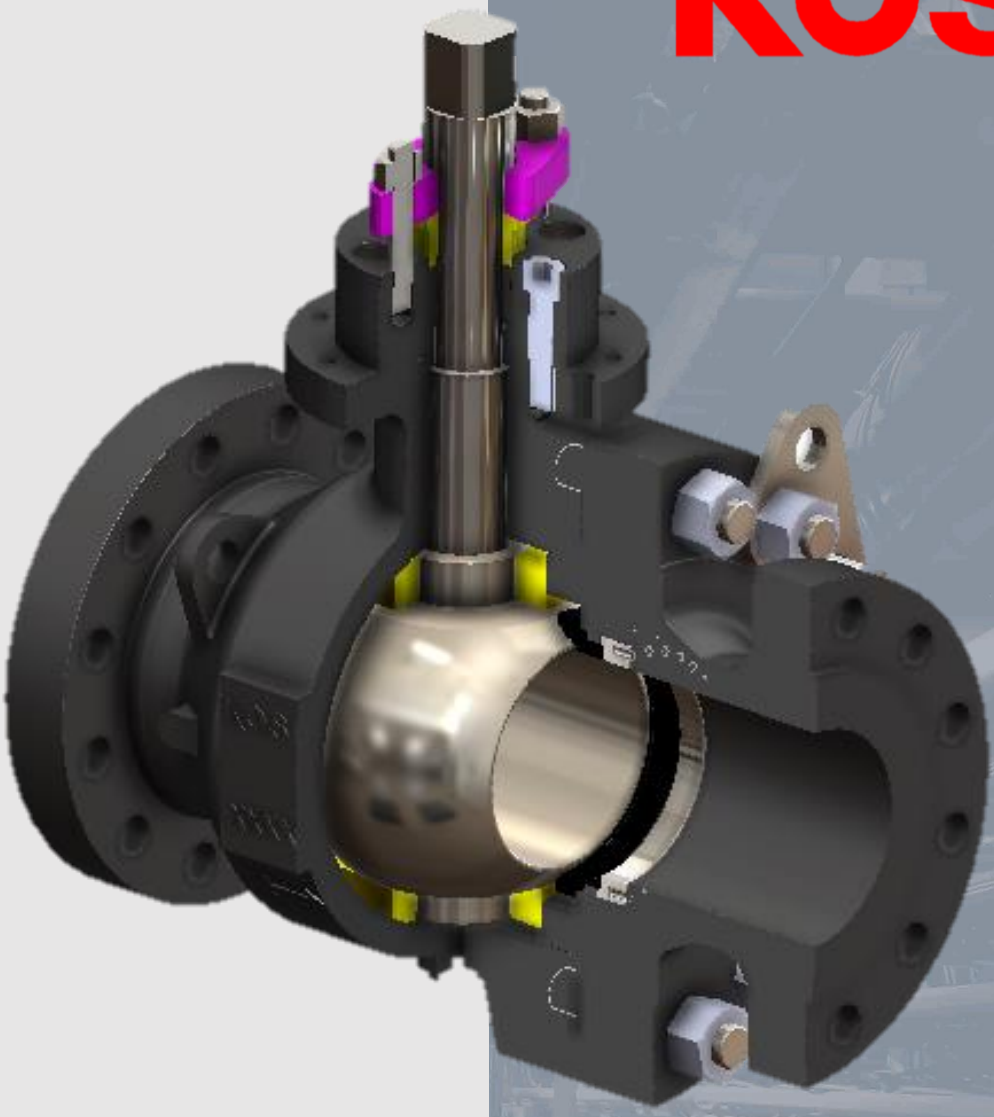
KOSO



BALL VALVE

(METAL SEAT & SOFT SEAT)

350 SERIES

350 SERIES – BALL VALVE

KOSO's new 350 series ball valve is a high performance, quarter-turn, Floating ball valve and trunnion-mounted ball valve, designed to suit a wide variety of applications. KOSO's 350 series is divided into two types based on the seat ring used.

350W Series: Metal Seated Ball Valve

350K Series: Soft Seated Ball Valve

350 SERIES BALL VALVE PRODUCT RANGE

KOSO manufactures a wide range of floating ball valves and trunnion-mounted ball valves in standard sizes up to 24", in ASME classes #150 to #2500, in metal seated (350W), and in soft seated (350K) valves. Valves can be made available with multiple end connections, variety of materials, and trim combinations.

