FLOWSERVE

Worcester Controls

Standard 3-Piece Ball Valves

Experience In Motion

The Flowserve Worcester Controls three-piece ball valve delivers rugged, high performance reliability for a range of applications, all in an easy-to-maintain design.

A variety of pipe ends, including socket weld, screwed or butt weld ends enables these valves to be adapted to fit both standard and more unusual piping specifications while the range of seat materials handles steam, chemicals, cryogenic gases, petroleum products, caustics, abrasive materials or fluids containing solids.

As you would expect, Worcester has developed and improved the Series 44/459 over the years to maintain its position as the 8-150mm valve design which others strive to equal. The 59 and 599 series full bore versions complete the range of 3-piece valves.

Wrench
Ergonomically designed for ease of operation (locking handle available)

Actuator Mounting
Conforms to ISO 5211 for ease of actuation (smaller sizes use Worcester two hole pattern)

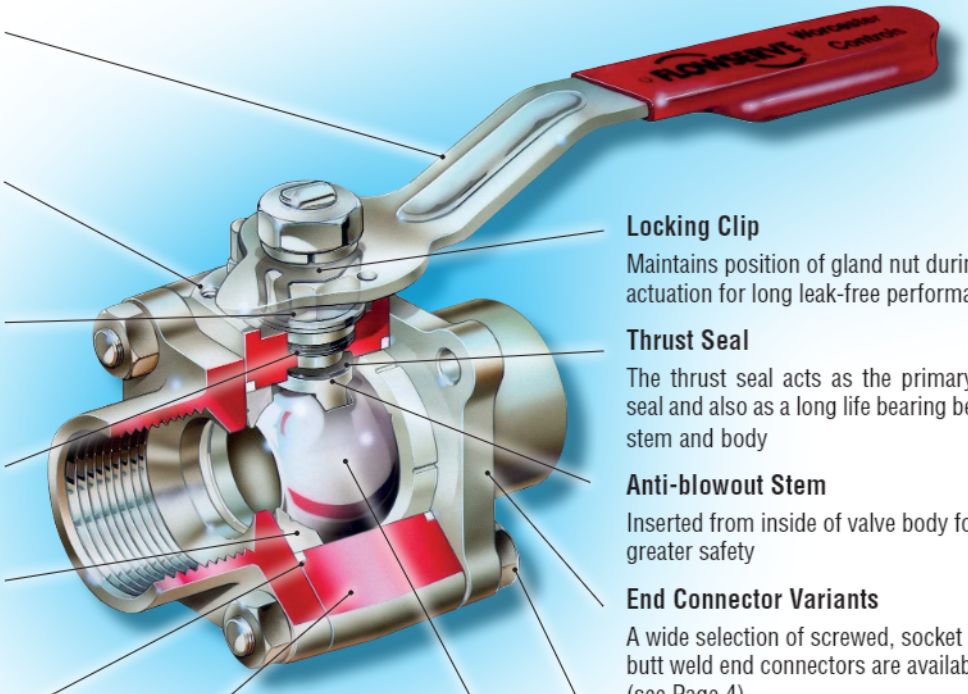
Gland Nut
Does not need to be removed for actuator mounting thereby maintaining valve integrity

Anti-static Stem Design
Ensures electrical continuity between ball and body

Seats
Wide range of seat materials to suit customer applications (see Pages 8 and 9)

Body Seals
PTFE as standard for media compatibility but can be interchanged for alternative applications

Materials of Construction
Cast body and end connectors in carbon or stainless steel (sizes 65mm and above are suitable for applications to -46 °C as standard)



Locking Clip
Maintains position of gland nut during actuation for long leak-free performance

Thrust Seal
The thrust seal acts as the primary stem seal and also as a long life bearing between stem and body

Anti-blowout Stem
Inserted from inside of valve body for greater safety

End Connector Variants
A wide selection of screwed, socket and butt weld end connectors are available (see Page 4)

Bolting
Bolting enclosed (44/59 Series) to minimise corrosion and maintain alignment of body and end connections. Stainless steel valves are supplied with stainless steel bolting

Ball
316 stainless steel as standard with pressure equalising hole to balance cavity pressure with line pressure when valve is open.

Standards of Compliance

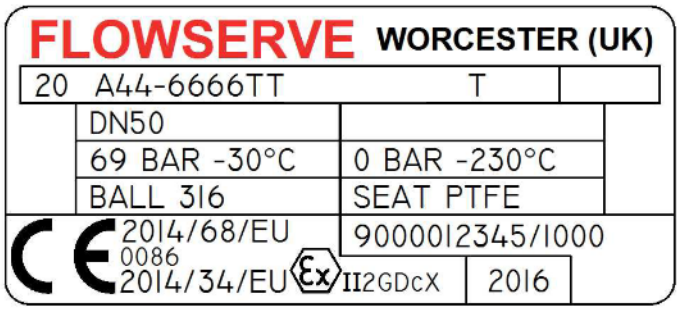
Worcester have always taken the lead when it comes to standards of compliance and the 3-piece valve is no exception, meeting all the mandatory requirements along with a number of others relating to product for use in the process industry.

PED 2014/68/EU

The Pressure Equipment Directive was introduced to ensure the safety and integrity of pressure containing equipment used within Europe. The Directive requires design files including calculations to ASME BPVC Sect. VIII, risk assessments, Product testing, Pressure containing components with 3.1 Certification along with supporting QA certification validated by a Notified Body.
CE marking for PED only applies to valves greater than DN25 nominal bore. Below that design files are still maintained but classified as SEP.

Atex 94/9/EC

The Atex Directive was established to prevent explosive atmospheres forming, prevent ignition and control the effect of explosions. Valves complying with the Atex requirement are CE marked with the standard designation. Worcester valves carry a rating Ex II2GDcX due to the anti-static devices used in the build.



SIL (Safety Integrity Level) IEC61508

Safety Integrity is now an essential part of many process plants allowing assessments to be made based on the reliability of the equipment used within it. Worcester valves have been independently reviewed and assessed and given the rating of SIL ‘SC 3’. This allows an assembly utilising a Worcester valve to carry a maximum overall rating of SIL 3 or less if other equipment has a lower rating

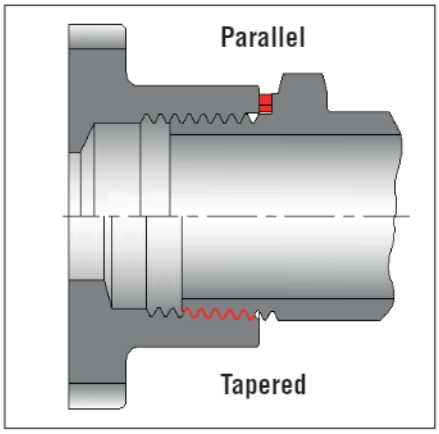
Fugitive Emission ISO15848

Introduced to ensure that product used in process plants can maintain a specified level of integrity based on service conditions. The Worcester 44 Series now has a combined class rating as follows;

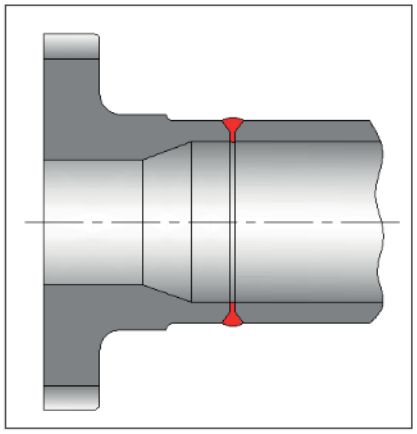
Tightness Class: BH (Helium)
Endurance Class: C01 (500 cycles)
Test Pressure: 69 Bar
Test temperature: Ambient 20 °C & 120 °C
Stem seal Adjustments (SSA): 0 (No adjustments)
ISO FE BH-C01-SSA 0-t(-29 °C to 120 °C)-69 bar

End Connector Variants

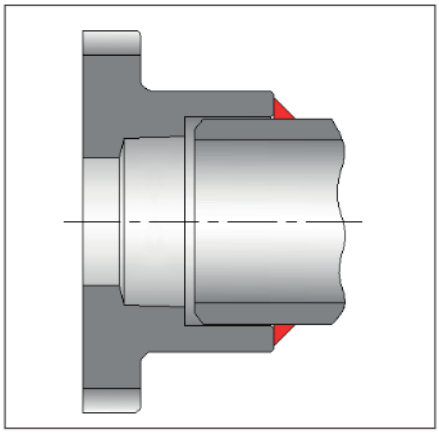
Worcester offers a wide range of end connector variants to meet international, European and regional standards. The variety of connectors is shown below with their reference standard against the Worcester 3-digit product code designation.



