

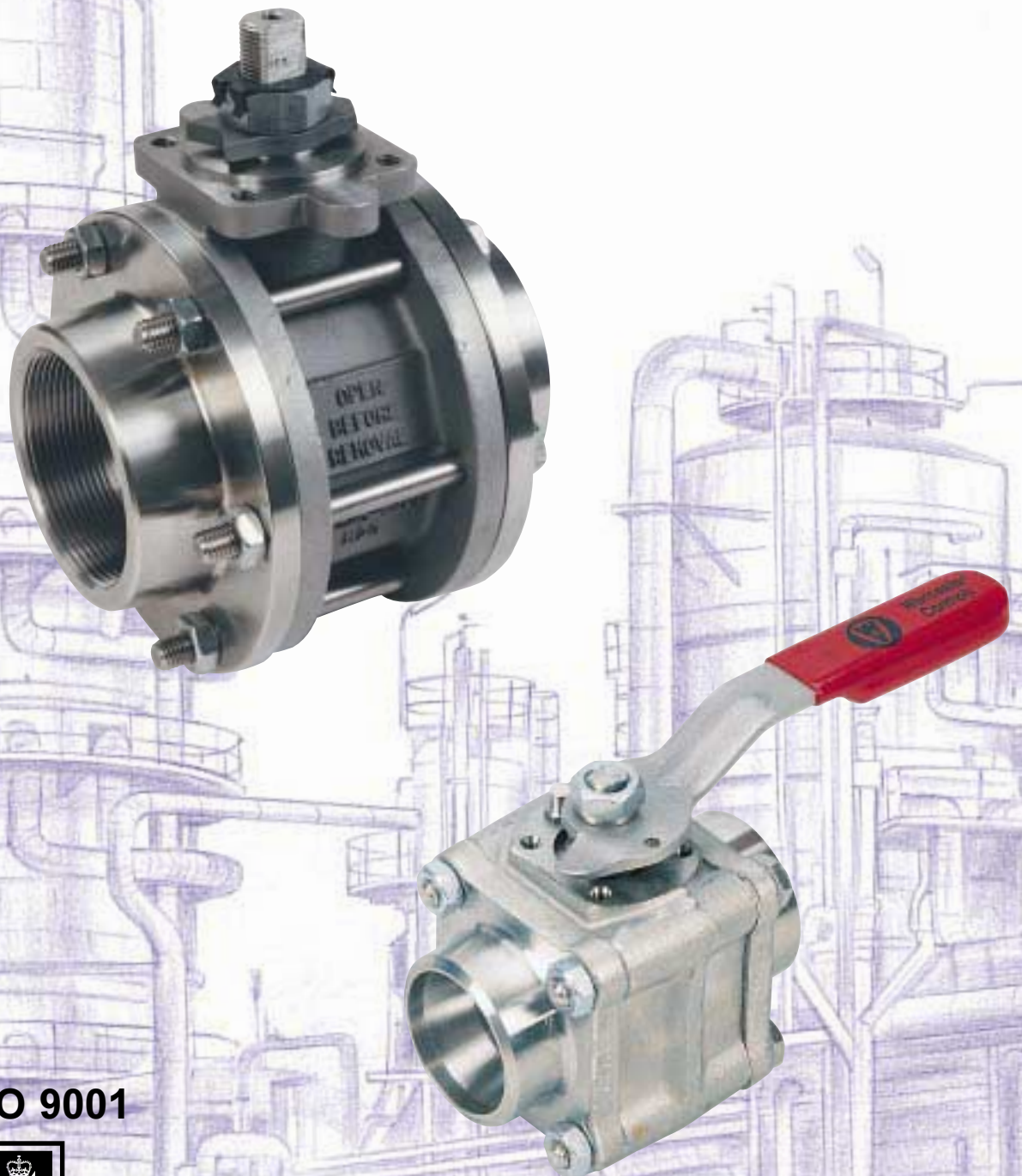


44/459

Worcester Controls

3-piece reduced bore ball valves

**Designed for a wide range of
general services.**



BS EN ISO 9001



FM 00707

Almost 40 years ago, Worcester Controls' original 3-piece valve was responsible for the development of the UK ball valve market. The Series 44 rapidly established itself as the industry standard for quality, reliability and long service.

As you would expect, Worcester has developed and improved the

Series 44 over the years to maintain its position as the 8-50mm valve design which others strive to equal (see Page 11). Now, Worcester's new, larger valve, the 65-150mm Series 459, complements the Series 44 to offer you the most versatile, reliable and widely specified range of 3-piece ball valves available.

Actuator mounting

Conforms to ISO 5211 for ease of actuation (8-25mm valves use Worcester two hole pattern – see page 4)

Locking clip

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

Gland nut

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

Wrench

Ergonomically designed for ease of operation

Anti-static stem design

Ensures electrical continuity between ball and body

Anti-blowout stem

Inserted from inside of valve body for greater safety

Seats

Wide range of seat materials to suit customer applications (see centre pages)

Ball

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

Body seals

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

Seat design

Cavity pressure relieving (CPR) seats ensure that pressure generated through media expansion when the valve is closed is safely relieved upstream

