CELEROS™ FLOW TECHNOLOGY

CVK-BV BALL VALVE

COPES-VULCAN®

RELIABLE, EFFICIENT FLOW CONTROL FOR GENERAL SERVICE APPLICATIONS

CELEROS FLOW TECHNOLOGY - AN INTRODUCTION

Celeros Flow Technology (Celeros FT) is a full lifecycle partner for sustainable flow technology solutions, from initial design and installation of equipment to after sales support. Celeros FT's products and technologies support many different industries including power generation, oil & gas, defense, water, chemical processing and energy transition. The company's innovative product portfolio contains many energy efficient products, including valves, pumps, and closures.

CVK-BV BALL VALVE

PRODUCT INFORMATION

CVK-BV ball valves have been developed for a wide range of process-industry applications, including severe service and critical processes. CVK-BV ball valves comply with API standards and incorporate additional features, including fire-safe capability, a secondary metal seat, an anti-blowout stem, and a static-electric grounding device. The CVK-BC series is designed for both pressure and vacuum service. CVK-BV valves are available with full-bore and reduced-bore configurations.

DESIGN HIGHLIGHTS:

- Designed in accordance with API 6D/608.
- Available in manual or actuated configurations.
- Soft seat, Metal seat configurations are available
- Butt weld or socket weld valves can be welded directly onto the pipeline assembly

PERFORMANCE BENEFITS

- **Fire-safe design:** Ensures safe operation under extreme conditions.
- **Metal secondary seat:** Provides extra sealing reliability.
- **Anti-blowout stem:** Prevents stem ejection under pressure.
- **Static grounding:** Reduces static discharge risk.
- **Flexible installation:** Full/reduced bore, manual or actuated, butt/socket weld compatible.
- **Pressure & vacuum service:** Handles wide operating ranges.

Figure 1. CVK-BV Ball Valve mounted with series

SPECIFICATIONS:

Valve Type	Ball Valve										
Valve Model	CVK BV										
Body Type	Two Way										
Valve Size (inch)	1/2	3/4	1	1.5	2	2.5	3	4	5	6	8
(mm)	15	20	25	40	50	65	80	100	125	150	200
Pressure Rating	ANSI 150# ~ 300# (JIS 10K ~ 20K, PN 10~ 50)										
End Connection	RF, FF, SW, BW, RTJ, etc										
Body Materials	A216WCB, A351CF8/CF8M, A351CF3M										
Bonnet Type	Plain: -17°C to 230°C (1.4°F to 446°F), Extension: -45°C to -17°C and above 230°C (-49°F to 1.4°F and above 446°F).										
Packing	Teflon, Graphite										
Guiding	O-ring										
Seat Type	Metal/Soft										
Valve Plug Shape	Ball										
Plug type	On / Off										
Trim Materials	A351CF8/CF8M, A351CF3/CF3M, and so on										

Table 1. CVK BV Valve Specifications

FEATURES

Seat / Seal Design

The ACTI-Seal seat design utilizes a precision lip-seal principle that delivers reliable sealing performance across the full pressure range, from zero differential pressure to the valve's maximum rated pressure. The seats are pre-loaded during assembly to ensure tight shutoff at low pressure conditions. As system pressure increases, the ball is forced more firmly against the seat, creating a pressure-assisted seal that maintains positive shutoff at elevated pressures. The generous lip geometry provides additional resilience, helping to extend seat life and maintain consistent sealing performance even under demanding service conditions.

Ball

The ball is one of the most critical components in the valve, directly affecting sealing performance, operating torque, and overall valve longevity. To ensure optimal performance, the ball is manufactured with tight tolerances—achieving a sphericity of ±0.0008 in. and a 4 RMS surface finish. These precise manufacturing standards help maintain consistent sealing, minimize wear, and ensure smooth operation throughout the service life of the valve.

