



KAVAL INDUSTRIES LTD.



# FLOATING BALL VALVE

# ABOUT US

KAVAL is a Canadian valve fabricator, providing customers with gate, globe, check, floating and trunnion ball valves as well as butterfly valves, etc. Our valve is complete range of sizes and ratings for industries of oil and gas, chemistry, power generation, refinery, fertilizer, steel, sugar and paper etc..

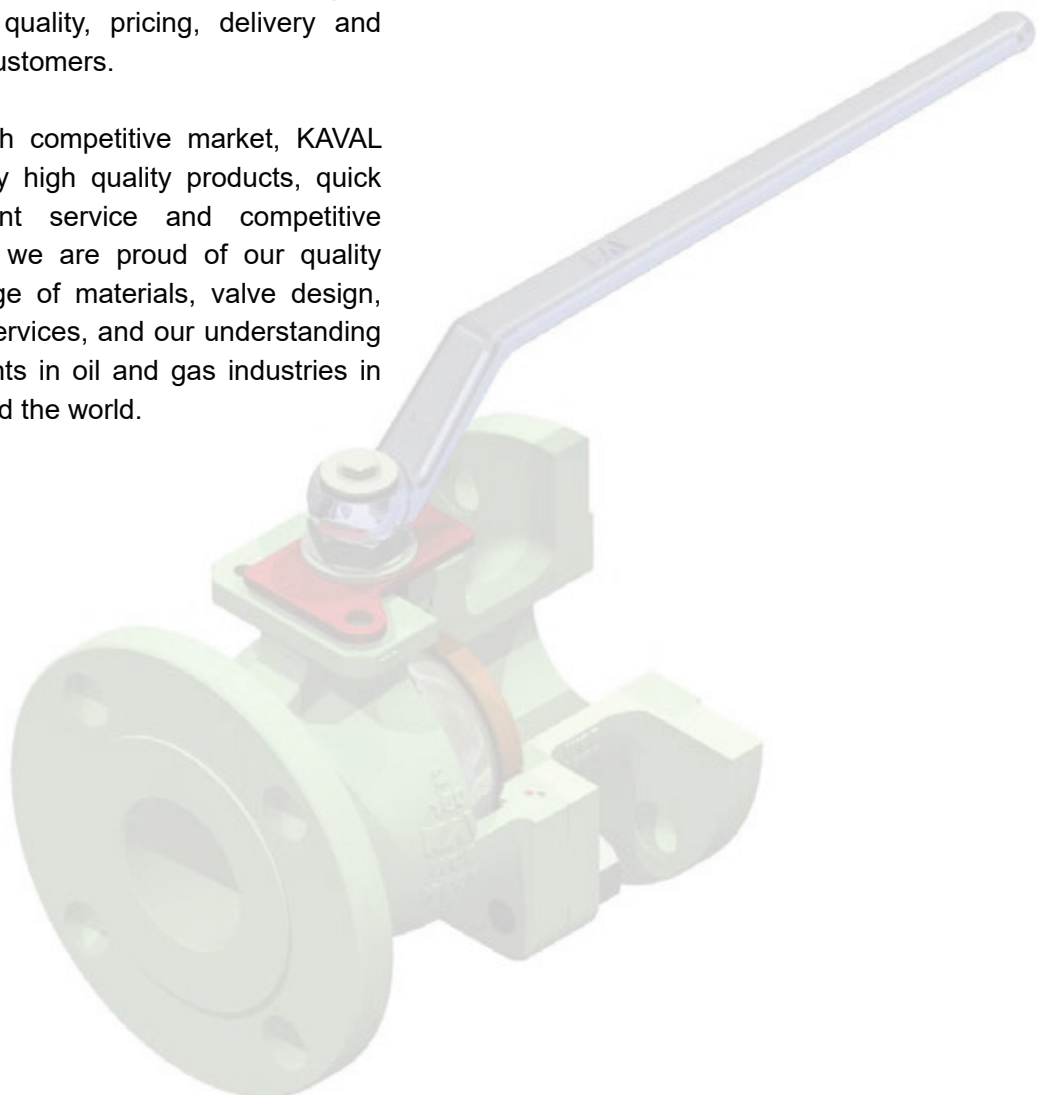
KAVAL has production and distribution centers in Calgary, Canada and Nanjing, China, consisting of experienced RD, QA/QC, Engineering and production teams, to provide customers in the world with flow control solutions, products and technical supports.

KAVAL is ISO 9000 certified. KAVAL valve design meets industry standards, including API 6D, API 600, API 594, ASME B16.34, CSA Z245.15, and tested as per API 598, API 6D, API 607. Our products meet the most stringent requirements in quality, pricing, delivery and services by our customers.

In the very tough competitive market, KAVAL wins its share by high quality products, quick delivery, excellent service and competitive price. In KAVAL we are proud of our quality control, knowledge of materials, valve design, fabrication, our services, and our understanding about requirements in oil and gas industries in North America and the world.

Our international team is composed of experts of valve design, valve manufacture, material production, oil and gas production, EPC, etc. Based on know-how and know-why, we provide our clients with result-oriented flow control solutions for their projects, including selection of materials, specification of valves, etc. rather than only valve products, to meet our client particular applications.

Matching up the market requirement and technology development, we have been dedicating on developing products and services to best meet our client's needs in various industries. Client's success is our achievement. Our experienced staff, high standards of excellence, expertise in problem solving and variety of our products will provide our clients with fully satisfaction.



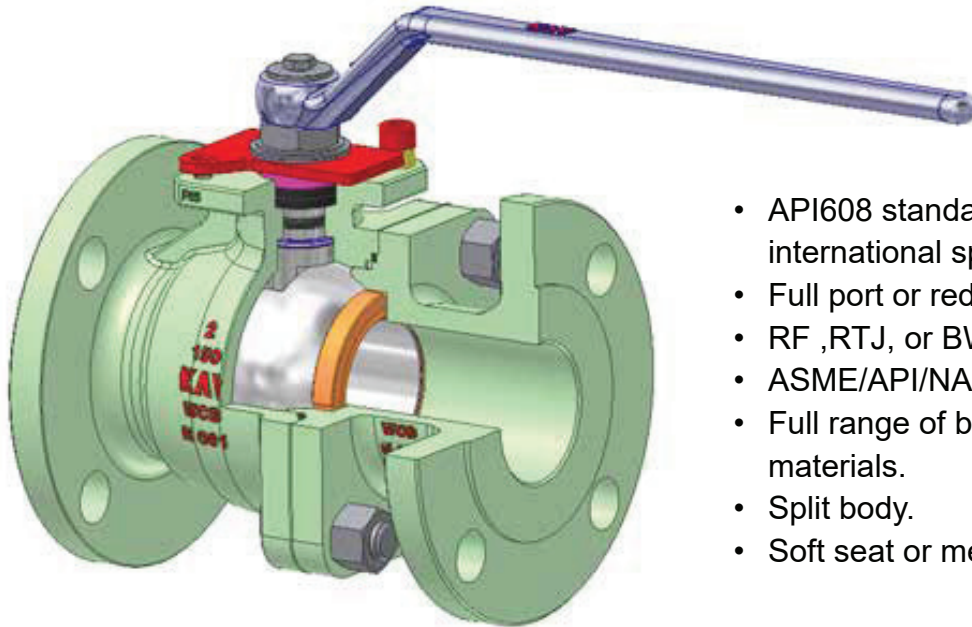
# HOW TO ORDER

	TYPE OF VALVE	MODEL	SIZE	PORT	CLASS	END CONNECTION	BODY	TRIM (seal face + stem )	OPERATOR
	A	B	C	D	E	F	G	H	I
EG:	KFA	B	02	R	01	R	01	01	L