Threaded



Butt Weld



Socket Weld

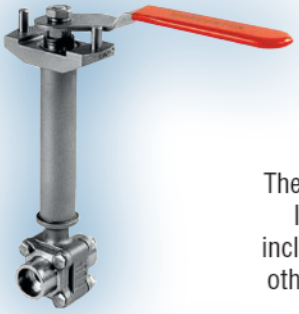
Type	Code	Reference	Standard of Compliance
Threaded	SEP	BSPP / G	BS EN ISO 228-1
	SET	BSPT / Rc	BS EN ISO 10226-1 / ISO 7-1
	SEN	NPT	ASME B1.20.1
Butt Weld	BW5	Schedule 5	Pipe to BS1600, ASME B36.10/B36.19 Butt weld preparation to ASME B16.25
	BWE	Schedule 10	
	BWA	Schedule 40	
	BWC	Schedule 80	
	BW6	Schedule 160	
	BOD	Hygienic Tube	Inch series O/D pipe, 16 swg wall
	BWG	ISO Pipe (special)	ISO 4200 Series 1 O/D with Wall thickness to EN 1092-1 PN16/40
	BWJ	ISO Pipe (special)	ISO 4200 Series 1 O/D with 2.6mm Wall thickness
	BWH	ISO Pipe (special)	ISO 4200 Series 1 O/D with I/D as per valve DN size
	BWK	DIN Pipe	DIN 2463 Row 1
	BWL	DIN Pipe	DIN 11850 Row 2
	BWM	Swedish Std	SSG7837 (Pulp and Paper)
	BWR	DIN Pipe	DIN 11850 Row 1
	BX*	ISO Pipe	ISO 4200 Series 1
	BY*	ISO Pipe	ISO 4200 Series 2
	BZ*	ISO Pipe	ISO 4200 Series 3
Socket Weld	SWA	Schedule 40	Pipe to BS1600, ASME B36.10/B36.19
	SWC	Schedule 80	Pipe to BS1600, ASME B36.10/B36.19 (Not available on A44)

Alternative end connectors such as extended or Tri-clamp are available upon request.

Application Variants

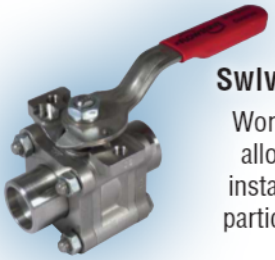
EC 1935 Food Contact Valve

This special variation of the 44/459 series fully complies with the requirements of Regulation EC 1935, enabling it to be safely installed on applications involving direct food contact.



Cryogenic Valves C44/59/459/599

The cryogenic valve is suitable for low temperature applications, including CO2, N2, Ar, O2, LNG and other liquid gases. It is available in stainless steel or brass.



Swivel Ended Valves AS44/59

Worcester's swivel-end connector allows for simple orientation and installation of butt welded valves, particularly when long, complicated sections of pre-fabricated pipework are used.

High Integrity Valve E44

The unique dual stem sealing design of the Worcester Enviro-Safe valve makes it ideal for toxic media and high cycling applications.

Clean Valves WK70

This valve has been specifically developed for use in semi-conductor, pharmaceutical and bio-tech applications.

Control Valves V44/459

Worcester's versatile rotary V-Flow control valve offers accurate control through a range of V-ported, characterized seats, providing a compact control valve for a variety of applications (Also available in firesafe version).

High Pressure Valves 5HP44

The 5HP44 is Worcester's three-piece ball valve for high pressure hydraulic systems up to 345 Bar (5000 psi).

Steam and Thermal Fluid Valves AW44/59

Specifically designed for on/off steam applications in conditions up to 250 psi (continuous saturated steam) or 1500 psi (thermal fluids), the AW44 is available in stainless or carbon steel.

Firesafe Valves F44/59/459/599

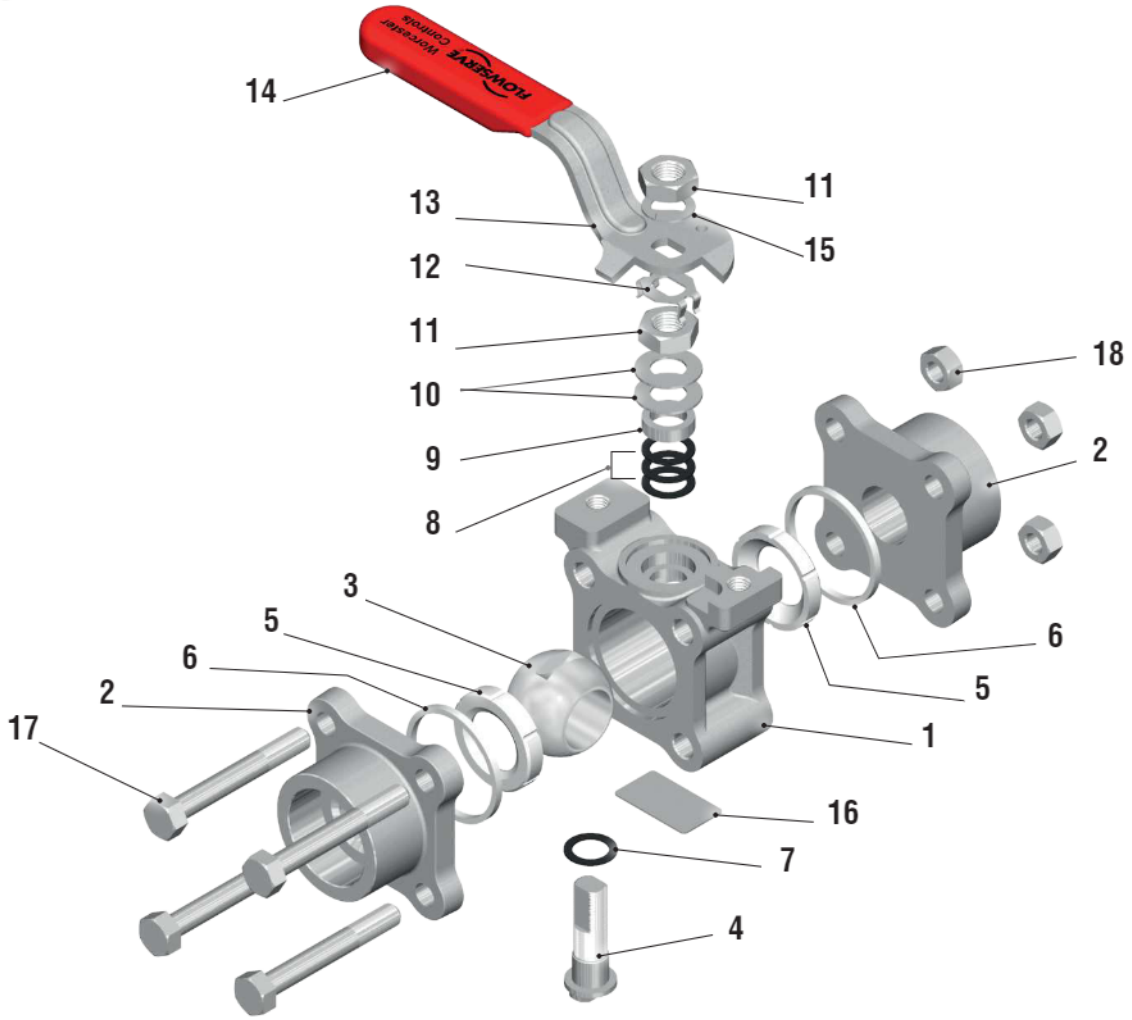
This firesafe design is particularly suitable for hazardous areas in hydrocarbon and chemical process lines.