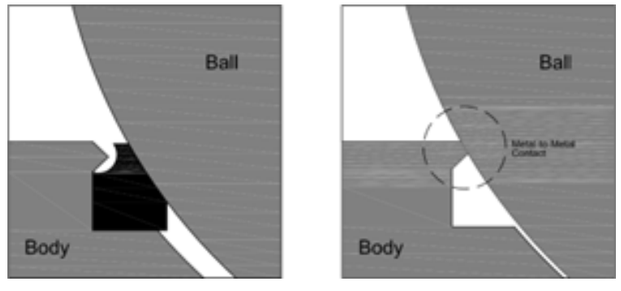
STEM SEAL AND BEARING

The stem assembly incorporates a PTFE bearing to absorb radial loads applied to the valve stem, while a PTFE thrust bearing reduces friction generated by axial loading. The packing system utilizes V-shaped PTFE rings; when the gland nut is tightened, each ring expands to create multiple sealing barriers between the stem and the valve body. This design allows simple gland adjustment to compensate for operational wear, ensuring long-term sealing performance. In addition, internal fluid pressure beneath the stem packing further energizes the packing rings, increasing sealing stress to prevent leakage and minimize maintenance requirements

FIRE-SAFE API-607

The valve uses a fire-safe design with a metal backup seat that takes over if the soft seat is damaged during a fire. In normal service, the soft seat provides tight shutoff. If exposed to high heat, the soft materials degrade and the metal-to-metal sealing surface engages automatically to control leakage. This ensures the valve maintains containment in accordance with API-607 until the unit can be safely isolated and the seats replaced.

Figure 2.Ball



Before fire *Metal to meta seal after fire*

Figure 3. Fire Safe

SEAT PERFORMANCE DATA

TFE

General application seat material, exhibiting lowest operating torque and excellent resistance to chemical attack.

RTFE

Most commonly specified seat material, and used as the basis for published torque valves. Maintains the excellent chemical resistance of unfilled Teflon (TFE) with increased resistance to wear and abrasion result-ing in longer life.

Carbon Graphite

Designed for high temperature applications. Maximum service temperature is limited to 759 deg F(404 deg C) in oxidizing applications. Like all hard seat materials does not necessarily provide "bubble tight" shut-off. Most test standards have allowable leakage rates or list "classes" of shut-off for this type of seat. Be aware of the system design requirements when specifying this or any hard sea.

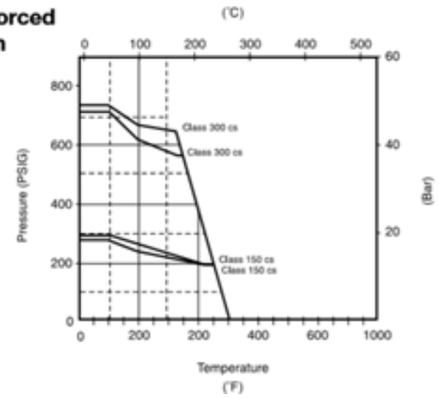
(UHMWPE)

Ultra High Molecular Weight Polyethylene offers good abrasion resistance making it suitable for use in high solids or slurry applications. These seats are com-pletely confined by a metallic seat holder enhancing their performance in abrasive.
This seat is frequently specified in services where fluo-rine off gassing in even the slightest services.
UHMWPE should be used with caution in the pres-ence of solvents, and the operating torque can be ex-pected to be 30% higher than that of the Teflon based seat materials.

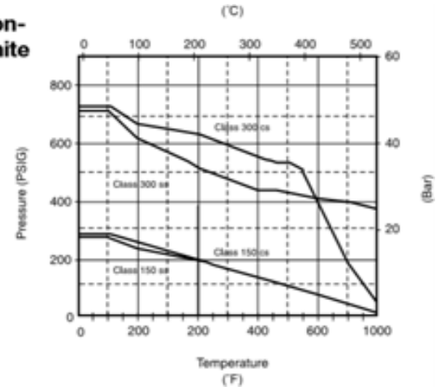
(PEEK)

PEEK(Poly Ether Ether Ketone) offers a high strength alternative to RTFE, resistant to creep and cold flow.
This seat offers good abrasion resistance. The material offers similar chemical resistance to TFE but should be checked on application.
Operating torque tend to be 40% higher than RTFE.