**Example:** FLOATING BALL, STANDARD, 2PC, BOLTED BONNET, NPS 2", REGULAR PORT, CLASS 150, RAISED FACE, WCB BODY, SEAT & BALL, STEM ENP, RPTFE SEAT, LEVER OPERATOR

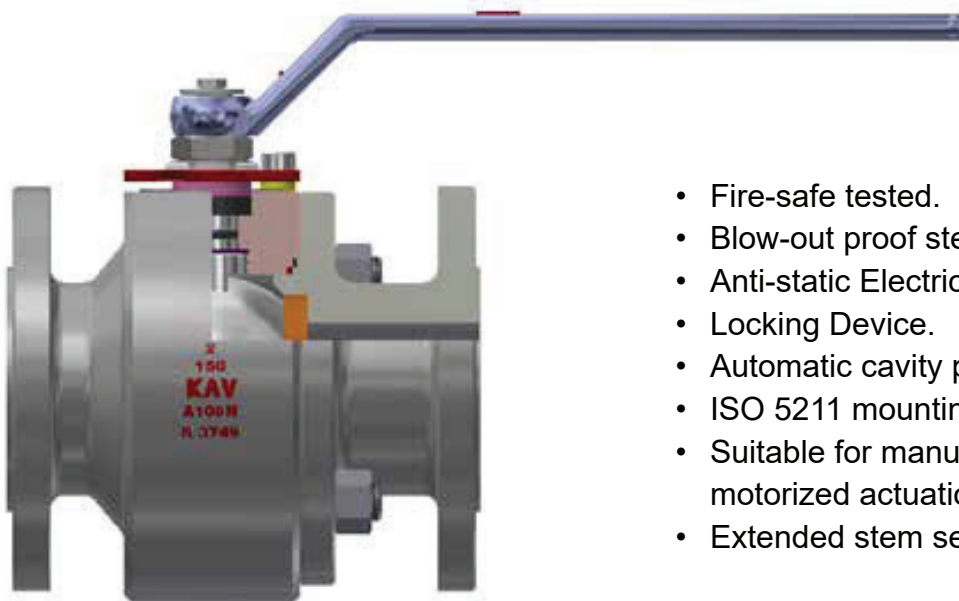
<b>A</b>	KFA = FLOATING BALL, STANDARD KFB = FLOATING BALL, CRYOGENIC KFC = FLOATING BALL, SPECIAL		KTA = TRUNNION BALL, DBB KTB = TRUNNION BALL, DPE X DPE KTC = TRUNNION BALL, DPE X SPE KTD = TRUNNION BALL, CRYOGENIC			
<b>B</b>	A = 1PC, SIDE ENTRY B = 2PC, BOLTED BONNET C = 3PC, BOLTED BONNET D = 2PC, THREADED BONNET		E = 3PC, THREADED BONNET F = 2PC, WELDED BONNET G = 3PC, WELDED BONNET H = 1PC, TOP ENTRY			
<b>C</b>	07 = 1/4" 09 = 3/8" 11 = 1/2" 13 = 3/4" 01 = 1" 15 = 1 1/4" 17 = 1 1/2" 02 = 2" 25 = 2 1/2"	03 = 3" 04 = 4" 05 = 5" 06 = 6" 08 = 8" 10 = 10" 12 = 12" 14 = 14" 16 = 16"	18 = 18" 20 = 20" 22 = 22" 24 = 24" 26 = 26" 28 = 28" 30 = 30" 32 = 2" 34 = 34"	36 = 36" 40 = 40" 42 = 42" 48 = 48" 56 = 56" 60 = 60"		
<b>D</b>	R = REGULAR      F = FULL					
<b>E</b>	01 = 150 03 = 300 04 = 400	06 = 600 08 = 800 09 = 900	15 = 1500 25 = 2500 45 = 4500	10 = 1000 20 = 2000 30 = 3000	40 = 4000 50 = 5000 60 = 6000	70 = 10000 80 = 15000 90 = 20000
<b>F</b>	R = RAISED FACE J = RTJ	W = BUTT WELD S = SOCKET WELD	N = NPT FEMALE M = NPT MALE	P = SW X NPT		
<b>G</b>	01 = WCB,WCC 02 = LCB 03 = LCC 04 = CF8M 05 = CF8	06 = CF3M 07 = CF3 08 = CA15 09 = WC6 10 = WC9	11 = A105N 12 = LF2 13 = 316 14 = 304 15 = 316L	16 = 304L 17 = F6A 18 = F11 19 = F22 20 = F91	21 = 4A 22 = F51 23 = 5A 24 = F53	25 = A494 M35-1(MONEL 400) 26 = A351 CN7M(B473 N08026) 27 = A494 CW6MC(B564 N06625) 28 = A494 CW2M(B564 N10276) 29 = A494 CU5MCUC(B564 N08825)
<b>H</b>	01= ENP+RPTFE 02= ENP+NYLON/ DEVLON 03= ENP+PEEK 04= ENP,316+RPTFE 05= ENP,316+NYLON/ DEVLON 06= ENP,316+PEEK 07= ENP,F6A+RPTFE 08= ENP,F6A+NYLON/ DEVLON 09= ENP,F6A+PEEK 10= ENP,17-4PH+RPTFE	11= ENP,17-4PH+NYLON/ DEVLON 12= ENP,17-4PH+PEEK 13= 316,316+RPTFE 14= 316,316+NYLON/ DEVLON 15= 316,316+PEEK 16= 316,F51+RPTFE 17= 316,F51+NYLON/ DEVLON 18= 316,F51+PEEK 19= F51,F51+RPTFE 20= F51,F51+NYLON/ DEVLON	21= F51,F51+PEEK 22= 6A,F6A+RPTFE 23= F6A,F6A+NYLON/ DEVLON 24= F6A,F6A+PEEK 50= CS,410+ HF 51= CS,17-4PH+ HF 52= CS,F51+ HF 53= 316,410+ HF 54= 316,17-4PH+ HF 55= 316,F51+ HF			
<b>I</b>	G = MANUAL GEAR L = LEVER	B = BARE STEM S = SPRING LEVER	E = ELECTRIC A = GAS HYDRAULIC			

## Casting Floating Ball Valve



- API608 standard and applicable international specifications as required.
- Full port or reduce port design.
- RF ,RTJ, or BW end connections.
- ASME/API/NACE/DIN materials.
- Full range of body, bonnet and trim materials.
- Split body.
- Soft seat or metal seat available.

## Forged Floating Ball Valve



- Fire-safe tested.
- Blow-out proof stem.
- Anti-static Electricity.
- Locking Device.
- Automatic cavity pressure relief.
- ISO 5211 mounting pad.
- Suitable for manual (wrench or gear) or motorized actuation (hydraulic,pneumatic).
- Extended stem service.

## DESIGN FEATURES

### BI-DIRECTIONAL SEALING

With the bi-directional sealing design of KAVAL floating ball valves, either end can be installed upstream without compromising the integrity of the bubble-tight seal.

### FLOATING BALL DESIGN DELIVERS TIGHT SEAL

The ground and polished ball is free to float and mates perfectly with the conical seats for a positive leakproof seal. Self cleaning and self adjusting, the ball is also pressure activated. The higher the line pressure, the tighter the seal.