Diverter Valves 13/14

Worcester Series 13/14 range of three-way valves has been designed for diverting and mixing process media, and features a number of variants which provide a range of operational solutions. Available in bottom entry and side entry configurations

Construction

A44/A59



Item	Description	Carbon Steel	Stainless Steel
1	Body	ASTM A216 WCB UNS J03002	ASTM A351 CF8M UNS J92900
2	End Connector	ASTM A216 WCB UNS J03002	ASTM A351 CF3M UNS J92800
3	Ball	ASTM A479 316 UNS S31600 ASTM A351 CF8M UNS J92900	
4	Stem	Stainless Steel AISI Type 316	
5	Seats*	T PTFE, Virgin R PTFE, 15% Glass Filled H PTFE, 25% Glass Filled P Fluorofill (10% Glass, 15% Carbon Filled) Also Acetal, PEEK, UHMWPE & Metal Seats	
6	Body Seal*	PTFE, Virgin	
7	Stem Thrust Seal*	PTFE, 35% Carbon Filled	
8	Gland Packing*	PTFE, 35% Carbon Filled	
9	Gland Follower	Stainless Steel	
10	Disc Springs*	Stainless Steel	

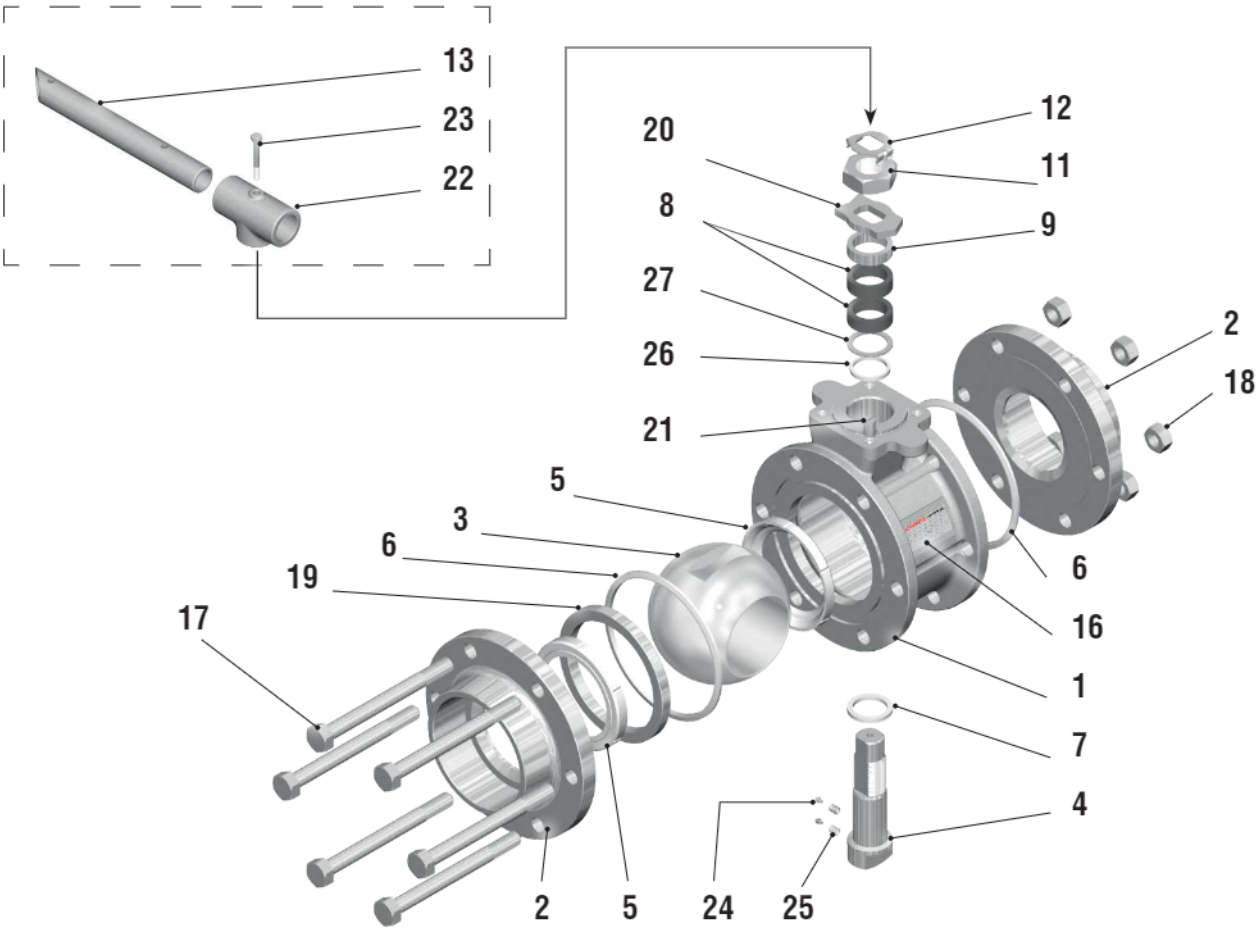
Item	Description	Carbon Steel	Stainless Steel
11	Gland/Wrench Nut*	Stainless Steel	
12	Locking Clip*	Stainless Steel	
13	Wrench	Carbon Steel	Stainless Steel
14	Wrench Sleeve	Vinyl Plastisol	
15	Spring Washer	Stainless Steel	
16	Indentification Plate	Stainless Steel	
17	Body Bolts	BS3692 Gr.8.8 ASTM A193M Gr.B7	BS EN 3506-1 A4-80 BS6105 Gr.A4-80 BS1506 Gr.MB8MX ASTM A193M Gr.B8M Cl.2
18	Body Nuts	BS3692 Gr.8 ASTM A194M Gr.2H	BS EN 3506-2 A4-80 BS6105 Gr.A4-80 BS1506 Gr.M8MX ASTM A194M Gr.8M

1 Items marked with * denote components supplied in repair kits.
2 All material grades stated are known to be correct at the time of issue but may be subject to change. Customers are advised to contact Flowserve when exact materials of construction are required.
3 Stainless steel stop pin fitted on 1¼" - 2" A44 and 1" - 1½" A59

Construction

A459/A599

Wrench kit supplied separately. To be ordered at time of valve Purchase Order.



Item	Description	Carbon Steel	Stainless Steel
1	Body	ASTM A352 LCB UNS J03003	ASTM A351 CF8M UNS J92900
2	End Connector	ASTM A352 LCB UNS J03003	ASTM A351 CF3M UNS J92800
3	Ball	Stainless Steel ASTM A351 CF8M UNS J92900	
4	Stem	Stainless Steel AISI Type 316	
5	Seats*	T PTFE, Virgin R PTFE, 15% Glass Filled H PTFE, 25% Glass Filled P Fluorofill (10% Glass, 15% Carbon Filled) Also Acetal, PEEK, UHMWPE & Metal Seats	
6	Body Seal*	PTFE, Virgin	
7	Stem Thrust Seal*	PTFE, 25% Glass Filled	
8	Gland Packing*	Graphite	
9	Gland Follower	Stainless Steel	
11	Gland/Wrench Nut*	Carbon Steel	Stainless Steel
12	Locking Clip*	Stainless Steel	
13	Wrench	Carbon Steel	

Item	Description	Carbon Steel	Stainless Steel
16	Indentification Plate	Stainless Steel	
17	Body Bolts	ASTM A193M Gr.B7 BS3692 Gr.8.8	ASTM A193M Gr.B8M Cl.2 BS EN 3506-1 A4-80 BS1506 Gr.MB8MX
18	Body Nuts	ASTM A194M Gr.2H	ASTM A194M Gr.8M
19	Seat Ring Retainer	BS3692 Gr.8 ASTM A352 LCB UNS J03003	BS EN ISO 3506-2 Gr.A4-80 BS1506 Gr.M8MX ASTM A351 CF8M UNS J92900
20	Stop Indicator	Carbon Steel	Stainless Steel
21	Stop Pin	Carbon Steel	Stainless Steel
22	Wrench Head	Cast Iron / Stainless Steel	
23	Wrench Bolt	Stainless Steel	
24	Anti-static Plunger	Stainless Steel	
25	Anti-static Spring	Stainless Steel	
26	Stem Location Ring	Stainless Steel	
27	Stem Seal (Seconday)	PTFE, Virgin	

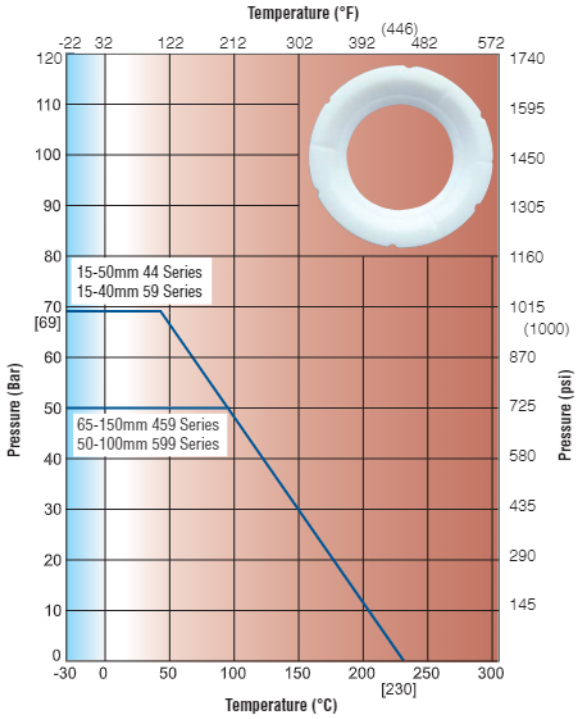
1 Items marked with * denote components supplied in repair kits.
2 Material selection may alter the valves operating pressure/temperature range. Customers are advised to contact Flowserve on ratings for special valve builds.
3 All material grades stated are known to be correct at the time of issue but may be subject to change. Customers are advised to contact Flowserve when exact materials of construction are required.

