged valves in the world. Industrial Valves Manufacturer has been manufacturing a growing range of forged steel gate, globe and check valves to API/ASME specifications. The parent company OMB s.p.a. based in Bergamo specialises in large scale manufacturing of valves for the petro - chemical industry ranking second in the world for output. The Saudi operation by contrast, is a skilled flexible team with a capability to manufacture up to five thousand valves per month and provide a customization and quick delivery service.

INDUSTRIAL VALVES MANUFACTURER (LICENSOR OF OMB VALVES PRODUCTS)

Industrial Valves Manufacturer is a part of a network of worldwide valve supply through OMB, an italian based group with 5 manufacturing plants, and its distribution partners. OMB manufactures valves in Italy, Singapore, UK and in Kingdom of Saudi Arabia, with a team of more than 200 engineers and valve specialists and 6 specialized plants. IVM products range starts from API602 gate, globe and check valves in any material, to cryogenic service, bellows sealed and specialized chemical service valves.
In kingdom of saudi arabia, IVM manufactures floating,trunnion and top entry ball valves up to 24'' A complete set of catalogues can be requested in any of IVM sites or at IVM Agents and Distributors located in Gulf countries and at over 10 locations.

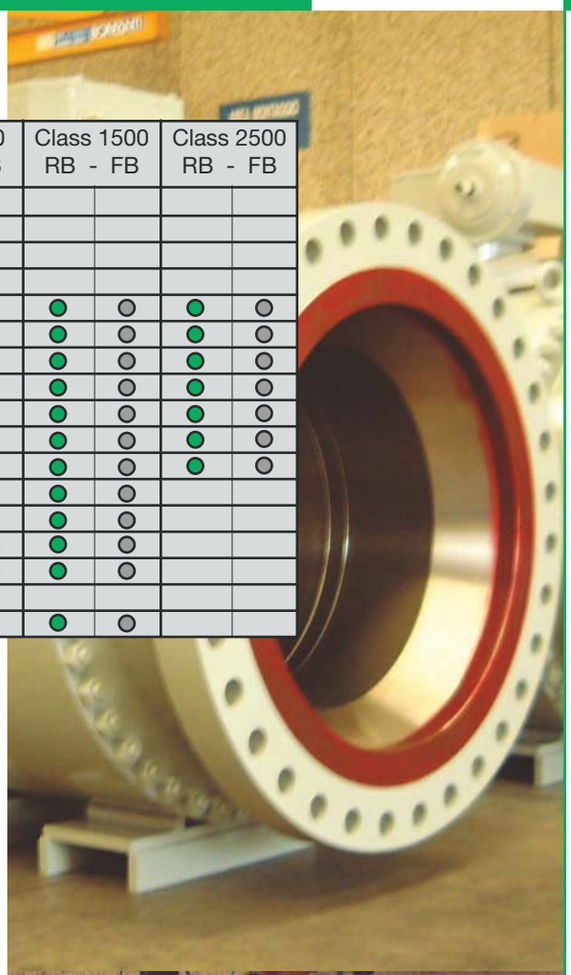
IVM
Industrial Valves Manufacturer

BSE

TRUNNION CONSTRUCTION

Class Diameter	Class 150 RB	Class 150 FB	Class 300 RB	Class 300 FB	Class 600 RB	Class 600 FB	Class 900 RB	Class 900 FB	Class 1500 RB	Class 1500 FB	Class 2500 RB	Class 2500 FB
1/2"												
3/4"												
1"												
1 1/2"												
2"	●	○	●	○	●	○	●	○	●	○	●	○
3"	●	○	●	○	●	○	●	○	●	○	●	○
4"	●	○	●	○	●	○	●	○	●	○	●	○
6"	●	○	●	○	●	○	●	○	●	○	●	○
8"	●	○	●	○	●	○	●	○	●	○	●	○
10"	●	○	●	○	●	○	●	○	●	○	●	○
12"	●	○	●	○	●	○	●	○	●	○	●	○
14"	●	○	●	○	●	○	●	○	●	○		
16"	●	○	●	○	●	○	●	○	●	○		
18"	●	○	●	○	●	○	●	○	●	○		
20"	●	○	●	○	●	○	●	○	●	○		
22"		○		○		○		○				
24"	●	○	●	○	●	○	●	○	●	○		

Other dimensions on request



APPLICABLE STANDARDS

BS 5351 - Steel Ball Valves

BS 6755 - Testing of Valves

API 6D LICENCE N° 6D-0286 - Specification for pipeline valves

API 6A LICENCE N° 6A-0778 - Specification wellhead valves

API Spec. Q1 - Quality

API 607 - Testesting of valves - fire type - testing

API 598 - Valve inspection and testing

ISO 9001 - Specification for Q.A.

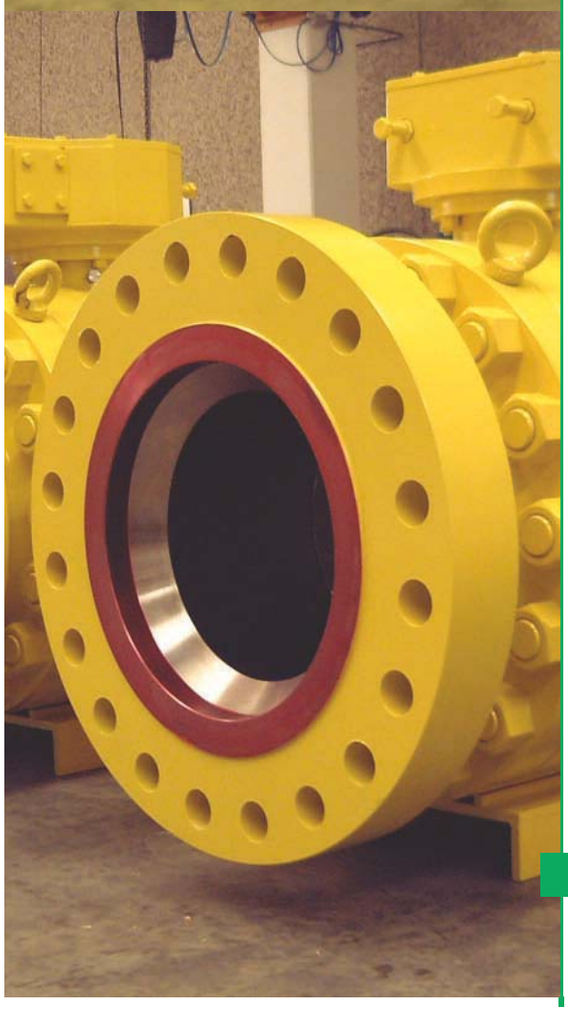
ASME/ANSI B16.10 - Face-to-face and End-to-end dimensions of valves

ASME/ANSI B16.5 - B16.47 - Pipe flanges and flanged fittings

ASME/ANSI B16.34 - Valves-flanged threaded and welded end

MSS SP-25 - Standard Marking system for valves

NACE std MRO175 - Sulfide stress cracking resistant metallic materials for oilfield equipment



SIDE ENTRY TYPE BALL VALVES

IVM trunnion mounted type ball valves are manufactured to API 6D specification and tested to API 598/API 607. The construction is side entry three piece body, full and reduced port. The valves are lever operated and where recommended or when required are gear operated or actuated. The following are some of the major design features:

Structure: Solid entirely forged construction.

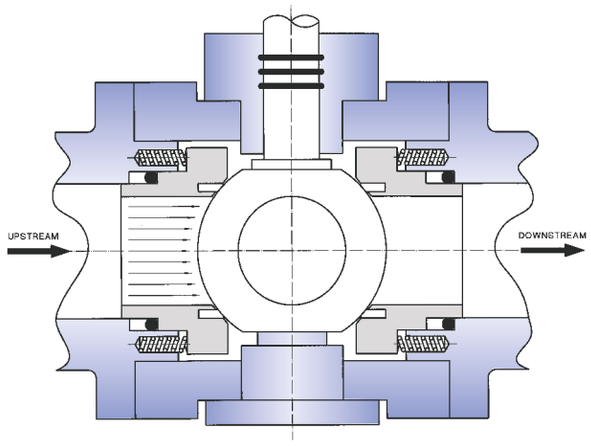
Fire-safe: All sizes and pressure classes have been succesfully fire-safe tested according to the relevant API and BS specifications.Test certificates are available on request.

Antistatic: Electrical continuity of all valve components, prevent static build-up.

Double Block & Bleed: The body cavity is isolated when the ball is in either fully closed or fully opened position, the medium entrapped can easily be bled to avoid overpressure.

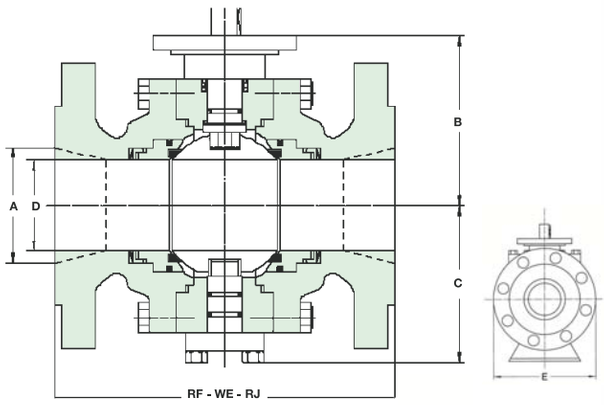
Seat Ring Sealing: as line pressure increases, our seat design enacts a piston effect forcing the resilient seat insert against the ball. In absence of the pressure or with low pressures, the seats are forced against the ball by the set of preloaded springs. (see sketch)

Pressure relieving: If excessive pressure builds up in the body cavity exceeding the safe working pressure, the seat automatically relieves.



Trunnion Construction

IVM reserves the right to make modifications or changes to its production without prior notice.



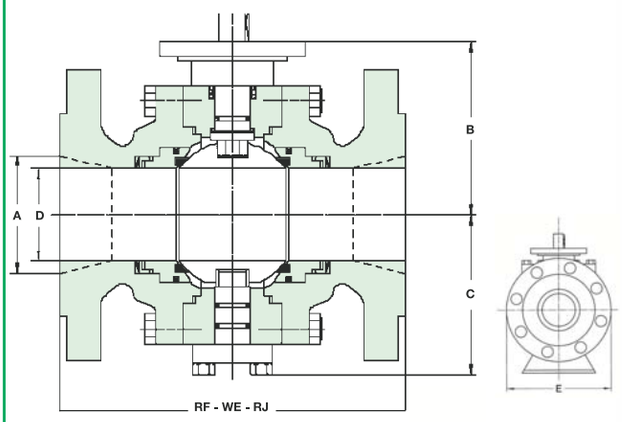
ASME CLASS 150 FULL BORE

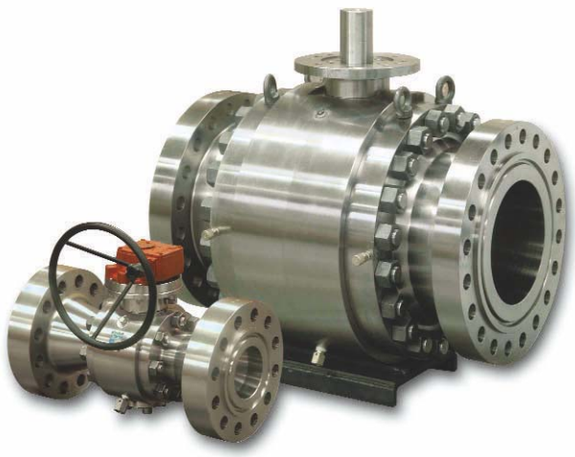
SIZE IN/MM	SIDE ENTRY						
	D	RF	WE	E	B	C	WEIGHT LBS/KG
2	2.00	7.00	8.50	5.90	5.51	3.54	44
50	51	178	216	150	140	90	20
3	3.00	8.00	11.13	7.48	7.48	4.13	91
80	76	203	283	190	190	105	41
4	4.00	9.00	12.00	9.00	9.72	5.55	144
100	102	229	305	230	247	141	65
6	6.00	15.50	18.00	12.20	11.61	6.88	338
150	152	394	457	310	295	175	152
8	8.00	18.00	20.50	15.35	12.99	8.26	489
200	203	457	521	390	330	210	220
10	10.00	21.00	22.00	18.11	15.74	9.84	922
250	254	533	559	460	400	250	415
12	12.00	24.00	25.00	21.45	18.11	12.20	1289
300	305	610	635	545	460	310	580
14	14.00	27.00	30.00	24.00	18.89	13.38	1802
350	356	686	762	610	480	340	811
16	16.00	30.00	33.00	26.37	21.25	15.15	2644
400	406	762	838	670	540	385	1150
18	18.00	34.00	36.00	24.80	22.83	16.85	2888
450	457	864	914	630	580	428	1300
20	20.00	36.00	39.00	33.43	23.00	21.45	4000
500	508	914	991	849	584	545	1800
22	22.00	40.00	43.00	36.81	24.00	23.00	5333
550	559	991	1092	935	610	584	2400
24	24.00	42.00	45.00	39.57	24.10	25.87	6888
600	610	1067	1143	1005	612	655	3100