### DEEP RECESSED SEATS

The seat is recessed into a deep machined pocket, which serves to surround and protect the seat on all sides. This design eliminates cold flow of the soft seats into the valve conduit where the seats can be damaged by the action of the ball or the flow medium. The result is extremely long service life.

### DOUBLE PACKING SEAL AND LIVE LOAD FEATURES

Primary O-ring and secondary fire safe flexible graphite stem seal are standard for all KAVAL ball valves which provide low break torque, excellent emission control, and good chemical and thermal resistance. Belleville spring washers are used to achieve live loading and minimize the need to retighten packing.

### BODY SEAL

PTFE as primary body seal, fully captured graphite packing provided secondary fire safe seal.

### FIRE-TESTED FOR SAFETY

All KAVAL valves are qualified under API STD 607. The pocketed seat and locked in stem design contribute to its excellent fire proof characteristics. Should the soft seats be destroyed by fire, the ball floats downstream, providing a tight metal to metal seal against the lip of the seat pocket. If the primary seals are destroyed, the secondary graphite seal both on the body connection and on the stem retards external leakage.

### INTEGRAL ISO ACTUATOR MOUNTING PAD

Top work flange dimensions are in accordance the ISO5211 standard, which provides easy installation of actuators and locking device.

### ANTISTATIC

The valve stem has a built in antistatic device which ensures continuous contact of stem-to-ball and stem-to-body.

## INDICATOR HANDLE

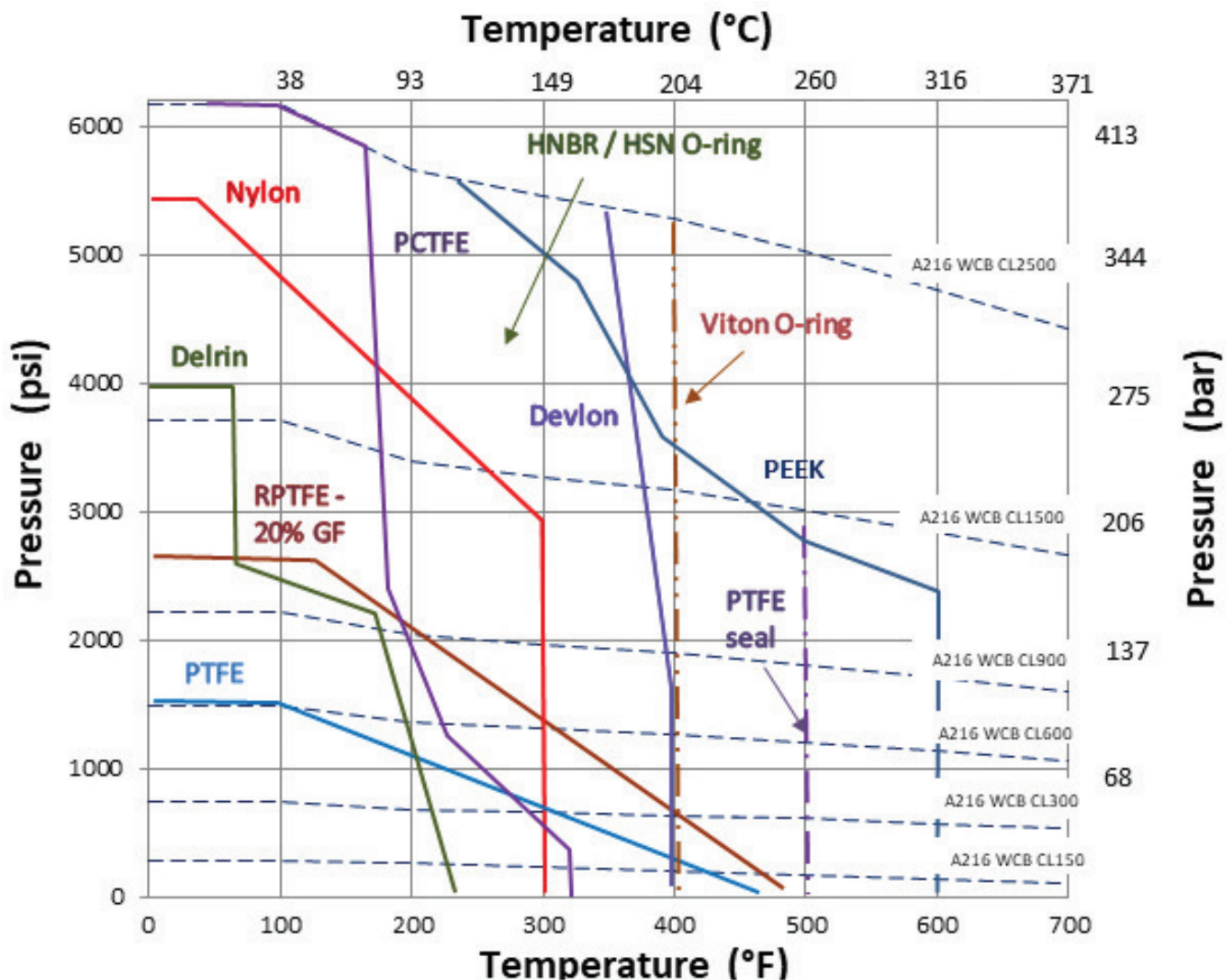
The design of the handle installation on the stem in the correct position only, in alignment with the ball port. When the handle is aligned with the pipe, the valve is open. When the handle is perpendicular to the pipe, the valve is closed.

## BODY AND TRIM MATERIALS

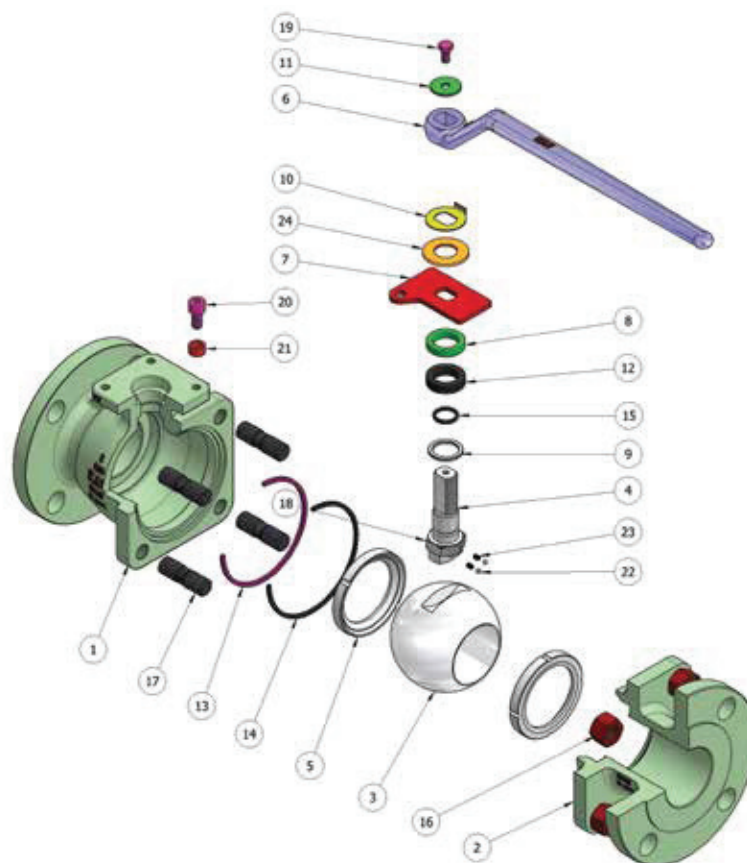
The standard valve body materials are Stainless Steel, Carbon Steel. Other materials are also available. Standard trim materials are 316 Stainless Steel and Carbon Steel. Trim material such as Hastelloy-C, Alloy-20, Monel and other materials are available for specific applications.