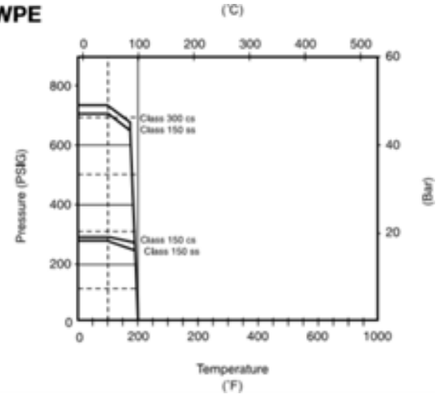
Reinforced Teflon



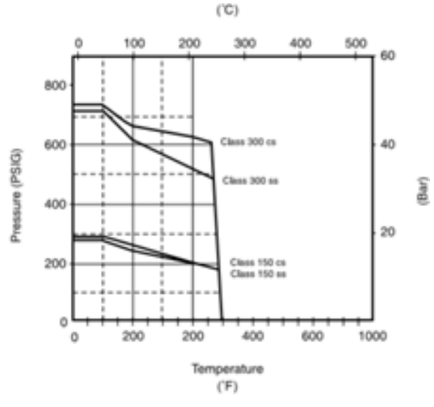
Carbon-Graphite



UHMWPE



PEEK



FLOATING BALL VALVE TORQUE VALUE (N.M) - SOFT SEAT

Size	1/2”	3/4”	1”	1-1/2”	2”	2-1/2”	3”	4”	5”	6”	8”
Class (lbs))											
150	3	5	5	16	25	50	65	125	250	410	700
300	7	12	12	38	60	120	160	280	600	950	1550
400	15	30	30	90	140	240	350	540	-	-	-
600	19	35	35	130	190	360	460	770	-	-	-

SPECIFICATIONS FOR SEAL MATERIALS

	Viton A	NBR	Viton B	HNBR(HSN)	Viton AED
Temperature Range (° F)	-20~400	-50~250	-20~400	-40~320	-20~480
Temperature Range (°C)	-28.9~204.4	-45.6~121.1	-28.9~204.4	-40~160	-28.9~248.9
Service Application	Petroleum Oils, Gasoline Transmission Fluid	Petroleum Oils, Water, Hydraulic Oils	Mineral Acid, Steam, MTBE	Petroleum Oils, H2S & Co2	Anti-Explosive Decom-pression

SPECIFICATIONS FOR SEAL MATERIALS

	Flexible	Spiral Wound 316+graphite	PTFE	Spiral Wound Mo-nel+PTFE
Temperature Range (° F)	-300~900	-300~900	-300~400	-300~400
Temperature Range (°C)	-184.4~482.2	-184.4~482.2	-184.4~204.4	-184.4~204.4
Service Application	Fire-safe	Fire-safe	High Corrosive	High Corrosive

