

# WKM DynaSeal 370D4 Trunnion Mounted Ball Valves

Designed and engineered for heavy-duty performance in general purpose petroleum and chemical process applications

TECHNOLOGY



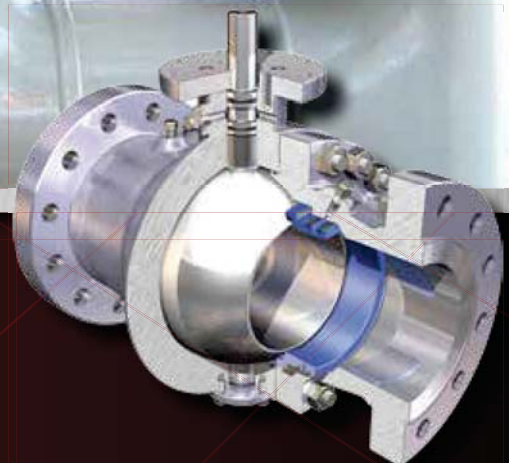
**FLOCONX**<sup>®</sup>  
— USA FLOW CONTROL COMPANY —

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## WKM DynaSeal 370D4 Trunnion Mounted Ball Valves



Oklahoma City, Okla.,  
USA

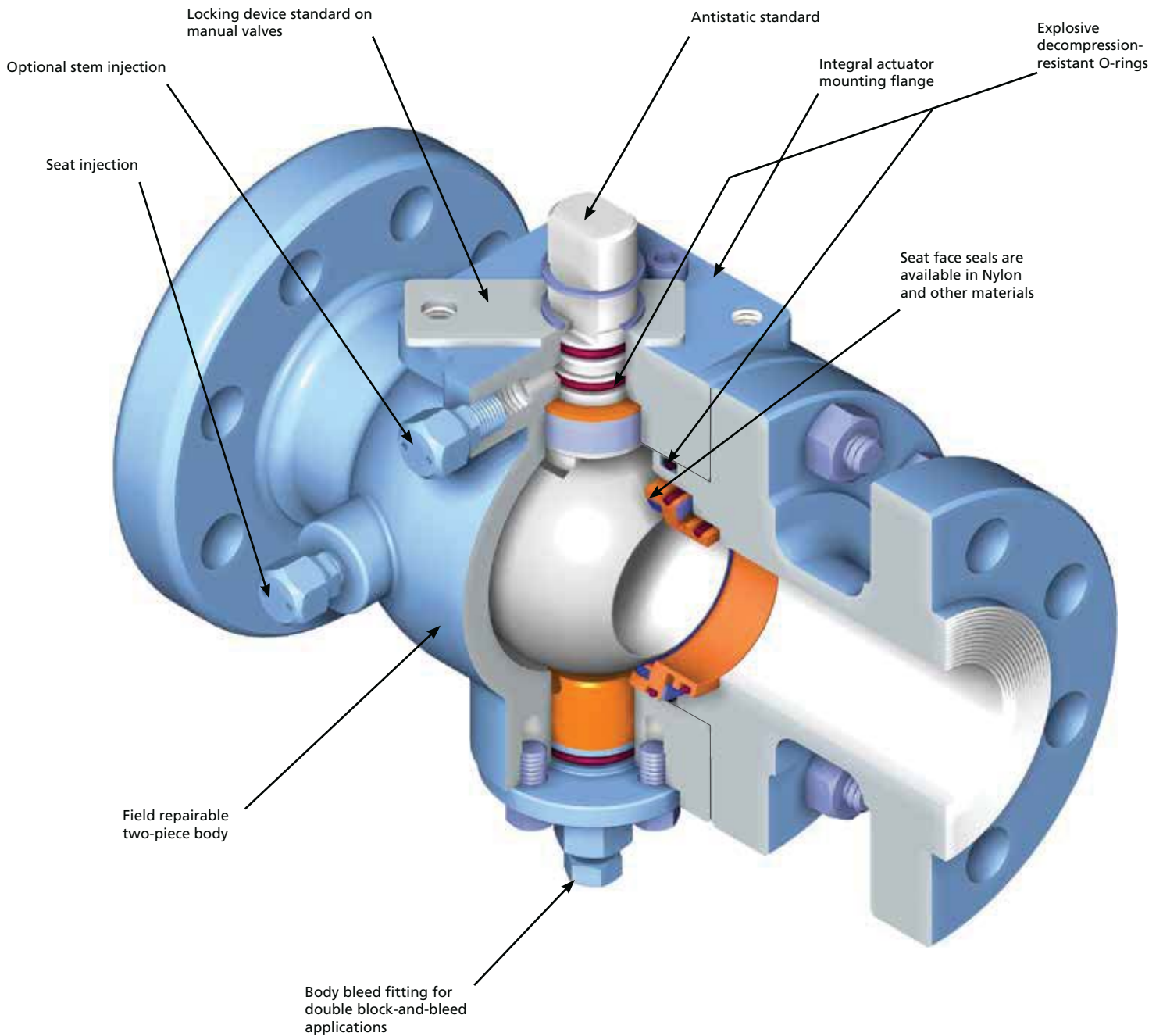
Cameron is a leading provider of valve, valve automation and measurement systems to the oil and gas industry. We offer products primarily used to control, direct and measure the flow of oil and gas as it is moved to refineries, petrochemical plants and industrial centers for processing.

Cameron provides valve products that are sold through distributor networks worldwide. Our products are used in oil, gas and industrial applications, and include widely recognized brands such as DEMCO®, NAVCO®, NEWCO®, NUTRON®, THORNHILL CRAVER®, TECHNO™, TOM WHEATLEY®, WHEATLEY® and WKM®.

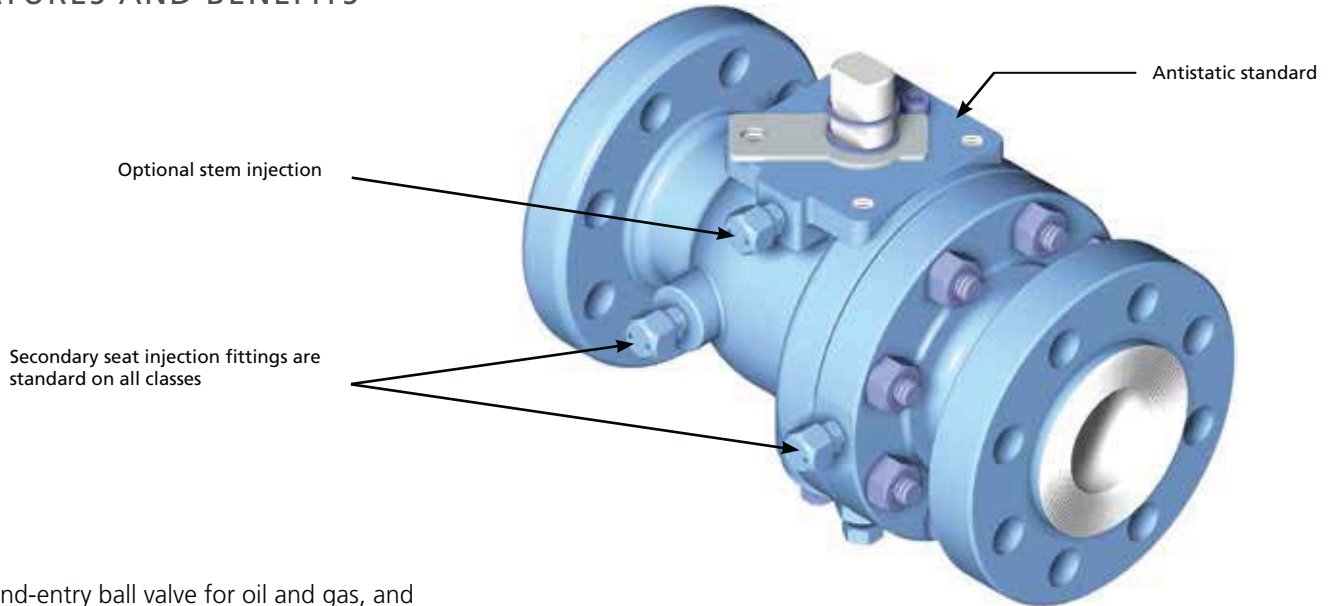
Cameron's WKM brand is recognized throughout the world for durable, reliable and flexible valves built for many challenging situations. The WKM product line offers a broad line of valves including ANSI gate valves, DynaSeal™ ball valves and DynaCentric™ butterfly valves, all built to standards for demanding applications.

## ASME Classes 150 through 2500 and 5000# MOP 2" to 6" x 4" (50 mm to 150 mm x 100 mm)

Cameron's WKM DynaSeal 370D4 trunnion mounted ball valves are designed and engineered for heavy-duty performance, and meet API 6D specifications for general purpose petroleum and chemical process applications.



## FEATURES AND BENEFITS



The end-entry ball valve for oil and gas, and product pipelines is the choice for gas distribution and other specialized applications.

Cameron's WKM DynaSeal 370D4 trunnion mounted ball valves offer the required features and options demanded by the gas transmission, gas distribution and oilfield production industries. Seat and stem sealant injection fittings, and low-pressure sealability are in compliance with ASME B16.34, API 6D, API 6FA and API 607 standards.

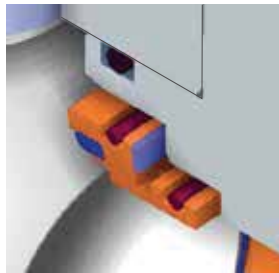
The end connections may be specified in flanged, weld end or weld-by-flanged end connections.

### Pressure-Actuated Seats

This valve uses pressure-actuated seats with locked-in, non-metallic face seals. To assure tight sealing at low pressures, special wave springs force the seats against the ball. At higher pressures, the upstream seat is forced against the ball by the pressure working across the differential between the area of the seat insert and the seat O-ring. The higher the pressure, the tighter the seal.

### Secondary Seat Sealant Injection

In the event of damage to the valve seat, sealant can be injected to temporarily seal the valve until repairs can be performed.

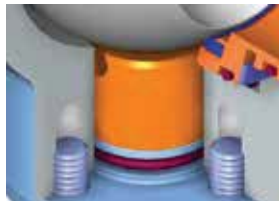


### Field Repairable

The split body design permits repairs to be made in the field without special tools.