## PRESSURE/TEMPERATURE RATINGS

The pressure-temperature ratings for KAVAL's floating ball valves are determined by the body material and the seat material rating. The chart is indicative of the standard seat materials, for ratings of other materials, contact the technical department of KAVAL.



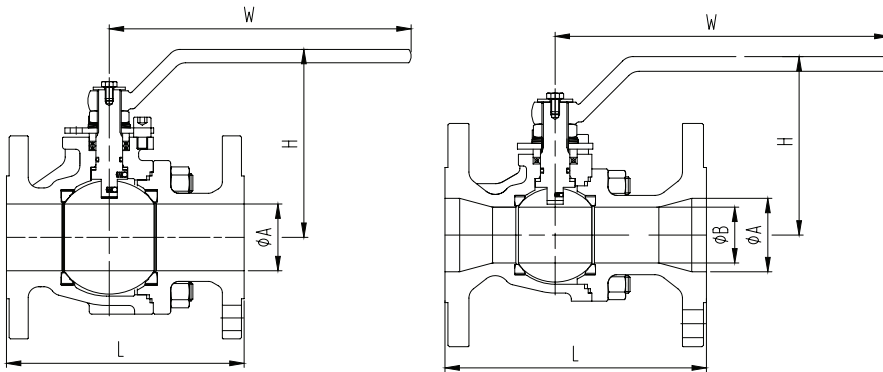
# STANDARD MATERIAL SELECTION



## STANDARD MATERIALS OF FLOATING BALL VALVE

NO.	Parts Name	Normal Temperature Service	Low Temperature Service	Stainless Steel for Server
1	Body (Casting)	ASTM A216 WCB	ASTM A352 LCC	ASTM A351 CF8M
	Body (Forged)	ASTM A105N	ASTM A350 LF2	ASTM A182 F316
2	Adapter(Casting)	ASTM A216 WCB	ASTM A352 LCC	ASTM A351 CF8M
	Adapter (Forged)	ASTM A105N	ASTM A350 LF2	ASTM A182 F316
3	Ball	ASTM A105N+ENP	ASTM A350 LF2+ENP	ASTM A182 F316
4	Stem	ASTM A182 F6a	ASTM A182 F6a	ASTM A182 F316
5	Seat	RPTFE/NYLON/DEVLON/PEEK		
6	Handle	ASTM A216 WCB	ASTM A216 WCB	ASTM A216 WCB
7	Stopper	Carbon steel	Carbon steel	Carbon steel
8	Gland	ASTM A276 316	ASTM 276 316	
9	Thrust Washer	PTFE	PTFE	PTFE
10	Lock Washer	Carbon steel	Carbon steel	Carbon steel
11	Washer	Carbon steel	Carbon steel	Carbon steel
12	Packing	Graphite	Graphite	Graphite
13	Body Seal	PTFE	PTFE	PTFE
14	Body Gasket	Graphite	Graphite	Graphite
15	O Ring	VITON	VITON	VITON
16	Body Stud	ASTM A193 B7	ASTM A320 L7	ASTM A193 B8M
17	Body Nut	ASTM A194 2H	ASTM A194 7	ASTM A194 8M
18	Stem Nut	ASTM A193 B7	ASTM A320 L7	ASTM A193 B8M
19	Stem Bolt	CARBON STEEL	CARBON STEEL	CARBON STEEL
20	Stop Screw	ASTM A193 B7	ASTM A320 L7	ASTM A193 B8M
21	Stop Sleeve	ASTM A276 410	ASTM A276 410	ASTM A276 410
22	Antistatic Ball	SS316	SS316	SS316
23	Antistatic Spring	SS316	SS316	SS316
24	Belleville Spring	AS 9262	AS 9262	AS 9262

\*Seat material will be determined according to temperature/pressure rating and fluid.



Design and Manufacture: API 608  
 Face to Face dimensions: ASME B16.10  
 Flange Ends: ASME B16.5  
 BW Ends: ASME B16.25  
 Pressure Temperature Ratings: ASME B16.34  
 Pressure Testing: API 598

### CLASS 150 FULL & REGULAR PORT

NPS	in	1/2"	3/4"X1/2"	3/4"	1"X3/4"	1"	1 1/2"X1"	1 1/2"	2"X1 1/2"	2"	3"x2"	3"	4"X3"	4"	6"X4"	6"	8"X6"
DN	mm	15	20X15	20	25X20	25	40X25	40	50X40	50	80X50	80	100X80	100	150X100	150	200X150
A	in	0.44"	0.68"	0.68"	0.94"	0.94"	1.44"	1.44"	1.94"	1.94"	2.94"	2.94"	3.94"	3.94"	5.94"	5.94"	7.94"
	mm	11	17	17	24	24	37	37	49	49	74	75	100	100	150	151	201
B	in	-	0.44"	-	0.68"	-	0.94"	-	1.44"	-	1.94"	-	2.94"	-	3.94"	-	5.94"
	mm	-	11	-	17	-	24	-	37	-	49	-	74	-	100	-	150
L(RF)	in	4.25"	4.62"	4.62"	5.00"	5.00"	6.50"	6.50"	7.0"	7.0"	8.0"	8.0"	9.0"	9.0"	15.5"	15.5"	18.0"
	mm	108	117	117	127	127	165	165	178	178	203	203	229	229	394	394	457
L1(BW)	in	5.50"	6.00"	6.00"	6.50"	6.50"	7.50"	7.50"	8.5"	8.5"	11.1"	11.1"	12.0"	12.0"	18.0"	18.0"	20.5"
	mm	140	152	152	165	165	190	190	216	216	283	283	305	305	457	457	521
W	in	6.3"	6.3"	6.3"	6.3"	7.87"	7.87"	9.84"	9.84"	9.84"	9.84"	16.5"	16.5"	16.5"	16.5"	23.6"	23.6"
	mm	160	160	160	160	200	200	250	250	250	250	420	420	420	420	600	600
H	in	2.76"	2.76"	3.5"	3.5"	4.2"	4.2"	4.9"	4.9"	5.75"	5.75"	8.2"	8.2"	9.1"	9.1"	12.0"	12.0"
	mm	70	70	89	89	107	107	125	125	146	146	208	208	230	230	305	305
WT(RF)	kg	1.5	1.8	2.0	4.0	5.0	6.0	7.0	8.5	11.5	17	25	30	37	51	81	107