Body connectors

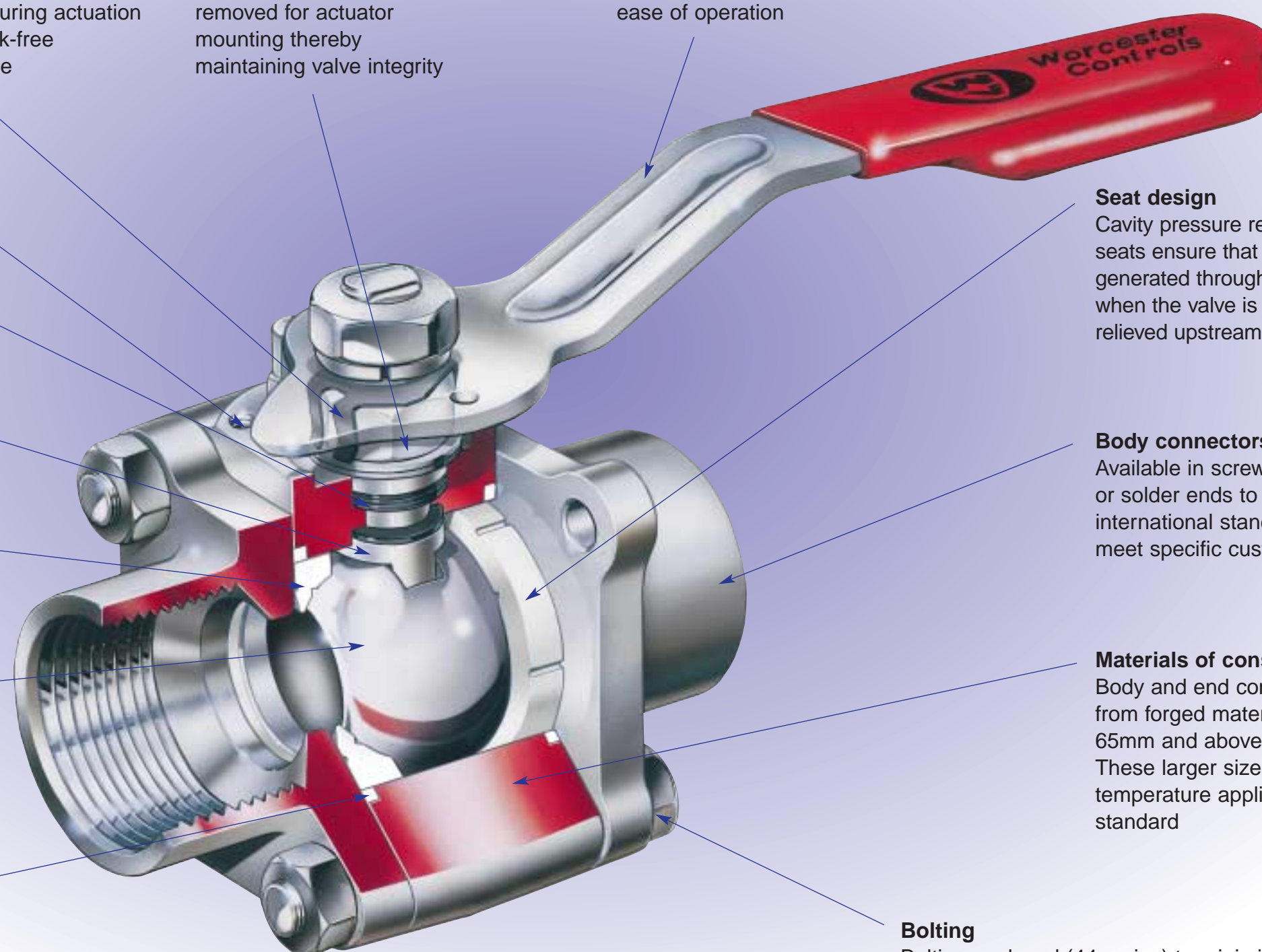
Available in screwed, butt weld, socket weld or solder ends to meet all major international standards or alternatively to meet specific customer needs