### Indicator Handle

When the handle is aligned with the pipe, the valve is open. When the handle is perpendicular to the pipe, the valve is closed.



### Positive Double Block-and-Bleed Operation

The pressure-actuated seats and bleed fittings allow double block-and-bleed operation. When used for block-and-bleed, this feature permits the valve to take the place of two valves. It also allows the operator to check up and downstream sealing by bleeding off the body pressure.



### Automatic Body Pressure Relief

Seats internally relieve excess body pressure.

### Fire-Tested for Safety

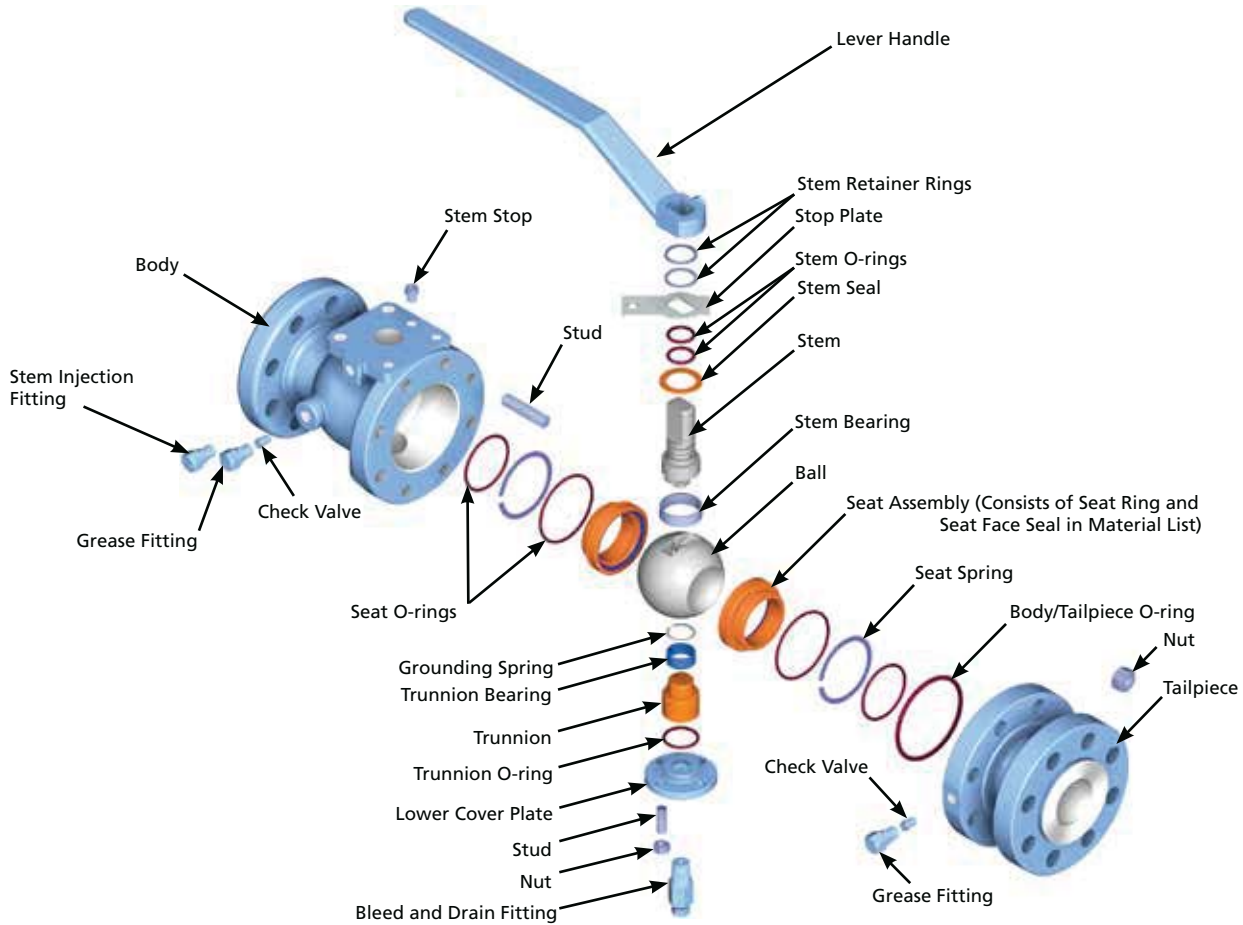
The WKM DynaSeal 370D4 trunnion mounted ball valves are qualified under API Standard 6FA and API 607.

### Nace Trim Standard

Compliant with NACE MR0175/ISO 15156 for buried service.



## STANDARDS AND SPECIFICATIONS



### Design and testing standards:

- API 6D/ISO 14313
- NACE MR0175/ISO 15156
- ASME B16.34 (valves, flange end)
- ASME B16.5 (steel pipe flanges and flange fitting)
- MSS-SP-6 (standard finishes for pipe flanges)
- MSS-SP-25 (standard marking system for valves)
- MSS-SP-55 (quality standards for steel castings)
- API 607/6FA (fire-test specification)
- SIL 3

In addition, WKM DynaSeal 370D4 trunnion mounted ball valves can be supplied to comply with these standards:

- ASME B31.1 (power piping)
- API 598 (valve inspection and testing)
- ASME B31.3 (chemical plant and petroleum refinery piping)
- MSS-SP-61 (pressure testing of steel valves)
- ABS
- DNV
- CE/PED

### ASME Pressure Classes

Size		Classes					
in.	mm	150	300	600	900	1500	2500
2	50	•	•	•	•	•	•
3 x 2	75 x 50			•	•		
3	75	•	•	•	•	•	•
4 x 3	100 x 75			•	•		
4	100	•	•	•	•	•	•
6 x 4	150 x 100	•	•	•	•	•	•

Size		5000# MOP
in.	mm	
2-1/16	52	•
3-1/8	79	•
4-1/16	103	•

## MATERIALS LIST

### Body Group Trim Number

Part	Carbon Steel (NACE) 24	Carbon Steel Low Temp. (NACE) 37	Stainless Steel (NACE) 23	410 Stainless Steel (NACE) 41
	Body	A216 Gr. WCC/A105	A352 Gr. LCC/A350 Gr. LF2	A351 Gr. CF8M/316 SS
Body 5000# MOP	A487 Gr. 4	A487 Gr. 4	N/A	-
Tailpiece	A216 Gr. WCC/A105	A352 Gr. LCC/A350 Gr. LF2	A351 Gr. CF8M/316 SS	-
Tailpiece 5000# MOP	A-487 Gr. 4	A-487 Gr. 4	N/A	-
Studs	A193 Gr. B7M	A320 Gr. L7M	A193 Gr. B7M Zinc Plate	-
Nuts	A194 Gr. 2HM	A194 Gr. 7M	A194 Gr. 2HM Zinc Plate	-
Stem Stop	CS Zinc Plate	CS Zinc Plate	CS Zinc Plate	-
Stem Bearing	CS/Filled PTFE	CS/Filled PTFE	SS/Filled PTFE	-
Trunnion Bearing	CS/Filled PTFE	CS/Filled PTFE	SS/Filled PTFE	-
Stop Plate	Carbon Steel	Carbon Steel	Carbon Steel	-
Lever Handle	Ductile Iron	Ductile Iron	Ductile Iron	-
Lower Cover Plate	Carbon Steel	A350 Gr. LF2	316 SS	-

NACE indicates compliance with NACE MR0175/ISO 15156.

### Internal Group Trim Number

Ball Classes 150 through 900	A105 CS ENP	A105 CS ENP	A182 Gr. 316 SS	A182 Gr. F6A/A479 Gr. 410 ENP
Ball Classes 1500, 2500 and 5000# MOP	4130/4140 ENP	4130/4140 ENP	A564 type 630 SS	A182 Gr. F6A/A479 Gr. 410 ENP
Stem	4130/4140 ENP	4130/4140 ENP*	A564 Type 630 SS ENP	A182 Gr. F6A/A479 Gr. 410 ENP
Trunnion	4130/4140 ENP	4130/4140 ENP	A564 Type 630 SS ENP	A182 Gr. F6A/A479 Gr. 410 ENP
Seat Rings Classes 150 through 900	1018/1029 CS ENP	1018/1029 CS ENP	A182 Gr. 316 SS	A182 Gr. F6A/A479 Gr. 410 ENP
Seat Rings Classes 1500, 2500 and 5000# MOP	4130 ENP	4130 ENP	A564 Type 630 SS	A182 Gr. F6A/A479 Gr. 410 ENP
Seat Springs	B637 N07500	B637 N07500	B637 N07500	B637 N07500
Grounding Spring	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel

Note: Trims 23 and 24 are suitable for ambient temperatures from -20° F to 400° F (-29° C to 204° C). Trim 37 is suitable for ambient temperatures from -50° F to 400° F (-46° C to 204° C).

\* 37 low-temperature internal trim in class 2500 uses a type 630 SS ENP stem.