\* Lever Operator

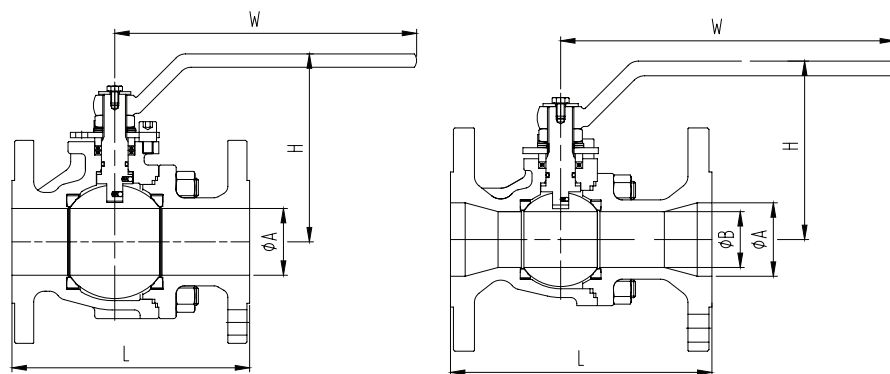
### CLASS 300 FULL & REGULAR PORT

NPS	in	1/2"	3/4"X1/2"	3/4"	1"X3/4"	1"	1 1/2"X1"	1 1/2"	2"X1 1/2"	2"	3"x2"	3"	4"X3"	4"	6"X4"	6"	8"X6"
DN	mm	15	20X15	20	25X20	25	40X25	40	50X40	50	80X50	80	100X80	100	150X100	150	200X150
A	in	0.44"	0.68"	0.68"	0.94"	0.94"	1.44"	1.44"	1.94"	1.94"	2.94"	2.94"	3.94"	3.94"	5.94"	5.94"	7.94"
	mm	11	17	17	24	24	37	37	49	49	74	75	100	100	150	151	201
B	in	-	0.44"	-	0.68"	-	0.94"	-	1.44"	-	1.94"	-	2.94"	-	3.94"	-	5.94"
	mm	-	11	-	17	-	24	-	37	-	49	-	74	-	100	-	150
L(RF)	in	5.5"	6.0"	6.0"	6.5"	6.5"	7.5"	7.5"	8.5"	8.5"	11.12"	11.12"	12.0"	12.0"	15.88"	15.88"	19.75"
	mm	140	152	152	165	165	190	190	216	216	283	283	305	305	403	403	502
L1(BW)	in	5.5"	6.0"	6.0"	6.5"	6.5"	7.5"	7.5"	8.5"	8.5"	11.12"	11.12"	12.0"	12.0"	18.0"	18.0"	20.5"
	mm	140	152	152	165	165	190	190	216	216	283	283	305	305	457	457	521
W	in	6.3"	6.3"	6.3"	6.3"	7.87"	7.87"	9.84"	9.84"	9.84"	9.84"	16.5"	16.5"	23.6"	23.6"	31.5"	31.5"
	mm	160	160	160	160	200	200	250	250	250	250	420	420	600	600	800	800
H	in	2.76"	2.76"	3.5"	3.5"	4.2"	4.2"	4.9"	4.9"	5.75"	5.75"	8.2"	8.2"	10.24"	10.24"	13.2"	13.2"
	mm	70	70	89	89	107	107	125	125	146	146	208	208	260	260	335	335
WT(RF)	kg	1.6	2.0	2.5	4.8	5.8	7.0	8.5	11	14	24	32	42	52	72	104	142

\* Lever Operator



## Casting Floating Ball Valve



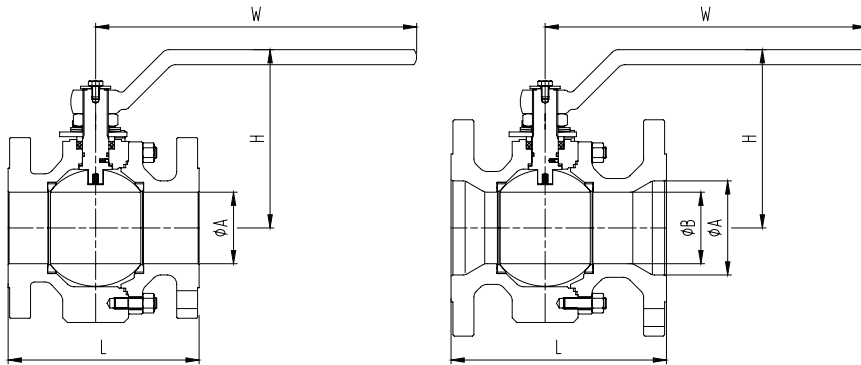
Design and Manufacture: API 608  
 Face to Face dimensions: ASME B16.10  
 Flange Ends: ASME B16.5  
 BW Ends: ASME B16.25  
 Pressure Temperature Ratings: ASME B16.34  
 Pressure Testing: API 598

### CLASS 600 FULL & REGULAR PORT

NPS	in	1/2"	3/4"X1/2"	3/4"	1"X3/4"	1"	1 1/2"X1"	1 1/2"	2"X1 1/2"	2"	3"x2"	3"	4"X3"	4"
DN	mm	15	20X15	20	25X20	25	40X25	40	50X40	50	80X50	80	100X80	100
A	in	0.44"	0.68"	0.68"	0.94"	0.94"	1.44"	1.44"	1.94"	1.94"	2.94"	2.94"	3.94"	3.94"
	mm	11	17	17	24	24	37	37	49	49	74	75	100	100
B	in	-	0.44"	-	0.68"	-	0.94"	-	1.44"	-	1.94"	-	2.94"	-
	mm	-	11	-	17	-	24	-	37	-	49	-	74	-
L(RF)	in	6.5"	7.5"	7.5"	8.5"	8.5"	9.5"	9.5"	11.5"	11.5"	14.0"	14.0"	17.0"	17.0"
	mm	165	190	190	216	216	241	241	292	292	356	356	432	432
L1(BW)	in	6.5"	7.5"	7.5"	8.5"	8.5"	9.5"	9.5"	11.5"	11.5"	14.0"	14.0"	17.0"	17.0"
	mm	165	190	190	216	216	241	241	292	292	356	356	432	432
W	in	6.3"	6.3"	6.3"	6.3"	7.87"	7.87"	16.5"	16.5"	16.5"	16.5"	23.6"	23.6"	31.5"
	mm	160	160	160	160	200	200	420	420	420	420	600	600	800
H	in	2.76"	2.76"	3.5"	3.5"	4.6"	4.6"	6.9"	6.9"	6.9"	6.9"	9.3"	9.3"	11.0"
	mm	70	70	89	89	117	117	175	175	175	175	235	235	280
WT(RF)	kg	3.0	4.0	4.5	6.1	9.0	13	16	18	20	29.5	43	65	88

\* Lever Operator

## Forged Floating Ball Valve



Design and Manufacture: API 608  
 Face to Face dimensions: ASME B16.10  
 Flange Ends: ASME B16.5  
 BW Ends: ASME B16.25  
 Pressure Temperature Ratings: ASME B16.34  
 Pressure Testing: API 598