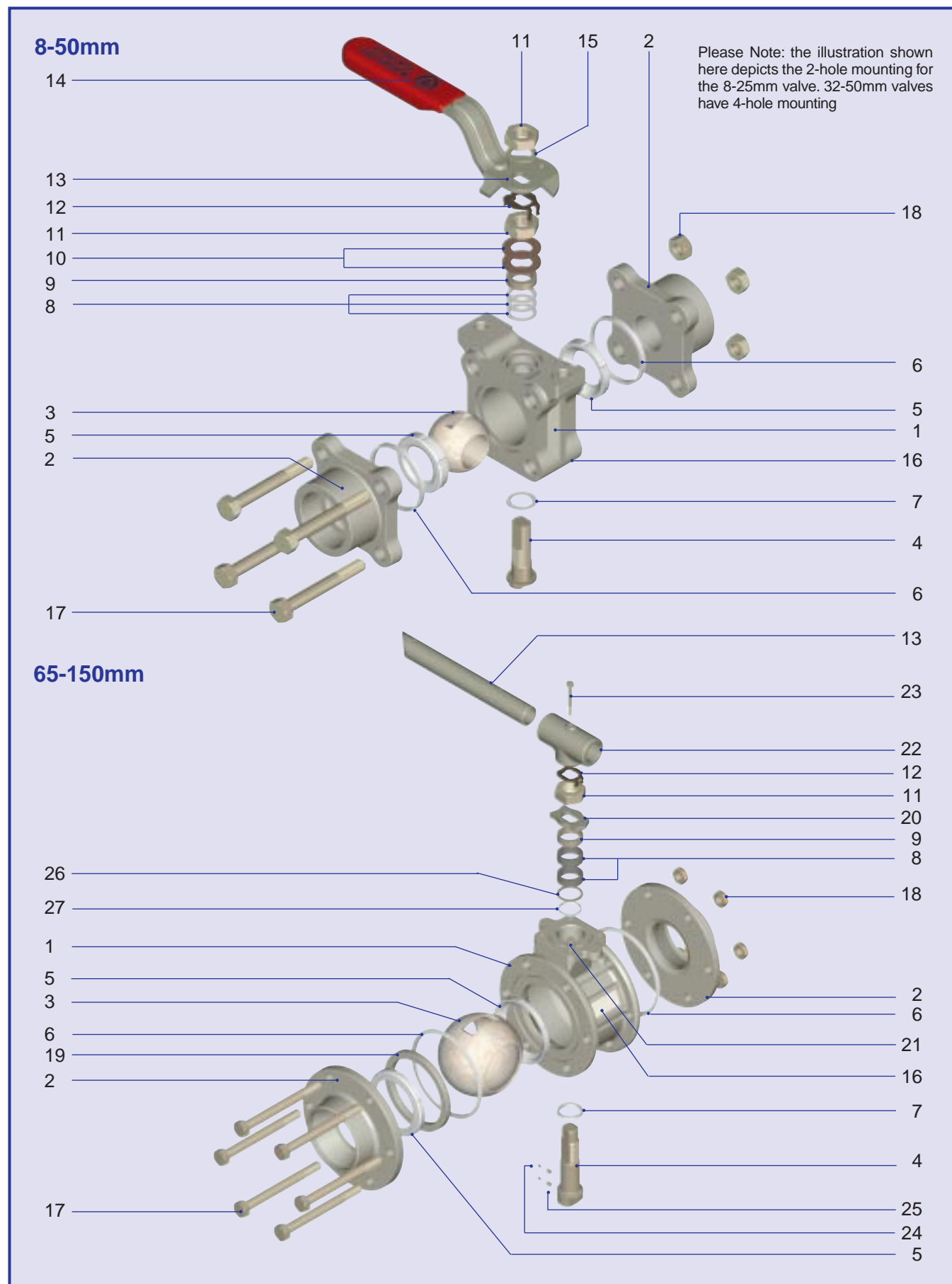
Materials of construction

Body and end connectors are manufactured from forged material (valve bodies, sizes 65mm and above, are from cast material). These larger sizes are also suitable for low temperature applications (to -46°C) as standard

Bolting

Bolting enclosed (44 series) to minimise corrosion and maintain alignment of body and end connectors. Stainless steel valves are supplied with stainless steel bolting





Parts/Materials List

ITEM No. AND DESCRIPTION	8-50mm	65-150mm	ITEM No. AND DESCRIPTION	8-50mm	65-150mm
1. BODY			12.* GLAND NUT LOCKING CLIP		
Carbon Steel ASTM A105	●		Carbon Steel, Rustproofed	●	●
Carbon Steel ASTM A352 LCB		●	13. WRENCH		
Stainless Steel ASTM A351 CF8M		●	Stainless Steel	●	
Stainless Steel ASTM A182 F316	●		Carbon Steel, Rustproofed	●	●
Aluminium BS1472 HF 30TF	●		14. WRENCH SLEEVE		
Nickel Aluminium Bronze NES 833 Part 2	●		Vinyl Plastisol	●	
Brass BSEN12165, CW617N	●		15. SPRING WASHER		
2. BODY CONNECTOR			Stainless Steel	●	
Carbon Steel ASTM A105	●		16. IDENTIFICATION PLATE		
Carbon Steel ASTM A350 LF2		●	Stainless Steel	●	●
Stainless Steel ASTM A182 F316L	●	●	17. BODY CONNECTOR BOLTS (see Note 1)		
Aluminium BS1472 HF 30TF	●		Stainless Steel BS6105 A4/80	●	●
Nickel Aluminium Bronze NES 833 Part 2	●		Stainless Steel BS4882 MB8 MX		● (150mm only)
Brass BSEN12165, CW617N	●		Carbon Steel BS3692 Grade 8.8	●	●
3. BALL			Carbon Steel ASTM A193 B7		● (150mm only)
Stainless Steel 316		●	Aluminium Bronze	●	
Aluminium Bronze		●	18. BODY CONNECTOR NUTS		
Brass BSEN 12164, CW 609N (8-25mm) BS2871 BSEN12449, CW505L	●		Stainless Steel BS6105 A4/80	●	●
	●		Stainless Steel BS4882 M8 MX		● (150mm only)
4. STEM			Carbon Steel BS3692 Grade 8.8	●	●
Stainless Steel 316	●	●	Carbon Steel ASTM A194 TM		● (150mm only)
Stainless Steel BS970 431 S29	●	●	19. SEAT RETAINING RING		
Aluminium Bronze	●		Carbon Steel ASTM A352 LCB		●
Brass BSEN12163, CW719R	●		Stainless Steel ASTM A351 CF8M		●
5.* SEATS (see also Pages 6-8)			20. STOP INDICATOR		
PTFE Virgin	●	●	Stainless Steel 316		●
PTFE 15% Glass Filled	●	●	Carbon Steel, Rustproofed	●	●
PTFE VX1	●	●	21. STOP PIN		
Fluorofill	●	●	Stainless Steel 316	●	●
Acetal Resin	●	●	Carbon Steel, Rustproofed	●	●
PEEK	●	●	22. WRENCH HEAD		
Metal	●	●	Malleable Iron, Rustproofed		●
6.* BODY SEAL			23. WRENCH BOLT		
PTFE Virgin	●	●	Stainless Steel BS6105 A4/80		●
Buna 'B'	●	●	24. ANTI-STATIC PLUNGER		
Viton	●	●	Stainless Steel		●
PTFE-coated Stainless Steel	●		25. ANTI-STATIC SPRING		
7.* STEM THRUST SEAL			Stainless Steel		●
PTFE 35% Carbon Filled	●		26. STEM LOCATION RING		
PTFE 25% Glass Filled		●	Stainless Steel 316		●
PEEK	●	●	27.* SECONDARY STEM SEAL		
8.* GLAND PACKING			PTFE Virgin		●
PTFE 35% Carbon Filled	●		Buna 'B'		●
Flexible Graphite		●	Viton		●
9. GLAND FOLLOWER					
Stainless Steel 316	●	●			
Aluminium Bronze	●				
10.* DISC SPRINGS					
Stainless Steel 302	●				
Copper Beryllium	●				
11.* GLAND/WRENCH NUT					
Stainless Steel 316	●	●			
Aluminium Bronze	●				
Carbon Steel, Rustproofed	●	●			