### Seal Group Trim Code (Note Pressure Classes)

Part	YFF	TFF	YRF***	PFF
	Fire-Tested	Fire-Tested	Fire-Tested	Fire-Tested
Temperature Limits	-0° F to 250° F (-18° C to 121° C)	-0° F to 400° F (-18° C to 204° C)	-50° F to 250° F (-46° C to 121° C)**	0° F to 400° F (-18° C to 204° C)
Seat Face Seals Classes 150 through 900	Nylon (N6)	Filled PTFE*	Nylon (N6)	PEEK
Seat Face Seals Classes 1500, 2500 and 5000# MOP	Nylon (N6)	N/A	Devlon	PEEK
Stem Seal Classes 150 through 900	Filled PTFE	Filled PTFE	Filled PTFE	Filled PTFE
Stem Seal Classes 1500, 2500 & 5000# MOP	PEEK	N/A	PEEK	PEEK
Stem O-rings	FKM	FKM	HNBR	FKM
Body/Tailpiece O-ring	FKM	FKM	HNBR	FKM
Seat O-rings	FKM	FKM	HNBR	FKM
Trunnion O-ring	FKM	FKM	HNBR	FKM
O-ring Backup Ring Classes 1500, 2500 and 5000# MOP	PEEK	N/A	PEEK	PEEK

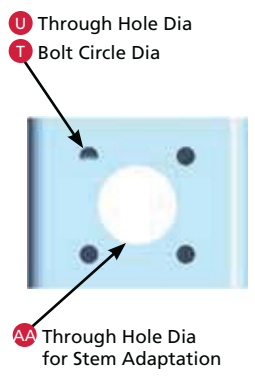
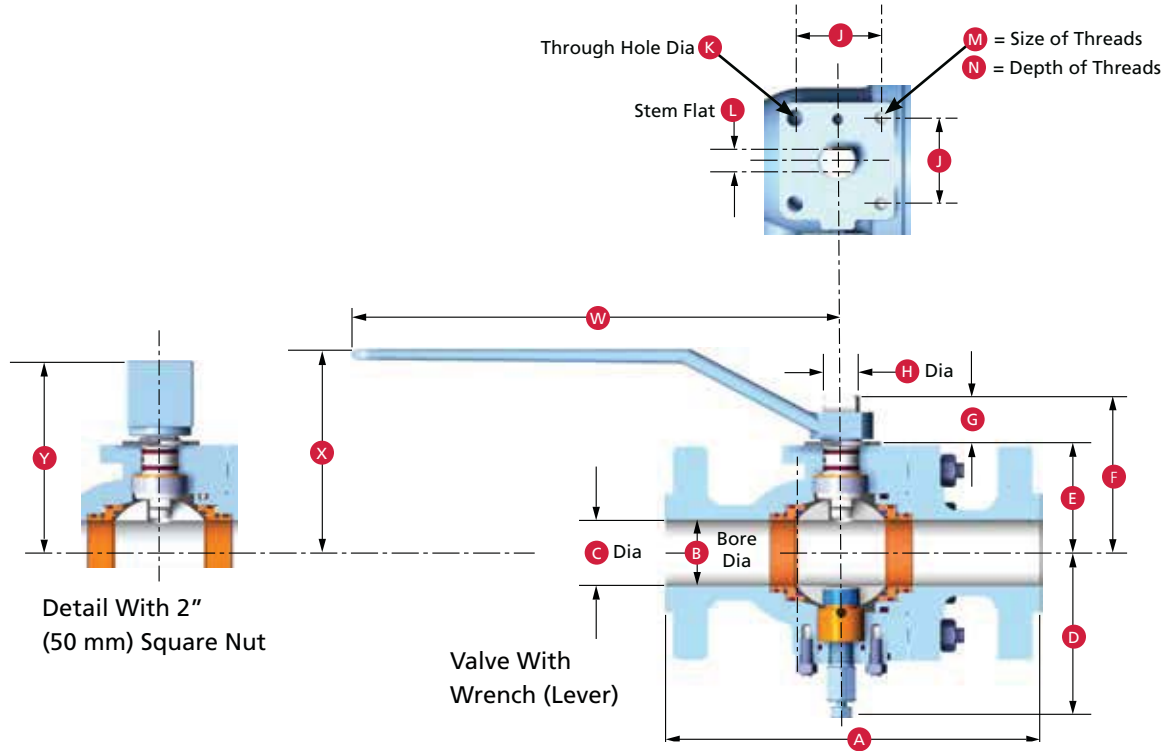
\* Only available in Classes 150 through 600.

\*\* With 37 body group and 23/37 internal group.

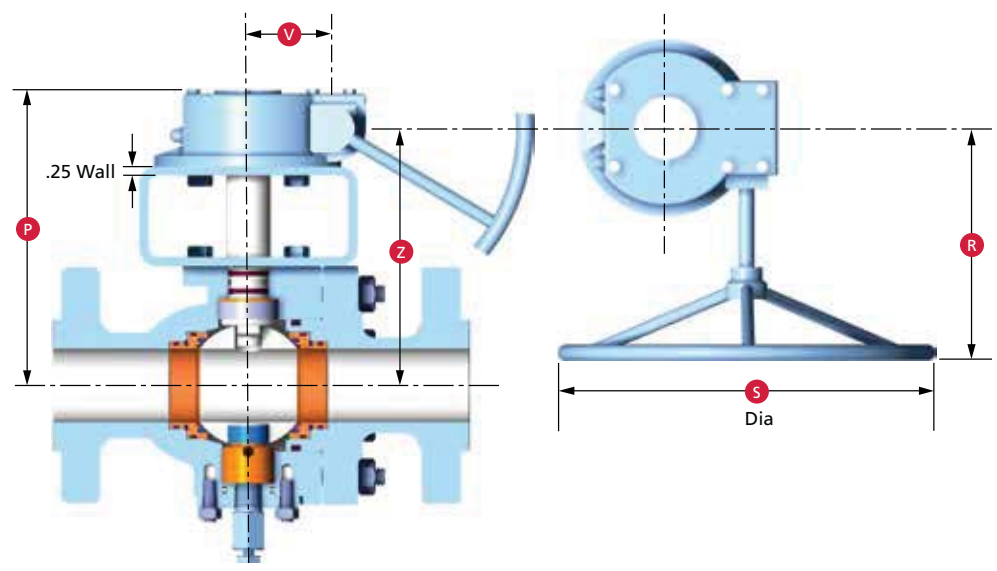
\*\*\* Standard trim 24YRF23/24 are suitable for ambient temperatures from -20° F to 250° F (-29° C to 121° C).



ASME CLASSES 150 AND 900 DIMENSIONS  
 2" to 4" x 3" (50 mm to 100 x 75 mm)



Mounting Bracket  
 Top View



Valve With Gear

## ASME CLASSES 150 THROUGH 900 DIMENSIONS

2" to 4" x 3" (50 mm to 100 x 75 mm)

### Full Port Dimensions

#### ASME Class 150

Size in.	A																								
(mm)	RF	RJ	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z	AA
2 (50)	7.00 (178)	7.50 (191)	2.00 (51)	2.00 (51)	5.11 (130)	3.29 (84)	4.80 (122)	1.52 (39)	1.112 (28.24)	2.66 (68)	1/2-13UNC -	0.688 (17.48)	3/8-16UNC -	0.40 (10)	8.91 (226)	7.84 (199)	6.00 (152)	4.02 (102)	0.44 (11.2)	1.75 (44.5)	15.00 (381)	5.81 (148)	5.56 (141)	7.39 (187.7)	3.00 (76)
3 (75)	8.00 (203)	8.50 (216)	3.00 (76)	3.00 (76)	5.96 (151)	4.81 (122)	6.38 (162)	1.57 (40)	1.112 (28.24)	3.00 (76)	1/2-13UNC -	0.688 (17.48)	1/2-13UNC -	0.55 (14)	10.43 (265)	7.84 (199)	6.00 (152)	4.02 (102)	0.44 (11.2)	1.75 (44.5)	15.00 (381)	6.67 (169)	7.08 (180)	8.91 (226.3)	3.00 (76)

#### ASME Class 300

Size in.	A																								
(mm)	RF	RJ	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z	AA
2 (50)	8.50 (216)	9.12 (232)	2.00 (51)	2.00 (51)	5.11 (130)	3.29 (84)	4.80 (122)	1.52 (39)	1.112 (28.24)	2.66 (68)	1/2-13UNC -	0.688 (17.48)	3/8-16UNC -	0.40 (10)	8.91 (226)	7.84 (199)	6.00 (152)	4.02 (102)	0.44 (11.2)	1.75 (44.5)	15.00 (381)	5.81 (148)	5.56 (141)	7.39 (187.7)	3.00 (76)
3 (75)	11.12 (282)	11.75 (298)	3.00 (76)	3.00 (76)	5.96 (151)	4.81 (122)	6.38 (162)	1.57 (40)	1.112 (28.24)	3.00 (76)	1/2-13UNC -	0.688 (17.48)	1/2-13UNC -	0.55 (14)	10.43 (265)	7.84 (199)	6.00 (152)	4.02 (102)	0.44 (11.2)	1.75 (44.5)	15.00 (381)	6.67 (169)	7.08 (180)	8.91 (226.3)	3.00 (76)

#### ASME Class 600

Size in.	A																								
(mm)	RF	RJ	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z	AA
2 (50)	11.50 (292)	11.62 (295)	2.00 (51)	2.00 (51)	5.11 (130)	3.29 (84)	4.80 (122)	1.52 (39)	1.112 (28.24)	2.66 (68)	1/2-13UNC -	0.688 (17.48)	3/8-16UNC -	0.55 (14)	8.91 (226)	7.84 (199)	6.00 (152)	4.02 (102)	0.44 (11.2)	1.75 (44.5)	15.00 (381)	5.81 (148)	5.56 (141)	7.39 (187.7)	3.00 (76)
3 (75)	14.00 (356)	14.12 (359)	3.00 (76)	3.00 (76)	5.96 (151)	4.81 (122)	6.38 (162)	1.57 (40)	1.112 (28.24)	3.00 (76)	1/2-13UNC -	0.688 (17.48)	1/2-13UNC -	0.55 (14)	10.43 (265)	8.46 (214.9)	8.00 (203.2)	4.02 (102)	0.44 (11.2)	1.75 (44.5)	15.00 (381)	6.67 (169)	7.08 (180)	8.91 (226.3)	3.00 (76)

#### ASME Class 900

Size in.	A																								
(mm)	RF	RJ	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z	AA
2 (50)	14.50 (368)	14.62 (371)	2.00 (51)	2.00 (51)	5.11 (130)	3.73 (95)	5.25 (133)	1.52 (39)	1.112 (28.24)	2.66 (68)	1/2-13UNC -	0.688 (17.48)	1/2-13UNC -	0.55 (14)	9.35 (237.5)	7.84 (199.1)	6.00 (152)	4.02 (102)	0.44 (11.2)	1.75 (44.5)	15.00 (381)	6.25 (159)	6.00 (152)	7.83 (198.9)	3.00 (76)
3 (75)	15.00 (381)	15.12 (384)	3.00 (76)	3.00 (76)	5.96 (151)	4.81 (122)	6.38 (162)	1.57 (40)	1.112 (28.24)	3.00 (76)	1/2-13UNC -	0.688 (17.48)	1/2-13UNC -	0.55 (14)	10.79 (274.1)	9.56 (242.8)	10.00 (254)	4.92 (125)	0.56 (14)	2.51 (63.8)	15.00 (381)	6.67 (169)	7.08 (180)	9.18 (233.2)	3.00 (76)