### CLASS 150 FULL & REGULAR PORT

NPS	in	1/2"	3/4"X1/2"	3/4"	1"X3/4"	1"	1 1/2"X1"	1 1/2"	2"X1 1/2"	2"	3"x2"	3"	4"X3"	4"	6"X4"	6"	8"X6"
DN	mm	15	20X15	20	25X20	25	40X25	40	50X40	50	80X50	80	100X80	100	150X100	150	200X150
A	in	0.44"	0.68"	0.68"	0.94"	0.94"	1.44"	1.44"	1.94"	1.94"	2.94"	2.94"	3.94"	3.94"	5.94"	5.94"	7.94"
	mm	11	17	17	24	24	37	37	49	49	74	75	100	100	150	151	201
B	in	-	0.44"	-	0.68"	-	0.94"	-	1.44"	-	1.94"	-	2.94"	-	3.94"	-	5.94"
	mm	-	11	-	17	-	24	-	37	-	49	-	74	-	100	-	150
L(RF)	in	4.25"	4.62"	4.62"	5.00"	5.00"	6.50"	6.50"	7.0"	7.0"	8.0"	8.0"	9.0"	9.0"	10.5"	15.5"	11.5"
	mm	108	117	117	127	127	165	165	178	178	203	203	229	229	267	394	292
L1(BW)	in	5.50"	6.00"	6.00"	6.50"	6.50"	7.50"	7.50"	8.5"	8.5"	11.1"	11.1"	12.0"	12.0"	15.88"	18.0"	16.5"
	mm	140	152	152	165	165	190	190	216	216	283	283	305	305	403	457	419
W	in	6.3"	6.3"	6.3"	6.3"	7.87"	7.87"	9.84"	9.84"	9.84"	9.84"	16.5"	16.5"	16.5"	16.5"	23.6"	23.6"
	mm	160	160	160	160	200	200	250	250	250	250	420	420	420	420	600	600
H	in	3.0"	3.0"	3.43"	3.43"	3.94"	3.94"	4.9"	4.9"	5.75"	5.75"	7.5"	7.5"	8.3"	8.3"	11.6"	11.6"
	mm	76	76	87	87	100	100	125	125	146	146	190	190	210	210	295	295
WT(RF)	kg	2.5	2.8	3.5	4.5	6.0	8.0	10.0	13	17	23	28	34	48	60	93	100

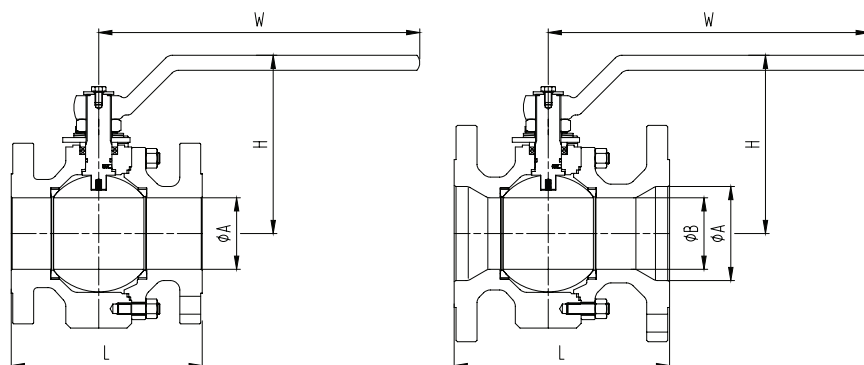
\* Lever Operator

### CLASS 300 FULL & REGULAR PORT

NPS	in	1/2"	3/4"X1/2"	3/4"	1"X3/4"	1"	1 1/2"X1"	1 1/2"	2"X1 1/2"	2"	3"x2"	3"	4"X3"	4"	6"X4"	6"	8"X6"
DN	mm	15	20X15	20	25X20	25	40X25	40	50X40	50	80X50	80	100X80	100	150X100	150	200X150
A	in	0.44"	0.68"	0.68"	0.94"	0.94"	1.44"	1.44"	1.94"	1.94"	2.94"	2.94"	3.94"	3.94"	5.94"	5.94"	7.94"
	mm	11	17	17	24	24	37	37	49	49	74	75	100	100	150	151	201
B	in	-	0.44"	-	0.68"	-	0.94"	-	1.44"	-	1.94"	-	2.94"	-	3.94"	-	5.94"
	mm	-	11	-	17	-	24	-	37	-	49	-	74	-	100	-	150
L(RF)	in	5.5"	6.0"	6.0"	6.5"	6.5"	7.5"	7.5"	8.5"	8.5"	11.12"	11.12"	12.0"	12.0"	15.88"	15.88"	16.5"
	mm	140	152	152	165	165	190	190	216	216	283	283	305	305	403	403	419
L1(BW)	in	5.5"	6.0"	6.0"	6.5"	6.5"	7.5"	7.5"	8.5"	8.5"	11.12"	11.12"	12.0"	12.0"	15.88"	15.88"	16.5"
	mm	140	152	152	165	165	190	190	216	216	283	283	305	305	403	403	419
W	in	6.3"	6.3"	6.3"	6.3"	7.87"	7.87"	9.84"	9.84"	9.84"	9.84"	16.5"	16.5"	23.6"	23.6"	31.5"	31.5"
	mm	160	160	160	160	200	200	250	250	250	250	420	420	600	600	800	800
H	in	3.0"	3.0"	3.43"	3.43"	3.94"	3.94"	4.9"	4.9"	5.75"	5.75"	7.5"	7.5"	8.3"	8.3"	11.6"	11.6"
	mm	76	76	87	87	100	100	125	125	146	146	190	190	210	210	295	295
WT(RF)	kg	3.0	3.5	4.3	6.0	7.0	11	13	16	20	30	40	45	63	81	130	162

\* Lever Operator

## Forged Floating Ball Valve



Design and Manufacture: API 608  
 Face to Face dimensions: ASME B16.10  
 Flange Ends: ASME B16.5  
 BW Ends: ASME B16.25  
 Pressure Temperature Ratings: ASME B16.34  
 Pressure Testing: API 598

### CLASS 600 FULL & REGULAR PORT

NPS	in	1/2"	3/4"X1/2"	3/4"	1"X3/4"	1"	1 1/2"X1"	1 1/2"	2"X1 1/2"	2"	3"x2"	3"	4"X3"	4"
DN	mm	15	20X15	20	25X20	25	40X25	40	50X40	50	80X50	80	100X80	100
A	in	0.44"	0.68"	0.68"	0.94"	0.94"	1.44"	1.44"	1.94"	1.94"	2.94"	2.94"	3.94"	3.94"
	mm	11	17	17	24	24	37	37	49	49	74	75	100	100
B	in	-	0.44"	-	0.68"	-	0.94"	-	1.44"	-	1.94"	-	2.94"	-
	mm	-	11	-	17	-	24	-	37	-	49	-	74	-
L(RF)	in	6.5"	7.5"	7.5"	8.5"	8.5"	9.5"	9.5"	11.5"	11.5"	14.0"	14.0"	17.0"	17.0"
	mm	165	190	190	216	216	241	241	292	292	356	356	432	432
L1(BW)	in	6.5"	7.5"	7.5"	8.5"	8.5"	9.5"	9.5"	11.5"	11.5"	14.0"	14.0"	17.0"	17.0"
	mm	165	190	190	216	216	241	241	292	292	356	356	432	432
W	in	6.3"	6.3"	6.3"	6.3"	7.87"	7.87"	16.5"	16.5"	16.5"	16.5"	23.6"	23.6"	31.5"
	mm	160	160	160	160	200	200	420	420	420	420	600	600	800
H	in	3.35"	3.35"	3.86"	3.86"	4.7"	4.7"	6.9"	6.9"	6.9"	6.9"	9.3"	9.3"	11.0"
	mm	85	85	98	98	120	120	175	175	175	175	235	235	280
WT(RF)	kg	6.5	8.0	8.5	10	12	15	19	24	26	42	60	82	110