ASME CLASS 150 REDUCED BORE

SIZE IN/MM	SIDE ENTRY							
	A	D	RF	WE	E	B	C	WEIGHT LBS/KG
2 x 1½	2.00	1.50	7.00	8.50	5.90	4.00	3.00	33
50 x 40	51	38	178	216	150	101	76	15
3 x 2	3.00	2.00	11.13	3.03	7.48	5.51	3.54	66
80 x 50	76	51	203	283	190	140	90	30
4 x 3	4.00	3.00	12.00	4.02	9.00	7.48	4.13	133
100 x 80	102	76	229	305	230	190	105	60
6 x 4	6.00	4.00	15.50	18.00	12.20	11.02	6.53	262
150 x 100	152	102	394	457	310	280	166	118
8 x 6	8.00	6.00	18.00	20.50	15.35	11.61	6.88	366
200 x 150	203	152	457	521	395	295	175	165
10 x 8	10.00	8.00	21.00	22.00	15.98	12.99	8.26	588
250 x 200	254	203	533	559	406	330	210	265
12 x 10	12.00	10.00	24.00	25.00	19.02	15.74	9.84	1000
300 x 250	305	254	610	635	483	400	250	450
14 x 10	14.00	10.00	27.00	30.00	21.06	18.11	12.30	1155
350 x 250	356	254	686	762	535	460	310	520
14 x 12	14.00	12.00	27.00	30.00	21.06	18.11	12.20	1577
350 x 300	356	305	686	762	535	460	310	710
16 x 12	16.00	12.00	30.00	33.00	23.43	18.89	13.38	1755
400 x 300	406	305	762	838	595	480	340	790
16 x 14	16.00	14.00	30.00	33.00	23.43	18.89	13.38	2000
400 x 350	406	356	762	838	595	480	340	900
18 x 16	18.00	16.00	34.00	36.00	24.80	21.25	15.15	2777
450 x 400	457	406	864	914	630	540	385	1250
20 x 16	20.00	16.00	36.00	39.00	27.56	22.83	16.85	1555
500 x 400	508	406	914	991	700	580	428	1150

BSE - DIMENSIONS & WEIGHTS CL 300





ASME CLASS 300 FULL BORE

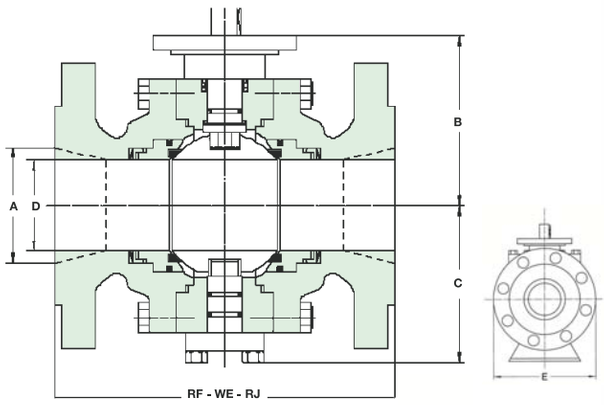
SIZE IN/MM	SIDE ENTRY						
	D	RF	WE	E	B	C	WEIGHT LBS/KG
2	2.00	8.50	8.50	6.50	7.87	4.72	91
50	51	216	216	165	200	120	41
3	3.00	11.10	11.10	8.50	9.44	5.11	133
80	76	283	283	218	240	130	60
4	4.00	12.00	12.00	10.00	9.72	5.55	222
100	102	305	305	254	247	141	100
6	6.00	15.90	18.00	12.20	11.61	6.88	395
150	152	403	457	310	295	175	178
8	8.00	19.80	20.50	15.40	12.99	8.26	422
200	203	502	521	390	330	210	190
10	10.00	22.40	22.00	18.50	16.53	10.62	1066
250	254	568	559	470	420	270	480
12	12.00	25.50	25.00	21.30	18.30	12.79	1444
300	305	648	635	545	465	325	650
14	14.00	30.00	30.00	24.80	21.45	16.92	1777
350	356	762	762	630	545	430	800
16	16.00	33.00	33.00	27.20	23.62	18.50	2977
400	406	838	838	690	600	470	1340
18	18.00	36.00	36.00	30.30	23.10	20.07	3511
450	457	914	914	770	586	510	1580
20	20.00	39.00	39.00	33.50	23.90	19.68	6000
500	508	991	991	850	607	500	2200
22	22.00	43.00	43.00	37.00	24.10	21.00	6222
550	559	1092	1092	940	612	533	2800
24	24.00	45.00	45.00	39.70	24.50	23.62	8000
600	610	1143	1143	1010	622	600	3600

•) Other dimension on request.

ASME CLASS 300 REDUCED BORE

SIZE IN/MM	SIDE ENTRY							
	A	D	RF	WE	E	B	C	WEIGHT LBS/KG
2 x 1½	2.00	1.50	8.50	8.50	6.50	6.88	3.14	44
50 x 40	51	38	216	216	165	175	80	20
3 x 2	3.00	2.00	11.10	11.10	8.50	7.87	4.72	122
80 x 50	76	51	283	283	218	200	120	55
4 x 3	4.00	3.00	12.00	12.00	10.00	9.44	5.11	153
100 x 80	102	76	305	305	254	240	130	69
6 x 4	6.00	4.00	15.90	18.00	12.20	11.02	5.90	260
150 x 100	152	102	403	457	310	280	150	117
8 x 6	8.00	6.00	19.80	20.50	15.40	11.61	6.88	433
200 x 150	203	152	502	521	390	295	175	195
10 x 8	10.00	8.00	22.40	22.00	17.50	12.99	8.26	722
250 x 200	254	203	568	559	445	330	210	325
12 x 10	12.00	10.00	25.50	25.00	20.50	16.53	10.62	1222
300 x 250	305	254	648	635	520	420	270	550
14 x 10	14.00	10.00	30.00	30.00	23.00	18.30	12.79	1444
350 x 250	356	254	762	762	585	465	325	650
14 x 12	14.00	12.00	30.00	30.00	23.00	18.30	12.79	1555
350 x 250	356	305	762	762	585	465	325	700
16 x 12	16.00	12.00	33.00	33.00	25.60	21.45	16.92	2177
400 x 300	406	305	838	838	650	545	430	980
16 x 14	16.00	14.00	33.00	33.00	25.60	21.45	16.92	2644
400 x 350	406	356	838	838	650	545	430	1190
18 x 16	18.00	16.00	36.00	36.00	28.00	23.62	18.50	3338
450 x 400	457	406	914	914	710	600	470	1500
20 x 16	20.00	16.00	39.00	39.00	30.70	24.40	20.07	3777
500 x 400	508	406	991	991	780	620	510	1700

•) Other dimension on request.



ASME CLASS 600 FULL BORE

SIZE IN/MM	SIDE ENTRY							
	D	RF	RJ	WE	E	B	C	WEIGHT LBS/KG
2	2.00	11.50	11.63	11.50	6.50	7.67	4.33	108
50	51	292	295	292	165	195	110	49
3	3.00	14.00	14.13	14.00	8.50	9.44	4.33	166
80	76	356	359	356	218	240	110	75
4	4.00	17.00	17.13	17.00	10.70	11.02	6.88	371
100	102	432	435	432	273	280	175	147
6	6.00	22.00	22.13	22.00	14.10	12.00	7.67	557
150	152	559	562	559	360	305	195	253
8	8.00	26.00	26.13	26.00	16.50	15.74	11.02	1111
200	203	660	664	660	419	400	280	500
10	10.00	31.00	31.13	31.00	20.40	17.12	11.22	1733
250	254	787	791	787	520	435	285	760
12	12.00	33.00	33.13	33.00	22.60	17.32	12.59	2444
300	305	838	841	838	575	440	320	1100
14	14.00	35.00	35.13	35.00	24.70	19.88	13.38	2844
350	356	889	892	889	628	505	340	1280
16	16.00	39.00	39.13	39.00	27.60	23.22	16.14	4222
400	406	991	994	991	700	590	410	1900
18	18.00	43.00	43.13	43.00	30.50	23.55	17.51	6088
450	457	1092	1095	1092	775	589	445	2740
20	20.00	47.00	47.25	47.00	34.10	23.80	20.07	7777
500	508	1194	1200	1194	865	604	510	3500
22	22.00	51.00	51.38	51.00	37.40	24.00	20.35	8331
550	559	1296	1305	1296	950	609	571	3787
24	24.00	55.00	55.38	55.00	40.50	24.50	25.19	10666
600	610	1397	1406	1397	1028	622	640	4810

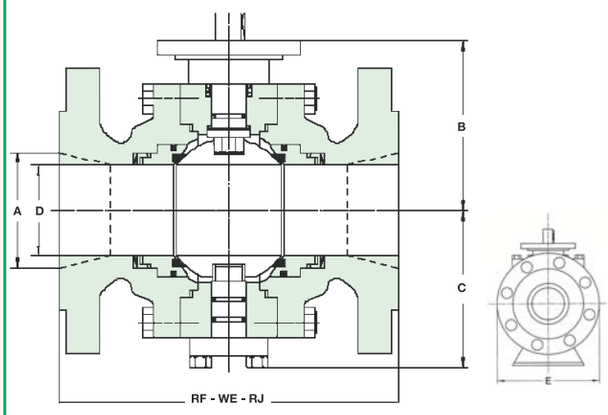
•) Other dimension on request.

ASME CLASS 600 REDUCED BORE

SIZE IN/MM	SIDE ENTRY								
	A	D	RF	RJ	WE	E	B	C	WEIGHT LBS/KG
2 x 1½	2.00	1.50	11.50	11.63	11.50	6.50	7.48	3.54	93
50 x 40	51	38	292	295	292	165	190	90	42
3 x 2	3.00	2.00	14.09	14.13	14.00	8.30	14.01	4.33	120
80 x 50	76	51	356	359	356	210	356	110	54
4 x 3	4.00	3.00	17.00	17.13	17.00	14.70	9.44	4.33	211
100 x 80	102	76	432	436	432	373	240	110	95
6 x 4	6.00	4.00	22.00	22.13	22.00	14.00	11.02	6.88	422
150 x 100	152	102	559	562	559	356	280	175	190
8 x 6	8.00	6.00	26.00	26.13	26.00	16.50	12.00	7.67	444
200 x 150	203	152	660	664	660	419	305	195	290
10 x 8	10.00	8.00	31.00	31.13	31.00	20.10	15.74	11.02	1333
250 x 200	254	203	787	791	787	510	400	280	600
12 x 10	12.00	10.00	33.00	33.13	33.00	22.00	17.12	11.22	1866
300 x 250	305	254	838	841	838	560	435	285	840
14 x 10	14.00	10.00	35.00	35.13	35.00	23.80	17.32	12.59	2006
350 x 250	356	254	889	892	889	605	440	320	912
14 x 12	14.00	12.00	35.00	35.13	35.00	23.80	17.32	12.59	2755
350 x 300	356	305	889	892	889	605	440	320	1240
16 x 12	16.00	12.00	39.00	39.13	39.00	27.00	19.88	13.38	2966
400 x 300	406	305	991	994	991	685	505	340	1348
16 x 14	16.00	14.00	35.00	39.13	35.00	24.70	19.88	13.38	3355
400 x 350	406	356	889	994	889	628	505	340	1510
18 x 16	18.00	16.00	43.00	43.13	43.00	29.30	23.22	16.10	3696
450 x 400	457	406	1092	1095	1092	745	590	410	1680
20 x 16	20.00	16.00	47.00	47.25	47.00	32.10	23.80	17.51	4587
500 x 400	508	406	1194	1200	1194	815	604	445	2085

•) Other dimension on request.

BSE - DIMENSIONS & WEIGHTS CL 900



ASME CLASS 900 FULL BORE

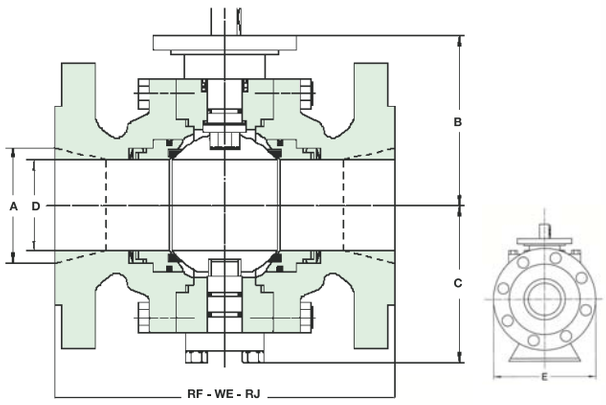
SIZE IN/MM	SIDE ENTRY							
	D	RF	RJ	WE	E	B	C	WEIGHT LBS/KG
2	2.00	14.49	14.61	14.49	8.50	7.87	4.72	106
50	51	368	371	368	220	200	120	48
3	3.00	15.00	15.12	15.00	9.49	9.44	5.11	121
80	76	381	384	381	241	240	130	87
4	4.00	17.99	18.11	17.99	11.50	11.02	6.88	319
100	102	457	460	457	290	280	175	145
6	6.00	24.02	24.13	24.02	15.00	13.77	8.66	792
150	152	610	613	610	381	350	220	360
8	8.00	29.02	29.13	29.02	18.50	15.35	10.23	1276
200	203	737	740	737	470	390	260	528
10	10.00	32.99	33.11	32.99	21.46	18.89	14.20	2222
250	254	838	841	838	545	480	310	1730
12	12.00	37.99	38.11	37.99	24.02	17.24	16.14	3322
300	305	965	968	965	610	438	410	1340
14	14.00	40.51	40.87	40.51	25.50	21.45	14.56	3190
350	356	1029	1038	1029	650	545	370	1450
16	16.00	44.49	44.88	44.49	27.95	24.59	16.53	4730
400	406	1130	1140	1130	710	624	420	2540
18	18.00	47.99	48.50	47.99	31.50	24.80	24.29	6204
450	457	1219	1232	1219	800	630	617	2820
20	20.00	52.01	52.48	52.01	35.04	25.00	28.54	9240
500	508	1321	1333	1321	890	635	725	4770
24	24.00	60.98	61.73	60.98	41.69	26.00	32.71	14960
600	610	1549	1568	1549	1059	660	831	7310

•) Other dimension on request.