### Reduced Port Dimensions

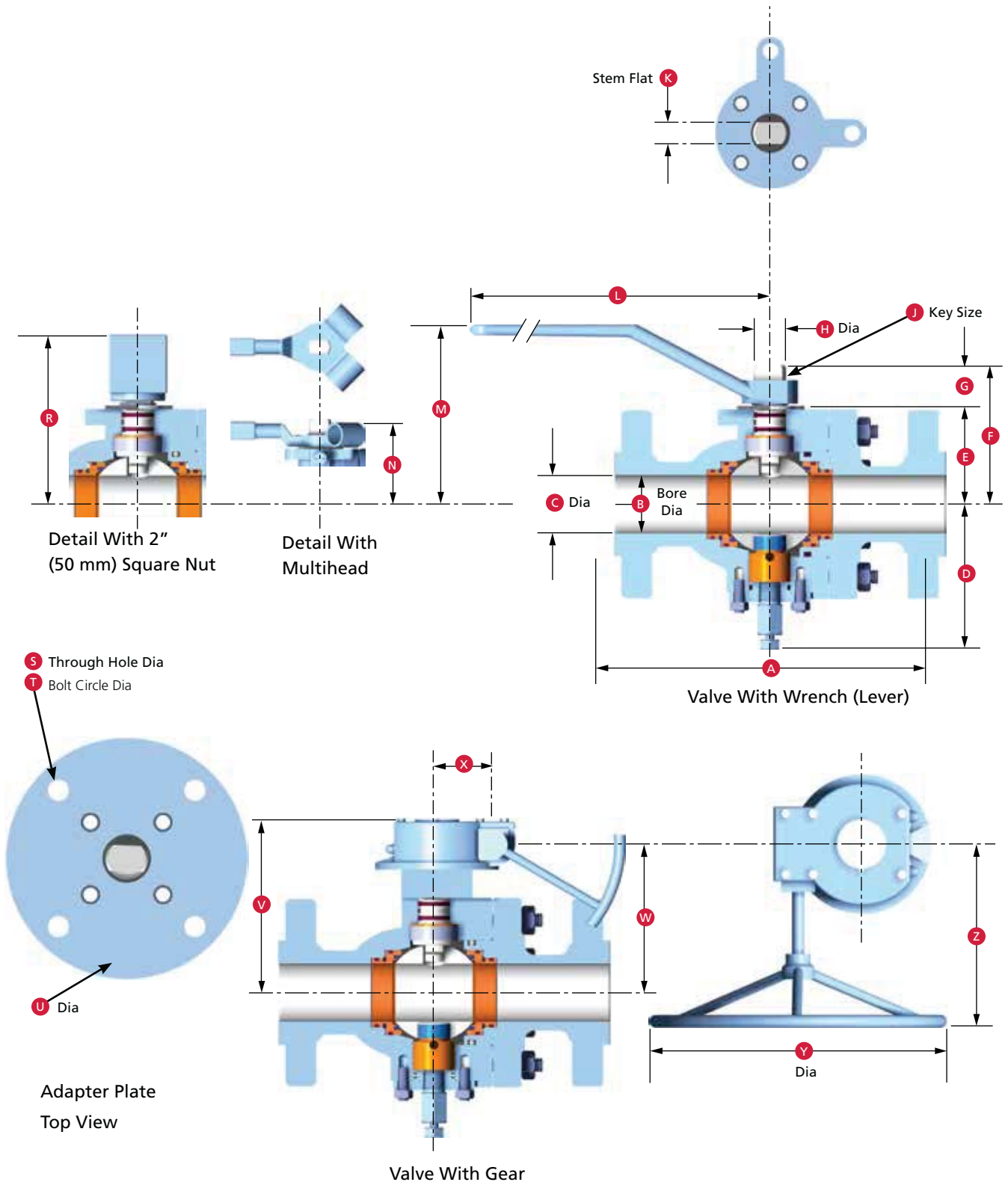
#### ASME Class 600

Size in.	A																								
(mm)	RF	RJ	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z	AA
3 x 2 (75 x 50)	14.00 (356)	14.12 (359)	2.00 (51)	3.00 (76)	5.11 (130)	3.29 (84)	4.80 (122)	1.52 (39)	1.112 (28.24)	2.66 (68)	1/2-13UNC -	0.688 (17.48)	3/8-16UNC -	0.55 (14)	8.96 (228)	7.84 (199.1)	6.00 (152)	4.02 (102)	0.44 (11.2)	1.75 (44.5)	15.00 (381)	5.81 (148)	5.56 (141)	7.39 (187.7)	3.00 (76)
4 x 3 (100 x 75)	17.00 (432)	17.12 (435)	3.00 (76)	4.00 (102)	5.96 (151)	4.81 (122)	6.38 (162)	1.57 (40)	1.112 (28.24)	3.00 (76)	1/2-13UNC -	0.688 (17.48)	1/2-13UNC -	0.55 (14)	10.43 (265)	8.46 (214.9)	8.00 (203.2)	4.02 (102)	0.44 (11.2)	1.75 (44.5)	15.00 (381)	6.67 (169)	7.08 (180)	8.91 (226.3)	3.00 (76)

#### ASME Class 900

Size in.	A																								
(mm)	RF	RJ	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z	AA
3 x 2 (75 x 50)	15.00 (381)	15.12 (384)	2.00 (51)	3.00 (76)	5.11 (130)	3.73 (95)	5.25 (133)	1.52 (39)	1.112 (28.24)	2.66 (68)	1/2-13UNC -	0.688 (17.48)	1/2-13UNC -	0.55 (14)	9.35 (237.5)	7.84 (199.1)	6.00 (152)	4.02 (102)	0.44 (11.2)	1.75 (44.5)	15.00 (381)	6.25 (159)	6.00 (152)	7.83 (198.9)	3.00 (76)
4 x 3 (100 x 75)	18.00 (457)	18.12 (460)	3.00 (76)	4.00 (102)	5.96 (151)	4.81 (122)	6.38 (162)	1.57 (40)	1.112 (28.24)	3.00 (76)	1/2-13UNC -	0.688 (17.48)	1/2-13UNC -	0.55 (14)	10.79 (274.1)	9.56 (242.8)	10.00 (254)	4.92 (125)	0.56 (14)	2.51 (63.8)	15.00 (381)	6.67 (169)	7.08 (180)	9.18 (233.2)	3.00 (76)

ASME CLASSES 150 THROUGH 900 DIMENSIONS  
 4" to 6" x 4" (100 mm to 150 mm x 100 mm)



## ASME CLASSES 150 THROUGH 900 DIMENSIONS

4" to 6" x 4" (100 mm to 150 mm x 100 mm)

### Full Port Dimensions

#### ASME Class 150

Size in.	A																						
(mm)	RF	RJ	B	C	D	E	F	G	H	J	K	L	M	N	R	S	T	U	V	W	X	Y	Z
4 (100)	9.00 (229)	9.50 (241)	4.00 (102)	4.00 (102)	7.19 (183)	6.25 (159)	8.52 (216)	2.27 (58)	1.49 (38)	0.375 (10)	0.994 (25)	26.00 (660)	10.26 (261)	9.61 (244)	8.65 (220)	0.56 (14)	4.921 (125)	6.25 (159)	10.01 (254.3)	7.03 (178.6)	2.51 (63.8)	6.00 (152.4)	9.07 (230.4)

#### ASME Class 300

Size in.	A																						
(mm)	RF	RJ	B	C	D	E	F	G	H	J	K	L	M	N	R	S	T	U	V	W	X	Y	Z
4 (100)	12.00 (305)	12.63 (321)	4.00 (102)	4.00 (102)	7.19 (183)	6.25 (159)	8.52 (216)	2.27 (58)	1.49 (38)	0.375 (10)	0.994 (25)	26.00 (660)	10.26 (261)	9.61 (244)	8.65 (220)	0.56 (14)	4.921 (125)	6.25 (159)	10.01 (254.3)	7.03 (178.6)	2.51 (63.8)	6.00 (152.4)	9.07 (230.4)

#### ASME Class 600

Size in.	A																						
(mm)	RF	RJ	B	C	D	E	F	G	H	J	K	L	M	N	R	S	T	U	V	W	X	Y	Z
4 (100)	17.00 (432)	17.13 (435)	4.00 (102)	4.00 (102)	7.19 (183)	6.25 (159)	8.52 (216)	2.27 (58)	1.49 (38)	0.375 (10)	0.994 (25)	48.00 (1219)	10.26 (261)	9.61 (244)	8.65 (220)	0.56 (14)	4.921 (125)	6.25 (159)	10.01 (254.3)	7.03 (178.6)	2.51 (63.8)	10.00 (254)	9.56 (242.8)

#### ASME Class 900

Size in.	A																						
(mm)	RF	RJ	B	C	D	E	F	G	H	J	K	L	M	N	R	S	T	U	V	W	X	Y	Z
4 (100)	18.00 (457)	18.13 (461)	4.00 (102)	4.00 (102)	7.31 (186)	6.25 (159)	8.52 (216)	2.27 (58)	1.49 (38)	0.375 (10)	0.994 (25)	48.00 (1219)	10.26 (261)	9.61 (244)	8.65 (220)	0.56 (14)	4.921 (125)	6.25 (159)	10.01 (254.3)	7.03 (178.6)	2.51 (63.8)	12.00 (304.8)	12.19 (309.6)

### Reduced Port Dimensions

#### ASME Class 150

Size in.	A																						
(mm)	RF	RJ	B	C	D	E	F	G	H	J	K	L	M	N	R	S	T	U	V	W	X	Y	Z
6 x 4 (150 x 100)	15.50 (394)	16.00 (406)	4.00 (102)	6.00 (152)	7.30 (185)	6.25 (159)	8.52 (216)	2.27 (58)	1.49 (38)	0.375 (10)	0.994 (25)	26.00 (660)	10.26 (261)	9.61 (244)	8.65 (220)	0.56 (14)	4.921 (125)	6.25 (159)	10.01 (254.3)	7.03 (178.6)	2.51 (63.8)	6.00 (152.4)	9.07 (230.4)