Pressure Temperature Ratings

PTFE based seats

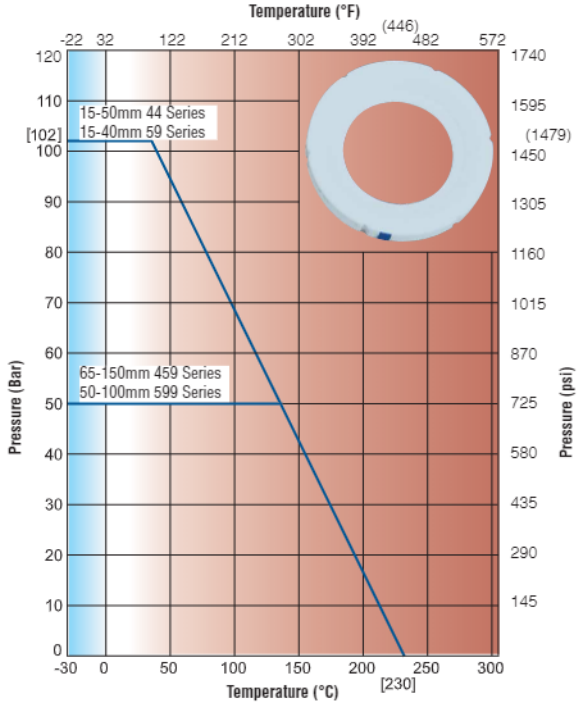
VIRGIN PTFE (T)

Virgin PTFE is the most common sealing material and is suitable for almost all media as it has excellent chemical resistance.



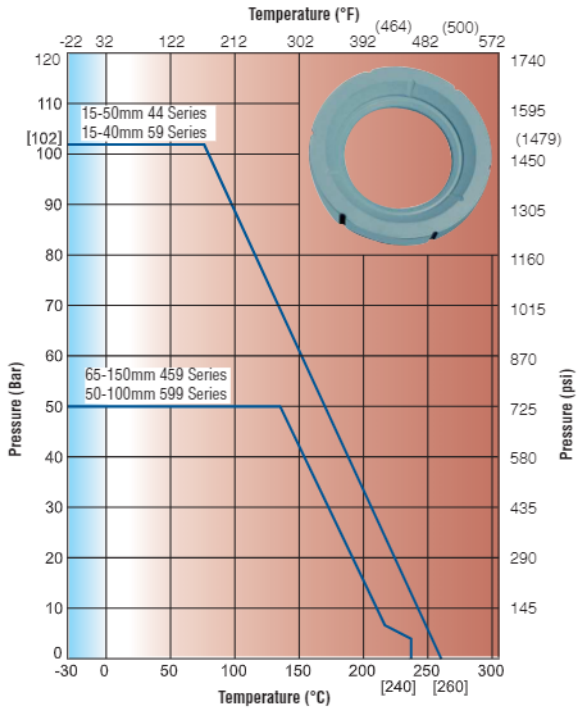
15% GLASS FILLED PTFE (R)

Glass re-inforced PTFE seats are stronger than virgin and have higher pressure/temperature ratings. Chemical resistance as per virgin PTFE.



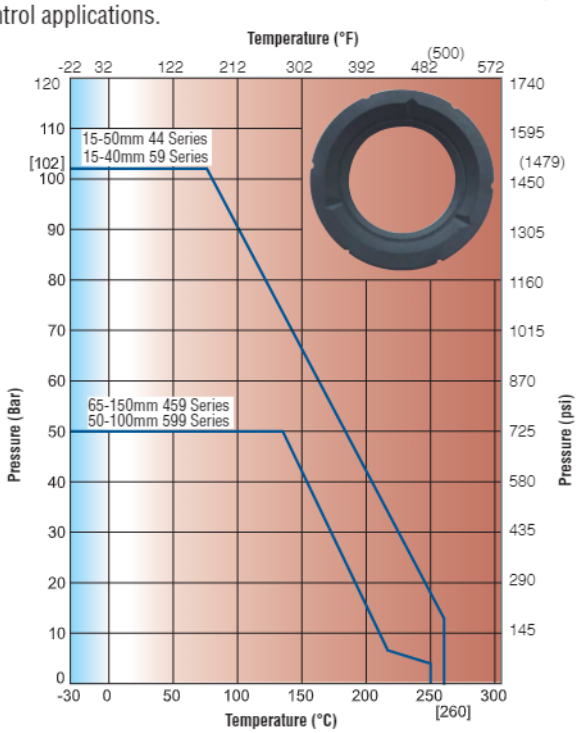
25% GLASS FILLED PTFE (H)

Glass re-inforced PTFE material offering a greater pressure / temperature capability than the R seat.



FLUOROFILL (P)

Carbon, glass and graphite filled PTFE material, an excellent seat material for steam and thermal services. Due to its high cycling capabilities, it is the recommended soft seat for modulating control applications.

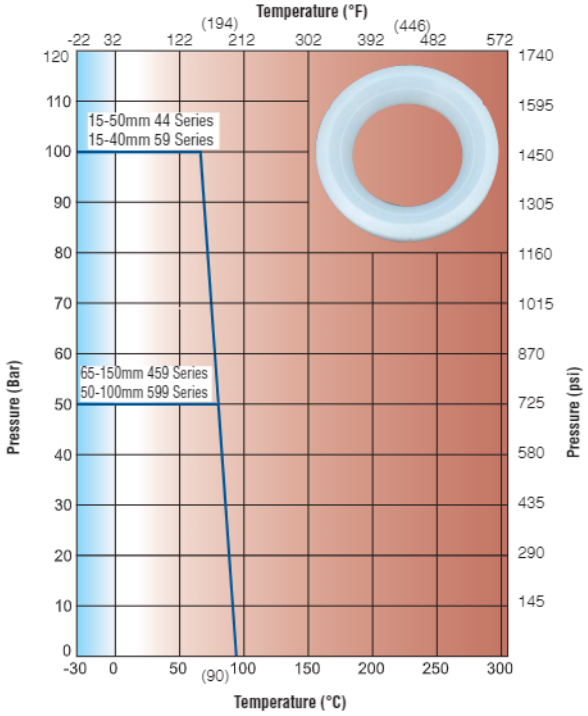


Pressure Temperature Ratings

Non PTFE seats

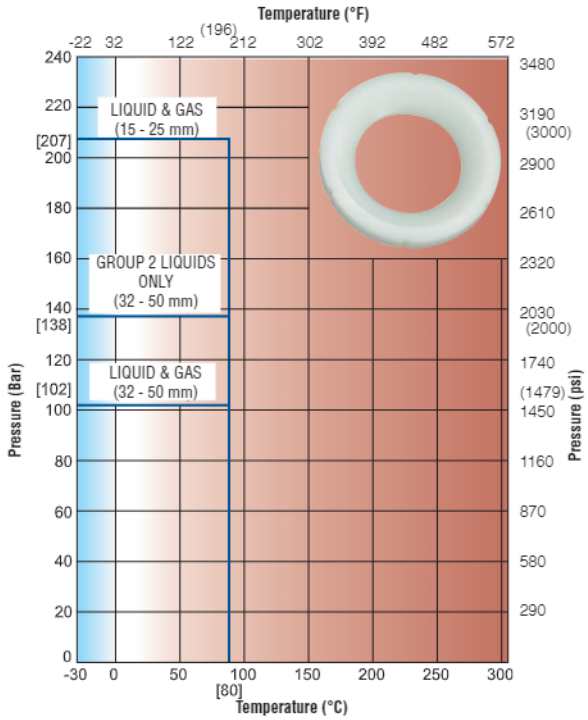
UHMWPE (U)

Ultra High Molecular Weight Polyethylene offers good performance characteristics in applications where PTFE is not suitable (for example on tobacco duty). It also has good abrasion resistance.