ASME CLASS 900 REDUCED BORE

SIZE IN/MM	SIDE ENTRY								
	A	D	RF	RJ	WE	E	B	C	WEIGHT LBS/KG
2 x 1½	2.00	1.50	14.49	14.61	14.49	8.60	6.10	4.25	90
50 x 40	51	38	368	371	368	220	155	108	48
3 x 2	3.00	2.00	15.00	15.12	15.00	9.49	7.87	4.72	114
80 x 50	76	51	381	384	381	241	200	120	75
4 x 3	4.00	3.00	17.99	18.11	17.99	11.50	9.44	5.11	209
100 x 80	102	76	457	460	457	290	240	130	106
6 x 4	6.00	4.00	24.02	24.13	24.02	14.90	11.02	6.88	451
150 x 100	152	102	610	613	610	380	280	175	205
8 x 6	8.00	6.00	29.02	29.13	29.02	18.50	13.77	8.66	968
200 x 150	203	152	737	740	737	470	350	220	440
10 x 8	10.00	8.00	32.99	33.11	32.99	21.46	15.35	10.23	1518
250 x 200	254	203	838	841	838	545	390	260	690
12 x 10	12.00	10.00	37.99	38.11	37.99	24.02	18.89	12.20	2541
300 x 250	305	254	965	968	965	610	480	310	1155
14 x 10	14.00	10.00	40.51	40.87	40.51	25.50	17.24	16.14	2728
350 x 250	356	254	1029	1038	1029	650	438	410	1240
14 x 12	14.00	12.00	40.51	40.87	40.51	27.90	17.24	16.14	3597
350 x 300	356	305	1029	1038	1029	710	438	410	1670
16 x 12	16.00	12.00	44.49	44.88	44.49	29.50	21.45	14.56	3800
400 x 300	406	305	1130	1140	1130	750	545	370	1730
16 x 14	16.00	14.00	44.49	44.88	44.49	31.10	21.45	14.56	3740
400 x 350	406	356	1130	1140	1130	790	545	370	1820
18 x 16	18.00	16.00	47.99	48.50	47.99	31.50	24.59	16.53	5368
450 x 400	457	406	1219	1232	1219	800	624	420	2500

•) Other dimension on request.



ASME CLASS 1500 FULL BORE

SIZE IN/MM	SIDE ENTRY							
	D	RF	RJ	WE	E	B	C	WEIGHT LBS/KG
2	2.00	a14.49	14.61	14.49	8.60	8.07	4.72	110
50	51	368	371	368	220	205	120	71
3	3.00	18.50	18.62	18.50	10.51	8.26	4.92	213
80	76	473	473	470	267	210	125	97
4	4.00	21.50	21.61	21.50	12.20	9.64	6.29	436
100	102	546	549	546	310	245	160	198
6	6.00	27.76	27.99	27.76	15.51	13.18	10.03	1056
150	152	705	711	705	394	335	255	500
8	8.00	32.76	33.11	32.76	19.09	17.20	13.38	1804
200	203	832	841	832	485	437	340	850
10	10.00	39.02	39.37	39.02	23.03	19.76	15.00	3300
250	254	991	1000	991	585	502	381	1600
12	12.00	44.49	44.61	44.49	27.95	20.98	17.24	4950
300	305	1130	1133	1130	710	533	438	2250
14	14.00	49.49	50.24	49.49	30.12	24.64	19.60	6270
350	356	1257	1276	1257	765	626	498	2900
16	16.00	54.49	55.35	54.49	33.39	28.54	18.11	8954
400	406	1384	1406	1384	848	725	460	4200
18	18.00	60.51	61.38	60.51	38.58	29.00	23.90	1369
450	457	1537	1559	1537	980	736	607	6400
20	20.00	65.51	66.38	66.51	39.96	30.00	25.40	19965
500	508	1664	1686	1664	1015	762	644	10100
24	24.00	80.43	81,54	80.43	50.91	32.00	28.50	31416
600	610	2043	2071	2043	1295	813	725	15050

•) Other dimension on request.

- Flanges in accordance with ASME B16.5
- Shaded bore sizes (D) according to API 6D
- Butt welding ends according to ASME B16.25
- Shaded end-to-end dimensions according to API 6D

ASME CLASS 1500 REDUCED BORE

SIZE IN/MM	SIDE ENTRY								
	D	RF	RJ	WE	E	B	C		WEIGHT LBS/KG
2 x 1½	2.00	1.50	14.49	14.61	14.49	8.66	7.48	4.33	90
50 x 40	51	38	368	371	368	220	190	110	48
3 x 2	3.00	2.00	18.50	18.62	18.50	10.51	8.07	4.72	150
80 x 50	76	51	470	473	470	2.67	205	120	68
4 x 3	4.00	3.00	21.50	21.61	21.50	12.20	8.26	4.92	268
100 x 80	102	76	546	549	546	310	210	125	122
6 x 4	6.00	4.00	27.76	27.99	27.76	15.51	9.64	6.29	627
150 x 100	152	102	705	711	705	394	245	160	285
8 x 6	8.00	6.00	32.76	33.11	32.76	19.09	13.18	10.03	1245
200 x 150	203	152	832	841	832	485	335	255	590
10 x 8	10.00	8.00	39.02	39.37	39.02	23.03	16.14	11.41	2248
250 x 200	254	203	991	1000	991	585	410	290	1200
12 x 10	12.00	10.00	44.49	45.12	44.49	26.57	18.30	13.18	3872
300 x 250	305	254	1130	1146	1130	675	465	335	1800
14 x 10	14.00	10.00	49.49	50.24	49.49	27.95	21.77	17.24	4719
350 x 250	356	254	1257	1276	1257	710	553	439	2200
14 x 12	14.00	12.00	49.49	50.24	49.49	29.92	21.77	17.24	5500
350 x 300	356	305	1257	1276	1257	760	553	438	2500
16 x 12	16.00	12.00	54.59	55.35	54.49	32.48	24.64	19.60	6160
400 x 300	406	305	1384	1406	1384	825	626	498	2800
16 x 14	16.00	14.00	54.49	55.35	54.49	32.48	24.64	19.60	7139
400 x 350	406	356	1384	1406	1384	825	626	498	3250
18 x 16	18.00	16.00	60.51	61.38	60.51	36.22	25.00	20.00	10934
450 x 400	457	406	1537	1559	1537	920	630	508	5100
20 x 16	20.00	16.00	65.51	66.38	65.51	38.97	26.00	20.00	11297
500 x 400	508	406	1664	1686	1664	990	660	508	5300
20 x 18	20.00	18.00	65.52	66.38	65.51	38.97	28.00	23.00	16500
500 x 450	508	457	1664	1686	1664	990	711	542	7560
24 x 20	24.00	20.00	80.43	81.54	80.43	46.06	30.00	25.00	23925
600 x 500	610	508	2043	2071	2043	1170	762	635	11100

•) Other dimension on request.

ASME CLASS 2500 FULL BORE

SIZE IN/MM	SIDE ENTRY							
	D	RF	RJ	WE	E	B	C	WEIGHT LBS/KG
2	2.00	17.76	17.87	17.76	9.05	8.46	5.11	(1)
50	51	451	454	451	230	215	130	
3	3.00	22.76	22.99	22.76	11.08	8.66	5.31	(1)
80	76	578	584	578	300	220	135	
4	4.00	26.50	26.89	26.50	14.02	10.03	6.96	(1)
100	102	673	683	673	356	255	170	
6	6.00	35.98	36.50	35.98	19.09	16.92	10.43	(1)
150	152	914	927	914	485	430	265	
8	8.00	40.24	40.87	40.24	24.41	16.92	13.30	(1)
200	203	1022	1038	1022	620	430	340	
10	10.00	50.00	50.87	50.00	29.33	17.50	16.60	(1)
250	254	1270	1292	1270	745	444	421	
12	12.00	55.98	56.89	55.98	34.44	18.00	18.90	(1)
300	305	1422	1445	1422	875	457	480	

•) Other dimension on request.

ASME CLASS 2500 REDUCED BORE

SIZE IN/MM	SIDE ENTRY								
	D	RF	RJ	WE	E	B	C		WEIGHT LBS/KG
2 x 1½	2.00	1.50	17.76	17.87	17.76	9.25	7.78	4.72	(1)
50 x 40	51	38	451	454	451	230	200	120	
3 x 2	3.00	2.00	22.76	22.99	22.76	11.01	8.46	5.11	(1)
80 x 50	76	51	578	584	578	300	215	130	
4 x 3	4.00	3.00	26.50	26.89	26.50	14.02	8.66	5.31	(1)
100 x 80	102	76	673	683	673	356	220	135	
6 x 4	6.00	4.00	35.98	36.50	35.98	19.09	10.03	6.96	(1)
150 x 100	152	102	914	927	914	485	255	170	
8 x 6	8.00	6.00	40.24	40.87	40.24	22.05	12.00	9.00	(1)
200 x 150	203	152	1022	1038	1022	560	348	228	
10 x 8	10.00	8.00	50.00	50.87	50.00	26.57	14.00	13.00	(1)
250 x 200	254	203	1270	1292	1270	670	355	330	
12 x 10	12.00	10.00	55.98	56.89	55.98	30.70	16.00	18.00	(1)
300 x 250	305	254	1422	1445	1422	780	406	475	

•) Other dimension on request.

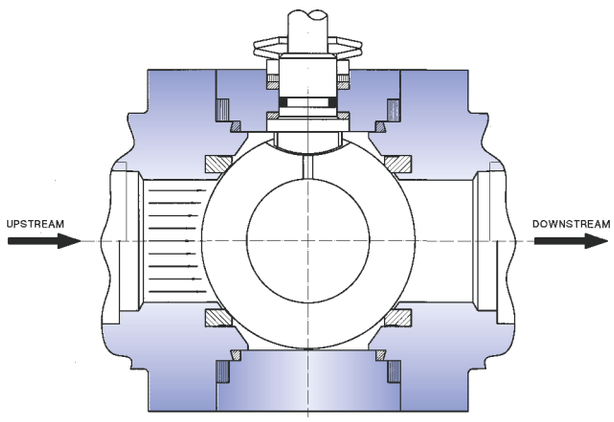
IVM reserves the right to make modifications or changes to its production without prior notice.

IVM
Industrial Valves Manufacturer

FLOATING

TRUNNION CONSTRUCTION

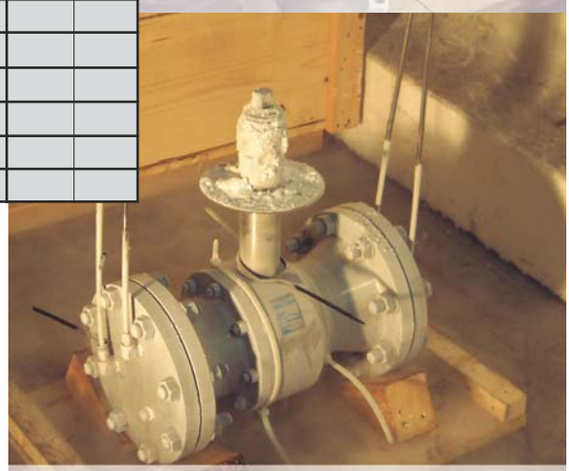
Class Diameter	Class 150 RB	Class 150 FB	Class 300 RB	Class 300 FB	Class 600 RB	Class 600 FB	Class 1500 RB	Class 1500 FB	Class 2500 RB	Class 2500 FB
1/2"	●	○	●	○	●	○	●	○	●	○
3/4"	●	○	●	○	●	○	●	○	●	○
1"	●	○	●	○	●	○	●	○	●	
1 1/2"	●	○	●	○	●	○	●			
2"	●	○	●	○	●	○				
3"	●	○	●	○	●	○				
4"	●	○	●	○	●	○				
6"	●	○	●	○	●	○				
8"	●		●		●					
10"										
12"										



Floating Construction

IVM reserves the right to make modifications or changes to its production without prior notice

METAL TO METAL

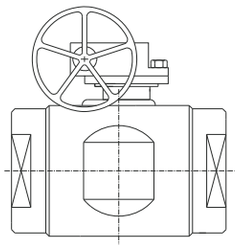


CRYOGENIC

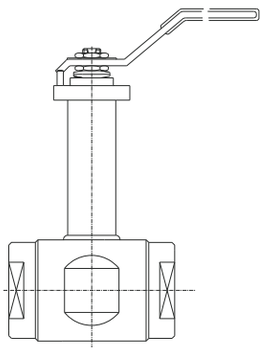
JACKETED

ACTUATED

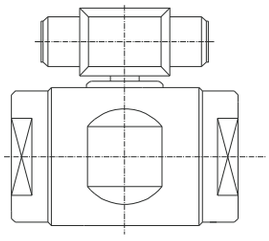
SPECIAL PATTERN



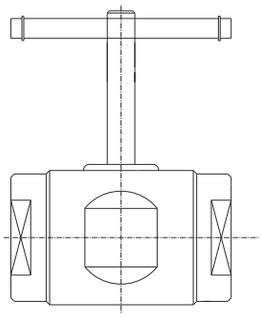
Gear Operator



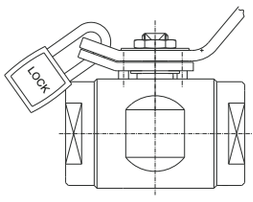
Criogenic Service



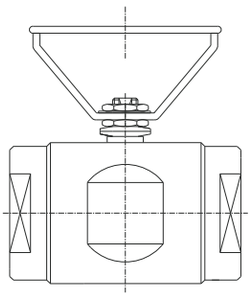
Pneumatic Operator



“T” Handle

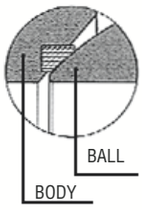


Locking Device

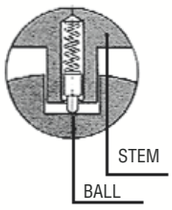


Oval Handle

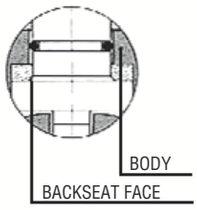
FIRE SAFE FEATURE
incapsulated Seat



ANTISTATIC FEATURE

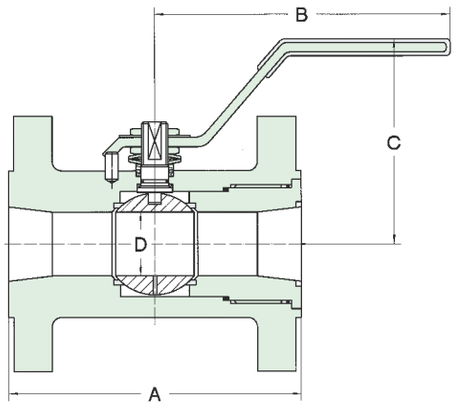


ANTIBLOWOUT STEM



Valve construction according to BS 5351

Certified Fire Safe to BS 6755 - API 607



CLASS 150

REGULAR BORE END ENTRY ONE PIECE BALL VALVES BODY
Integral Flanged - End to end according to ANSI 16.10