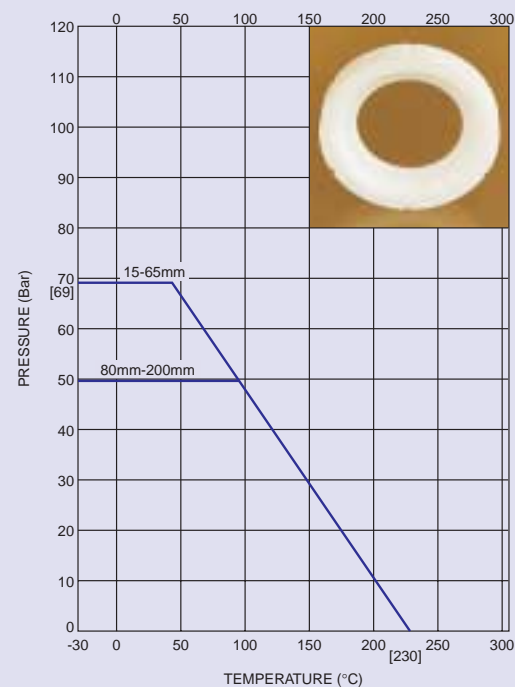
Note 1: 4 bolts for valves up to 50mm, 6 bolts 65-80mm, and 8 bolts for 100mm, 8 studs for 150mm.

* Items marked thus denote components supplied in repair kit.

Pressure/Temperature Ratings – IMPORTANT – see note on p.10

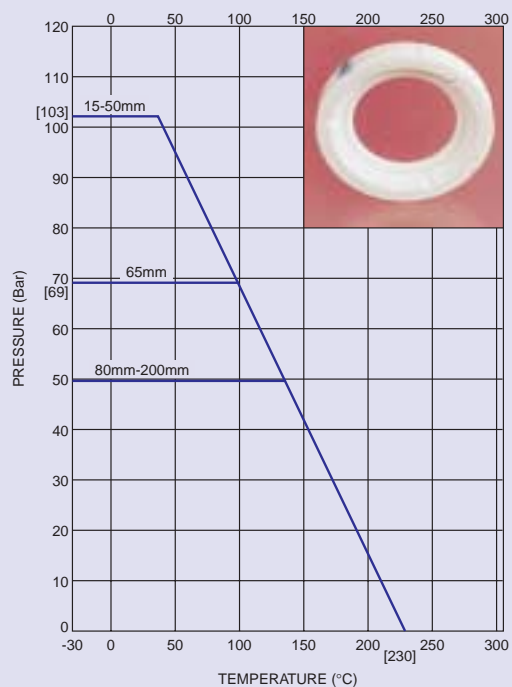
VIRGIN PTFE (T)

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



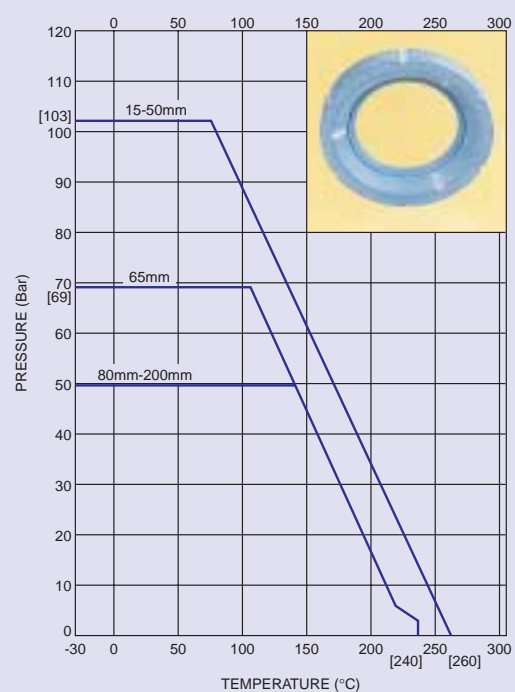
RE-INFORCED PTFE (R)

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



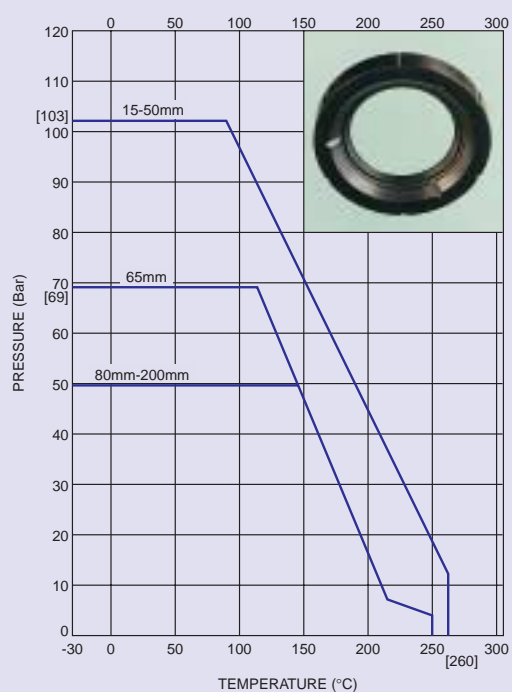
VXI (H)