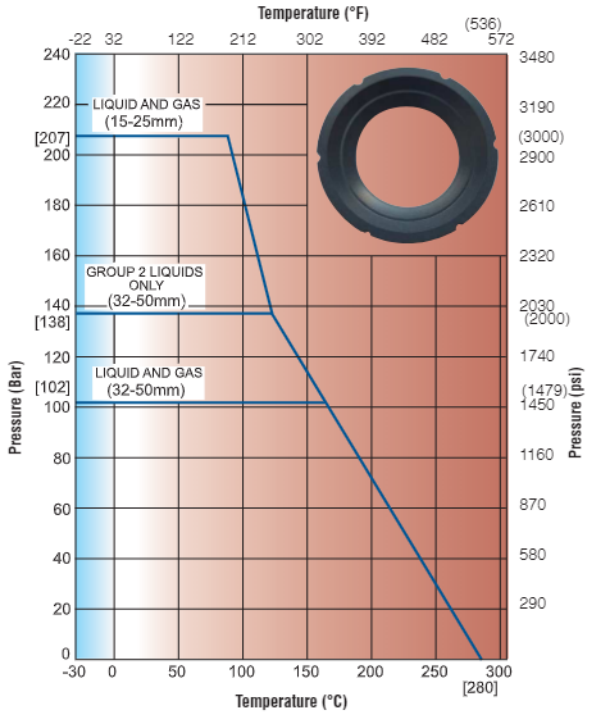
ACETAL (Y)

Machined from acetal homopolymer, these seats are capable of handling extremely high pressures.



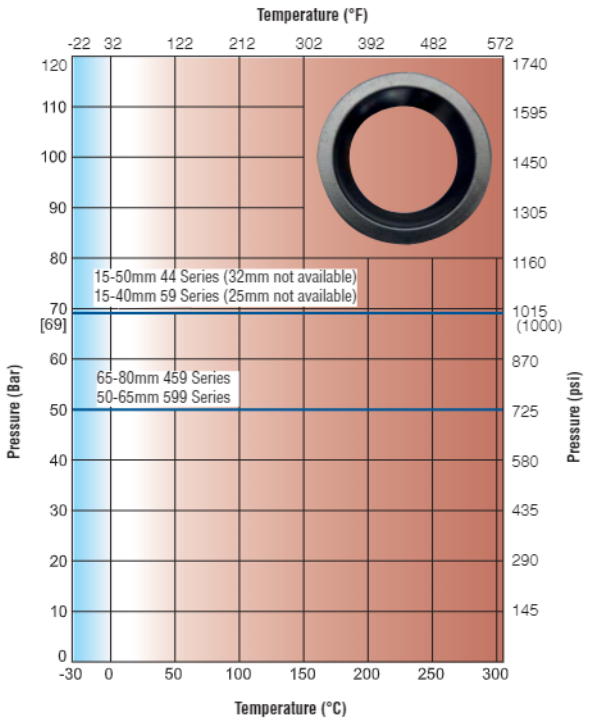
PEEK (A - DN15-25) (X - DN32-150)

PEEK is Poly Ether Ether Ketone, a material which demonstrates outstanding pressure capabilities at elevated temperatures. PEEK has excellent chemical and abrasion resistance.



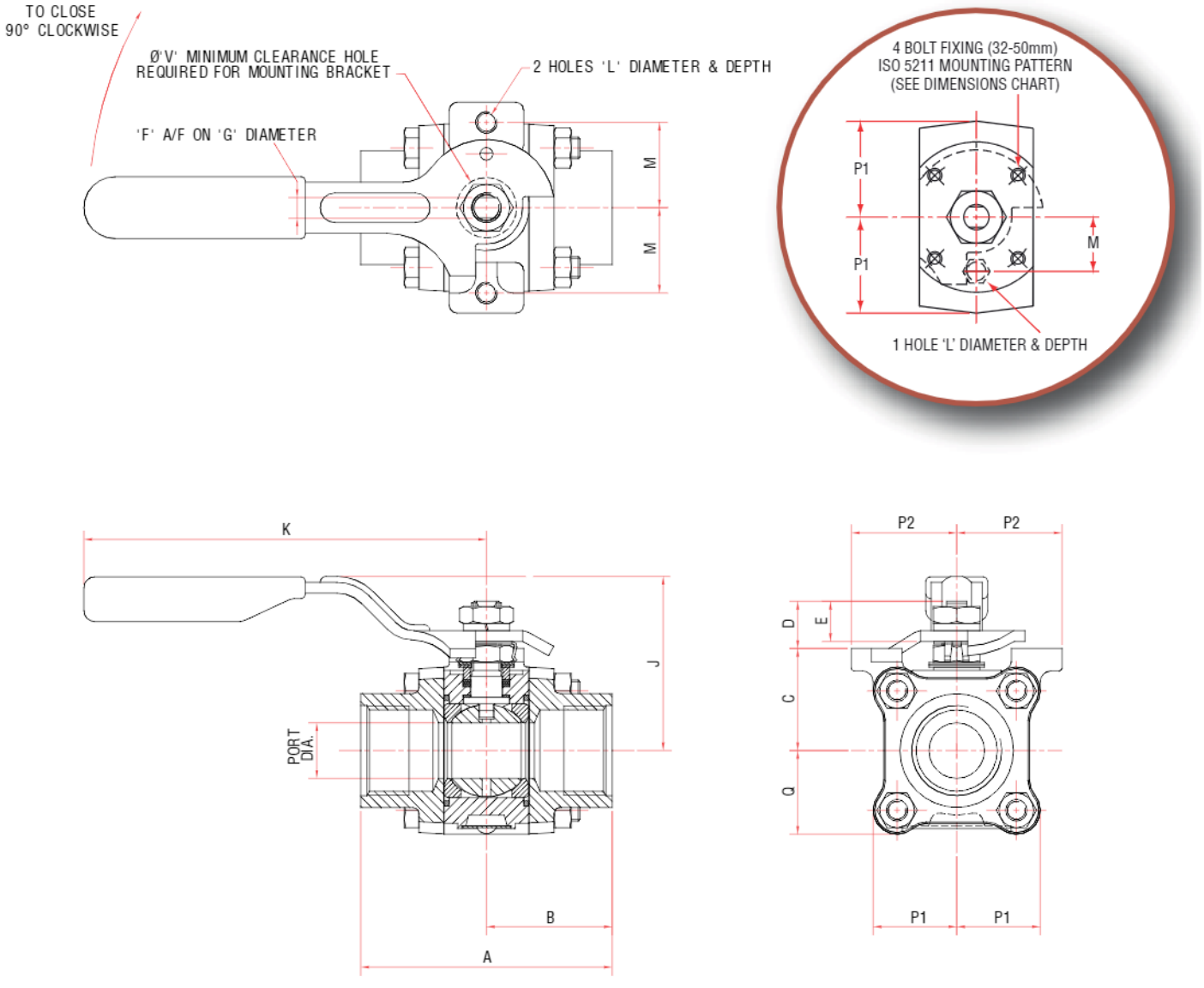
METAL – ALPHA (N) / GAMMA (G)

A 316L sintered metal seat impregnated with PTFE - Alpha (N) or graphite - Gamma (G) improves the strength and abrasion resistance of metal.



Dimensions (mm)