REGULAR BORE	F1-E-800	1/2" x 3/8"		3/4" x 1/2"		1" x 3/4"		1.1/2" x 1.1/4"		2" x 1.1/2"	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	**A**	108	4.25	118	4.62	127	5.00	165	6.50	178	7.00
Lever	**B**	155	6.10	155	6.10	170	6.69	230	905	230	9.05
Center to Top	**C**	74	2.91	76	2.99	98	3.85	119	4.68	130	5.11
Ball Bore	**D**	11.1	0.43	14.2	0.55	20.5	0.80	31.7	1.24	38	1.49
Approx. Weight	**Kg/Lb**	1.5	3.3	2.4	5.2	3.5	7.7	6.5	14.3	8.3	16.2

CLASS 300

REGULAR BORE END ENTRY ONE PIECE BALL VALVES BODY
Integral Flanged - End to end according to ANSI 16.10

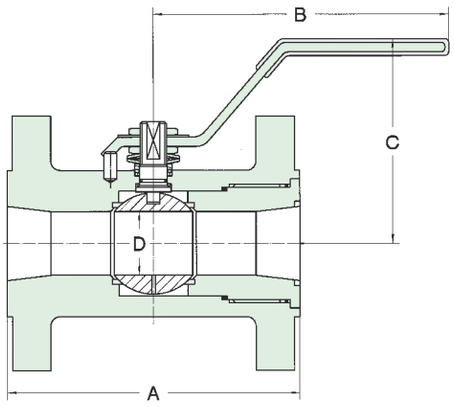
REGULAR BORE	F3-E-800	1/2" x 3/8"		3/4" x 1/2"		1" x 3/4"		1.1/2" x 1.1/4"		2" x 1.1/2"	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	**A**	140	5.5	153	6.0	165	6.5	191	7.5	216	8.5
Lever	**B**	155	6.1	155	6.1	170	6.69	230	9.05	230	9.05
Center to Top	**C**	74	2.91	76	2.99	98	3.85	119	4.68	130	5.11
Ball Bore	**D**	11.1	0.43	14.2	0.55	20.5	0.80	31.7	1.24	38	1.49
Approx. Weight	**Kg/Lb**	2.5	5.5	3.1	6.8	4.0	8.8	8.1	17.8	10.2	22.4

CLASS 600

REGULAR BORE END ENTRY ONE PIECE BALL VALVES BODY
Integral Flanged - End to end according to ANSI 16.10

REGULAR BORE	F6-E-800	1/2" x 3/8"		3/4" x 1/2"		1" x 3/4"		1.1/2" x 1.1/4"		2" x 1.1/2"	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	165	6.5	191	7.5	216	8.5	241	9.5	292	11.5
Lever	**B**	155	6.1	155	6.1	170	6.69	230	9.05	230	9.05
Center to Top	**C**	74	2.91	76	2.99	98	3.85	119	4.68	130	5.11
Ball Bore	**D**	11.1	0.43	14.2	0.55	20.5	0.80	31.7	1.24	38	1.49
Approx. Weight	**Kg/Lb**	2.9	6.3	3.8	8.3	5.3	11.6	10.6	23.3	13	28.6

ONE PIECE BODY - FLOATING REDUCED BORE



CLASS 150

REGULAR BORE SIDE ENTRY TWO PIECE BALL VALVES BODY
Integral Flanged - End to end according to ANSI 16.10

REGULAR BORE	F1-C-800	2" x 1.1/2"		4" x 3"		6" x 4"		8" x 6"	
		mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	178	7.00	229	9.0	394	10.53	457	11.50
Lever	B	310	12.20	450	17.71	465	18.30	*	*
Center to Top	C	155	6.10	184	7.24	223	8.78	247	9.72
Ball Bore	D	38	1.49	76	2.99	127	5.00	152	5.98
Approx. Weight	Kg/Lb	-	-	27.1	59.6	47.2	103.9	77.5	170.7

* Gear operator suggested

CLASS 300

REGULAR BORE END ENTRY TWO PIECE BALL VALVES BODY
Integral Flanged - End to end according to ANSI 16.10

REGULAR BORE	F3-C-800	2" x 1.1/2"		4" x 3"		6" x 4"		8" x 6"	
		mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	216	8.50	305	12.00	403	15.88	419	16.50
Lever	B	310	12.20	450	17.71	465	18.30	*	*
Center to Top	C	155	6.10	184	7.24	223	8.78	247	9.72
Ball Bore	D	38	1.49	76	2.99	127	5.00	152	5.98
Approx. Weight	Kg/Lb	-	-	41.5	91.4	77.9	171.5	125	275.3

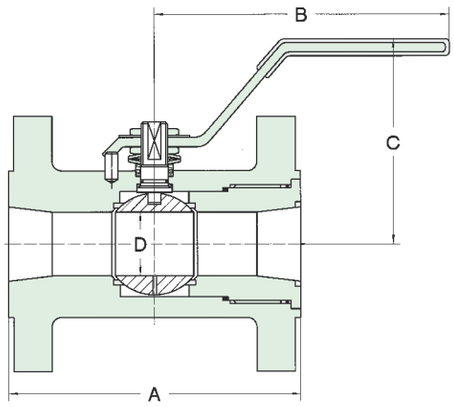
* Gear operator suggested

CLASS 600

REGULAR BORE END ENTRY TWO PIECE BALL VALVES BODY
Integral Flanged - End to end according to ANSI 16.10

REGULAR BORE	F6-C-800	2" x 1.1/2"		4" x 3"		6" x 4"		8" x 6"	
		mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	292	11.50	432	17.00	559	22.00	660	26.00
Lever	B	310	12.20	450	17.71	685	26.96	*	*
Center to Top	C	155	6.10	200	7.87	245	9.64	405	15.94
Ball Bore	D	38	1.49	76	2.99	127	5.00	152	5.98
Approx. Weight	Kg/Lb	-	-	55.3	121.8	102.0	224.6	184.6	406.6

* Gear operator suggested



CLASS 150

FULL BORE SIDE ENTRY TWO PIECE BALL VALVES BODY
Integral Flanged - End to end according to ANSI 16.10

FULL BORE	F1-C-600	1/2"		3/4"		1"		1.1/2"		2"		3"		4"		6"	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	108	4.25	118	4.63	127	5.00	165	6.50	178	7.00	203	8.00	229	9.00	394	15.50
Lever	B	155	6.10	170	6.69	170	6.69	230	9.05	310	12.20	450	17.71	465	18.30	*	*
Center to Top	C	76	2.99	98	3.85	100	3.93	130	5.11	155	6.10	184	7.24	215	8.46	279	10.98
Ball Bore	D	14.2	0.55	20.5	0.80	25.4	100	38	1.49	51	2.00	76	2.99	102	4.01	152	5.98
Approx. Weight	Kg/Lb	2.1	4.6	3.7	8.1	4.7	10.3	9.1	20.0	12.0	26.4	22.0	48.5	38.2	84.1	93.0	204.8

* Gear operator suggested

CLASS 300

FULL BORE SIDE ENTRY TWO PIECE BALL VALVES BODY
Integral Flanged - End to end according to ANSI 16.10

FULL BORE	F1-C-600	1/2"		3/4"		1"		1.1/2"		2"		3"		4"		6"	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	140	5.50	153	6.00	165	6.50	191	7.50	216	8.50	283	11.13	305	12.00	-	-
Lever	B	155	6.10	170	6.69	170	6.69	230	9.05	310	12.20	450	17.71	*	*	-	-
Center to Top	C	76	2.99	98	3.85	100	3.93	130	5.11	155	6.10	184	7.24	215	8.46	-	-
Ball Bore	D	14.2	0.55	20.5	0.80	25.4	100	38	1.49	51	2.00	76	2.99	102	4.01	-	-
Approx. Weight	Kg/Lb	3.1	6.8	4.4	9.6	5.2	11.4	10.7	23.5	13.9	30.6	29.5	64.9	50.3	110.8	-	-

* Gear operator suggested

CLASS 600

FULL BORE SIDE ENTRY TWO PIECE BALL VALVES BODY
Integral Flanged - End to end according to ANSI 16.10

FULL BORE	F1-C-600	1/2"		3/4"		1"		1.1/2"		2"		3"		4"		6"	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	165	16.50	191	7.50	216	8.50	241	9.50	292	11.50	356	14.00	432	17.00	-	-
Lever	B	155	6.10	170	6.69	170	6.69	230	9.05	310	12.20	450	17.71	*	*	-	-
Center to Top	C	76	2.99	78	3.85	100	3.93	130	5.11	155	6.10	200	7.87	244	9.60	-	-
Ball Bore	D	14.2	0.55	20.5	0.80	25.4	1.00	38	1.49	51	2.00	76	2.99	102	4.01	-	-
Approx. Weight	Kg/Lb	3.5	7.7	5.1	11.2	6.5	14.3	13.21	29.0	16.7	36.7	34.0	74.8	48.6	107.0	-	-

* Gear operator suggested

CLASS 1500

FULL BORE SIDE ENTRY TWO PIECE BALL VALVES BODY
Integral Flanged - End According to ANSI 16.10

FULL BORE	F1-C-600	1/2"		3/4"		1"		1.1/2"		2"		3"		4"		6"	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	216	8.50	229	9.00	254	10.0	305	12.0	368	14.48	-	-	-	-	-	-
Lever	B	170	6.69	170	6.69	230	9.05	310	12.20	450	18.00	-	-	-	-	-	-
Center to Top	C	98	3.85	100	3.93	119	4.68	155	610	210	8.00	-	-	-	-	-	-
Ball Bore	D	14.2	0.55	20.5	0.80	25.4	1.00	38	1.49	51	2.00	-	-	-	-	-	-
Approx. Weight	Kg/Lb	8.5	18.7	11.0	24.2	16.0	35.2	30	66	45	1.00	-	-	-	-	-	-

* Gear operator suggested

CLASS 800

REGULAR AND FULL BORE LIP TWO PIECES BAR STOCK
Floating Ball Valve - Threaded and Socket Weld Ends

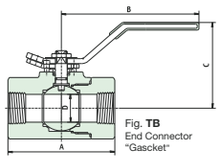


Fig. **TB**
End Connector
"Gascket"

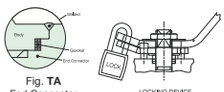


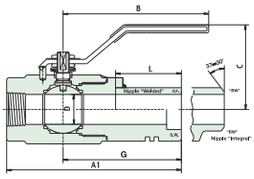
Fig. **TA**
End Connector
"Welded"

LOCKING DEVICE
ON REQUEST

REGULAR BORE	T-800	-		1/2		3/4		1		1.1/4		1.1/2		2		-	
FULL BORE	T-600	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	85	3.34	85	3.34	90	3.54	110	4.33	125	4.92	135	5.31	150	5.90	160	6.29
Lever	B	155	6.10	155	6.10	155	6.10	170	6.69	170	6.69	230	9.05	230	9.05	310	12.20
Center to Top	C	74	2.91	74	2.91	76	2.99	98	3.85	100	3.93	119	4.68	124	4.88	160	6.29
Ball Bore	D	10	0.39	10	0.39	14	0.55	20	0.78	25	0.98	32.5	1.27	38	1.49	51	2.00
Centre to End	G	131	5.15	131	5.15	132	0.56	140	5.51	146	5.75	149	5.86	156	6.15	158	6.22
Nipple Welded sch. 40/80/160	L	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"
Approx. Weight	Kg/Lb	0.8	1.7	0.8	1.7	1.2	2.6	2.1	4.6	3.4	7.5	5.2	11.4	6.3	14.0	10.0	22.2

CLASS 800

REGULAR AND FULL BORE LIP TWO PIECES BAR STOCK
Floating Ball Valve - Threaded and Socket Weld Ends



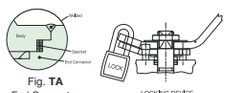


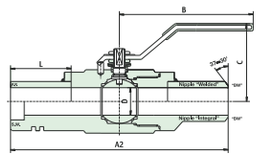
Fig. **TA**
End Connector
"Welded"

LOCKING DEVICE
ON REQUEST

REGULAR BORE	T1-800	-		1/2		3/4		1		1.1/4		1.1/2		2		-	
FULL BORE	T1-600	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	174	6.85	174	6.85	177	6.69	195	7.67	209	8.22	217	8.54	228	8.97	238	9.37
Lever	B	155	6.10	155	6.10	155	6.10	170	6.69	170	6.69	230	9.05	230	9.05	310	12.20
Center to Top	C	74	2.91	74	2.91	76	2.99	98	3.85	100	3.93	119	4.68	124	4.88	160	6.29
Ball Bore	D	10	0.39	10	0.39	14	0.55	20	0.78	25	0.98	32.5	1.27	38	1.49	51	2.00
Centre to End	G	131	5.15	131	5.15	132	0.56	140	5.51	146	5.75	149	5.86	156	6.15	158	6.22
Nipple Welded sch. 40/80/160	L	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"
Approx. Weight	Kg/Lb	0.9	2.0	1.0	2.2	1.4	3.1	2.4	5.3	3.8	8.45	5.7	12.7	6.9	15.3	10.8	24.0

CLASS 800

REGULAR AND FULL BORE LIP TWO PIECES BAR STOCK
Floating Ball Valve - Threaded and Socket Weld Ends



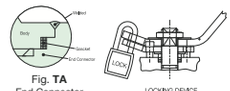


Fig. **TA**
End Connector
"Welded"