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



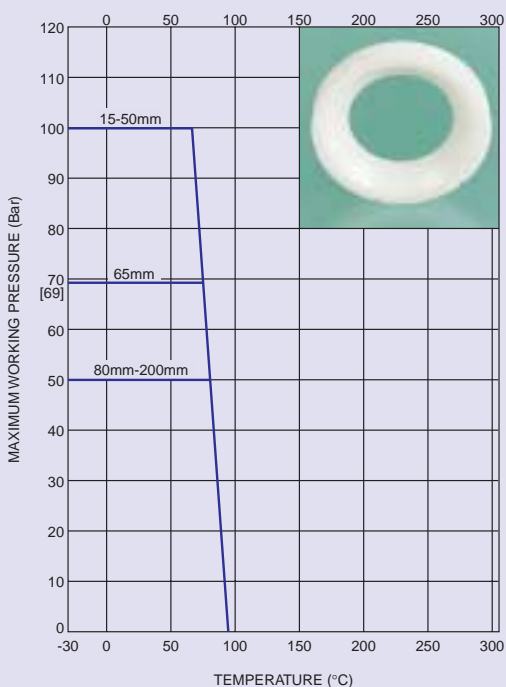
FLUOROFILL (P)

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



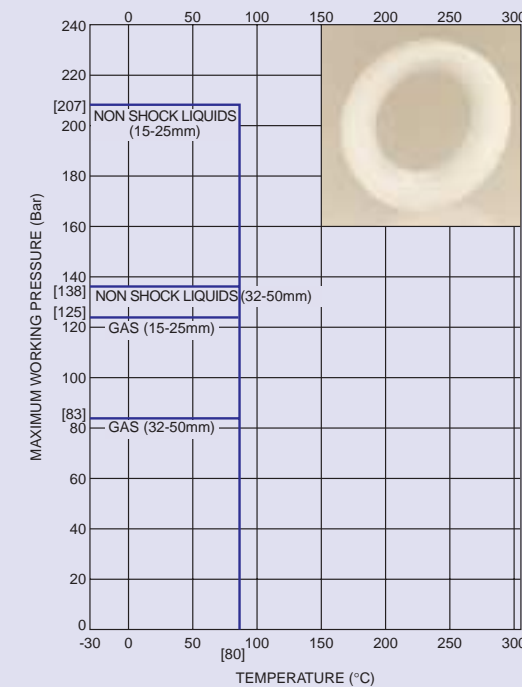
UHMWPE (U)

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



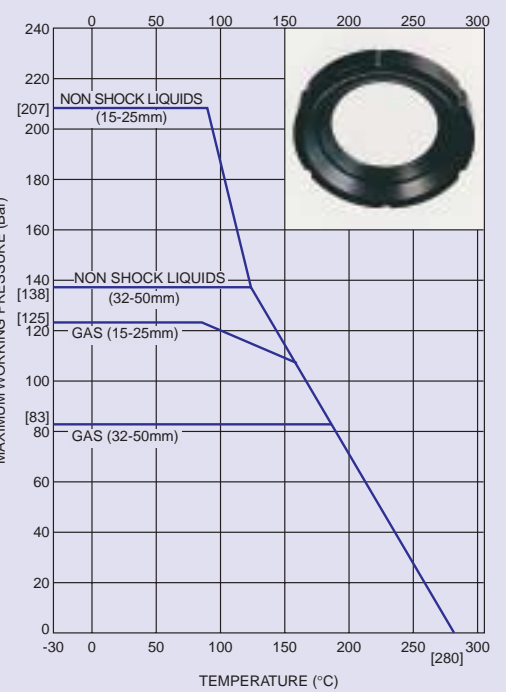
ACETAL (Y)

Machined from acetal homopolymer, these seats are capable of handling extremely high pressures. Please note this material should not be used on oxygen service.



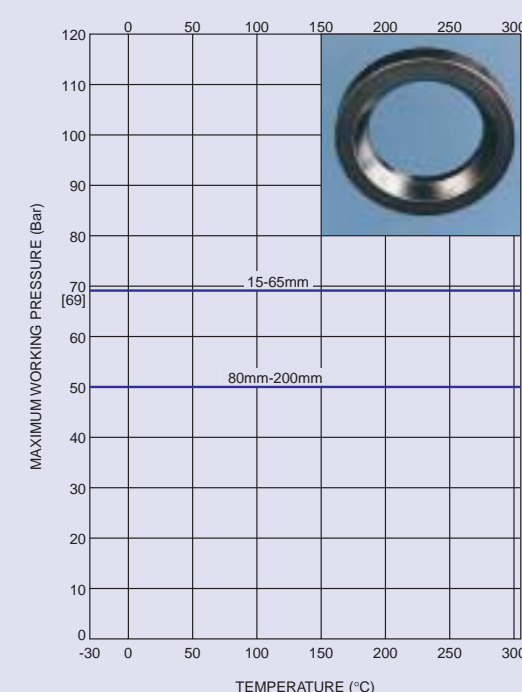
PEEK (X)