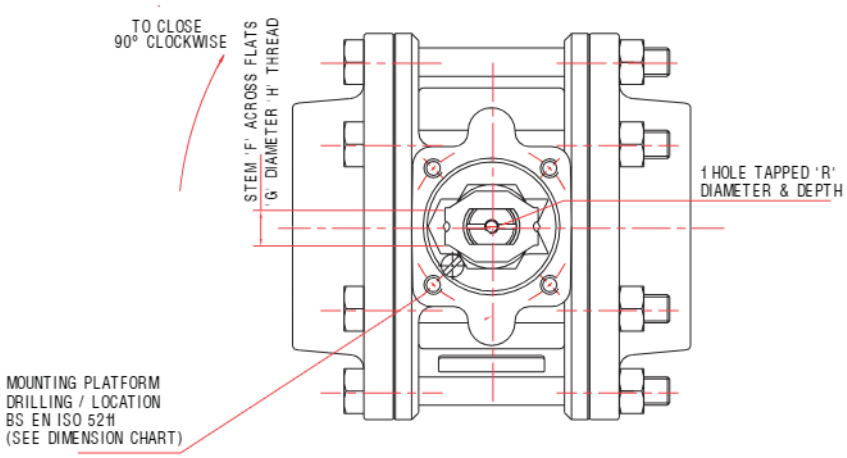
A44 8-50 mm Reduced Bore

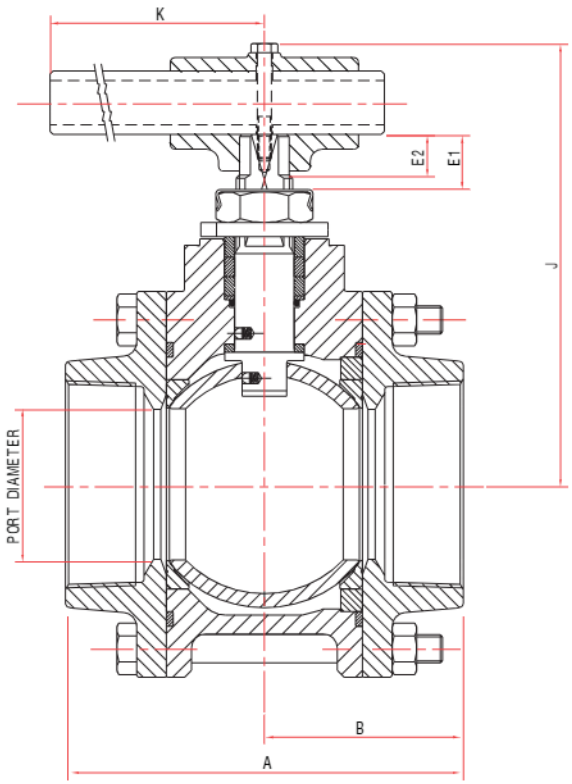


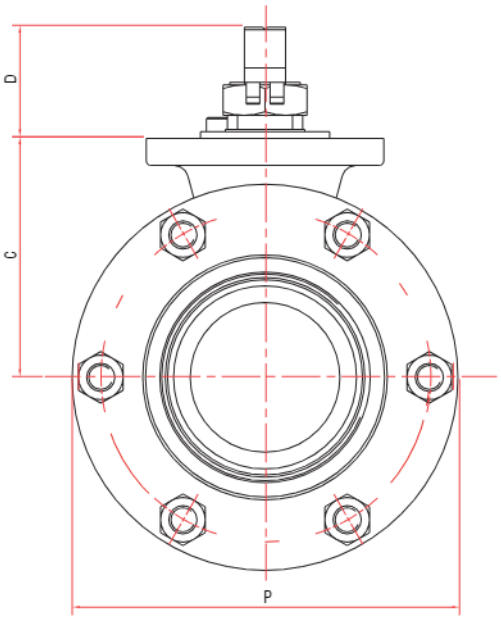
Valve Size (mm)	Port Ø Min	A	B	C	D	E	Stem		J	K	L Thread & Depth	M	P1	P2	Q	V Ø	Mounting Platform (ISO 5211)			Weight Kg
							F A/F	G Ø Thread									ISO Size	Mounting Holes	Platform Recess	
15	10.9	66.25 64.52	32.69	26.7 26.5	11.68 11.04	10.69 10.19	5.54 5.46	3/8"-24 UNF	57.9	136.0	M6 x1.0p 9.5 Min	24.0	23.8	30.4	23.8	19.5				0.7
20	14.0	71.81 70.09	35.48	29.1 28.9	11.68 11.04	10.69 10.19	5.54 5.46	3/8"-24 UNF	60.3	136.0	M6 x1.0p 9.5 Min	27.0	27.2	33.4	27.2	19.5				0.9
25	20.4	94.55 92.82	46.84	38.1 37.9	17.94 17.16	15.19 14.69	7.54 7.47	7/16"-20 UNF	64.8	149.0	M8 x1.25p 9.7 Min	31.75	32.7	40.5	32.7	22.5				1.6
32	25.1	106.90 105.17	53.02	37.10 36.85	23.74 22.91	15.19 14.69	7.54 7.47	7/16"-20 UNF	69.6	149.0	M5 x0.8p 6.0 Min	19.5	36.3		36.3	22.5	F04	4 OFF M5 x0.8p x7.5 Deep Min ON 42.0 P.C.D.	Ø 30.15/30.02 x4.29/3.52 Deep	2.2
40	31.3	115.41 113.6	57.28	44.0 43.75	29.55 28.73	18.39 17.89	8.71 8.64	9/16"-18 UNF	77.9	181.0	M6 x1.0p 7.5 Min	23.0	42.3		42.3	29.5	F05	4 OFF M6 x1.0p x8.7 Deep Min ON 50.0 P.C.D.	Ø 35.15/35.02 x4.01/3.26 Deep	3.2
50	37.7	127.94 126.21	63.54	48.75 48.50	29.55 28.73	18.39 17.89	8.71 8.64	9/16"-18 UNF	82.6	181.0	M6 x1.0p 8.7 Min	23.0	47.4		47.4	29.5	F05	4 OFF M6 x1.0p x8.7 Deep Min ON 50.0 P.C.D.	Ø 35.15/35.02 x4.01/3.26 Deep	4.3

Dimensions (mm)