FLOATING BALL VALVE

ASME Class	½" (15)	¾" (20)	1" (25)	1 ½" (40)	2" (50)	3" (80)	4" (100)
CL 150	●	●	●	●	●	●	●
CL 300	●	●	●	●	●	●	
CL 600	●	●	●	●			
CL 900	●	●	●	●			
CL 1500	●	●	●	●			

TRUNNION MOUNTED BALL VALVE

ASME Class	2" (50)	3" (80)	4" (100)	6" (150)	8" (200)	10" (250)	12" (300)	14" (350)	16" (400)	18" (450)	20" (500)	24" (600)
CL 150				●	●	●	●	●	●	●	●	●
CL 300			●	●	●	●	●	●	●	●	●	●
CL 600	●	●	●	●	●	●	●	●	●	●	●	●
CL 900	●	●	●	●	●	●	●	●	●	●	●	
CL 1500	●	●	●	●	●	●	●	●	●			
CL 2500	●	●	●	●	●	●	●					

Sizes and class combinations other than the standard shown above are also available on request. Other specialty requirements such as reduced bore valves, jacketed valves, or valves with an extended stem, etc. are also available on request. Kindly contact the KOSO sales representatives for more details.

RATED CV FOR STANDARD PRODUCT RANGE

(Valve at full open condition for full bore)

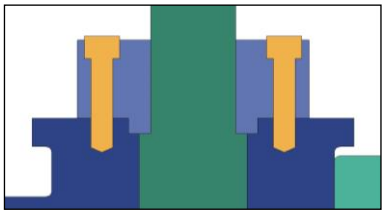
Valve Size		350 Series Valve Rated Cv					
NPS	DN	CL 150	CL 300	CL 600	CL 900	CL1500	CL 2500
½	15	14	14	14			
¾	20	35	35	40	31	31	16
1	25	75	75	65	46	46	32
1 ½	40	235	235	210	150	150	80
2	50	400	400	345	320	320	195
3	80	1105	1105	985	900	700	390
4	100	1930	1930	1755	1800	1300	680
6	150	4940	4940	4475	4300	3100	1500
8	200	10135	10135	8615	7500	6400	3200
10	250	16900	16900	13110	12000	9600	5600
12	300	25520	25520	21860	21000	13500	6900
14	350	30700	30700	26969	24000	16000	
16	400	41245	41245	35025	26000	22000	
18	450	55570	55570	45639	38000		
20	500	70045	70045	55095	54000		
24	600	103732	103732	80860			

DESIGN AND TESTING COMPLIANCE STANDARDS

Parameter		Standard/s
Valve Design		ASME B16.34 / API 6D
Pressure – Temperature Rating		ASME B16.34
Face-to-Face Dimension		ASME 16.10 / API 6D
Valve Bore		API 6D
End Connection		ASME B16.5 / ASME B16.47
End Connection (Butt Weld End)		ASME B16.25
Wall Thickness		ASME B16.34
Testing	Hydrostatic Shell Test	API 6D / API 598
	Seat Leakage Test	API 6D / ISO 5208 / ANSI FCI 70-2
Quality System Certifications		ISO 9001-2015 / ISO 14001-2015 ISO 45001-2018, API 6D – Q1 PED 2014/68/EU Module H/H1, ATEX

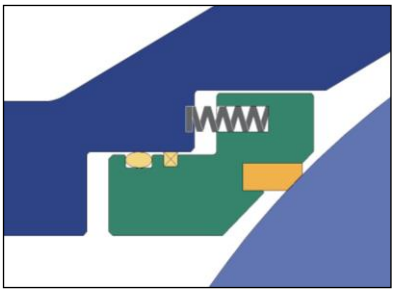
DESIGN FEATURES IN 350 SERIES TMBV

Stem Blowout-Proof Design:



KOSO TMBVs have a positive stem blowout-proof system. The gland plate is fastened to the body from the top so that the stem collar is locked in place, and can prevent the stem from coming out under pressure.