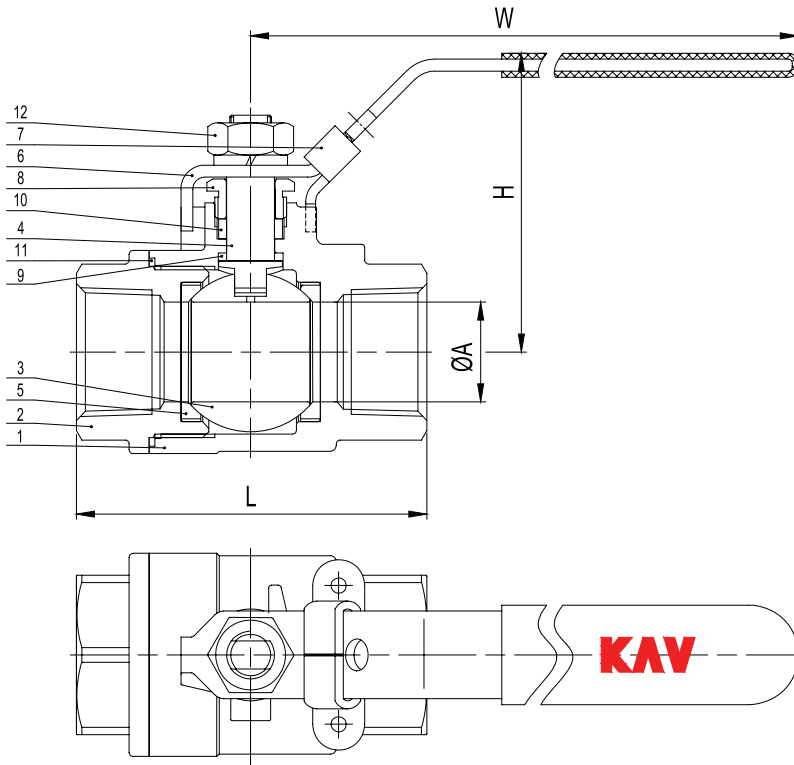
\* Lever Operator

### CLASS 900 FULL & REGULAR PORT

NPS	in	1/2"	3/4"X1/2"	3/4"	1"X3/4"	1"	1 1/2"X1"	1 1/2"	2"X1 1/2"	2"
DN	mm	15	20X15	20	25X20	25	40X25	40	50X40	50
A	in	0.44"	0.68"	0.68"	0.94"	0.94"	1.44"	1.44"	1.94"	1.94"
	mm	11	17	17	24	24	37	37	49	49
B	in	-	0.44"	-	0.68"	-	0.94"	-	1.44"	-
	mm	-	11	-	17	-	24	-	37	-
L(RF)	in	8.5"	9.0"	9.0"	10.0"	10.0"	12.0"	12.0"	14.5"	14.5"
	mm	216	229	229	254	254	305	305	368	368
L1(BW)	in	8.5"	9.0"	9.0"	10.0"	10.0"	12.0"	12.0"	14.5"	14.5"
	mm	216	229	229	254	254	305	305	368	368
W	in	6.3"	6.3"	7.87"	7.87"	10.6"	10.6"	16.5"	16.5"	23.6"
	mm	160	160	200	200	270	270	420	420	600
H	in	3.74"	3.74"	3.98"	3.98"	5.12"	5.12"	6.9"	6.9"	7.3"
	mm	95	95	101	101	130	130	175	175	185
WT(RF)	kg	8.5	10	11	15	17	22	30	35	39

\* Lever Operator

## 1000psi Casting Floating Ball Valve



- ASME B16.34 standard design.
- Full port or reduce port design.
- NPT or SW end connections.
- ASME/API/NACE/DIN materials.
- Full range of body, bonnet and trim materials.
- 2-Piece casting body.
- Blow-out proof stem.
- Anti-static Electricity.
- Locking Device.

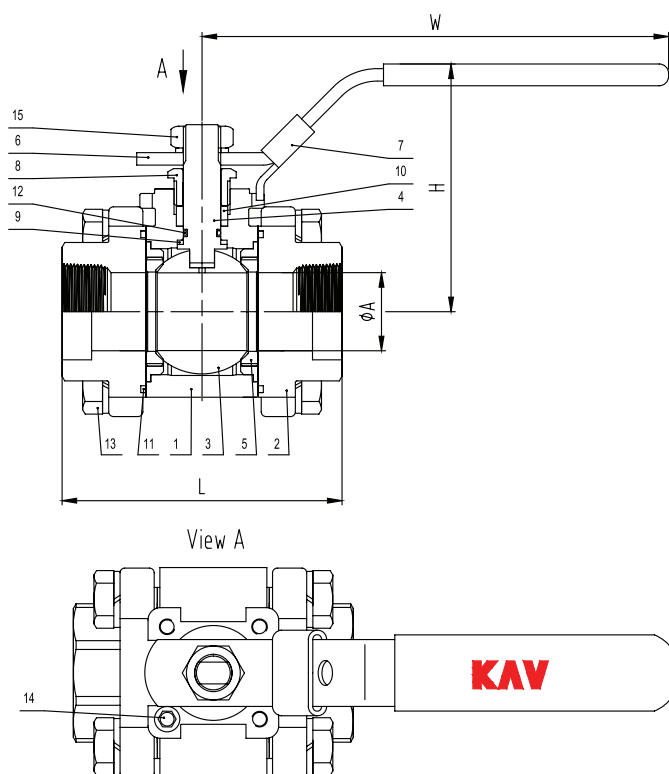
### STANDARD MATERIALS OF CASTING FLOATING BALL VALVE

NO.	Parts Name	Normal Temperature Service	Stainless Steel for Server
1	Body	ASTM A216 WCB	ASTM A351 CF8M
2	Adapter	ASTM A216 WCB	ASTM A351 CF8M
3	Ball	ASTM A182 F316	ASTM A182 F316
4	Stem	ASTM A276 316	ASTM A276 316
5	Seat	RPTFE	RPTFE
6	Handle	Carbon steel	Stainless steel
7	Lock Plate	Carbon steel	Stainless steel
8	Gland	ASTM A276 304	ASTM A276 316
9	Thrust Washer	PTFE	PTFE
10	Packing	PTFE	Graphite
11	Body Gasket	PTFE	Graphite
12	Nut	Stainless steel	Stainless steel

### 1000PSI FULL PORT

NPS	in	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
DN	mm	8	10	15	20	25	32	40	50	65	80	100
A	in	0.43"	0.59"	0.59"	0.75"	0.98"	1.26"	1.50"	1.97"	2.56"	3.15"	3.86"
	mm	10.8	12.5	15	19	25	32	38	50	65	80	98
L	in	2.09"	2.09"	2.48"	2.91"	3.39"	3.98"	4.21"	4.84"	6.14"	7.28"	8.98"
	mm	53	53	63	74	86	101	107	123	156	185	228
W	in	3.82"	3.82"	3.94"	5.12"	5.91"	5.91"	7.09"	7.09"	10.04"	12.60"	14.57"
	mm	97	97	100	130	150	150	180	180	255	320	370
H	in	1.97"	1.97"	2.48"	2.64"	2.80"	2.99"	3.54"	3.86"	4.96"	5.51"	7.68"
	mm	50	50	63	67	71	76	90	98	126	140	195
WT	kg	0.27	0.26	0.32	0.58	0.82	1.18	1.85	2.74	5.40	8.73	18.35

## 1500psi/2000psi Casting Floating Ball Valve



- ASME B16.34 standard design.
- Full port or reduce port design.
- NPT or SW end connections.
- ASME/API/NACE/DIN materials.
- Full range of body, bonnet and trim materials.
- 3-Piece casting body.
- Blow-out proof stem.
- Anti-static Electricity.
- Locking Device.
- ISO 5211 mounting pad.
- Working pressure: 2000psi @ 1/2"~1"  
1500psi @ 1 1/4"~2"