LOCKING DEVICE
ON REQUEST

REGULAR BORE	T2-800	-		1/2		3/4		1		1.1/4		1.1/2		2		-	
FULL BORE	T2-600	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End**	A	263	10.33	263	10.33	264	10.42	281	11.01	293	11.51	300	11.82	312	12.30	316	12.44
Lever	B	155	6.10	155	6.10	155	6.10	170	6.69	170	6.69	230	9.05	230	9.05	310	12.20
Center to Top	C	74	2.91	74	2.91	76	2.99	98	3.85	100	3.93	119	4.68	124	4.88	160	6.29
Ball Bore	D	10	0.39	10	0.39	14	0.55	20	0.78	25	0.98	32.5	1.27	38	1.49	51	2.00
Centre to End	G	131	5.15	131	5.15	132	0.56	140	5.51	146	5.75	149	5.86	156	6.15	158	6.22
Nipple Welded sch. 40/80/160	L	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"
Approx. Weight	Kg / Lb	1.0	2.2	1.1.	2.4	1.6	3.5	2.7	6.0	4.2	9.3	6.2	13.8	7.5	6.6	11.6	25.8

**In case of T2 design : length "A" ± 6mm

CLASS 800 - 2000 psi WOG - Hydrostatic body test pressure 210 bar @ 38°C - 3000 psi @ 100 F° - Hydrostatic seat test pressure 155 bar @ 38°C - 2200 psi @ 100 F°
Max working pressure 140 bar @ 38°c - 2000 psi @ 100 F° - Mat: Body Carbon Steel - RTFE

SOCKET WELD DIMENSIONS	mm	6		10		15		20		25		32		40		50	
	inch	1/4"		3/8"		1/2"		3/4"		1"		1.1/4"		1.1/2"		2"	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in
	D	11.1	0.44	11.1	0.44	12.7	0.5	14.5	0.57	16.0	0.63	17.5	0.69	19.0	0.75	22.0	0.86
	E	14.2	0.555	17.6	0.690	21.8	0.855	27.02	1.065	33.9	1.330	42.7	1.675	48.8	1.915	61.2	2.406

CLASS 1500

REGULAR AND FULL BORE LIP TWO PIECES BAR STOCK
Floating Ball Valve - Threaded and Socket Weld Ends

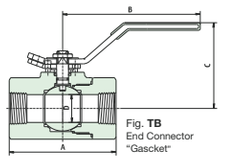


Fig. **TB**
End Connector
"Gascket"

Fig. **TA**
End Connector
"Welded"

LOCKING DEVICE
ON REQUEST

REGULAR BORE	T-R900	-		1/2		3/4		1		1.1/4		1.1/2		2		-	
FULL BORE	T-900	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	85	3.34	85	3.34	90	3.54	110	4.33	125	4.92	135	5.31	150	5.90	160	6.29
Lever	B	155	6.10	155	6.10	155	6.10	170	6.69	170	6.69	230	9.05	230	9.05	310	12.20
Center to Top	C	74	2.91	74	2.91	76	2.99	98	3.85	100	3.93	119	4.68	124	4.88	160	6.29
Ball Bore	D	10	0.39	10	0.39	14	0.55	20	0.78	25	0.98	32.5	1.27	38	1.49	51	2.00
Centre to End	G	131	5.15	131	5.15	132	0.56	140	5.51	146	5.75	149	5.86	156	6.15	158	6.22
Nipple Welded sch. 40/80/160	L	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"
Approx. Weight	Kg/Lb	0.8	1.7	0.8	1.7	1.2	2.6	2.1	4.6	3.4	7.5	5.2	11.4	6.3	14.0	10.0	22.2

CLASS 1500

REGULAR AND FULL BORE LIP TWO PIECES BAR STOCK
Floating Ball Valve - Threaded and Socket Weld Ends

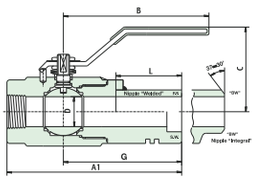


Fig. **TA**
End Connector
"Welded"

LOCKING DEVICE
ON REQUEST

REGULAR BORE	T1-R900	-		1/2		3/4		1		1.1/4		1.1/2		2		-	
FULL BORE	T1-900	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	174	6.86	174	6.86	177	6.69	195	7.76	209	8.22	217	8.54	231	9.09	160	6.29
Lever	B	155	6.10	155	6.10	155	6.10	170	6.69	170	6.69	230	9.05	230	9.05	310	12.20
Center to Top	C	74	2.91	74	2.91	76	2.99	98	3.85	100	3.93	119	4.68	124	4.88	160	6.29
Ball Bore	D	10	0.39	10	0.39	14	0.55	20	0.78	25	0.98	32.5	1.27	38	1.49	51	2.00
Centre to End	G	131	5.15	131	5.15	132	0.56	140	5.51	146	5.75	149	5.86	156	6.15	158	6.22
Nipple Welded sch. 40/80/160	L	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"
Approx. Weight	Kg / Lb	0.8	1.7	0.8	1.7	1.2	2.6	2.1	4.6	3.4	7.5	5.2	11.4	6.3	14.0	10.0	22.2

CLASS 1500

REGULAR AND FULL BORE LIP TWO PIECES BAR STOCK
Floating Ball Valve - Threaded and Socket Weld Ends

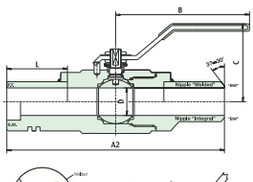


Fig. **TA**
End Connector
"Welded"

LOCKING DEVICE
ON REQUEST

REGULAR BORE	T2-R900	-		1/2		3/4		1		1.1/4		1.1/2		2		-	
FULL BORE	T2-900	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End*	A	263	10.33	263	10.33	264	10.42	281	11.01	293	11.51	300	11.82	321	12.30	316	12.44
Lever	B	155	6.10	155	6.10	155	6.10	170	6.69	170	6.69	230	9.05	230	9.05	310	12.20
Center to Top	C	74	2.91	74	2.91	76	2.99	98	3.85	100	3.93	119	4.68	124	4.88	160	6.29
Ball Bore	D	10	0.39	10	0.39	14	0.55	20	0.78	25	0.98	32.5	1.27	38	1.49	51	2.00
Centre to End	G	131	5.15	131	5.15	132	0.56	140	5.51	146	5.75	149	5.86	156	6.15	158	6.22
Nipple Welded sch. 40/80/160	L	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"	100	4"
Approx. Weight	Kg / Lb	0.8	1.7	0.8	1.7	1.2	2.6	2.1	4.6	3.4	7.5	5.2	11.4	6.3	14.0	10.0	22.2

*In case of T2 design : lenght "A" ± 6mm

CLASS 800 - 2000 psi WOG - Hydrostatic body test pressure 210 bar @ 38°C - 3000 psi @ 100 F° - Hydrostatic seat test pressure 155 bar @ 38°C - 2200 psi @ 100 F°
Max working pressure 140 bar @ 38°c - 2000 psi @ 100 F° - Mat: Body Carbon Steel - RTFE

SOCKET WELD DIMENSIONS	mm	6		10		15		20		25		32		40		50	
	inch	1/4"		3/8"		1/2"		3/4"		1"		1.1/4"		1.1/2"		2"	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in
	D	11.1	0.44	11.1	0.44	12.7	0.5	14.5	0.57	16.0	0.63	17.5	0.69	19.0	0.75	22.0	0.86
	E	14.2	0.555	17.6	0.690	21.8	0.855	27.02	1.065	33.9	1.330	42.7	1.675	48.8	1.915	61.2	2.406

LIP SEAL BALL VALVE

CLASS 2500

REGULAR AND FULL BORE LIP TWO PIECES BAR STOCK
Floating Ball Valve - Threaded and Socket Weld Ends

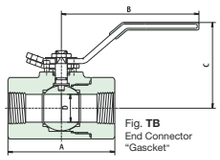


Fig. **TB**
End Connector
"Gascket"

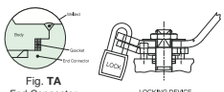


Fig. **TA**
End Connector
"Welded"

LOCKING DEVICE
ON REQUEST

REGULAR BORE	T-R2500	-		1/2		3/4		1		1.1/4		1.1/2		2		-	
FULL BORE	**T-2500**	**1/4**		**3/8**		**1/2**		**3/4**		**1**		**1.1/4**		**1.1/2**		**2**	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	**A**	*	*	*	*	110	4.33	125	4.49	135	5.31	*	*	*	*	*	*
Lever	**B**	*	*	*	*	170	6.69	230	9.05	230	9.05	*	*	*	*	*	*
Center to Top	**C**	*	*	*	*	95	3.74	110	4.33	125	4.92	*	*	*	*	*	*
Ball Bore	**D**	*	*	*	*	14	0.55	20	0.78	25	0.98	*	*	*	*	*	*
Centre to End	**G**	*	*	*	*	142	5.59	148	5.82	151	5.94	*	*	*	*	*	*
Nipple Welded sch. 40/80/160	**L**	*	*	*	*	100	4"	100	4"	100	4"	*	*	*	*	*	*
Approx. Weight	**Kg/Lb**	*	*	*	*	3.2	7.1	4.7	10.5	6.8	15.1	*	*	*	*	*	*

* on request

CLASS 2500

REGULAR AND FULL BORE LIP TWO PIECES BAR STOCK
Floating Ball Valve - Threaded and Socket Weld Ends

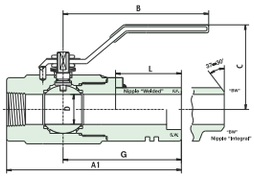


Fig. **TA**
End Connector
"Welded"

LOCKING DEVICE
ON REQUEST

REGULAR BORE	T1-R2500	-		1/2		3/4		1		1.1/4		1.1/2		2		-	
FULL BORE	**T1-2500**	**1/4**		**3/8**		**1/2**		**3/4**		**1**		**1.1/4**		**1.1/2**		**2**	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	**A**	*	*	*	*	197	7.75	211	8.30	219	8.62	*	*	*	*	*	*
Lever	**B**	*	*	*	*	170	6.69	230	9.05	230	9.05	*	*	*	*	*	*
Center to Top	**C**	*	*	*	*	95	3.74	110	4.33	125	4.92	*	*	*	*	*	*
Ball Bore	**D**	*	*	*	*	14	0.55	20	0.78	25	0.98	*	*	*	*	*	*
Centre to End	**G**	*	*	*	*	142	5.59	148	5.82	151	5.94	*	*	*	*	*	*
Nipple Welded sch. 40/80/160	**L**	*	*	*	*	100	4"	100	4"	100	4"	*	*	*	*	*	*
Approx. Weight	**Kg/Lb**	*	*	*	*	2.9	6.4	4.4	9.8	6.4	14.2	*	*	*	*	*	*

* on request

CLASS 2500

REGULAR AND FULL BORE LIP TWO PIECES BAR STOCK
Floating Ball Valve - Threaded and Socket Weld Ends

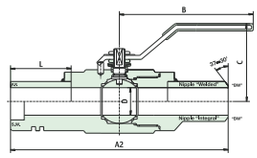


Fig. **TA**
End Connector
"Welded"

LOCKING DEVICE
ON REQUEST

REGULAR BORE	T1-R2500	-		1/2		3/4		1		1.1/4		1.1/2		2		-	
FULL BORE	**T2-2500**	**1/4**		**3/8**		**1/2**		**3/4**		**1**		**1.1/4**		**1.1/2**		**2**	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	**A**	*	*	*	*	284	11.18	296	11.65	303	11.90	*	*	*	*	*	*
Lever	**B**	*	*	*	*	170	6.69	230	9.05	230	9.05	*	*	*	*	*	*
Center to Top	**C**	*	*	*	*	95	3.74	110	4.33	125	4.92	*	*	*	*	*	*
Ball Bore	**D**	*	*	*	*	14	0.55	20	0.78	25	0.98	*	*	*	*	*	*
Centre to End	**G**	*	*	*	*	142	5.59	148	5.82	151	5.94	*	*	*	*	*	*
Nipple Welded sch. 40/80/160	**L**	*	*	*	*	100	4"	100	4"	100	4"	*	*	*	*	*	*
Approx. Weight	**Kg/Lb**	*	*	*	*	3.2	7.1	4.7	10.5	6.8	15.1	*	*	*	*	*	*

**In case of T2 design : length "A" ± 6mm

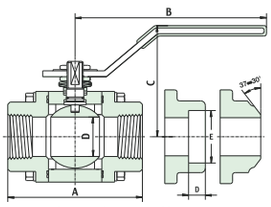
* on request

CLASS 800 - 2000 psi WOG - Hydrostatic body test pressure 210 bar @ 38°C - 3000 psi @ 100 F° - Hydrostatic seat test pressure 155 bar @ 38°C - 2200 psi @ 100 F°
Max working pressure 140 bar @ 38°c - 2000 psi @ 100 F° - Mat: Body Carbon Steel - RTFE

SOCKET WELD DIMENSIONS	mm	6		10		15		20		25		32		40		50	
	inch	1/4"		3/8"		1/2"		3/4"		1"		1.1/4"		1.1/2"		2"	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in
	D	11.1	0.44	11.1	0.44	12.7	0.5	14.5	0.57	16.0	0.63	17.5	0.69	19.0	0.75	22.0	0.86
	E	14.2	0.555	17.6	0.690	21.8	0.855	27.02	1.065	33.9	1.330	42.7	1.675	48.8	1.915	61.2	2.406

CLASS 800

REGULAR AND FULL BORE COMPACT THREE PIECES FORGED STEEL
Floating Ball Valve - Threaded and Socket Weld Ends



Type Compact Swing Fig. "CS"
Class 800

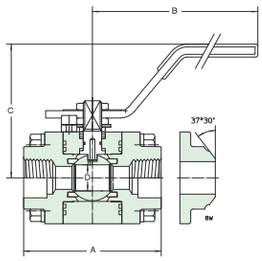
REGULAR BORE	CS-800	-		1/2		3/4		1		1.1/4		1.1/2		2		-	
FULL BORE	CS-600	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	75	2,95	75	2.95	75	2.95	87	3.42	110	4.33	120	4.72	140	5.51	160	6.29
Lever	B	155	6.10	155	6.10	155	6.10	170	6.69	170	6.69	230	9.05	230	9.05	310	12.20
Center to Top	C	72	2.83	72	2.83	76	2.99	98	3.86	100	3.94	120	4.72	130	5.12	150	5.90
Ball Bore	D	10	0.39	10	0.39	14	0.55	19	0.75	25	0.98	32.5	1.29	38	1.50	51	2.00
Socket Depth	E	11.10	0.44	11.10	0.44	12.70	0.50	14.50	0.57	16	0.63	17.50	0.69	19	0.75	22	0.87
Socket	F	14.20	0.56	17.60	0.69	21.80	0.68	27.20	1.07	33.90	1.33	42.70	1.68	48.80	1.92	61.20	2.41
Approx. Weight	Kg/Lb	0.75	1.76	0.75	1.76	1.0	2.20	2.2	4.85	3.1	6.83	4.8	10.58	6.8	14.99	10.7	23.59