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

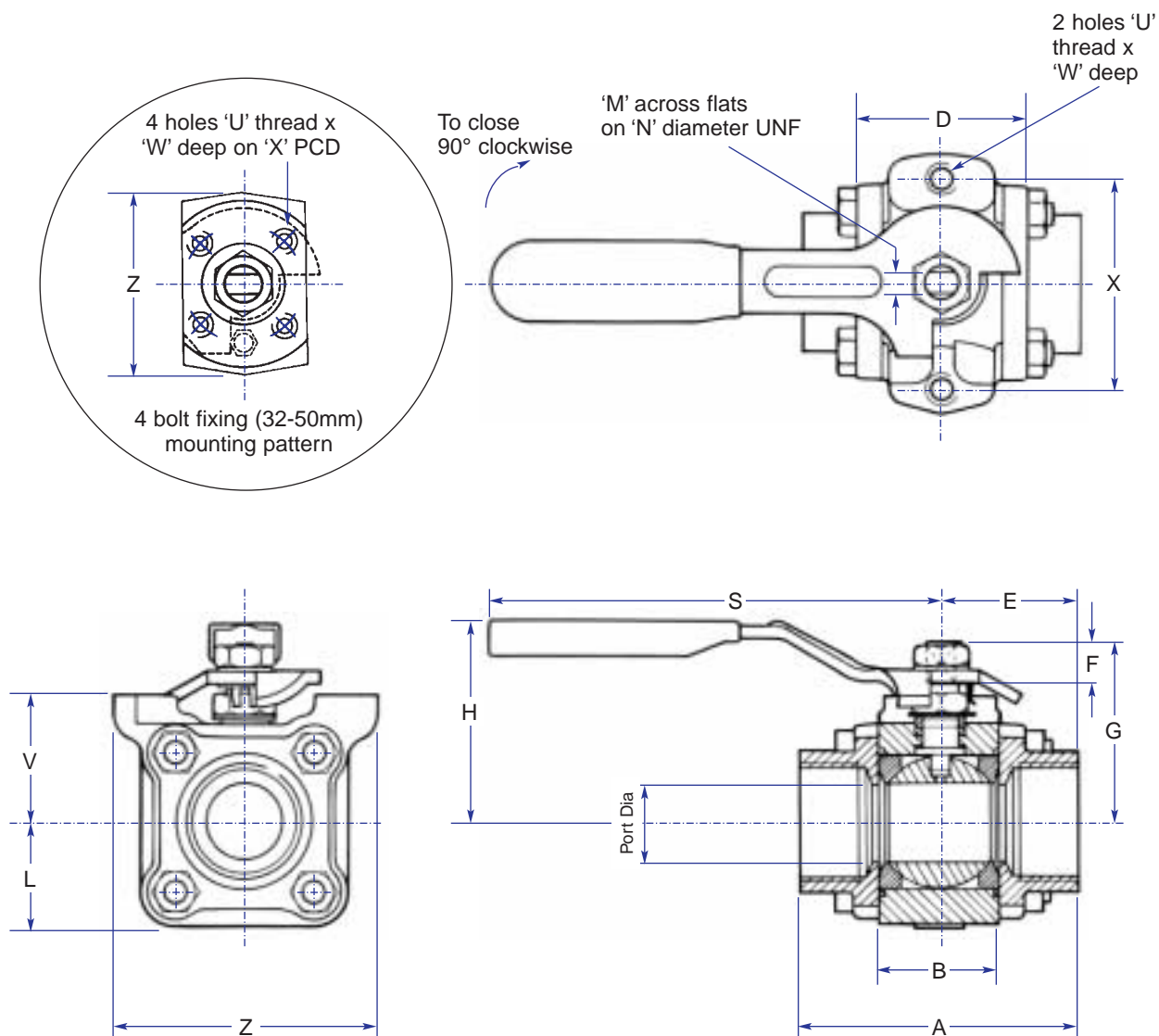


METAL – ALPHA (A)

A 316L sintered metal seat impregnated with PTFE, this material combines the strength and abrasion resistance of metal with the lubrication properties of PTFE. A graphite-impregnated metal seat is also available.