A459 65-150 mm Reduced Bore



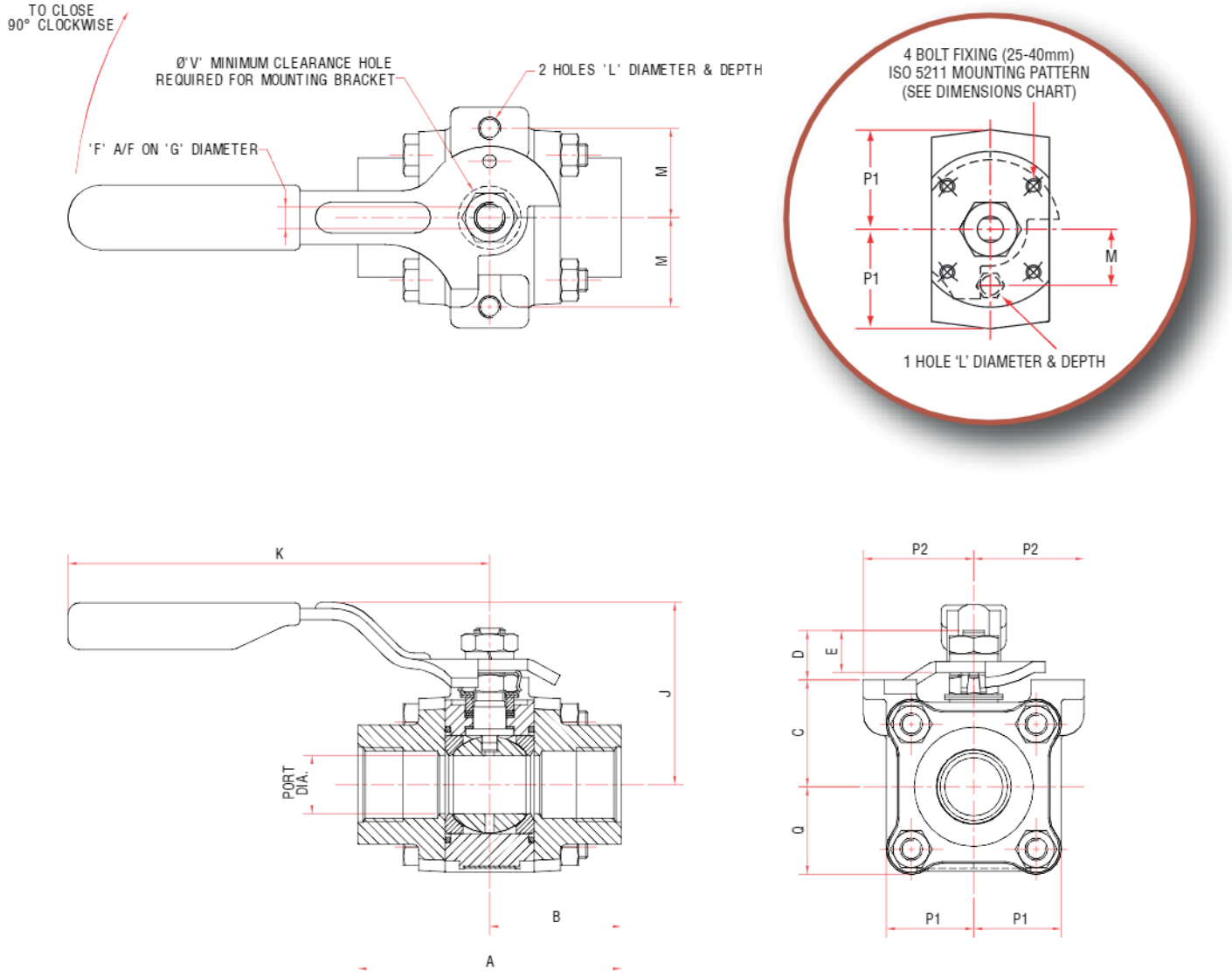




Valve Size (mm)	Port Ø Min	A	B	C	D	E1 Min	E2 Min	F A/F	Stem GØ	H Thread	J	K	P Ø	R Thread & Depth	Mounting Platform (ISO 5211)			Weight Kg
															ISO Size	Mounting Holes	Platform Recess	
65	50.8	149.74 148.11	74.46	87.57 86.87	43.83 41.50	13.15	–	14.0 13.9	–	M20 x1.5p	156.1	225.0	148.0	M6 x1.0p 10.0 MIN	F07	4 OFF M8 x1.25p ON 70.0 P.C.D.	Ø 54.97/54.90 x3.0/2.6 HIGH	9.0
80	63.55	170.04 168.31	84.59	101.90 101.10	51.10 48.44	19.37	16.80	15.1 15.0	21.2 21.0	M24 x2.0p	190.0	350.0	168.0	M6 x1.0p 12.0 MIN	F07	4 OFF M8 x1.25p ON 70.0 P.C.D.	Ø 54.97/54.90 x3.0/2.6 HIGH	13.3
100	76.2	214.67 212.94	106.9	119.90 119.10	55.70 53.04	21.67	21.00	19.3 19.2	27.2 27.0	M30 x2.0p	213.5	557.0	196.0	M6 x1.0p 12.0 MIN	F10	4 OFF M10 x1.5p ON 102.0 P.C.D.	Ø 69.97/69.85 x3.0/2.6 HIGH	23.0
150	102.0	299.26 297.54	149.20	147.10 146.30	73.05 70.39	30.27	28.20	26.6 26.5	33.2 33.0	M36 x2.0p	274.8	850.0	256.0	M8 x1.25p 12.0 MIN	F12	4 OFF M12 x1.75p ON 125.0 P.C.D.	Ø 84.97/84.85 x3.0/2.6 HIGH	51.0

Dimensions (mm)

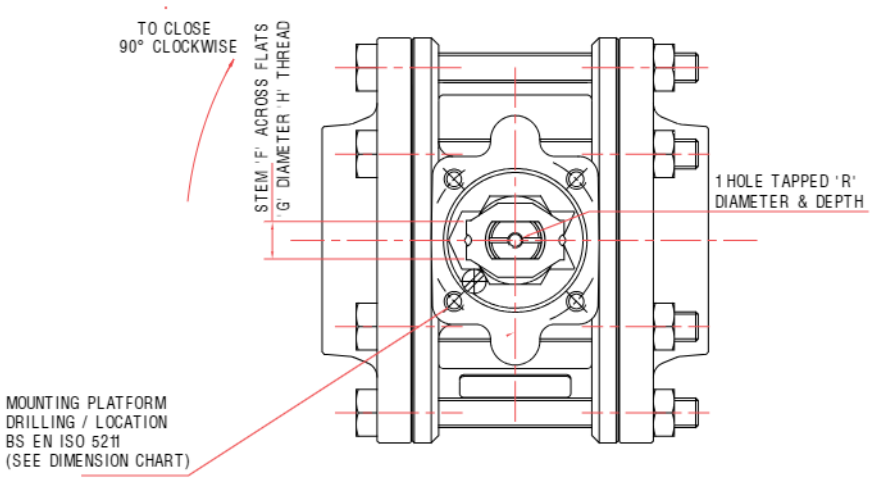
A59 8-40 mm Full Bore

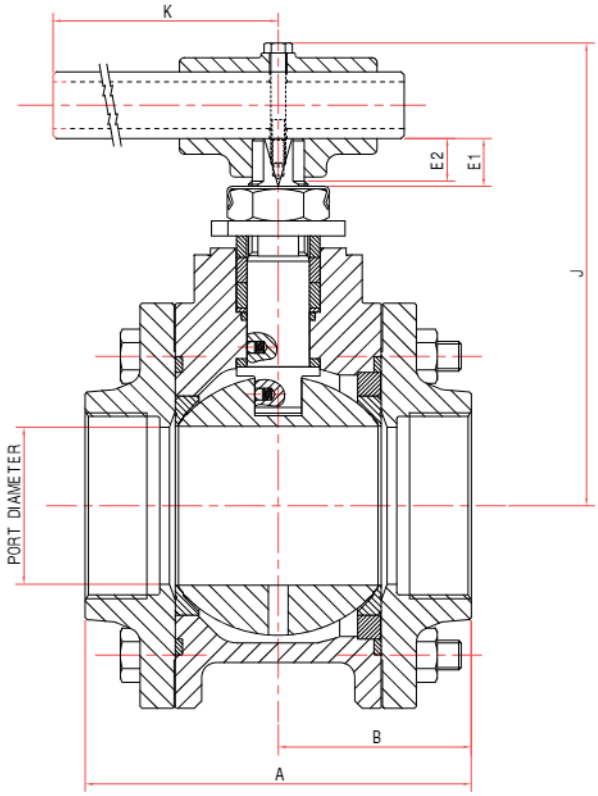


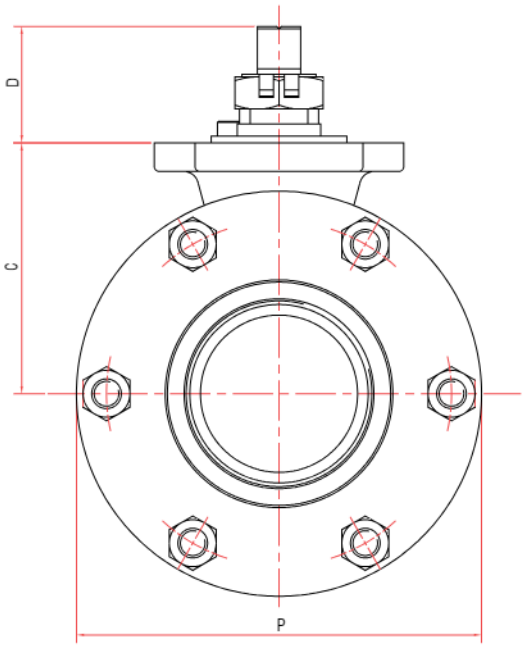
Valve Size (mm)	Port Ø Min	A	B	C	D	E	Stem		J	K	L Thread & Depth	M	P1	P2	Q	V Ø	Mounting Platform (ISO 5211)			Weight Kg
							F A/F	G Ø Thread									ISO Size	Mounting Holes	Platform Recess	
8-15	14.0	71.81 70.09	35.48	29.1 28.9	11.68 11.04	10.69 10.19	5.54 5.46	3/8"-24 UNF	60.3	136.0	M6 x1.0p 9.5 MIN	27.0	27.2	33.4	27.2	19.5				0.9
20	20.4	94.55 92.82	46.84	38.1 37.9	17.94 17.16	15.19 14.69	7.54 7.47	7/16"-20 UNF	64.8	149.0	M8 x1.25p 9.7 MIN	31.75	32.7	40.5	32.7	22.5				1.6
25	25.1	106.90 105.17	53.02	37.10 36.85	23.74 22.91	15.19 14.69	7.54 7.47	7/16"-20 UNF	69.6	149.0	M5 x0.8p 6.0 MIN	19.5	36.3		36.3	22.5	F04	4 OFF M5 x0.8p x7.5 DEEP MIN ON 42.0 P.C.D.	Ø 30.15/30.02 x4.29/3.52 DEEP	2.2
32	31.3	115.41 113.69	57.28	44.0 43.75	29.55 28.73	18.39 17.89	8.71 8.64	9/16"-18 UNF	77.9	181.0	M6 x1.0p 7.5 MIN	23.0	42.3		42.3	29.5	F05	4 OFF M6 x1.0p x8.7 DEEP MIN ON 50.0 P.C.D	Ø 35.15/35.02 x4.0/3.26 DEEP	3.2
40	37.7	127.94 126.21	63.54	48.75 48.50	29.55 28.73	18.39 17.89	8.71 8.64	9/16"-18 UNF	82.6	181.0	M6 x1.0p 8.7 MIN	23.0	47.4		47.4	29.5	F05	4 OFF M6 x1.0p x8.7 DEEP MIN ON 50.0 P.C.D.	Ø 35.15/35.02 x4.0/3.26 DEEP	4.3

Dimensions (mm)