CLASS 800 - 2000 psi WOG - Hydrostatic body test pressure 210 bar @ 38°C - 3000 psi @ 100 F° - Hydrostatic seat test pressure 155 bar @ 38°C - 2200 psi @ 100 F°
Max working pressure 140 bar @ 38°c - 2000 psi @ 100 F° - Mat: Body Carbon Steel - RTFE

		mm	6		10		15		20		25		32		40		50	
		inch	1/4"		3/8"		1/2"		3/4"		1"		1.1/4"		1.1/2"		2"	
SOCKET WELD DIMENSIONS			mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in
		D	11.1	0.44	11.1	0.44	12.7	0.5	14.5	0.57	16.0	0.63	17.5	0.69	19.0	0.75	22.0	0.86
		E	14.2	0.555	17.6	0.690	21.8	0.855	27.02	1.065	33.9	1.330	42.7	1.675	48.8	1.915	61.2	2.406
MOUNTING PAD ISO 5211																		
		M	M5		M5		M5		M5		M5		M6		M6		M8	
		N	1.41	36	1.41	36	1.41	36	1.41	36	1.65	42	1.96	50	1.96	50	2.75	70

CLASS 800

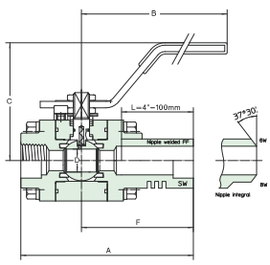
REGULAR AND FULL BORE COMPACT THREE PIECES FORGED STEEL
Floating Ball Valve - Threaded and Socket Weld Ends



REGULAR BORE	CM-800	-		1/2		3/4		1		1.1/4		1.1/2		2		-	
FULL BORE	**CM-600**	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	**A**	75	2,95	75	2.95	75	2.95	87	3.42	110	4.33	120	4.72	140	5.51	160	6.29
Lever	**B**	155	6.10	155	6.10	155	6.10	170	6.69	170	6.69	230	9.05	230	9.05	310	12.20
Center to Top	**C**	72	2.83	72	2.83	76	2.99	98	3.86	100	3.94	120	4.72	130	5.12	150	5.90
Ball Bore	**D**	10	0.39	10	0.39	14	0.55	19	0.75	25	0.98	32.5	1.29	38	1.50	51	2.00
Socket Depth	**E**	11.10	0.44	11.10	0.44	12.70	0.50	14.50	0.57	16	0.63	17.50	0.69	19	0.75	22	0.87
Socket	**F**	14.20	0.59	17.60	0.69	21.80	0.68	27.20	1.07	33.90	1.33	42.70	1.68	48.80	1.92	61.20	2.41
Approx. Weight	**Kg/Lb**	0.75	1.76	0.75	1.76	1.0	2.20	2.2	4.85	3.1	6.83	4.8	10.58	6.8	14.99	10.7	23.59

CLASS 800

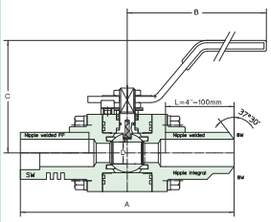
REGULAR AND FULL BORE COMPACT THREE PIECES FORGED STEEL
Floating Ball Valve - Threaded and Socket Weld Ends



REGULAR BORE	CM1-800	-		1/2		3/4		1		1.1/4		1.1/2		2		-	
FULL BORE	**CM1-600**	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	**A**	164	6.46	164	6.46	162	6.38	173	6.81	194	7.64	203	7.99	221	8.70	238	9.37
Lever	**B**	155	6.10	155	6.10	155	6.10	170	6.69	170	6.69	230	9.05	230	9.05	310	12.20
Center to Top	**C**	72	2.83	72	2.83	76	2.99	98	3.86	100	3.94	120	4.72	130	5.12	150	5.90
Ball Bore	**D**	10	0.39	10	0.39	14	0.55	19	0.75	25	0.98	32.5	1.28	38	1.50	51	2.00
Socket Depth	**E**	11.10	0.44	11.10	0.44	12.70	0.50	14.50	0.57	16	0.63	17.50	0.69	19	0.75	22	0.87
Socket	**F**	14.20	0.56	17.60	0.69	21.80	0.68	27.20	1.07	33.90	1.33	42.70	1.68	48.80	1.92	61.20	2.41
Approx. Weight	**Kg/Lb**	0.75	1.76	0.75	1.76	1.0	2.20	2.2	4.85	3.1	6.83	4.8	10.58	6.8	14.99	10.7	23.59

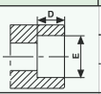
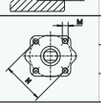
CLASS 800

REGULAR AND FULL BORE COMPACT THREE PIECES FORGED STEEL
Floating Ball Valve - Threaded and Socket Weld Ends



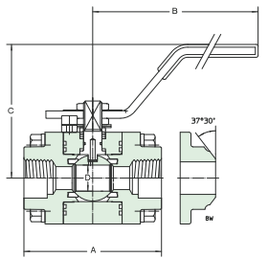
REGULAR BORE	CM2-800	-		1/2		3/4		1		1.1/4		1.1/2		2		-	
FULL BORE	**CM2-600**	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	**A**	253	9.96	253	9.96	250	9.84	258	10.16	278	10.94	285	11.22	302	11.89	316	12.44
Lever	**B**	155	6.10	155	6.10	155	6.10	170	6.69	170	6.69	230	9.05	230	9.05	310	12.20
Center to Top	**C**	72	2.83	72	2.83	76	2.99	98	3.86	100	3.94	120	4.72	130	5.12	150	5.90
Ball Bore	**D**	10	0.39	10	0.39	14	0.55	19	0.75	25	0.98	32.5	1.28	38	1.50	51	2.00
Socket Depth	**E**	11.10	0.44	11.10	0.44	12.70	0.50	14.50	0.57	16	0.63	17.50	0.69	19	0.75	22	0.87
Socket	**F**	14.20	0.56	17.60	0.69	21.80	0.86	27.20	1.07	33.90	1.33	42.70	1.68	48.80	1.92	61.20	2.41
Approx. Weight	**Kg/Lb**	0.8	1.76	0.8	1.76	1.0	2.20	2.2	4.85	3.1	6.83	4.8	10.58	6.8	14.99	10.7	23.59

CLASS 800 - 2000 psi WOG - Hydrostatic body test pressure 210 bar @ 38°C - 3000 psi @ 100 F° - Hydrostatic seat test pressure 155 bar @ 38°C - 2200 psi @ 100 F°
Max working pressure 140 bar @ 38°c - 2000 psi @ 100 F° - Mat: Body Carbon Steel - RTFE

		mm	6		10		15		20		25		32		40		50	
		inch	1/4"		3/8"		1/2"		3/4"		1"		1.1/4"		1.1/2"		2"	
SOCKET WELD DIMENSIONS			mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in
		D	11.1	0.44	11.1	0.44	12.7	0.5	14.5	0.57	16.0	0.63	17.5	0.69	19.0	0.75	22.0	0.86
		E	14.2	0.555	17.6	0.690	21.8	0.855	27.02	1.065	33.9	1.330	42.7	1.675	48.8	1.915	61.2	2.406
MOUNTING PAD ISO 5211																		
		M	M5		M5		M5		M5		M5		M6		M6		M8	
		N	1.41	36	1.41	36	1.41	36	1.41	36	1.65	42	1.96	50	1.96	50	2.75	70

CLASS 1500

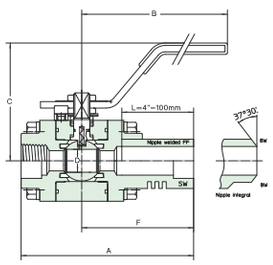
REGULAR AND FULL BORE COMPACT THREE PIECES FORGED STEEL
Floating Ball Valve - Threaded and Socket Weld Ends



REGULAR BORE	CM-R900	-		1/2		3/4		1		1.1/4		1.1/2		2		-	
FULL BORE	CM-900	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	75	2.95	75	2.95	87	3.42	110	4.33	120	4.75	140	5.51	160	6.30	200	7.87
Lever	B	155	6.10	155	6.10	170	6.69	170	6.69	230	9.05	230	9.05	310	12.20	400	15.75
Center to Top	C	76	2.99	76	2.99	91	3.58	98	3.86	119	4.68	124	4.88	147	5.79	168	6.61
Ball Bore	D	10	0.39	10	0.39	14	0.55	19	0.75	25	0.98	32.5	1.28	38	1.50	51	2.00
Socket Depth	E	11.10	0.44	11.10	0.44	12.70	0.50	14.50	0.57	16	0.63	17.50	0.69	19	0.75	22	0.87
Socket	F	14.20	0.56	17.60	0.69	21.80	0.86	27.20	1.07	33.90	1.33	42.70	1.68	48.80	1.92	61.20	2.41
Approx. Weight	Kg/Lb	1.2	2.64	1.2	2.64	2.5	5.51	3.2	7.05	4.7	10.36	6.7	14.77	10	22.04	20	44.09

CLASS 1500

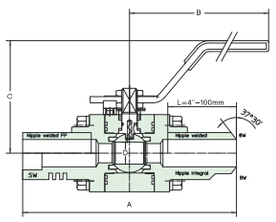
REGULAR AND FULL BORE COMPACT THREE PIECES FORGED STEEL
Floating Ball Valve - Threaded and Socket Weld Ends



REGULAR BORE	CM1-R900	-		1/2		3/4		1		1.1/4		1.1/2		2		-	
FULL BORE	CM1-900	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	164	6.46	164	6.46	175	6.89	196	7.72	204	8.03	223	8.78	241	9.49	278	10.94
Lever	B	155	6.10	155	6.10	170	6.69	170	6.69	230	9.05	230	9.05	310	12.20	400	15.75
Center to Top	C	76	2.99	76	2.99	91	3.58	98	3.86	119	4.68	124	4.88	147	5.79	168	6.61
Ball Bore	D	10	0.39	10	0.39	14	0.55	19	0.75	25	0.98	32.5	1.28	38	1.50	51	2.00
Socket Depth	E	11.10	0.44	11.10	0.44	12.70	0.50	14.50	0.57	16	0.63	17.50	0.69	19	0.75	22	0.87
Socket	F	14.20	0.56	17.60	0.69	21.80	0.86	27.20	1.07	33.90	1.33	42.70	1.68	48.80	1.92	61.20	2.41
Approx. Weight	Kg/Lb	1.2	2.64	1.2	2.64	2.5	5.51	3.2	7.05	4.7	10.36	6.7	14.77	10	22.04	20	44.09

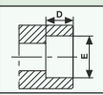
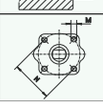
CLASS 1500

REGULAR AND FULL BORE COMPACT THREE PIECES FORGED STEEL
Floating Ball Valve - Threaded and Socket Weld Ends



REGULAR BORE	CM2-R900	-		1/2		3/4		1		1.1/4		1.1/2		2		-	
FULL BORE	CM2-900	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	253	9.96	253	9.96	262	10.31	282	11.10	288	11.33	305	12.00	322	12.68	356	14.01
Lever	B	155	6.10	155	6.10	170	6.69	170	6.69	230	9.05	230	9.05	310	12.20	400	15.75
Center to Top	C	76	2.99	76	2.99	91	3.58	98	3.86	119	4.68	124	4.88	147	5.79	168	6.61
Ball Bore	D	10	0.39	10	0.39	14	0.55	19	0.75	25	0.98	32.5	1.28	38	1.50	51	2.00
Socket Depth	E	11.10	0.44	11.10	0.44	12.70	0.50	14.50	0.57	16	0.63	17.50	0.69	19	0.75	22	0.87
Socket	F	14.20	0.56	17.60	0.69	21.80	0.86	27.20	1.07	33.90	1.33	42.70	1.68	48.80	1.92	61.20	2.41
Approx. Weight	Kg/Lb	1.2	2.64	1.2	2.64	2.5	5.51	3.2	7.05	4.7	10.36	6.7	14.77	10	22.04	20	44.09

CLASS 800 - 2000 psi WOG - Hydrostatic body test pressure 210 bar @ 38°C - 3000 psi @ 100 F° - Hydrostatic seat test pressure 155 bar @ 38°C - 2200 psi @ 100 F°
Max working pressure 140 bar @ 38°c - 2000 psi @ 100 F° - Mat: Body Carbon Steel - RTFE

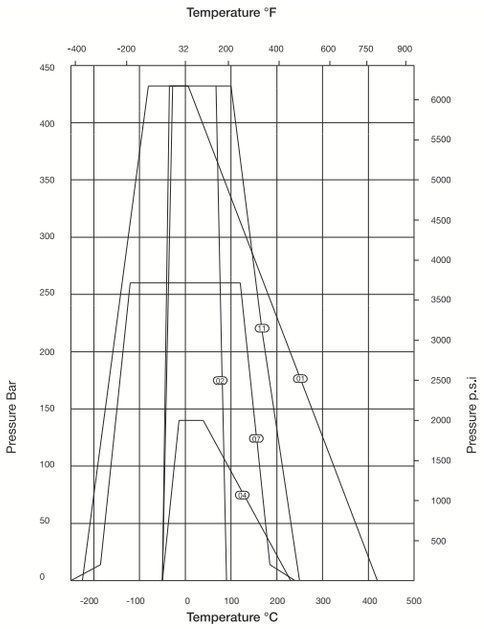
		mm	6		10		15		20		25		32		40		50	
		inch	1/4"		3/8"		1/2"		3/4"		1"		1.1/4"		1.1/2"		2"	
SOCKET WELD DIMENSIONS			mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in
		D	11.1	0.44	11.1	0.44	12.7	0.5	14.5	0.57	16.0	0.63	17.5	0.69	19.0	0.75	22.0	0.86
		E	14.2	0.555	17.6	0.690	21.8	0.855	27.02	1.065	33.9	1.330	42.7	1.675	48.8	1.915	61.2	2.406
MOUNTING PAD ISO 5211																		
		M	M5		M5		M5		M5		M5		M6		M6		M8	
		N	1.41	36	1.41	36	1.41	36	1.41	36	1.65	42	1.96	50	1.96	50	2.75	70

IVM reserves the right to make modifications or changes to its production without prior notice.