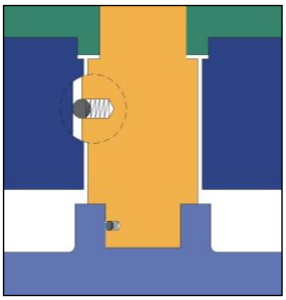
Fire Safe Design:



Our 350W series of metal-seated ball valves are inherently fire safe. The sealing contact between the ball and seat is metal-to-metal.

In 350K series of soft seated TMBV, if the soft insert gets damaged due to fire, the secondary sealing of metal-to-metal contact between seat and ball helps to hold the leakage during an emergency. This secondary metal seal is a standard feature in 350K series.

Anti-Static Device:



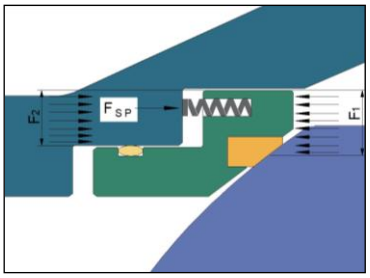
An anti-static device is provided between:

1) Ball & Stem 2) Stem & Body

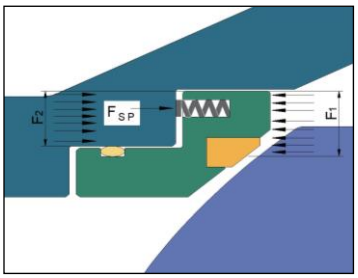
A static charge can build-up on the ball due to friction between the ball and soft seat. This is a fire hazard if not removed.

A spring loaded ball is provided on the stem to ensure electrical conductivity between the ball and the body to allow these static charges to dissipate.

Self-Relieving Seat – Cavity Relief:



F2 + Fsp > F1



F2 + Fsp < F1

The seat (image on the left) maintains contact with the ball and body or end cap ensuring a tight seal. When the pressure of the entrapped fluid in the cavity area exceeds 1.33 times the rated pressure of the valve, the seat gets pushed away from the ball to relieve this cavity pressure.

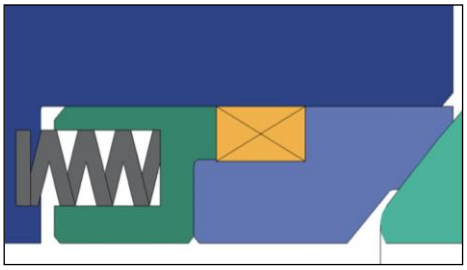
This prevents damage to the valve, due to over-pressurization inside valve cavity.

350W – METAL SEATED BALL VALVE

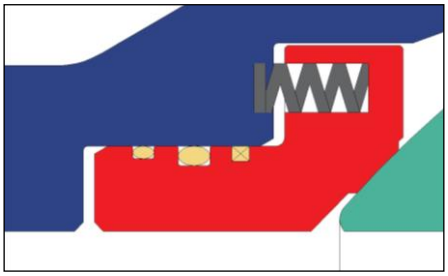
The 350W series ball valve is suitable for several service applications with a high temperature and/or a high pressure.

The ball and seat are hard coated with chrome carbide or tungsten carbide, which has a high erosion and abrasion resistance; manufactured using an in-house HVOF system. They are mate-lapped to ensure 100% sealing.

The ball never leaves the seat and wipes contaminants away. This self-cleaning action prevents the interference of and damage from contaminants. Therefore, this valve is suitable for slurry and abrasive service.