A599 50-100 mm Full Bore







Valve Size (mm)	Port Ø Min	A	B	C	D	E1 Min	E2 Min	F A/F	Stem GØ	H Thread	J	K	P Ø	R Thread & Depth	Mounting Platform (ISO 5211)			Weight Kg
															ISO Size	Mounting Holes	Platform Recess	
50	50.8	149.74 148.11	74.46	87.57 86.87	43.83 41.50	13.15	–	14.0 13.9	–	M20 x1.5p	156.1	225.0	148.0	M6 x1.0p 10.0 MIN	F07	4 OFF M8 x1.25p ON 70.0 P.C.D	Ø 54.97/54.90 x3.0/2.6 HIGH	9.0
65	63.55	157.24 155.51	78.19	101.90 101.10	51.10 48.44	19.37	16.80	15.1 15.0	21.2 21.0	M24 x2.0p	190.0	350.0	168.0	M6 x1.0p 12.0 MIN	F07	4 OFF M8 x1.25p ON 70.0 P.C.D.	Ø 54.97/54.90 x3.0/2.6 HIGH	13.3
80	76.2	192.27 190.77	95.75	119.90 119.10	55.70 53.04	21.67	21.00	19.3 19.2	27.2 27.0	M30 x2.0p	213.5	557.0	196.0	M6 x1.0p 12.0 MIN	F10	4 OFF M10 x1.5p ON 102.0 P.C.D.	Ø 69.97/69.85 x3.0/2.6 HIGH	23.0
100	102.0	299.26 297.54	149.20	147.10 146.30	73.05 70.39	30.27	28.20	26.6 26.5	33.2 33.0	M36 x2.0p	274.8	850.0	256.0	M8 x1.25p 12.0 MIN	F12	4 OFF M12 x1.75p ON 125.0 P.C.D.	Ø 84.97/84.85 x3.0/2.6 HIGH	51.0

Technical Information

Valve Pressure and Temperature Ratings

Body / Connector Material	Temperature Range °C	Standard Material	
		44 Series	459 Series
(4) Carbon Steel	-29 to 300	•	–
(5) Low temp Carbon Steel	-46 to 300	–	•
(6) Stainless Steel	-196 to 300	•	•
Body Seal Material	**Temperature Range °C**	**Max Pressure (Bar)**	
		44 Series	**459 Series**
(T) PTFE	-50 to 260	102	50
(Z) Graphite	-196 to 300	102	50
(M) S-Gasket, 316+PTFE	-196 to 260	90	50
(G) S-Gasket, 316+Graphite	-196 to 300	90	50
(B) Buna Nitrile	-40 to 110	102*	50
(V) Viton	-20 to 250	102*	50
(E) EPDM	-50 to 125	102*	50
(S) Silicon	-65 to 200	102*	50
Seat Material	**Temperature Range °C**	**Max Pressure (Bar)**	
		44 Series	**459 Series**
(T) PTFE	-30 to 230	69	50
(R) PTFE, 15% GF	-50 to 230	102	50
(H) PTFE, 25% GF	-80 to 260	102	50
(P) PTFE, Fluorofill	-80 to 260	102	50
(A) or (X) PEEK	-80 to 280	102	50
(Y) Delrin	-80 to 80	102	50
(U) UHMWPE	-80 to 80	102	50
(N) Alpha, 316+PTFE	-80 to 300	69	50
(G) Gamma, 316+Graphite	-80 to 300	69	50

1) *The maximum pressure ratings of 44 series valves with O-ring seals and PED SEP are: DN8 to DN25 = 207 bar, DN32 to DN50 = 138 bar
2) **Note:** All 459 series seals have a limit of 250 °C max even though the body rating is 300 °C.

The valve pressure and temperature ratings are made up from a combination of the body/end connector material, seat material and body seal material. The seat ratings are shown graphically on pages 8 and 9 but they need to be used in conjunction with the maximum and minimum ratings shown opposite.

Flow Coefficients / Limiting Stem Input Torque (reduced bore)

Valve Size		Flow Coefficients		Equivalent Length of pipe		Limiting Stem Input torque Nm	
mm	in	Cv	Kv	Feet	Metres	316S16	17/4pH
8-15	¼-½	8.3	7.2	1.8	0.58	13.2	90
20	¾	13.6	11.8	5.5	1.67		
25	1	37.5	32.6	3	0.91	24.4	165
32	1¼	57	49.3	3.1	0.94		
40	1½	79.7	69.1	3.9	1.19	48.6	268
50	2	106	91.8	7.5	2.28		
65	2½	188	163	150	1.52	192	1187
80	3	435	377	7	2.13	336	1677
100	4	638	553	27	8.21	620	3540
150	6	675	585	41	12.47	1138	7758

Notes:
1. When wrench is not fitted the flats on the stem, when parallel to the pipeline axis, denote ball open
2. All 44/59 weld end valves are assembled with Buna O-ring body seals with the correct body seals supplied loose. See IOM
3. For temperatures below -50 °C consult Flowserve
4. Alternative materials are available on request. These include NAB, Duplex, Monel, Hastelloy, 254 SMO for either body, connector, ball or stem
5. Valves containing PEEK, Delrin, or Metal seats are fitted with 17/4-PH stems as standard

Product Coding

Series A44/A59

A		B			C			D				E		F						G				H
Size		Standard Variant			Series		–	Body	End	Ball	Stem	Seat	Seal	End 1			End 2			Special				Revision
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25

A - Size Digits 1, 2		B - Std Variant Digits 3, 4, 5		C - Series Digits 6, 7		D - Main Parts Digits 9,10,11,12		E - Seat and Seals Digits 13,14,15,16,17		F - End Connector Variants Digits 18, 19, 20		G - Special Build Digits 21, 22, 23, 24		H - Revision Digit 25
¼"	08mm 02	Antistatic	A	44 Series	44	Brass	1	PEEK	A	Screwed NPT	SEN	Vacuum	P043	Denotes the revision of the product
3/8"	10mm 03			59 Series	59	Carbon St.	4	Buna	B	Screwed BSPT	SET	Oxygen	Q822	
½"	15mm 05					Stainless St.	6	EPDM	E	Screwed BSPP	SEP	Tobacco	P669	
¾"	20mm 07					Special	M	Metal Gamma	G	Socket Weld Schedule 40	SWA	Ammonia	Q797	
1"	25mm 10							25% Glass PTFE	H	Socket Weld Schedule 80	SWC	Press. Relief Ball	Q190	
1¼"	32mm 12							Metal Alpha	N	Butt Weld Schedule 5	BW5	Std. de-grease	P854	
1½"	40mm 15							Fluorofill	P	Butt Weld Schedule 10	BWE	Shrouded seats	P225	
2"	50mm 20							15% Glass PTFE	R	Butt Weld Schedule 40	BWA	O-Ring build	P882	
								Virgin PTFE	T	Butt Weld Schedule 80	BWC			
								UHMWPE	U		BWG			
								Viton	V		BWK			
								PolyPeek	X		BWM			
								Delrin	Y					

Series A459/A599

A		B			C			D				E		F						G				H
Size		Standard Variant			Series			–	Body and End	Ball	Stem	Seat	Body Seal	Thrust Seal	Stem Seal	Gland Packing	End			Special				Revision
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25

A - Size Digits 1, 2		B - Std Variant Digits 3, 4, 5		C - Series Digits 6, 7, 8		D - Main Parts Digits 10, 11, 12		E - Seat and Seals Digits 13,14,15,16, 17		F - End Connector Variants Digits 18, 19, 20		G - Special Build Digits 21, 22, 23, 24		H - Revision Digit 25
2"	50mm 20	Antistatic	A	459 Series	459	Carbon St.	5	PEEK	A	Screwed NPT	SEN	Vacuum	P043	Denotes the revision of the product
2½"	65mm 25			599 Series	599	Stainless St.	6	Buna	B	Screwed BSPT	SET	Oxygen	Q822	
3"	80mm 30					Special	M	35% Carbon PTFE	C	Screwed BSPP	SEP	Tobacco	P669	
4"	100mm 40							EPDM	E	Socket Weld Schedule 40	SWA	Ammonia	Q797	
6"	150mm 60							Metal Gamma	G	Socket Weld Schedule 80	SWC	Press. Relief Ball	Q190	
								25% Glass PTFE	H	Butt Weld Schedule 5	BW5	Std. de-grease	P854	
								Metal Alpha	N	Butt Weld Schedule 10	BWE	Shrouded seats	P225	
								Fluorofill	P	Butt Weld Schedule 40	BWA	O-Ring build	P882	
								15% Glass PTFE	R	Butt Weld Schedule 80	BWC			
								Virgin PTFE	T		BWG			
								UHMWPE	U		BWK			
								Viton	V		BWM			
								PolyPeek	X					
								Delrin	Y					
								Graphite	Z					
								25% Glass PTFE	7					

Ancillaries

Flowserve can supply a range of ancillary equipment such as lockable wrenches, stem extensions, spring return handles etc.

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