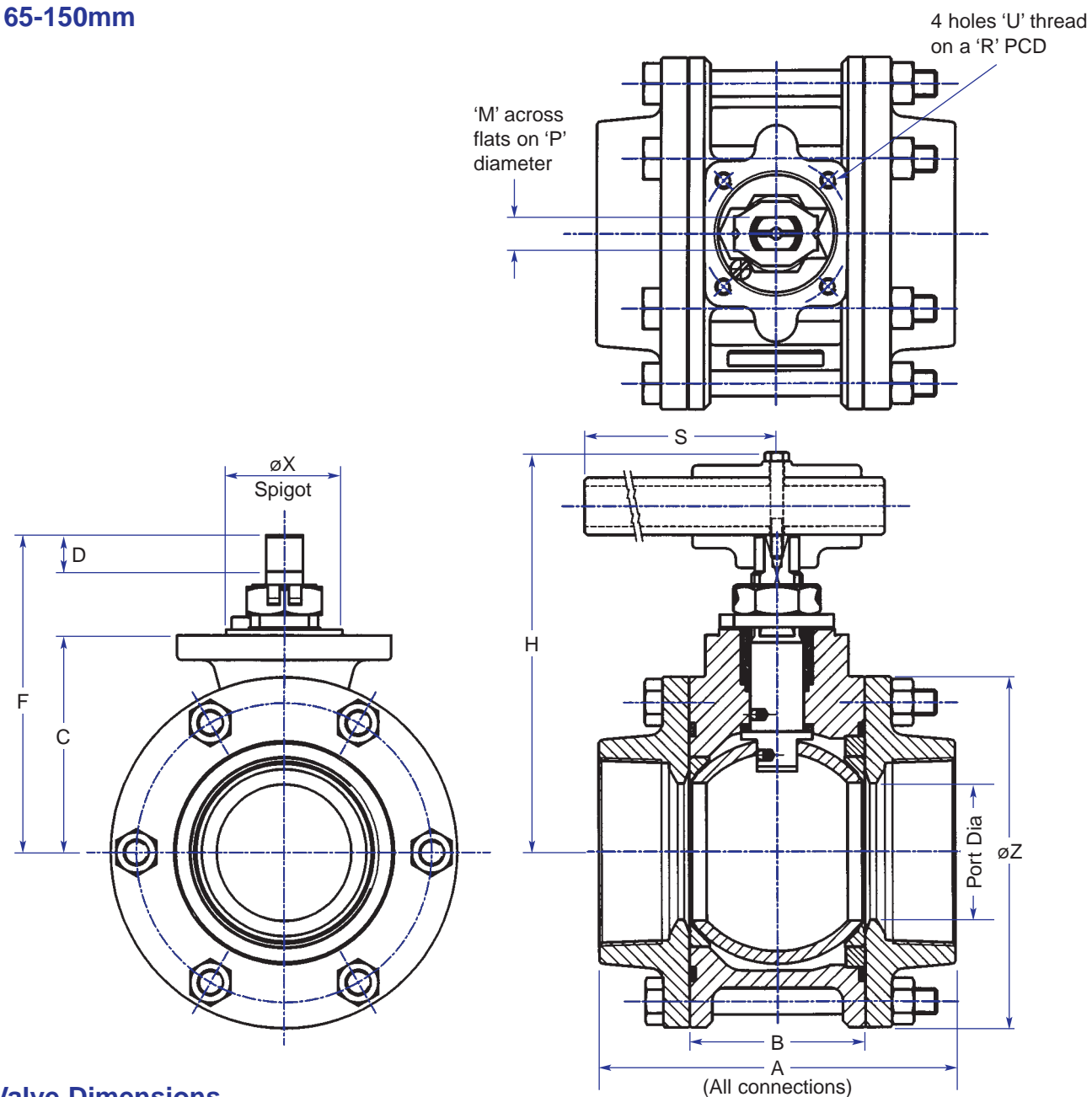
8-50mm



Valve Dimensions

Valve Size mm	Valve Dimensions (mm)																Weight kg
	Port Dia	A	B	E	F	G	H	L	M max	N	S	U	V	W	X	Z	
8, 10, 15	11.1	65.4	20.6	32.7	10.5	38.0	58.0	24.2	5.54	3/8 U.N.F.	136.0	M6	26.6	9.5	48.0	59.1	0.67
20	14.3	71.0	24.6	35.5	10.5	40.4	60.3	27.6	5.54	3/8 U.N.F.	136.0	M6	29.0	9.5	54.0	65.1	0.90
25	20.6	93.7	31.7	46.9	15.0	55.6	64.8	33.0	7.54	7/16 U.N.F.	149.0	M8	38.0	9.7	63.5	78.5	1.6
32	25.4	106.0	41.2	53.0	15.0	60.3	69.6	36.7	7.54	7/16 U.N.F.	149.0	M5	37.1	7.5	42.0	73.4	1.8
40	31.8	114.6	48.4	57.3	18.2	73.0	77.9	42.7	8.71	9/16 U.N.F.	181.0	M6	44.0	9.0	50.0	85.4	2.7
50	38.1	127.1	56.3	63.6	18.2	77.8	82.6	47.8	8.71	9/16 U.N.F.	181.0	M6	48.7	9.0	50.0	95.6	3.6

65-150mm



Valve Dimensions

Valve Size mm	Valve Dimensions (mm)																Weight kg
	Port Dia	A	B	C	D min	F	H	M max	øP max	R	S	U	ISO 5211/1	øX	øZ		
65	51.1	148.9	72.68	87.3	-	129.9	156.2	14.0	20.0	70.0	225.0	M8	F07	54.97	148.0	8.9	
80	64.2	169.2	83.38	101.6	16.8	151.4	188.0	15.1	21.2	70.0	350.0	M8	F07	54.97	164.0	13.9	
100	76.4	213.8	100.0	119.5	21.0	173.9	213.8	19.3	27.2	102.0	557.0	M10	F10	69.97	196.0	20.8	
150	102.2	296.4	134.0	146.8	28.2	218.4	275.4	26.6	33.2	125.0	850.0	M12	F12	84.97	256.0	50.8	

NOTES

1. 8-50mm valve balls are parallel bore.
2. When wrench not fitted flats on stem, when parallel to pipeline axis, denote ball open position.
3. All 8.50mm weld end valves are assembled with Buna O ring body connector seals with the correct body seals supplied loose. This provides for the valves to be tested by Worcesterc Controls, disassembled by the customer to weld in line, and reassembled. Instructions will be supplied for fitting fire seals.
4. Limiting stem input torque figures are based on random practical laboratory tests.
5. For temperatures below -30°C, consult Worcesterc Controls.
6. Installation, Operating and Maintenance instructions are available on request.

Standards of Compliance

Threaded Connections	Body connector screwed female to the following thread specifications: NPT ANSI B1.20.1 (NPT) BSPT ISO R/7.BS 21 (Rc) BSPP ISO R/7.BS 2779.BS 21.
Socket Weld Connections	Body connectors bored suitable for accepting plain end pipe to the following specifications: BS 1600 API 5L BS 3600
Butt Weld Connections	Body connectors prepared in accordance with relevant material specification & ASME code section IX. For butt welding pipe to the following specifications: API 5L BS 1600 schedules 80/40/10/5
Pressure Test Specification	BS 6755 Part 1 and EN 17
Quality Assurance	BS EN ISO 9001

Due to continuous development of our product range, we reserve the right to alter the dimensions and information contained in this leaflet as required.