Metal Seat with Graphite seal

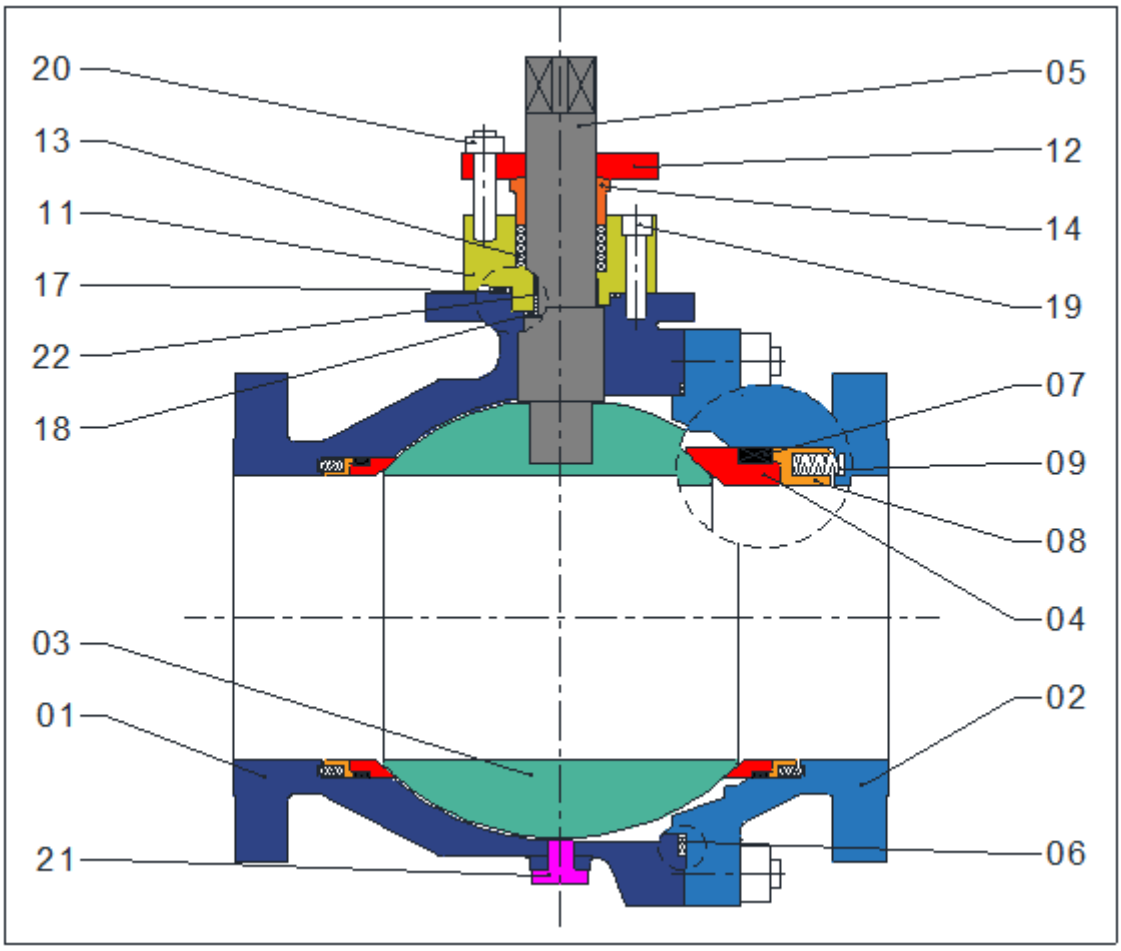


Metal Seat with O-ring seal

Type of HVOF Coatings used:

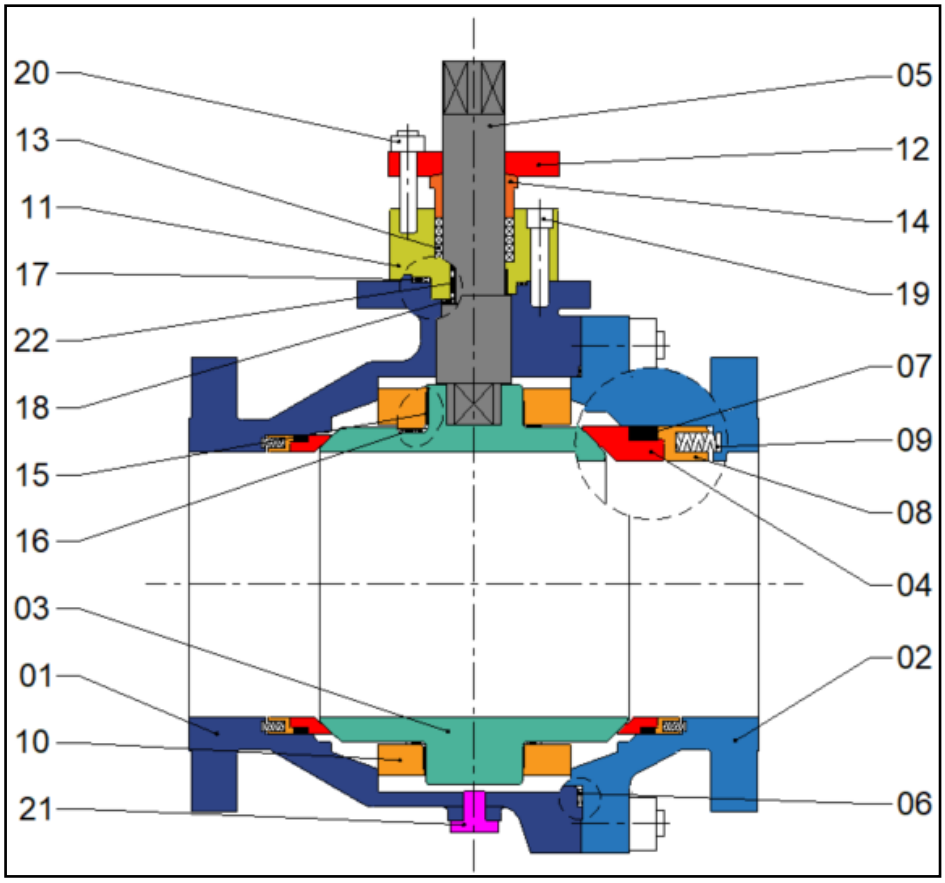
TYPE	MATERIAL	HARDNESS	APPLICATION	TEMPERATURE RANGE	
				O-ring	Graphite seal
Cr	Chrome Carbide ($75Cr_3$-$C_2$25Ni-Cr)	HV1100	Suitable for super-heated steam / High Hardness for high temperature	-	400 to +538 deg C
WcCr	Tungsten Chrome Carbide (73Wc-20Cr-7Ni)	HV1200	Suitable for all environment (Lower Hardness than Wc)	-20 to +180 deg C	-45 to 400 deg C
Wc	Tungsten Carbide (88Wc-12Co)	HV1400	Suitable for Slurry applications.	-20 to +180 deg C	-45 to 400 deg C
St	Stellite-6 / Stellite-21	40~50 HRC	Suitable for erosion resistance / High chemical resistance	-20 to +180 deg C	-45 to +538 deg C

350W – Metal-Seated Floating Ball Valve – MOC



No.	Description	Material	No.	Description	Material
01	Body	A216-WCB / A351-CF8M / A351-CF3M / A351-CF8 / A352-LCB	12	Gland Flange	SS316 / SS304
02	End Cap	A216-WCB / A351-CF8M / A351-CF3M / A351-CF8 / A352-LCB	13	Packing	Graphite
03	Ball + HVOF Coating	SS316 / A351-CF8M / A351-CF8 + Cr / WcCr / Wc / Stellite	14	Gland Bush	SS316 / SS304
04	Seat Ring + HVOF Coating	SS316 / A351-CF8M / A351-CF8 + Cr / WcCr / Wc / Stellite	17	Body-Plate Gasket	SS316 + Spiral Wound Graphite
05	Stem	S32760 / 17-4 PH / Inconel-718	18	Stem Thrust Washer	SS316 + Coating / Inconel + Coating / Inconel
06	Body Gasket	SS316 + Spiral Wound Graphite	19	Gland Stud	Alloy steel / Stainless Steel
07	Seat Back Seal	Graphite / O-ring (Viton / NBR)	20	Gland Nut	Alloy steel / Stainless Steel
08	Spring Holder	SS316 / SS304 / A351-CF8M / A351-CF8	21	Drain Plug	SS316
09	Spring	Inconel X-750 / Inconel-718	22	Stem Bush	SS316 + Coating / Inconel + Coating / Inconel
11	Gland Plate	SS316 / SS304			

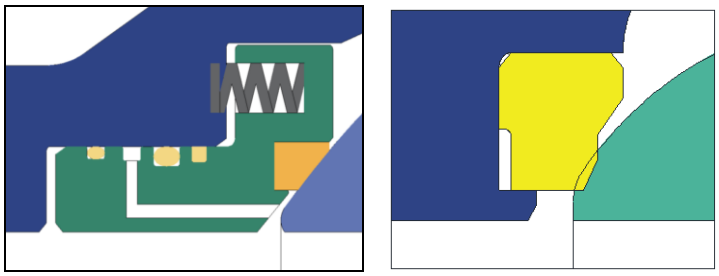
350W – Metal-Seated Trunnion Mounted Ball Valve – MOC