#### ASME Class 300

Size in.	A																						
(mm)	RF	RJ	B	C	D	E	F	G	H	J	K	L	M	N	R	S	T	U	V	W	X	Y	Z
6 x 4 (150 x 100)	15.88 (403)	16.50 (419)	4.00 (102)	6.00 (152)	7.30 (185)	6.25 (159)	8.52 (216)	2.27 (58)	1.49 (38)	0.375 (10)	0.994 (25)	26.00 (660)	10.26 (261)	9.61 (244)	8.65 (220)	0.56 (14)	4.921 (125)	6.25 (159)	10.01 (254.3)	7.03 (178.6)	2.51 (63.8)	6.00 (152.4)	9.07 (230.4)

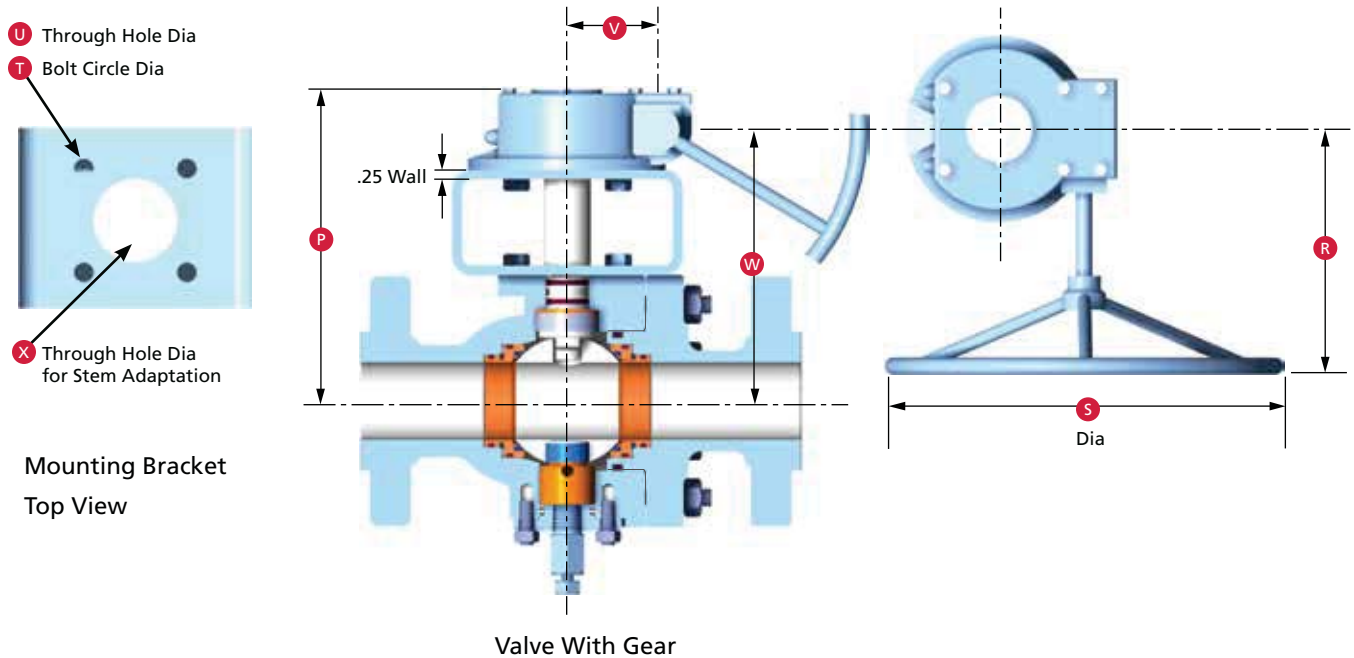
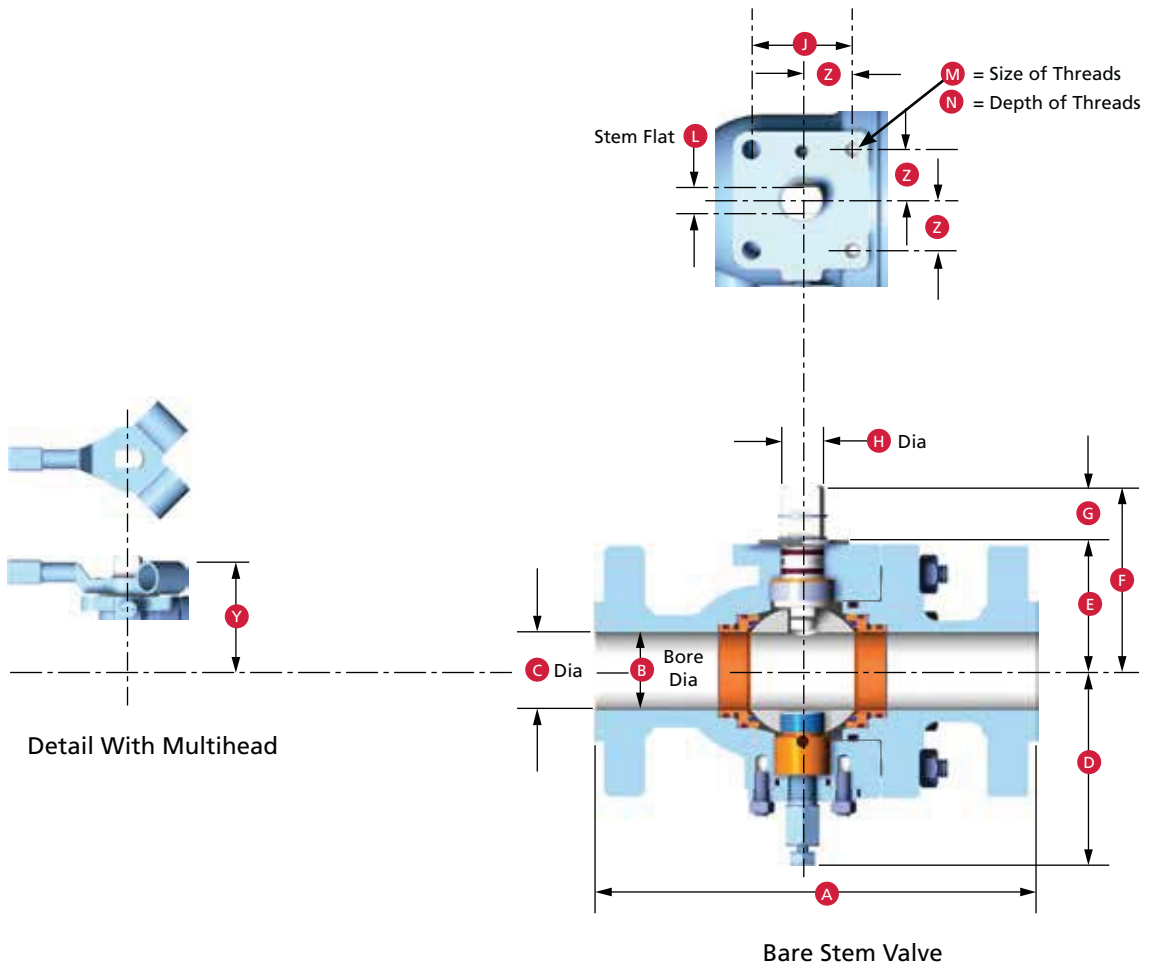
#### ASME Class 600

Size in.	A																						
(mm)	RF	RJ	B	C	D	E	F	G	H	J	K	L	M	N	R	S	T	U	V	W	X	Y	Z
6 x 4 (150 x 100)	22.00 (559)	22.13 (562)	4.00 (102)	6.00 (152)	7.30 (185)	6.25 (159)	8.52 (216)	2.27 (58)	1.49 (38)	0.375 (10)	0.994 (25)	48.00 (1219)	10.26 (261)	9.61 (244)	8.65 (220)	0.56 (14)	4.921 (125)	6.25 (159)	10.01 (254.3)	7.03 (178.6)	2.51 (63.8)	10.00 (254)	9.56 (242.8)

#### ASME Class 900

Size in.	A																						
(mm)	RF	RJ	B	C	D	E	F	G	H	J	K	L	M	N	R	S	T	U	V	W	X	Y	Z
6 x 4 (150 x 100)	24.00 (610)	24.13 (613)	4.00 (102)	6.00 (152)	7.43 (189)	6.25 (159)	8.52 (216)	2.27 (58)	1.49 (38)	0.375 (10)	0.994 (25)	48.00 (1219)	10.26 (261)	9.61 (244)	8.65 (220)	0.56 (14)	4.921 (125)	6.25 (159)	10.01 (254.3)	7.03 (178.6)	2.51 (63.8)	12.00 (304.8)	12.19 (309.6)

ASME CLASSES 1500 THROUGH 2500 AND 5000# MOP DIMENSIONS  
 2" to 6" x 4" (50 mm to 150 mm x 100 mm)



## ASME CLASSES 1500 AND 2500 AND 5000# MOP DIMENSIONS 2" to 6" x 4" (50 mm to 150 mm x 100 mm)

### Full Port Dimensions

#### ASME Class 1500 and 5000# MOP

Size in.	A																					Key		
(mm)	RF	RJ	B	C	D	E	F	G	H	J	L	M	N	P	R	S	T	U	V	W	X	Y	Z	Key
2 (50)	14.50 (368)	14.62 (371)	2.075 (53)	2.00 (51)	6.29 (160)	4.06 (103)	5.58 (142)	1.52 (39)	1.118 (28.40)	2.656 (67)	0.690 (17.53)	1/2-13UNC -	0.50 (13)	10.04 (255)	9.07 (230.4)	6.00 (152.4)	4.92 (125)	0.56 (14)	2.51 (63.8)	8.43 (214.2)	3.00 (76)	6.40 (163)	1.328 (34)	-
3 (75)	18.50 (470)	18.62 (473)	3.135 (80)	3.00 (76)	7.29 (185)	4.75 (121)	6.96 (177)	2.21 (56)	1.496 (38.00)	3.375 (86)	0.994 (25.25)	1/2-13UNC -	0.50 (13)	11.73 (297.94)	12.19 (309.63)	12.00 (304.8)	4.92 (125)	0.56 (14)	2.51 (63.75)	10.12 (257.05)	3.00 (76)	7.47 (190)	2.030 (52)	-
4 (100)	21.50 (546)	21.63 (549)	4.075 (104)	4.00 (102)	8.47 (215)	6.68 (170)	8.72 (221)	2.04 (52)	1.496 (38.00)	4.500 (114)	-	5/8-11UNC -	0.63 (16)	13.86 (352.04)	12.27 (311.66)	16.00 (406)	6.50 (165)	0.56 (14)	3.00 (76.2)	12.18 (309.37)	3.00 (76)	9.44 (240)	2.250 (57)	0.375 (9.53)