SEAT MATERIAL

IVM DESIGNATION	CHEMICAL NAME	TEMPERATURE RANGE	APPLICATION	TRADEMARK
PTFE	polytetrafluoroethylene	-100° to +180°/220°C	Virgin PTFE is used as a standard material for its high lubricity and superior sealing up tp 180C. It is white in color.	DuPont trademark : Teflon®
RPTFE/Glass	polytetrafluoroethylene/glass filled	-100° to +200°/250°C	Reinforced PTFE seats are made with glass filled PTFE (20%). They are harder than virgin PTFE. White in color with green or blue speckles.	
RPTFE/Carbon-graphite	polytetrafluoroethylene/carbon-graphite filled	-100° to +200°/250°C	Rinforced PTFE with 20% Corbon and 5% Graphite …These seats are black in color.	
POM (Delrin®)	polyoxymethylene / acetal resin	-57°C to 82°C	This material is very rigid It has a combination of strength, stiffness, hardness, dimensional stability, toughness, fatigue resistance, abrasion resistance, low wear and low friction. It can withstand pressure up to 5000 PSIG depending on valve size. Do not use on oxygen service.	Dupont trademark : Delrin®
NYLON 12G	polyamide	-50° to +120°C	Nylon 12G is more suitable than PTFE for higher pressure, but has a limited range in temperature.	
DEVLON	polyamide	-100° to +150°C	Devlon V is similar to Nylon 12G, but with a wider range of temperature application (lower and higher).	Devol trademark : Devlon V®
UHMWPE	Ultra High Molecular Weight Polyethylene	-200°C to 80°C	UHMWPE (05) is a common substitute where PTFE is not permitted and has excellent abrasion resistance.	
PEEK	polyetheretherketone	-100° to +260°C	Peek is recommended for high temperature (up to 260°C) but it is very hard compared to other non metallic materials.Not applicable for concentrated sulfuric acid.	
PCTFE (KEL-F®)	polyclorotrifluoroethilene	-250° to +150°C	PCTFE is specifically recommended for cryogenic service.	3-M trademark : KEL-F® / Daikin trademark :Neoflon®
Vespel ® Sp21	15% Graphite Filled Polyimide	-100° to +340°C	15% graphite filler. Performs well in a variety of chemical environments and a variety of industrial fluids at elevated temperatures.	Dupont trademark : Vespel®

SEAT MATERIAL PRESSURE - TEMPERATURE LIMITS



01 VESPEL (code n. 01)
02 DELRIN (code n. 02)
04 PTFE + 15% FIBER GLASS (code n.04)
07 KEL-F (code n. 07)
11 PEEK (code n. 11)

IVM STANDARD SEATS

Class 800 - 2000 PSI WOG		
SEAT		SERVICE APPLICATION
Material	Code	
PTFE virgin	05	PTFE (polytetrafluoroethylene) has the lowest friction coefficient in comparision with all of the solid materials usable for ball valve seating. It is recommandable for general service within its pressure temperature limits.
1 PTFE Virgin 2 PTFE +15% Fiberglass 3 PTFE +20% Graphite & 5% Carbon	04	PTFE with addition of 15 % fiberglass increase the performance at higher pressures than PTFE. The Glass content decreases the characteristics when in the presence of alcohol and it can be corroded by hydrofluoric acid. Graohite and Carbon content increase temperature and pressure range of this compound which is the OMB standard.

Class 1500-3000 PSI WOG - Class 2500-6000 PSI WOG		
SEAT		SERVICE APPLICATION
Material	Code	
PCTEF such as KEL-F®	07	Very good performance in high pressure and in cryogenic service.
POM such as DERLIN®	02	Generally used whenever pressures are higher and temperatures lower than the recommandable for PTFE
PEEK	11	Very good performance in high pressure and temperatures higher than code 02

(*) Class 800 is not normally tabulated ASME/ANSI B16.34 designation, but it is an intermediate class that is wildely used for SW - BW and threaded end valves

VALUES From API 6D and API 6A

PRESSURE CLASS OF VALVE		ANSI 150 PN 20	ANSI 300 PN 50	ANSI 600 PN 100	ANSI 800 (*)	ANSI 900 PN 150	ANSI 1500 PN 250	ANSI 2500 PN 420	API 2000	API 3000	API 5000	API 10000
MAXIMUM OPERATING PRESSURE 38°C-100°F	Bar	19	49.6	99.3	138	148.9	248.2	413.7	138	207	345	690
	Psig	275	720	1440	2000	2160	3600	6000	2000	3000	5000	10000
	kPa	1900	4960	9930	13800	14890	24820	41370	13800	20700	34500	69000
HYDRO-STATIC SHELL TEST	Bar	29.3	75.8	150	207	224.1	372.3	620.5	276	414	690	1035
	Psig	425	1100	2175	3000	3250	5400	9000	4000	6000	10000	15000
	kPa	2930	7580	15000	20700	22410	37230	62050	27600	41400	69000	103500

1 bar = 100 kPa - 1 Psig = 0.06894757 bar - 1 bar = 14.5 Psig.

FLOW COEFFICENT AND TORQUE

SIZE	COEFFICENT Cv	
	Full Bore	Reg. Bore
1/4	8	-
3/8	8	-
1/2	12	8
3/4	33	12
1	48	33
1 1/4	83	48
1 1/2	120	83
2	250	120

SIZE		275 p.s.i. 20 bar		500 p.s.i. 35 bar		720 p.s.i. 50 bar		1000 p.s.i. 70 bar		1500 p.s.i. 105 bar		2000 p.s.i. 140 bar	
Regular Bore	Full Bore	Kgm	Ft-Lb	Kgm	Ft-Lb	Kgm	Ft-Lb	Kgm	Ft-Lb	Kgm	Ft-Lb	Kgm	Ft-Lb
1/2	1/4 3/8	0.41	3.0	0.41	3.0	0.41	3.0	0.41	3.0	0.48	3.5	0.82	6.0
3/4	1/2	0.69	5.0	0.69	5.0	0.69	5.0	0.69	5.0	0.82	6.0	1.72	12.5
1	3/4	1.03	7.5	1.03	7.5	1.03	7.5	1.38	10.0	1.79	13.0	3.45	25.0
1 1/4	1	1.38	10.0	1.72	12.5	2.07	15.0	2.28	16.5	3.45	25.0	5.73	41.5
1 1/2	1 1/4	1.72	12.5	2.07	15.0	2.76	20.0	3.45	25.0	4.14	30.0	7.88	57.0
2	1 1/2	2.75	20.0	3.45	25.0	4.83	35.0	6.08	44.0	6.91	50.0	13.8	100.0
-	2	5.80	42.0	7.60	55.0	10.36	75.0	16.59	120.0	24.88	180.0	29.03	210.0

CLASS 800 According to API 602 8th edition

SERVICE TEMPER.	A105(1) A350-LF2(2)	A182(3) F11	A182(3) F22	A182 F5	A182 F9	A182 F304	A182 F316	A182 F304L	A182 F347H
°F	psi	psi	psi	psi	psi	psi	psi	psi	psi
-20 to 100	1975	2000	2000	2000	2000	1920	1920	1600	1920
200	1800	1900	1910	2000	2000	1600	1655	1350	1695
300	1750	1795	1805	1940	1940	1410	1495	1210	1570
400	1690	1755	1730	1880	1880	1255	1370	1100	1480
500	1595	1710	1705	1775	1775	1165	1275	1020	1380
600	1460	1615	1615	1615	1615	1105	1205	960	1310
650	1430	1570	1570	1570	1570	1090	1185	935	1280
700	1420	1515	1515	1515	1515	1075	1150	915	1250
750	1345	1420	1420	1420	1420	1060	1130	895	1230
800	1100	1355	1355	1325	1355	1050	1105	875	1215
850	715	1300	1300	1170	1300	1035	1080	860	1185
900	460	1200	1200	940	1200	1025	1050		1150
950	275	1005	1005	695	985	1000	1030		1030
1000	140	595	715	510	780	860	970		970
1050		365	530	375	505	825	960		960
1100		255	300	275	300	685	860		860
1150		140	275	185	200	520	735		735
1200		95	145	120	140	415	550		460
1250						295	485		330
1300						218	365		250
1350						165	275		180
1400						130	200		140
1450						95	155		110
1500						65	110		95

SERVICE TEMPER.	A105(1) A350-LF2(2)	A182(3) F11	A182(3) F22	A182 F5	A182 F9	A182 F304	A182 F316	A182 F304L	A182 F347H
°C	bar	bar	bar	bar	bar	bar	bar	bar	bar
-29 to 38	136.2	137.9	137.9	137.9	137.9	132.4	132.4	110.3	132.4
93.5	124.1	131.0	131.7	137.9	137.9	110.3	114.1	93.1	116.9
149	120.7	123.8	124.5	133.8	133.8	97.2	103.1	83.4	108.3
204.5	116.6	121.0	119.3	129.7	129.7	86.5	94.5	75.9	102.1
260	110.0	117.9	117.6	122.4	122.4	80.3	87.9	70.3	95.2
315.5	100.7	113.4	113.4	113.4	113.4	76.2	83.1	66.2	90.3
343.5	98.6	108.3	108.3	108.3	108.3	75.2	81.7	64.5	88.3
371	97.9	104.5	104.5	104.5	104.5	74.1	79.3	63.1	86.2
399	92.7	97.9	97.9	97.9	97.9	73.1	77.9	61.7	84.8
426.5	75.9	93.4	93.4	91.4	93.4	72.4	76.2	60.3	83.8
454.5	49.3	89.7	89.7	80.7	89.7	71.4	74.5	59.3	81.7
482	31.7	82.8	82.8	64.8	82.8	70.7	72.4		79.3
510	19	69.3	69.3	47.9	67.9	69.0	71.0		71.0
538	9.7	41.0	49.3	35.2	53.8	59.3	66.9		66.9
565.5		25.2	36.6	25.9	34.8	56.9	66.2		66.2
593.5		17.6	20.7	19.0	20.7	47.2	59.3		59.3
621		9.7	19.0	12.8	13.8	35.9	50.7		50.7
649		6.6	10.0	8.3	9.6	28.6	37.9		31.7
676.5						20.3	33.4		22.8
704.5						15.0	25.2		17.2
732.5						11.4	19.0		12.4
760.5						9.0	13.8		9.6
788.5						6.6	10.7		7.6
815.5						4.5	7.6		6.6

Notes: (1) Permissible, but not recommended for prolonged use above 800°F. (2) Not to be used over 650°F. 3) Permissible, but not recommended for prolonged use above 1050°F.

CARBON STEEL 105(1) & A350 LF2(2) According to API 602 8th edition

SERVICE TEMPERATURE	150	300	600	a1500	2500
°F	psi	psi	psi	psi	psi
-20 to 100	285	740	1480	3705	6170
200	260	675	1350	3375	5625
300	230	655	1315	3280	5470
400	200	635	1270	3170	5280
500	170	600	1200	2995	4990
600	140	550	1095	2735	4560
650	125	535	1075	2685	4475
700	110	535	1065	2665	4440
750	95	505	1010	2520	4200
800	80	410	825	2060	3430
850	65	270	535	1340	2230
900	50	170	345	860	1430
950	35	105	205	515	860
1000	20	50	105	260	430
1050					
1100					

SERVICE TEMPERATURE	PN 20	PN 50	PN 100	PN 250	PN 420
°C	bar	bar	bar	bar	bar
38	19.6	51.1	102.1	255.3	425.5
50	19.2	50.1	100.2	250.4	417.3
100	17.7	46.4	92.8	231.9	386.5
150	15.8	45.2	90.5	226.1	376.9
200	14.0	46.2	90.5	226.1	376.9
250	12.1	41.7	83.4	208.6	347.7
300	10.2	38.7	77.5	193.7	322.8
350	8.4	37.0	73.9	184.8	308.0
375	7.4	36.5	72.9	182.3	303.9
400	6.5	34.5	69.0	172.5	287.5
425	5.6	28.8	57.5	143.8	239.6
450	4.7	20.0	40.1	100.2	166.9
475	3.7	13.5	27.1	67.7	112.9
500	2.8	8.8	17.6	44.0	73.3
525	1.9	5.2	10.4	25.9	43.2
540	1.3	3.3	6.5	16.3	27.2

Notes: (1) Permissible, but not recommended for prolonged use above 800°F. (2) Not to be used over 650°F.

AVAILABLE MATERIALS FOR BALL VALUES

IVM valves are manufactured in a wide range of materials, supplied by the best available steel mills, forged by well known forgemasters with outstanding equipment and experience. All the materials can be certified in with chemical composition and the mechanical characteristics.