No.	Description	Material	No.	Description	Material
01	Body	A216-WCB / A351-CF8M / A351-CF3M / A351-CF8 / A352-LCB	12	Gland Flange	SS316 / SS304
02	End Cap	A216-WCB / A351-CF8M / A351-CF3M / A351-CF8 / A352-LCB	13	Packing	Graphite
03	Ball + HVOF Coating	SS316 / A351-CF8M / A351-CF8 + Cr / WcCr / Wc / Stellite	14	Gland Bush	SS316 / SS304
04	Seat Ring + HVOF Coating	SS316 / A351-CF8M / A351-CF8 + Cr / WcCr / Wc / Stellite	15	Bush Bearing	SS316 + Coating / Inconel + Coating / Inconel
05	Stem	S32760 / 17-4 PH / Inconel-718	16	Thrust Washer	SS316 + Coating / Inconel + Coating / Inconel
06	Body Gasket	SS316 + Spiral Wound Graphite	17	Body-Plate Gasket	SS316 + Spiral Wound Graphite
07	Seat Back Seal	Graphite / O-ring (Viton / NBR)	18	Stem Thrust Washer	SS316 + Coating / Inconel + Coating / Inconel
08	Spring Holder	SS316 / SS304 / A351-CF8M / A351-CF8	19	Gland Stud	Alloy steel / Stainless Steel
09	Spring	Inconel X-750 / Inconel-718	20	Gland Nut	Alloy steel / Stainless Steel
10	Trunnion Plate	SS316 / S32760	21	Drain Plug	SS316
11	Gland Plate	SS316 / SS304	22	Stem Bush	SS316 + Coating / Inconel + Coating / Inconel

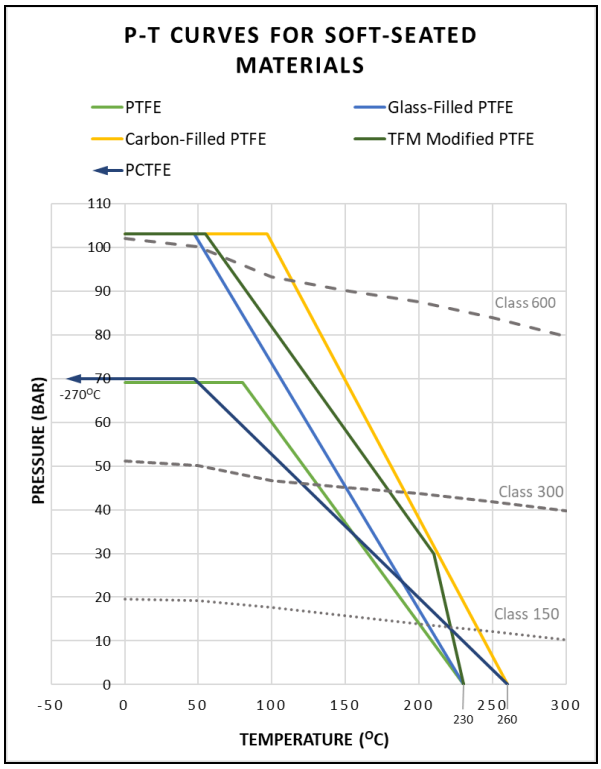
350K – SOFT SEATED BALL VALVE

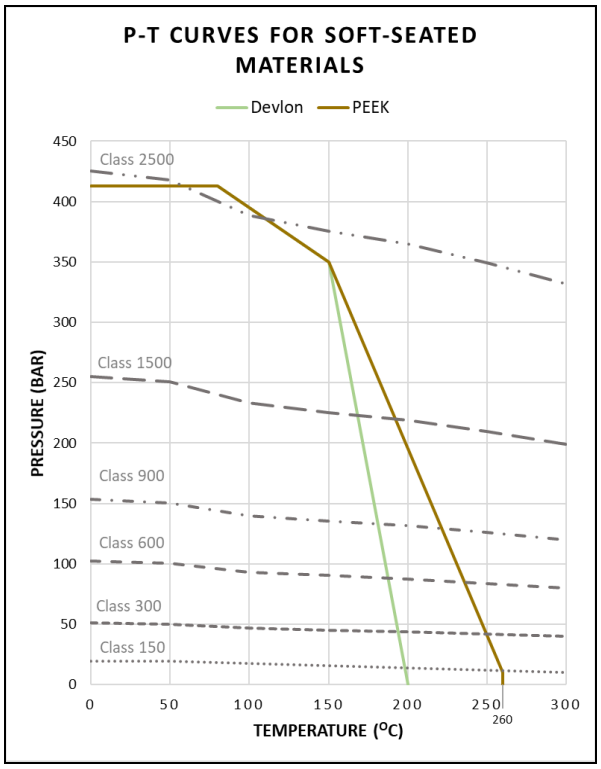
The 350K series ball valve has a resilient seat which provides a tight shut-off/zero leakage valve. This is best suited for ON-OFF service applications like controlling various types of fluids.