#### ASME Class 2500

Size in.	A																					Key		
(mm)	RF	RJ	B	C	D	E	F	G	H	J	L	M	N	P	R	S	T	U	V	W	X	Y	Z	Key
2 (50)	17.75 (451)	17.88 (454)	1.78 (45)	1.78 (45)	6.29 (160)	4.06 (103)	5.68 (144)	1.62 (41)	0.995 (25.27)	3.500 (89)	-	1/2-13UNC -	0.50 (13)	10.04 (255)	9.56 (242.8)	10.00 (254)	4.92 (125)	0.56 (14)	2.51 (63.8)	8.43 (214.1)	3.00 (76)	6.70 (170)	1.750 (44)	0.250 (6.35)
3 (75)	22.75 (578)	23.00 (584)	2.56 (65)	2.56 (65)	7.72 (196)	6.31 (160)	8.30 (211)	2.00 (51)	1.496 (38.00)	4.000 (102)	-	1/2-13UNC -	0.50 (13)	13.49 (342.6)	12.27 (311.6)	16.00 (406)	5.51 (140)	0.56 (14)	3.00 (76.2)	11.81 (300)	3.00 (76)	9.07 (230)	2.030 (52)	0.375 (9.53)
4 (100)	26.50 (673)	26.88 (683)	3.53 (90)	3.53 (90)	8.47 (215)	7.25 (184)	10.05 (255)	2.80 (71)	1.683 (42.75)	4.625 (117)	-	5/8-11UNC -	0.63 (16)	14.79 (375.67)	13.87 (352.3)	16.00 (406)	4.92 (125)	0.56 (14)	3.63 (92.2)	12.88 (327.2)	3.00 (76)	-	2.312 (59)	0.375 (9.53)

### Reduced Port Dimensions

#### ASME Class 1500 and 5000# MOP

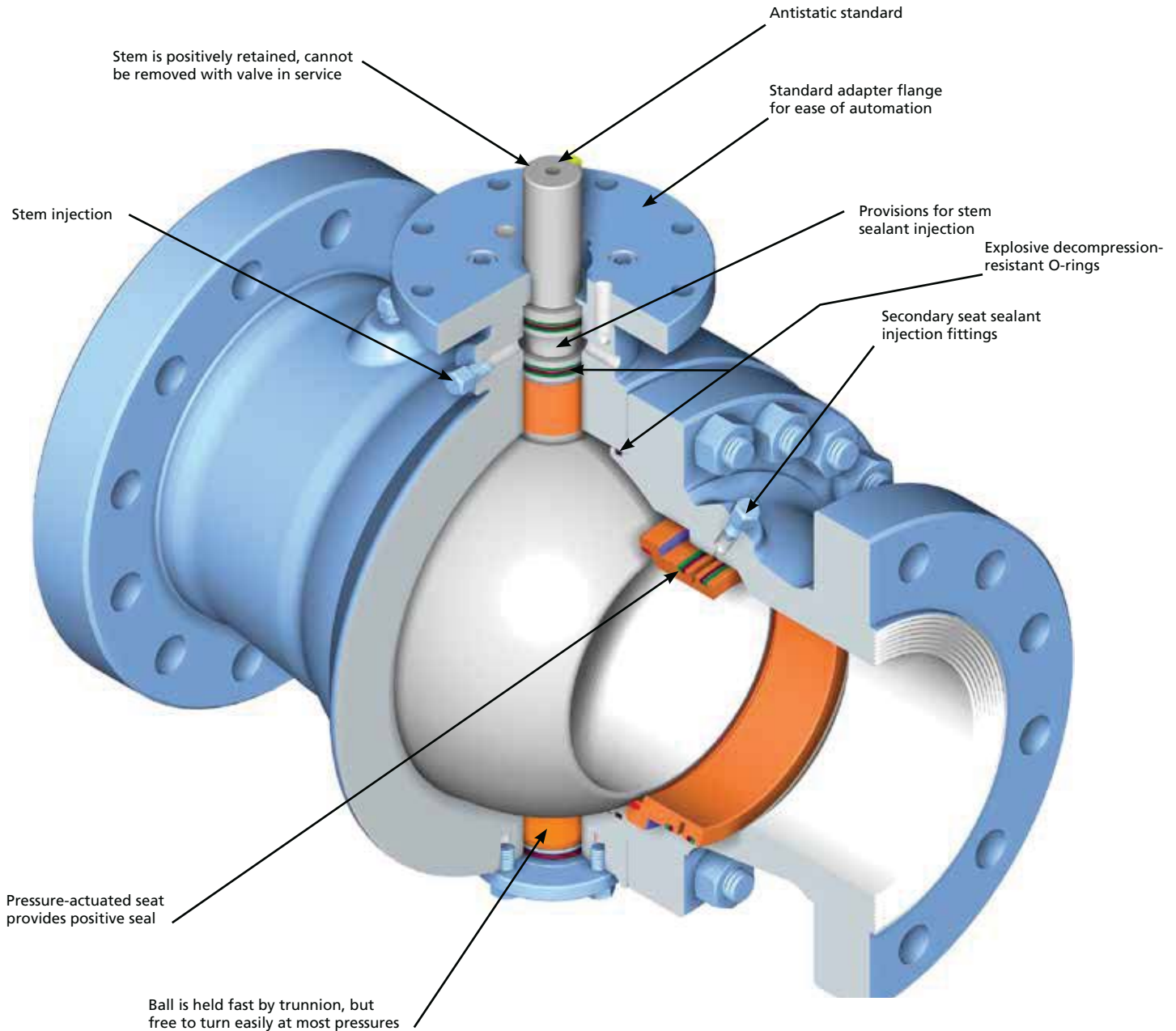
Size in.	A																					Key		
(mm)	RF	RJ	B	C	D	E	F	G	H	J	L	M	N	P	R	S	T	U	V	W	X	Y	Z	Key
6 x 4 (150 x 100)	27.75 (705)	28.00 (711)	4.00 (102)	5.81 (148)	8.59 (218)	6.68 (170)	8.72 (221)	2.04 (52)	1.496 (38.00)	4.500 (114)	-	5/8-11UNC -	0.63 (16)	13.86 (352.04)	12.27 (311.66)	16.00 (406)	6.50 (165)	0.56 (14)	3.00 (76.2)	12.18 (309.37)	3.00 (76)	9.44 (240)	2.250 (57)	0.375 (9.53)

#### ASME Class 2500

Size in.	A																					Key		
(mm)	RF	RJ	B	C	D	E	F	G	H	J	L	M	N	P	R	S	T	U	V	W	X	Y	Z	Key
6 x 4 (150 x 100)	36.00 (914)	36.50 (927)	3.53 (90)	5.31 (135)	8.90 (226)	7.25 (184)	10.05 (255)	2.80 (71)	1.683 (42.75)	4.625 (117)	-	5/8-11UNC -	0.63 (16)	14.79 (375.67)	13.87 (352.3)	16.00 (406)	4.92 (125)	0.56 (14)	3.63 (92.2)	12.88 (327.2)	3.00 (76)	-	2.312 (59)	0.375 (9.53)

## ASME Classes 150 and 300 6" to 16" (150 mm to 400 mm)

Cameron's WKM DynaSeal 370D4 trunnion mounted ball valves are designed and engineered for heavy-duty performance. Used in many general purpose petroleum and chemical process applications, these valves also are specified for more demanding applications.



## FEATURES AND BENEFITS

### Fire-Tested for Safety

The WKM DynaSeal 370D4 trunnion mounted ball valves are qualified under API 6FA and API 607 standards.

### Actuation-Friendly

A variety of actuator types can easily be installed. Cameron can provide a total package of valves, actuators or worm gear mounting plates to accommodate actuation.

### End Connections

Flanged, weld, weld-by-flange

### Body Styles

Two-piece

### Standard Materials

Carbon steel, stainless steel,  
NACE MR0175/ISO 15156

### Optional Materials

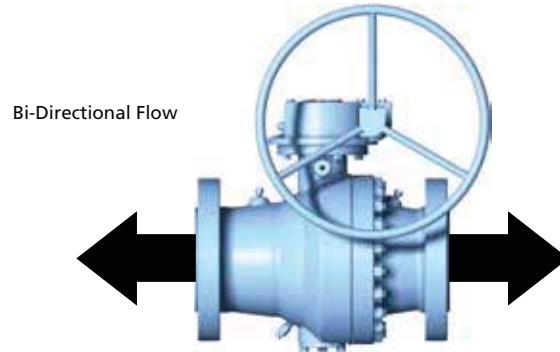
Special trims available upon request.

### Double Block-and-Bleed Operation

The pressure-actuated seats and bleed fittings allow double block-and-bleed operation. When used for block-and-bleed, this feature may permit the valve to take the place of two valves. It also allows the operator to check up and downstream sealing by bleeding off the body pressure.

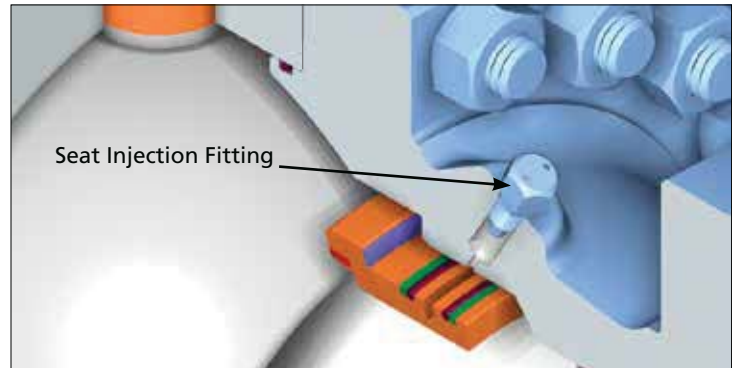
### NACE Trim Standard

Compliant with NACE MR0175/ISO 15156 for buried service.