IMPORTANT NOTE

The information given in the pressure/temperature graphs indicates the maximum performance capabilities of the seat materials. The full potential of virgin and re-inforced PTFE can be realised in the standard Worcesterc valve build. For more demanding applications requiring the greater pressure/temperature capabilities of the other seat materials, it is essential that the appropriate valve build is specified.

Examples of these applications include the following:

- Thermal Fluids (P221 Spec.)
- Nuclear Service
- Oxygen Service (Q822 Spec.)
- Tobacco (Q858 Spec.)
- Ammonia (Q797 Spec.)
- Helium (P043 Spec.)
- Vacuum Service (P043 Spec.)

and many more.

To ensure that the correct valve is supplied, please consult Worcesterc Controls.

Flow Coefficients

Valve Size	Flow Coefficient		Equivalent Length of Pipe	
	Cv	Kv	Feet	metres
mm				
15	8.3	7.2	1.9	0.58
20	13.6	11.8	5.5	1.67
25	37.6	32.6	3.0	0.91
32	37.7	32.7	3.1	0.94
40	79.7	69.1	3.9	1.19
50	106	91.8	7.5	2.28
65	188	163	5.0	1.52
80	435	377	7.0	2.13
100	638	553	27.0	8.21
150	675	585	41.0	12.47

Cv-Flow-US GPM (Pressure-psi)	Kv-Flow-m ³ /hr (Pressure-bar)
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Limiting Stem Input Torque (Nm)

(see Note 4)

Valve Size (mm)	316S16	431S29	17/4 PH
15			
20	13.2	32	90
25			
32	24.4	59	165
40			
50	48.6	118	268
65	192	644	1187
80	336	910	1677
100	620	1921	3540
150	1138	4210	7758

Standard Valve Variants



AW 44 Specifically designed for on/off steam applications in conditions up to 250 psi (continuous saturated steam) or 1500 psi (thermal fluids), the AW 44 is available in stainless or carbon steel in sizes from 8-50mm (1/4"-2").



F 44 The F 44 is particularly suitable for hazardous areas in hydrocarbon and chemical process lines, and is anti-static and firesafe to BS 6755 Part 2. It is available in stainless or carbon steel from 8 to 50mm (1/4"-2").



13/14 Worcesterc 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.



5HP 44 The 5HP 44 is Worcesterc's three-piece ball valve for high pressure hydraulic and gas systems up to 345 Bar (5000 psi).



WK 44 This valve has been specifically developed for use in semi-conductor, pharmaceutical and bio-tech applications. Highly polished internally, the WK 44 has no crevices or bug traps and ensures contamination-free media.



SMP 44 Worcesterc's SMP 44 sample/purge three-piece valve allows steam purging of a process line between batches or for sampling media requiring a high degree of cleanliness from a storage/process vessel.

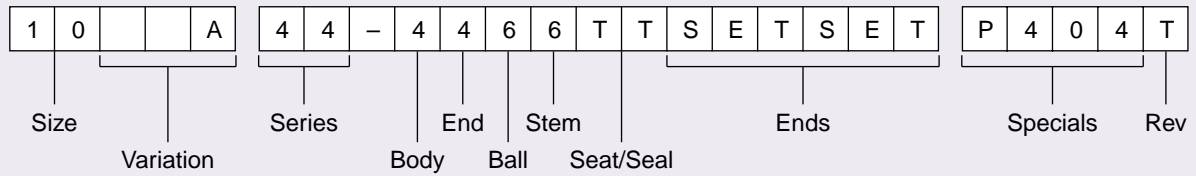


C 44 R7 The C 44 R7 cryogenic valve is suitable for low temperature applications, including CO₂, N₂, Ar, O₂, LNG and other liquid gases. It is available in stainless steel or brass, sizes 8-50mm (1/4"-2").

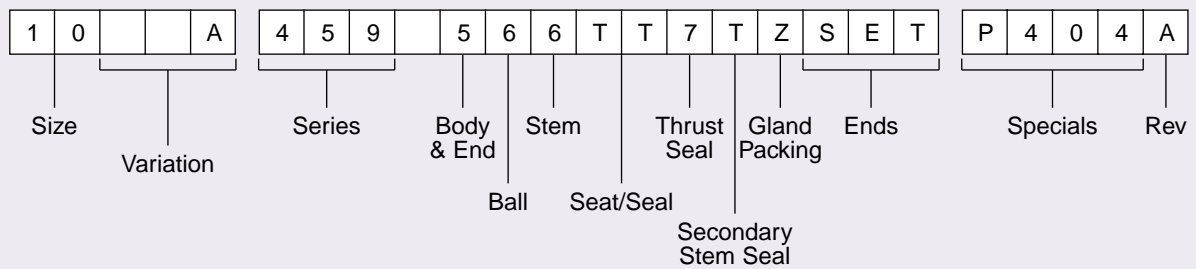


AS 44 Worcesterc's swivel-end connector AS 44 allows for simple orientation and installation of butt welded valves, particularly when long, complicated sections of pre-fabricated pipework are used.

44 Series – Valve Coding



459 Series – Valve Coding



44 with Norbro's Series 40R pneumatic actuator (l) and Series 75 electric actuator (r)



Worcester Controls

Invensys Flow Control (UK) Ltd

Burrell Road, Haywards Heath, West Sussex RH16 1TL

T: +44 (0)1444 314400 F: +44 (0)1444 314401

Website: www.worcestercontrols.co.uk

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Flow Control