Pressure-Temperature rating for seat material:

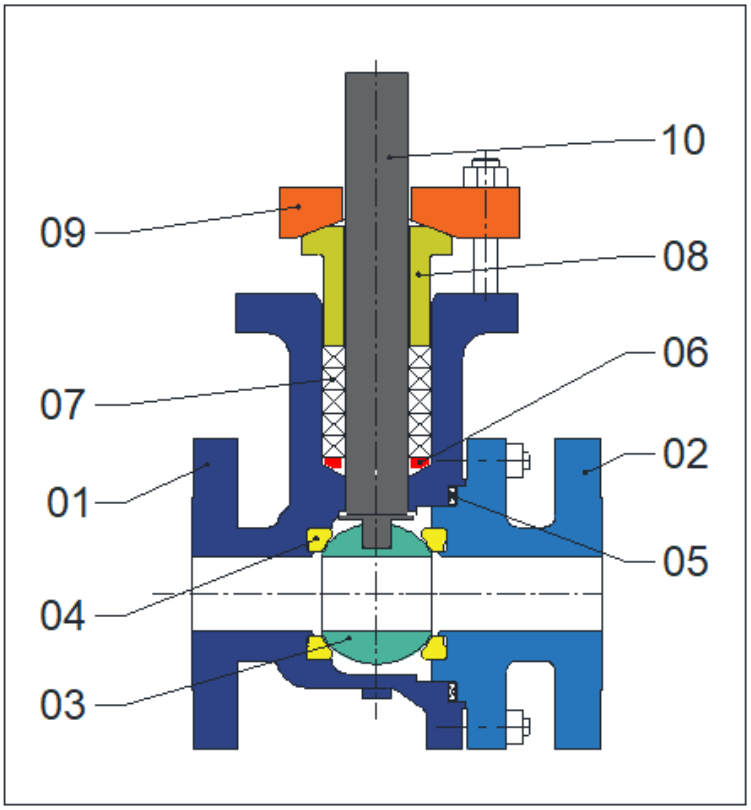
The graph lines represent maximum pressure-temperature rating for soft seat material. When selecting a soft seat material, the lower rating between valve body and seat should be considered.