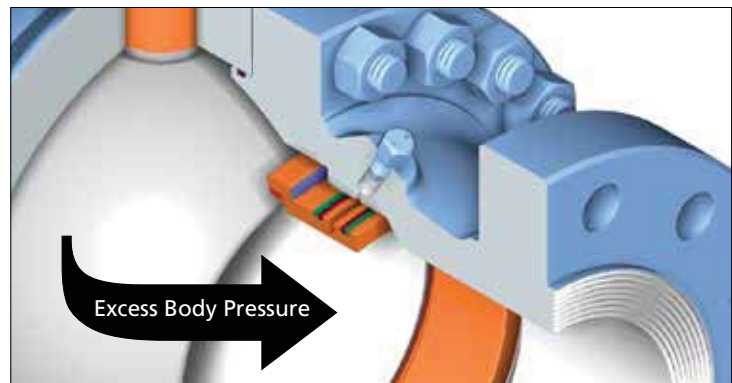
### Bi-Directional Flow

This valve uses pressure-actuated seats with locked-in, non-metallic face seals. To assure sealing at low pressure, special wave springs force the seats against the ball. At higher pressures, the upstream seat is forced against the ball by the pressure working across the differential area between the seat insert and the seat O-ring. The higher the pressure, the tighter the seal.



### Secondary Seat Seal Injection

In the event of damage to the valve seat, sealant can be injected to temporarily seal the valve.

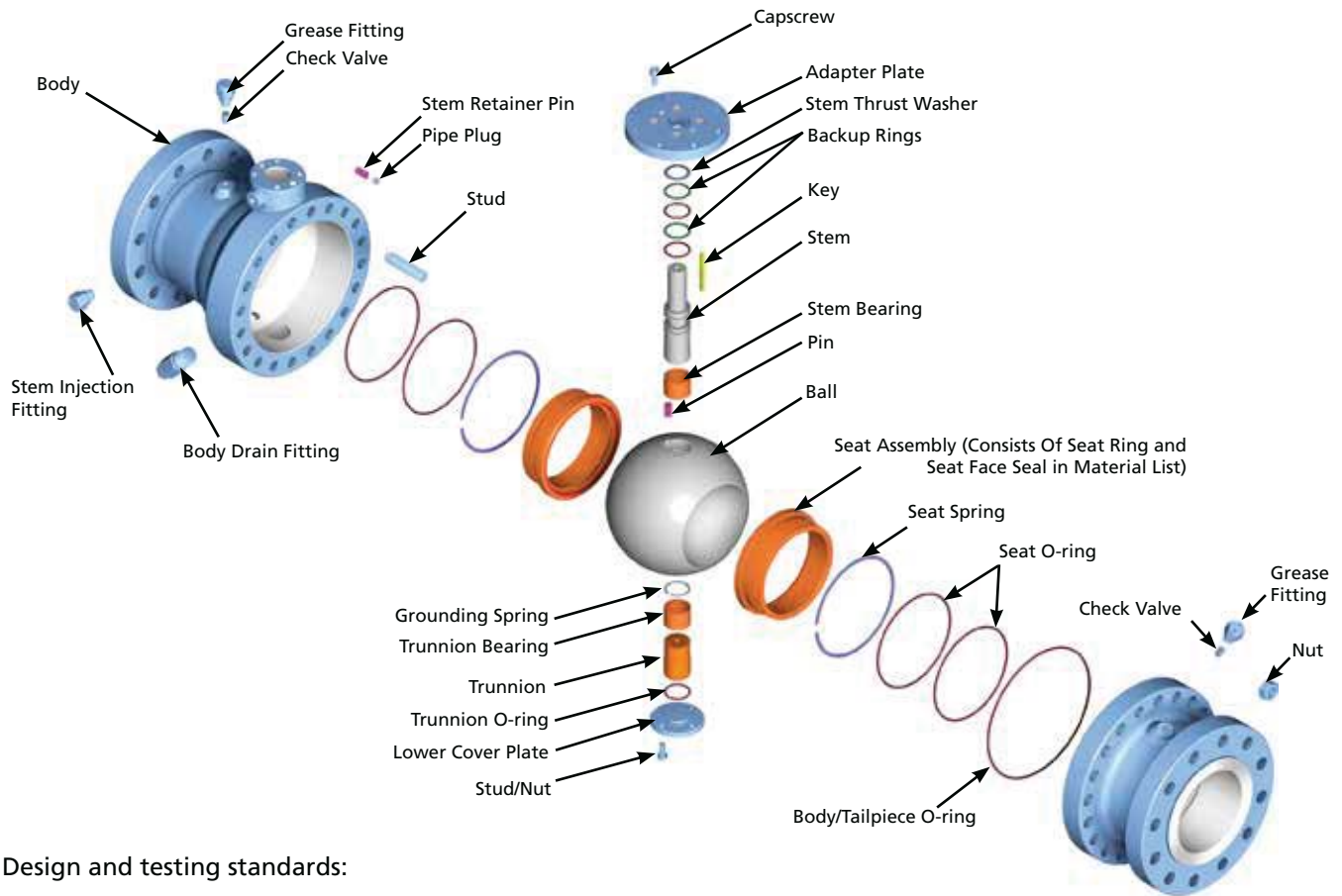


### Automatic Body Pressure Relief

Seats will internally relieve excess body pressure.



## STANDARDS AND SPECIFICATIONS



### Design and testing standards:

- API 6D
- NACE MR0175/ISO 15156
- ASME B16.34 (valves, flange end)
- ASME B16.5 (steel pipe flanges and flange fitting)
- MSS-SP-6 (standard finishes for pipe flanges)
- MSS-SP-25 (standard marking system for valves)
- MSS-SP-55 (quality standards for steel castings)
- API 607/6FA (fire-test specification)
- SIL 3

In addition, WKM DynaSeal 370D4 trunnion mounted ball valves can be supplied to comply with these standards:

- ASME B31.1 (power piping)
- API 598 (valve inspection and testing)
- ASME B31.3 (chemical plant and petroleum refinery piping)
- MSS-SP-61 (pressure testing of steel valves)
- CE/PED
- ABS
- DNV

### ASME Pressure Classes

Size		Classes	
in.	mm	150	300
6	150	•	•
8 x 6	200 x 150	•	•
8 x 8	200 x 200	•	•
10 x 8	250 x 200	•	•
10 x 10	250 x 250	•	•
12 x 10	300 x 250	•	•
12 x 12	300 x 300	•	•
14	350	•	•
16	400	•	•

## MATERIALS LIST

### Body Group Trim Number

Part	Carbon Steel (NACE) 24	Carbon Steel Low Temp. (NACE) 37	Stainless Steel (NACE) 23	410 Stainless Steel (NACE) 41
Body	A216 Gr. WCC	A352 Gr. LCC	A351 Gr. CF8M	-
Tailpiece	A216 Gr. WCC	A352 Gr. LCC	A351 Gr. CF8M	-
Studs	A193 Gr. B7M	A320 Gr. L7M	A193 Gr. B7M Zinc Plate	-
Nuts	A194 Gr. 2HM	A194 Gr. 7M	A194 Gr. 2HM Zinc Plate	-
Capscrew	A574 M	A574 M	A574 M	-
Stem Bearing	CS/Filled PTFE	CS/Filled PTFE	SS/Filled PTFE	-
Trunnion Bearing	CS/Filled PTFE	CS/Filled PTFE	SS/ Filled PTFE	-
Stop Plate	Carbon Steel	Carbon Steel	Carbon Steel	-
Wrench	Ductile Iron	Ductile Iron	Ductile Iron	-
Adapter Plate	Carbon Steel	A350 Gr LF2	Carbon Steel	-
Lower Cover Plate	Carbon steel	A350 Gr LF2	316 SS	-

NACE indicates compliance with NACE MR0175/ISO 15156.

### Internal Group Trim Number

Ball	A105 CS ENP	A105 CS ENP	A182 Gr. 3316 SS	A182 Gr. F6A / A479 Gr. 410 ENP
Stem	4130/4140 ENP	4130/4140 ENP	A564 Type 630 SS ENP	A182 Gr. F6A / A479 Gr. 410 ENP
Trunnion	4130/4140 ENP	4130/4140 ENP	A564 Type 630 SS ENP	A182 Gr. F6A / A479 Gr. 410 ENP
Seat Rings	1018/1029 CS ENP	1018/1029 CS ENP	A182 Gr. 316 SS	A182 Gr. F6A / A479 Gr. 410 ENP
Seat Springs	B637 N07500	B637 N07500	B637 N07500	B637 N07500
Grounding Spring	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
Stem Retainer Pin	A564 Type 630	A564 Type 630	A564 Type 630	A564 Type 630

Note: Trims 23 and 24 are suitable for ambient temperatures from -20° F to 400° F (-29° C to 204° C). Trim 37 is suitable for ambient temperatures from -50° F to 400° F (-46° C to 204° C).