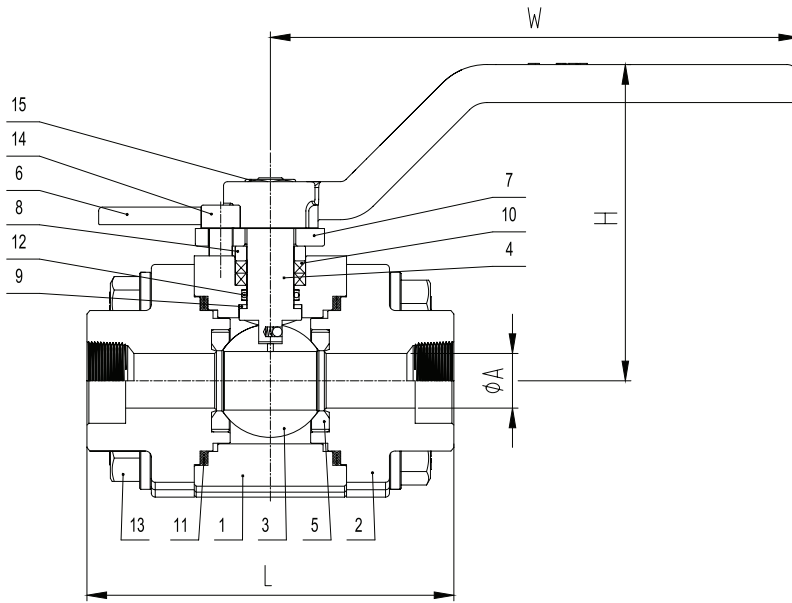
### STANDARD MATERIALS OF FLOATING BALL VALVE

NO.	Parts Name	Normal Temperature Service	Stainless Steel for Server
1	Body	ASTM A216 WCB	ASTM A351 CF8M
2	Adapter	ASTM A216 WCB	ASTM A351 CF8M
3	Ball	ASTM A182 F316	ASTM A182 F316
4	Stem	ASTM A276 316	ASTM A276 316
5	Seat	RPTFE	RPTFE
6	Handle	Carbon steel	Carbon steel
7	Stopper	Carbon steel	Carbon steel
8	Gland	ASTM A276 304	ASTM A276 316
9	Thrust Washer	PTFE	PTFE
10	Packing	Graphite	Graphite
11	Body Gasket	Graphite	Graphite
12	O Ring	VITON	VITON
13	Body Bolts	ASTM A193 B7	ASTM A193 B8
14	Screw	ASTM A193 B7	ASTM A193 B8
15	Nut	Stainless steel	Stainless steel

### 1500PSI /2000PSI FULL PORT

NPS	in	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
DN	mm	15	20	25	32	40	50
A	in	0.59"	0.75"	0.98"	1.26"	1.50"	1.97"
	mm	15	19	25	32	38	50
L	in	2.95"	3.15"	3.54"	4.33"	4.72"	5.51"
	mm	75	80	90	110	120	140
W	in	4.53"	5.91"	5.91"	7.48"	9.06"	9.06"
	mm	115	150	150	190	230	230
H	in	2.28"	2.56"	2.95"	3.54"	3.78"	4.13"
	mm	58	65	75	90	96	105
WT	kg	0.8	1.3	2.2	3.2	4.2	9.0

## CL800 Forged Floating Ball Valve



- ASME B16.34 standard design.
- Full port or reduce port design.
- NPT or SW end connections.
- ASME/API/NACE/DIN materials.
- Full range of body, bonnet and trim materials.
- 3-Piece forged body.
- Blow-out proof stem.
- Anti-static Electricity.
- Locking Device.
- ISO 5211 mounting pad.

### STANDARD MATERIALS OF FLOATING BALL VALVE

NO.	Parts Name	Normal Temperature Service	Stainless Steel for Server
1	Body	ASTM A216 WCB	ASTM A351 CF8M
2	Adapter	ASTM A216 WCB	ASTM A351 CF8M
3	Ball	ASTM A182 F316	ASTM A182 F316
4	Stem	ASTM A276 316	ASTM A276 316
5	Seat	RPTFE	RPTFE
6	Handle	Carbon steel	Carbon steel
7	Gland Flange	ASTM A216 WCB	ASTM A351 CF8M
8	Gland	ASTM A276 304	ASTM A276 316
9	Thrust Washer	PTFE	PTFE
10	Packing	Graphite	Graphite
11	Body Gasket	Graphite	Graphite
12	O Ring	VITON	VITON
13	Body Bolts	ASTM A193 B7	ASTM A193 B8
14	Screw	ASTM A193 B7	ASTM A193 B8
15	Nut	Stainless steel	Stainless steel

### CL800 FULL & REGULAR PORT

NPS	in	1/2"	3/4"X1/2"	3/4"	1"X3/4"	1"	1 1/4"	1 1/2"X1"	1 1/2"	2"X1 1/2"	2"
DN	mm	15	20X15	20	25X20	25	32	40X25	40	50X40	50
A	in	0.49"	0.59"	0.75"	0.79"	0.98"	1.26"	0.98"	1.5"	1.5"	1.97"
	mm	12.5	15	19	20	25	32	25	38	38	50
L	in	3.62"	4.41"	4.41"	4.96"	4.96"	5.24"	5.98"	5.98"	6.93"	6.93"
	mm	92	112	112	126	126	133	152	152	176	176
W	in	6.7"	6.7"	6.7"	6.7"	6.7"	9.84"	6.7"	9.84"	9.84"	9.84"
	mm	170	170	170	170	170	250	170	250	250	250
H	in	2.6"	2.84"	2.84"	3.94"	3.94"	4.41"	3.94"	4.41"	4.41"	4.8"
	mm	66	72	72	100	100	112	100	112	112	122
WT	kg	1.4	2.2	2.2	3.1	3.1	4.8	6.8	6.8	10.7	10.7

# FLOW COEFFICIENT

When flow goes through a valve it loses some energy. The pressure drop ( $\Delta P$ ) of the flow across a valve is determined by the flow rate, specific gravity of the flow and the **flow coefficient, K**, of the valve. For liquid,

$$\Delta P = Q^2 \cdot \frac{Sg}{K^2}$$

Where

Q: Flow rate

$\Delta P$ : Pressure drop

Sg: Specific gravity (1 for water)

K: Flow coefficient Kv (SI unit) or Cv (Imperial Unit)

**Cv** is defined as the flow rate in US Gallons per minute [gpm] of water at a temperature of 60°F with a pressure drop of 1 psi across a fully open valve.

**Kv** is the flow coefficient in metric units. It is defined as the flow rate in cubic meters per hour [m<sup>3</sup>/h] of water at a temperature of 16°C with a pressure drop of 1 bar across a fully open valve.

For gas (compressible flow):

$$\Delta P = \frac{T1 \cdot Gg}{P1} \cdot \left( \frac{q}{1,360 \cdot Cv \cdot y} \right)^2$$

where

Cv: Valve flow coefficient, dimensionless

q: Volumetric flow rate, scfh

Gg: Gas specific gravity (ratio of flowing gas to density of air with both at standard conditions, which is equal to the ratio of the molecular weight of gas to the molecular weight of air)

$\Delta P$ : Pressure differential, psi

T1: Absolute upstream temperatures (in °K)

P1: Upstream absolute static pressure, psia

y: Expansion factor, ratio of flow coefficient for a gas to that for a liquid at the same Reynolds Number, dimensionless

(y = 0.667 when P2 (down stream pressure) ≤ 0.5 times P1 for choked or critical flow,

y = 1.000 when P2 (down stream pressure) > 0.5 times P1 for very low pressure