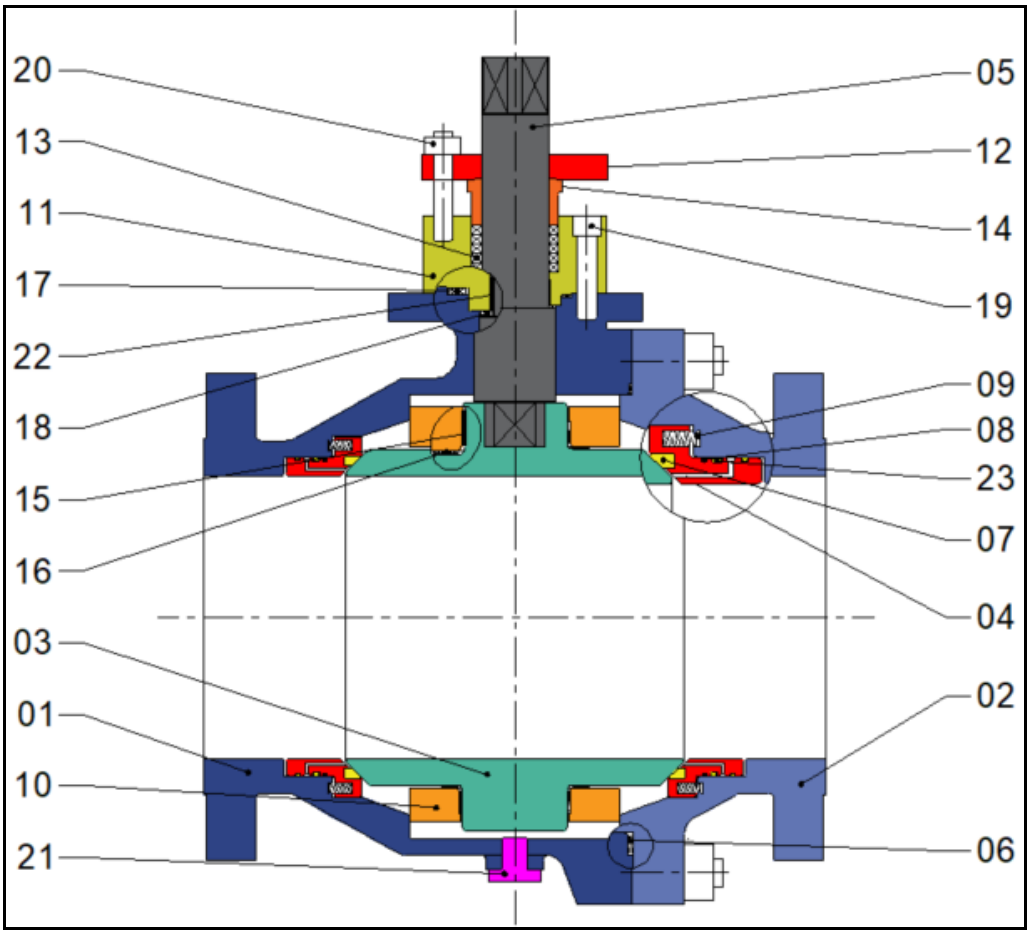
PTFE seat material have limitaions in terms of high pressure and temepratures. PEEK is more suitable for high pressure and temperature applications.

350K – Soft Seated Floating Ball Valve – MOC



No.	Description	Material
01	Body	A216-WCB / A351-CF8M / A351-CF3M / A351-CF8 / A352-LCB
02	End Cap	A216-WCB / A351-CF8M / A351-CF3M / A351-CF8 / A352-LCB
03	Ball	SS316 / A351-CF8M/ A351-CF8
04	Seat Seal	PTFE / C-PTFE / PEEK / PCTFE
05	Body Gasket	SS316 + Spiral Wound Graphite / Spiral Wound PTFE
06	Packing Adaptor	SS316 / SS304
07	Gland Bush	SS316 / SS304
08	Gland Bush	SS316 / SS304
09	Gland Flange	SS316 / SS304
10	Stem	SS316 / SS410 / S32760

350K – Soft Seated Trunnion Mounted Ball Valve – MOC



No.	Description	Material	No.	Description	Material
01	Body	A216-WCB / A351-CF8M / A351-CF3M / A351-CF8 / A352-LCB	13	Packing	Graphite / PTFE
02	End Cap	A216-WCB / A351-CF8M / A351-CF3M / A351-CF8 / A352-LCB	14	Gland Bush	SS316 / SS304
03	Ball	SS316 / A351-CF8M/ A351-CF8	15	Bush Bearing	Carbon Steel + Coating / SS316 + Coating
04	Seat Ring	SS316 / SS304 / A351-CF8M/ A351-CF8	16	Thrust Washer	Carbon Steel + Coating / SS316 + Coating
05	Stem	SS316 / SS410 / S32760	17	Body-Plate Gasket	SS316 + Spiral Wound Graphite / Spiral Wound PTFE
06	Body Gasket	SS316 + Spiral Wound Graphite / Spiral Wound PTFE	18	Stem Thrust Washer	Carbon Steel + Coating / SS316 + Coating
07	Seat Seal	PTFE / C-PTFE / PEEK / PCTFE	19	Gland Stud	Alloy steel / Stainless Steel
08	Fire safe seal	Graphite	20	Gland Nut	Alloy steel / Stainless Steel
09	Spring	Inconel X-750	21	Drain Plug	SS316
10	Trunnion Plate	SS316 / SS304 / S32760	22	Stem Bush	Carbon Steel + Coating / SS316 + Coating
11	Gland Plate	SS316 / SS304	23	O-ring	Viton / NBR
12	Gland Flange	SS316 / SS304			

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