BODY AND BONNET MATERIALS								
Material Group	**Common Name**	**Nominal Type**	**UNS**	**Forging Spec.**	**Casting Spec. Equivalent**	**DIN**	**DIN W. No**	**Application Notes**
Carbon Steel	CS	C-Mn-Fe	K03504	A105N	A216-WCB	C22.8 DIN 17243	1.0460	General non-corrosive service from -20F(-29C) to 800F(427C)
Low Temperature Carbon Steel	LTCS	C-Mn-Fe	K03011	A350-LF2	A352-,LCA A352-LCB A352-LCC	TSTE 355 DIN 18103	1.0566	General non-corrosive service from -50F (-46C) to 650F(340C), LF2 to 800F(427C).
Stainless Steel	Austenitic S.Steel 300 series S.Steel	304: 18Cr-8Ni	S30400	A182-F304	A351-CF8	DIN X5CrNi 18 9	1.4301	0.04% min. carbon for temp.>1000F(538C)
		316: 16Cr-12Ni-2Mo	S31600	A182-F316	A351-CF8M	DIN X5CrNiMo 18 10	1.4401	0.04% min. carbon for temp.>1000F(538C)
	Duplex 2205	22Cr-5Ni-3Mo-N	S31803 S32205	A182-F51	A890-J92205	X2CrNiMON22-5-3 DIN ,10088-1 (95)	1.4462	service to 600F(316C) -The original S31803 UNS designation has been supplemented by S32205 which has higher minimum N, Cr, and Mo.
	Super Duplex 2507	25Cr-7Ni-4Mo-N	S32750	A182-F53	A351-CD4MCu A890 5A	X2CrNiMoN25-7-4 DIN 10088-1 (95)	1.4501	service to 600F(316C)
	Super Austenitic 6Mo	20Cr-18Ni-6Mo	S31254	A182-F44	A351-CK3MCuN	X1CrNiMoCuN20-18-7 DIN 10088-1 (95)	1.4547	service to 600F(316C)
Nickel-Iron Alloy	Incoloy 825	42Ni-21.5Cr-3Mo-2.3Cu	N08825	B564-N08825	A494-CU5MCuC	DIN 17744	2.4858	service to 600F(316C) for N02200, 1200F(648C) for N02201
Nickel-Copper	Monel 400	67Ni-30Cu	N04400	B564-N04400	A494-M35-1	DIN 17730	2.4360	
Nickel Superalloys	Inconel 625	60Ni-22Cr-9Mo-3.5Cb	N06625	B564-N06625*	A494-CW-6MC		2.4856	*Difficult to forge in close dye
	Hastelloy C-276	54Ni-15Cr-16Mo	N10276	B564-N10276*	A494-CW-2M	NiMo 16 Cr 15 W	2.4819	*Difficult to forge in close dye
Titanium	Titanium	98Ti	R50400	B381-Gr2	B367-C2	Ti 2	3.7035	

CHEMICAL COMPOSITION

Body and Bonnet Materials

ASTM Material	**C %**	**Mn %**	**P %**	**S %**	**Si %**	**NI %**	**Cr %**	**Mo %**	**Co %**	**Other**
ASTM A105N	0.35 max	0.60 1.05	0.040 max	050 max	0.35	-	-	-	-	-
ASTM A350 LF2	0.30	0.60 1.35	0.035	0.040	0.15 0.30	-	-	-	-	-
ASTM 182 F304	0.08 max	2.0 max	0.040	0.030	1.00 max	8.00 11.00	18.00 20.00	-	-	-
ASTM 182 F316	0.08 max	2.0 max	0.040	0.030	1.00 max	10.00 14.00	16.00 18.00	2.00 3.00	-	-

Note: these charts are for reference only. IVM recommends customer engineers to analyze service requirements and specify the materials they consider optimum. OMB cannot be held liable for any damage occured due to the use of the tables.

MATERIALS

The following tables suggest standard combinations of body and bonnet materials and trim (stem, disc or wedge, seat) composition. Different combinations are available upon request.

TRIM STANDARD MATERIALS

Materials	*Description*	*Service Recommendations*	*Temperature*
Type 316 Stainless	18% Cr, 8% NI, 2% Mo Stainless Steel	For liquids and gasses corrosive	up to 850°F
MONEL	Nickel-Copper Alloy	Corrosive service such as acids, alkalies, salt solutions	up to 850°F
NACE	Specially treated 316 Trim combined with B7M Bolts and 2HM Nuts	To meet NACE MR-01-75 requirements	

CHEMICAL COMPOSITION

TRIM MATERIALS & BOLTING MATERIALS

ASTM Material	C %	Mn %	P %	S %	Si %	NI %	Cr %	Mo %	Co %	Other
ASTM A479 Type 304	0.08 max	2.00 max	0.045 max	0.030 max	1.00 max	8.00 10.50	18.00 20.00	-	-	-
ASTM A479 Type 316	0.08 max	2.00 max	0.045 max	0.030 max	1.00 max	10.00 14.00	16.00 18.00	-	-	-
ASTM B164 MONEL UNS N04400	0.30 max	2.00 max	-	0.024	0.50 max	63.0 min	-	-	28.0 34.0	Fe: 2.5 max
ASTM A193 B7	0.37 0.49	0.65 1.10	0.035 max	0.04 max	0.15 0.35	-	0.75 1.20	0.15 0.25	-	-
ASTM A193 B8	0.08 max	2.00 max	0.045 max	0.030 max	1.00 max	8.00 10.50	18.00 20.00	-	-	-
ASTM A194 2H	0.40 min	1.00 max	0.040 max	0.050 max	-	-	-	-	-	--
ASTM A194 Gr 8	0.08 max	2.00 max	0.045	0.30	1.00 max	8.00 10.5	18.00 20.00	-	-	-

ALL VALVES ARE IN STRICT ACCORDANCE WITH THE FOLLOWING STANDARDS

API 598	- Valve inspection and Testing
API 607	- Fire Safe Test Soft Seated
API 6FA	- Specification for Fire Test of Valves
API 6D	- Specification for Pipeline Valves
ANSI B 16.5	- Steel Pipe Flanges and Fittings
ANSI B 16.10	- Face-to-Face and End-to-End Dimension of Valves
ANSI B 16.11	- Forged Steel Fittings, Socket-Welding and Threaded
ANSI B 16.34	- Steel Valves, Flanged and Welded Ends
MSS SP 25	- Standard Marking System for Valves, Fittings, Flanges and Unions
MSS SP61	- Hydrostatic Testing of Steel Valves
MSS SP82	- Valves Pressure Testing Methods
BS 5351	- Specific for Ball Valve Petroleum, Petrolchemical and Allied Industries
BS 6364	- Valves for Cryogenic Servie
BS 6755	- Testing of Valves
NACE Standard MR 0175 - 2002	- Material Requirement - Sulfide Stress Cracking Resistant metallic material for Oil Field Equipment

CORROSIVE MEDIA	Carbon Steel	Stainless Steel 304	Stainless Steel 316	Inconel	Monel
Acetate Solvents, Crude	D	A	A	A	B
Acetate Solvents, Pure	C	A	A	A	A
Acetic Acid, 95%	D	B	A	A	A
Acetic Anhydride, Boiling	D	B	A	A	A
Acetone	B	A	A	A	A
Alcohols	B	A	A	A	A
Amines	B	A	A	A	A
Ammonia, Anhydrous	B	A	A	A	A
Ammonium Hydroxide, Hot	B	A	A	A	D
Ammonium Nitrate	B	A	A	A	C
Aniline Hydrochloride	D	D	C	B	B
Antimony Trichloride	D	D	C	B	B
Asphalt	B	A	A	A	A
Barium Chloride, 5%	C	A	A	A	A
Barium Hydroxide	C	A	A	A	A
Barium Nitrate	C	A	A	B	C
Benzene, Hot	B	A	A	A	A
Benzoic Acid	B	A	A	A	A
Blood	D	A	A	A	A
Bromine, Dry Gas	D	A	A	B	A
Bromine, Moist Gas	D	D	D	D	C
Buttermilk	D	A	A	A	A
Calcium Bisulfite, Hot	D	C	B	D	D
Calcium Chloride, Dilute	C	B	A	A	A
Calcium Hydroxide, 20%, Boiling	D	A	A	A	A
Calcium Hydrochloride, < 2%	C	C	B	B	C
Carbolic Acid, 90%	C	A	A	A	B
Carbon Dioxide, Dry	C	A	A	A	A
Carbon Disulphide	B	A	A	A	B
Chloroacetic Acid	D	D	C	B	B
Chloric Acid	D	D	C	C	C
Chlorinated Water, Sat.	D	D	C	C	C
Chlorine, Dry Gas	B	B	B	A	A
Chlorine, Moist Gas	D	D	C	D	C
Citric Acid, Dilute	D	A	A	A	A
Citric Acid, Hot, Conc.	D	C	B	B	B
Creosote, Hot	B	A	A	A	A
Cupric Chloride, 5%	D	D	C	D	D
Ethyl Chloride	A	A	A	A	A
Ethylene Glycol	A	A	A	A	A
Ferric Chloride < 1%	D	C	B	B	C
Ferric Nitrate, 5%	D	B	A	C	D
Ferric Sulfate, 5%	D	B	A	B	C
Ferrous Sulfate, 10%	C	A	A	B	A
Flourine, Dry Gas	C	C	B	A	A
Flourine, Moist Gas	D	D	D	B	A
Freon, Wet	C	C	C	B	A
Fuel Oil, 140°F	A	A	A	A	B

CORROSIVE MEDIA	Carbon Steel	Stainless Steel 304	Stainless Steel 316	Inconel	Monel
Furfural	B	B	B	B	B
Gasoline Sour	B	A	A	C	C
Gasoline Refined	A	A	A	B	A
Gelatine	D	B	A	A	A
Glucose	B	A	A	A	A
Glycerine	B	A	A	A	A
Hydrofluoric Acid, Boiling	D	D	D	D	B
Hydrofluosilicic Acid	D	D	C	B	A
Hydrogen Chloride, Dry	B	D	C	A	A
Hydrogen Chloride, Moist	D	D	D	D	C
Hydrogen Fluoride, Dry	C	D	C	A	A
Hydrogen Peroxide, Boiling	D	C	B	B	B
Hydrogen Sulfide, Dry	B	A	A	A	A
Hydrogen Sulfide, Moist	C	B	A	A	B
Iodine, Dry	D	D	B	A	A
Kerosene	A	A	A	A	A
Lactic Acid, 5%	D	B	A	A	B
Lactic Acid, 10%	D	B	A	A	B
Lactic Acid, Boiling, 5%	D	C	B	B	C
Lactic Acid, Boiling, 10%	D	D	B	B	C
Lead Acetate, Hot	D	A	A	B	B
Magnesium Chloride, Hot, 5%	D	C	B	A	A
Magnesium Hydroxide	B	A	A	A	A
Magnesium Sulfate	B	A	A	B	A
Magnesium Sulfate, Boiling	C	A	A	C	A
Mercury	B	A	A	A	B
Mercuric Chloride, < 2%	D	D	D	D	D
Mercuric Cyanide	D	B	B	B	D
Methyl Chloride, Dry	D	B	B	A	A
Milk	D	A	A	A	B
Molasses	B	A	A	A	A
Naptha	B	A	A	A	A
Nickel Chloride	D	C	B	B	B
Nickel Sulfate, Boiling	D	C	C	B	A
Nitric Acid, 20%	D	A	A	B	D
Nitric Acid, Boiling, Conc.	D	D	D	D	D
Nitrous Acid	D	B	B	B	C
Nitrobenzene	D	B	A	B	B
Oils - Miner.	B	A	A	C	B
Oxalic Acid, Boiling, 10%	C	A	A	A	A
Oxalic Acid, Boiling, 50%	D	D	C	B	B
Oxygen	B	A	A	A	A
Picric Acid	C	A	A	D	D
Potassium Bromide	D	C	B	A	A
Potassium Carbonate	B	A	A	A	A
Potassium Chlorate	B	A	A	A	B
Potassium Chloride	D	A	A	A	A
Potassium Chloride, Hot	D	C	B	B	A

CORROSIVE MEDIA	Carbon Steel	Stainless Steel 304	Stainless Steel 316	Inconel	Monel
Potassium Cyanide	B	B	B	B	B
Potassium Sulfate, Dil.	B	A	A	A	A
Propane, Liquid & Gas	B	A	A	A	A
Pyrogallic Acid	B	A	A	B	A
Rosin, Molten	D	A	A	A	A
Salicylic Acid	D	B	B	B	B
Silver Bromide	D	B	A	C	B
Silver Chloride	D	D	D	C	B
Silver Nitrate	D	A	A	A	C
Sodium Acetate	C	A	A	A	A
Sodium Bisulfate	D	B	B	B	A
Sodium Bromide, Dil.	D	B	B	B	A
Sodium Cyanide	B	B	B	B	A
Sodium Fluoride, 5%	D	B	A	B	A
Sodium Hydroxide, 50%	B	A	A	A	A
Sodium Hyposulfite	D	B	A	B	A
Sodium Nitrate	B	B	A	A	B
Sodium Perborate	C	A	A	A	B
Sodium Peroxide	C	A	A	A	B
Sodium Phosphate, Tribasic	C	A	A	A	A
Sodium Silicate	B	A	A	A	B
Sodium Thiosulfate	D	B	A	B	B
Stannous Chloride, Sat.	D	D	B	B	B
Steam, 212°F	A	A	A	A	A
Steam, 600°F	C	A	A	A	A
Sulfite Liquors	D	C	B	D	D
Sulfur Chloride	D	C	D	B	B
Sulfur Dioxide, Moist	D	B	A	D	D
Sulfuric Acid, Conc.	B	B	B	B	D
Sulfurous Acid, Sat.	D	B	B	D	D
Tannic Acid, 10%	D	A	A	B	A
Tar, Hot	B	A	A	A	B
Tartaric Acid, 120°F	D	B	A	A	A
Toluene	A	A	A	A	A
Trichlorethylene	B	A	A	A	A
Turpentine	B	A	A	A	A
Varnish, Hot	C	A	A	A	A
Vegetable Oils	B	A	A	A	B
Vinegar	D	A	A	A	A
Water, Acid Mine	D	A	A	A	C
Water, Boiler Feed	B	A	A	A	A
Water, Distilled	D	A	A	A	A
Water, Salt Sea	D	C	B	B	A
Whiskey, Boiling	D	A	A	A	C
Wine	D	A	A	A	C
Xylene, Boiling	D	A	A	A	A
Zinc Chloride, 5%	D	C	B	B	B
Zinc Sulfate, Boiling	D	A	A	B	A

A = Substantial resistance - Preferred material of construction.
B = Moderate resistance - Satisfactory for use under most conditions.
C = Questionable resistance - Use with caution.
D = Inadequate resistance - Not recommended.

OMB doesn't assume any responsibility from the use of a.m. data which are purely theoretical. The user must verify the best conditions of use.

NOTE

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