FLOATING BALL VALVE

Standard specifications

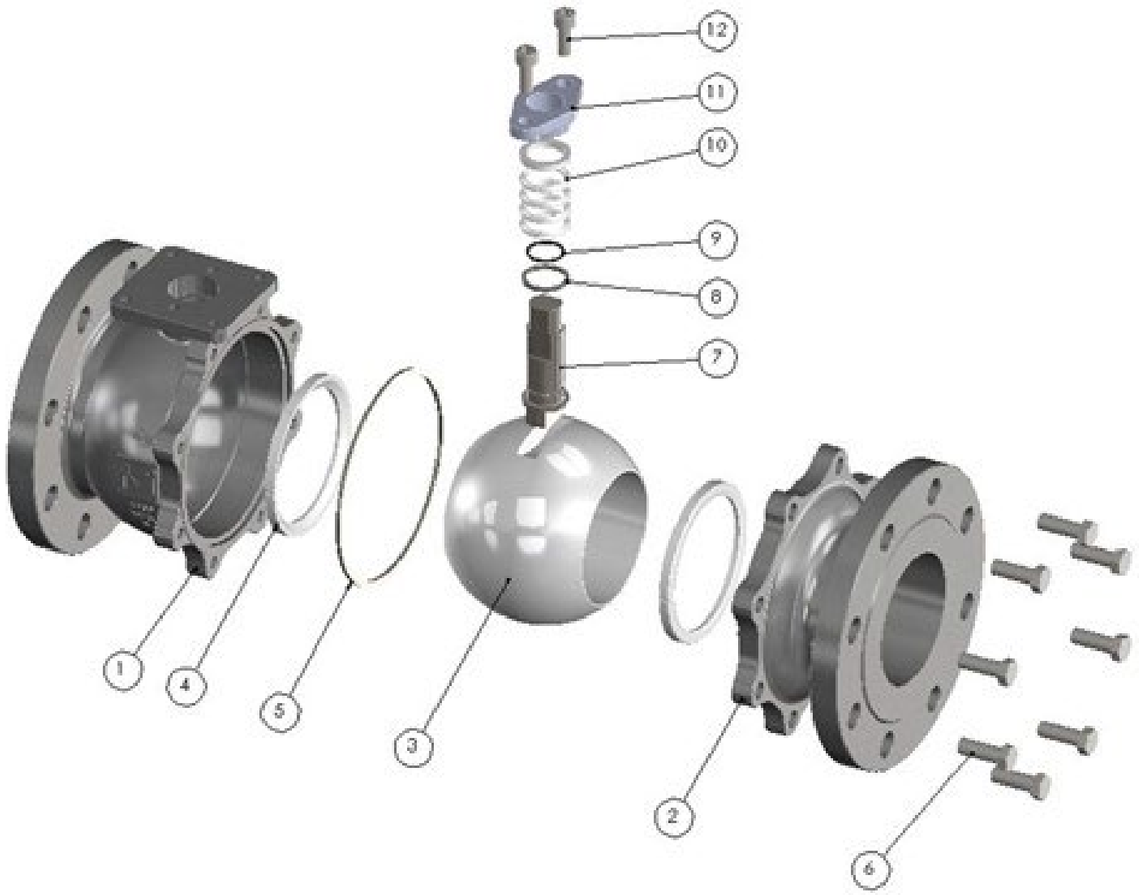
Flanged end, side entry body construction, Floating ball design, Full bore or reduced bore, Fields serviceable, wrench/ gear/actuator mounted.

The ball valves comply with one or more of the following standard specifications as to pressure, temperature ratings and dimensions: ANSI, API, BS, DIN, MSS

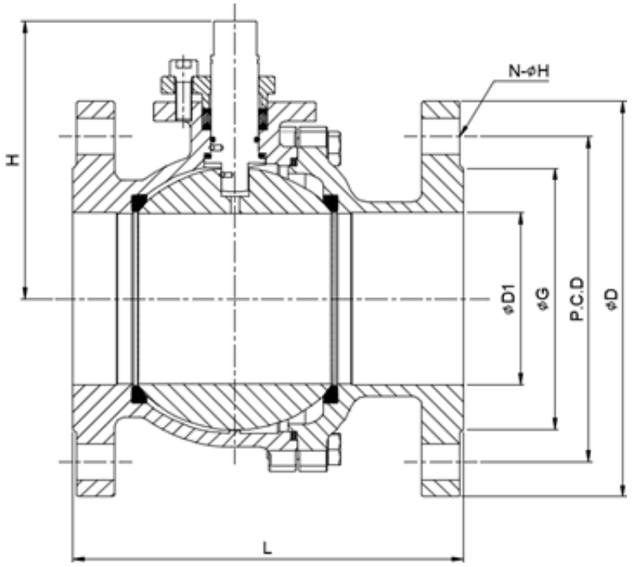
	ASME	JIS	API
Design standard	ASME B16.34	JIS B2071	API6D
Face to face	ASME B16.10	JIS B2002	API6D
Flanged ends	ASME B 16.5	JIS B2220	ASME B 16.5
Test & Inspection	API59	JIS B2003	API6D

BALL VALVE PARTS LIST

No.	Name of Part
1	Body
2	Bonnet Flange
3	Ball
4	Seat Ring
5	Bonnet Gasket
6	Bolt
7	Stem
8	Thrust Bearing
9	Stem O-ring
10	Packing
11	Gland Flange
12	Gland Flange Bolt



DIMENSION TABLE (FLOATING BALL VALVE) - METRIC



ANSI CLASS 150

NPS (Inch)	ØD1	ØG	P.C.D	ØD	N-ØH	L	H
1/2	15	34.9	60.3	90	4-16	108	46.5
3/4	20	42.9	69.9	100	4-16	117	50.8
1	25	50.8	79.4	110	4-16	127	58.3
1 1/2	38.5	73	98.4	125	4-16	165	83.5
2	50	92.1	120.7	150	4-19	178	91.6
2 1/2	62	104.8	139.7	180	4-19	190	115.5
3	76	127	152.4	190	4-19	203	128.5
4	101	157.2	190.5	230	8-19	229	162.8
5	123	185.7	215.9	255	8-22	356	195
6	151	215.9	241.3	280	8-22	394	217
8	201	269.9	298.5	345	8-22	457	253

ANSI CLASS 300

NPS (Inch)	ØD1	ØG	P.C.D	ØD	N-ØH	L	H
1/2	15	34.9	66.7	95	4-16	140	46.5
3/4	20	42.9	82.6	115	4-19	152	50.8
1	25	50.8	88.9	125	4-19	165	58.3
1 1/2	38.5	73	114.3	155	4-22	190	83.5
2	50	92.1	127	165	8-19	216	91.6
2 1/2	62	104.8	149.2	190	8-22	241	115.5
3	76	127	168.3	210	8-22	282	128.5
4	101	157.2	200	255	8-22	305	162.8
5	123	185.7	235	280	8-22	381	195
6	151	215.9	269.9	320	12-22	403	217
8	201	269.9	330.2	380	12-25	502	253

DIMENSION TABLE (FLOATING BALL VALVE) - IMPERIAL

ANSI CLASS 150

NPS (Inch)	ØD1	ØG	P.C.D	ØD	N-ØH	L	H
1/2	0.6	1.4	2.4	3.5	4-16	4.3	1.8
3/4	0.8	1.7	2.8	3.9	4-16	4.6	2
1	1	2	3.1	4.3	4-16	5	2.3
1 1/2	1.5	2.9	3.9	4.9	4-16	6.5	3.3
2	2	3.6	4.8	5.9	4-19	7	3.6
2 1/2	2.4	4.1	5.5	7.1	4-19	7.5	4.5
3	3	5	6	7.5	4-19	8	5.1
4	4	6.2	7.5	9.1	8-19	9	6.4
5	4.8	7.3	8.5	10	8-22	14	7.7
6	5.9	8.5	9.5	11	8-22	15.5	8.5
8	7.9	10.6	11.7	13.6	8-22	18	10

ANSI CLASS 300

NPS (Inch)	ØD1	ØG	P.C.D	ØD	N-ØH	L	H
1/2	15	34.9	66.7	95	4-16	140	46.5
3/4	20	42.9	82.6	115	4-19	152	50.8
1	25	50.8	88.9	125	4-19	165	58.3
1 1/2	38.5	73	114.3	155	4-22	190	83.5
2	50	92.1	127	165	8-19	216	91.6
2 1/2	62	104.8	149.2	190	8-22	241	115.5
3	76	127	168.3	210	8-22	282	128.5
4	101	157.2	200	255	8-22	305	162.8
5	123	185.7	235	280	8-22	381	195
6	151	215.9	269.9	320	12-22	403	217
8	201	269.9	330.2	380	12-25	502	253

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