### Seal Group Trim Code

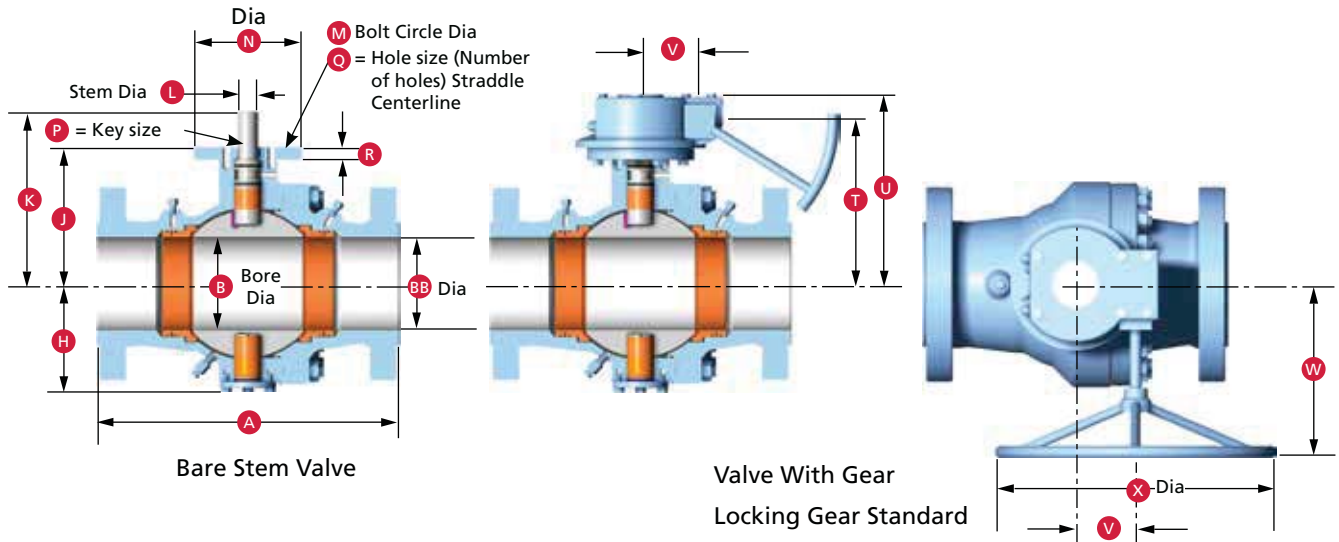
Part	YFF	TFF	YRF**
	Fire-Tested	Fire-Tested	Fire-Tested
Temperature Limits	-0° F to 250° F (-18° C to 121° C)	-0° F to 400° F (-18° C to 204° C)	-50° F to 250° F (-46° C to 121° C)*
Seat Face Seals	Nylon (N6)	Filled PTFE	Nylon (N6)
Seat Backup Rings	Nylon (N6)	PEEK	Nylon (N6)
Stem Backup Rings	Nylon (N6)	PEEK	Nylon (N6)
Stem Thrust Washer	304 SS	304 SS	304 SS
Stem O-rings	FKM	FKM	HNBR
Body/Tailpiece O-ring	FKM	FKM	HNBR
Trunnion O-ring	FKM	FKM	HNBR

\* With 37 body group and 23/37 internal group.

\*\* Standard trim 24YRF23/24 are suitable for ambient temperatures from -20° F to 250° F (-29° C to 121° C).

# ASME CLASSES 150 AND 300 DIMENSIONS

## 6" to 16" (150 mm to 400 mm)



### Full Port Dimensions

#### ASME Class 150

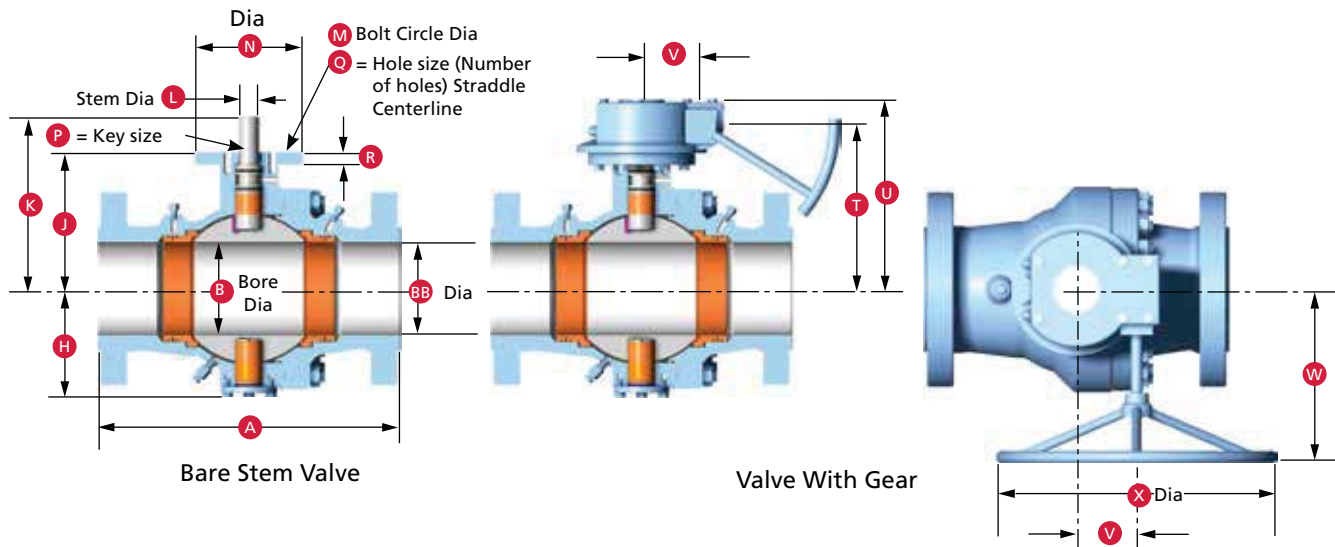
Size in. (mm)	A		B	BB	H	J	K	L	M	N	P	Q	R	T	U	V	W	X
	RF	RJ																
6 (150)	15.50 (394)	-	6.00 (152)	6.00 (152)	7.87 (200)	9.41 (239)	11.16 (283)	1.503 (38.18)	7.50 (191)	9.50 (241)	0.382 (9.70)	0.56-(8) -	0.88 (22)	10.91 (278.64)	12.59 (319.79)	3.00 (76.2)	11.77 (298.96)	12.00 (305)
8 (200)	18.00 (457)	-	8.00 (203)	8.00 (203)	9.32 (237)	10.98 (279)	12.79 (325)	1.503 (38.18)	7.50 (191)	9.50 (241)	0.382 (9.70)	0.56-(8) -	0.63 (16)	12.49 (317.25)	14.17 (360)	3.00 (76)	11.64 (295.66)	14.00 (356)
10 (250)	21.00 (533)	-	10.00 (254)	10.00 (254)	11.21 (285)	13.11 (333)	16.17 (411)	1.685 (42.80)	8.00 (203)	9.25 (235)	0.382 (9.70)	0.66-(8) -	0.80 (20)	15.36 (390.14)	17.82 (452.63)	4.63 (117.6)	14.96 (380)	12.00 (305)
12 (300)	24.00 (610)	-	12.00 (305)	12.00 (305)	13.51 (343)	15.30 (389)	18.29 (465)	2.003 (50.88)	7.50 (191)	9.50 (241)	0.506 (12.85)	0.56-(8) -	1.16 (29)	17.47 (444)	19.63 (499)	5.37 (136)	15.24 (387)	24.00 (610)
14 (350)	27.00 (686)	27.51 (699)	13.25 (337)	13.25 (337)	15.12 (384)	17.40 (442)	21.50 (546)	2.584 (65.63)	10.00 (254)	11.81 (300)	0.63 (16)	0.687-(8) (17.45-(8))	1.50 (38)	19.62 (498)	22.55 (573)	5.12 (130)	15.82 (401.83)	18.00 (457)
16 (400)	30.00 (762)	30.51 (775)	15.25 (387)	15.25 (387)	16.88 (429)	18.59 (472)	22.27 (566)	2.875 (65.81)	10.00 (254)	11.81 (300)	0.63 (16)	0.687-(8) (17.45-(8))	1.28 (33)	20.84 (529.34)	23.30 (591.82)	4.63 (117.6)	18.08 (459.23)	24.00 (610)

#### ASME Class 300

Size in. (mm)	A		B	BB	H	J	K	L	M	N	P	Q	R	T	U	V	W	X
	RF	RJ																
6 (150)	15.88 (403)	-	6.00 (152)	8.00 (203)	7.87 (200)	9.41 (239)	11.16 (283)	1.503 (38.18)	7.50 (191)	9.50 (241)	0.382 (9.70)	0.56-(8) -	0.88 (22)	10.91 (278.64)	12.59 (319.79)	3.00 (76.2)	11.77 (298.96)	12.00 (305)
8 (200)	19.75 (502)	-	8.00 (203)	10.00 (254)	9.32 (237)	10.98 (279)	12.79 (325)	1.503 (38.18)	7.50 (191)	9.50 (241)	0.382 (9.70)	0.56-(8) -	0.63 (16)	12.67 (322)	14.56 (370)	4.11 (104)	12.89 (327)	18.00 (457)
10 (250)	22.38 (568)	-	10.00 (254)	12.00 (305)	11.21 (285)	13.11 (333)	16.17 (411)	1.685 (42.80)	8.00 (203)	9.25 (235)	0.382 (9.70)	0.66-(8) -	0.80 (20)	15.07 (388)	17.44 (443)	5.25 (133)	14.96 (380)	20.00 (508)
12 (300)	25.50 (648)	-	12.00 (305)	14.00 (356)	13.51 (343)	15.30 (389)	18.29 (465)	2.003 (50.88)	7.50 (191)	9.50 (241)	0.506 (12.85)	0.56-(8) -	1.16 (29)	17.55 (445.8)	20.01 (508.25)	4.63 (117.6)	16.58 (421.13)	20.00 (508)
14 (350)	30.00 (762)	30.63 (778)	13.25 (337)	13.25 (337)	15.12 (384)	17.40 (442)	21.50 (546)	2.584 (65.63)	10.00 (254)	11.81 (300)	0.63 (16)	0.687-(8) (17.45-(8))	1.50 (38)	19.62 (498)	22.55 (573)	5.12 (130)	15.82 (401.83)	24.00 (610)
16 (400)	33.00 (838)	33.62 (854)	15.25 (387)	15.25 (387)	16.88 (429)	18.59 (472)	22.27 (566)	2.875 (65.81)	10.00 (254)	11.81 (300)	0.63 (16)	0.687-(8) (17.45-(8))	1.28 (33)	23.71 (602.2)	25.10 (637.54)	5.67 (144)	18.66 (473.96)	24.00 (610)

## ASME CLASSES 150 AND 300 DIMENSIONS

8" X 6" (200 MM X 150 MM) THROUGH 12" X 10" (300 MM X 250 MM)



### Reduced Port Dimensions

#### ASME Class 150

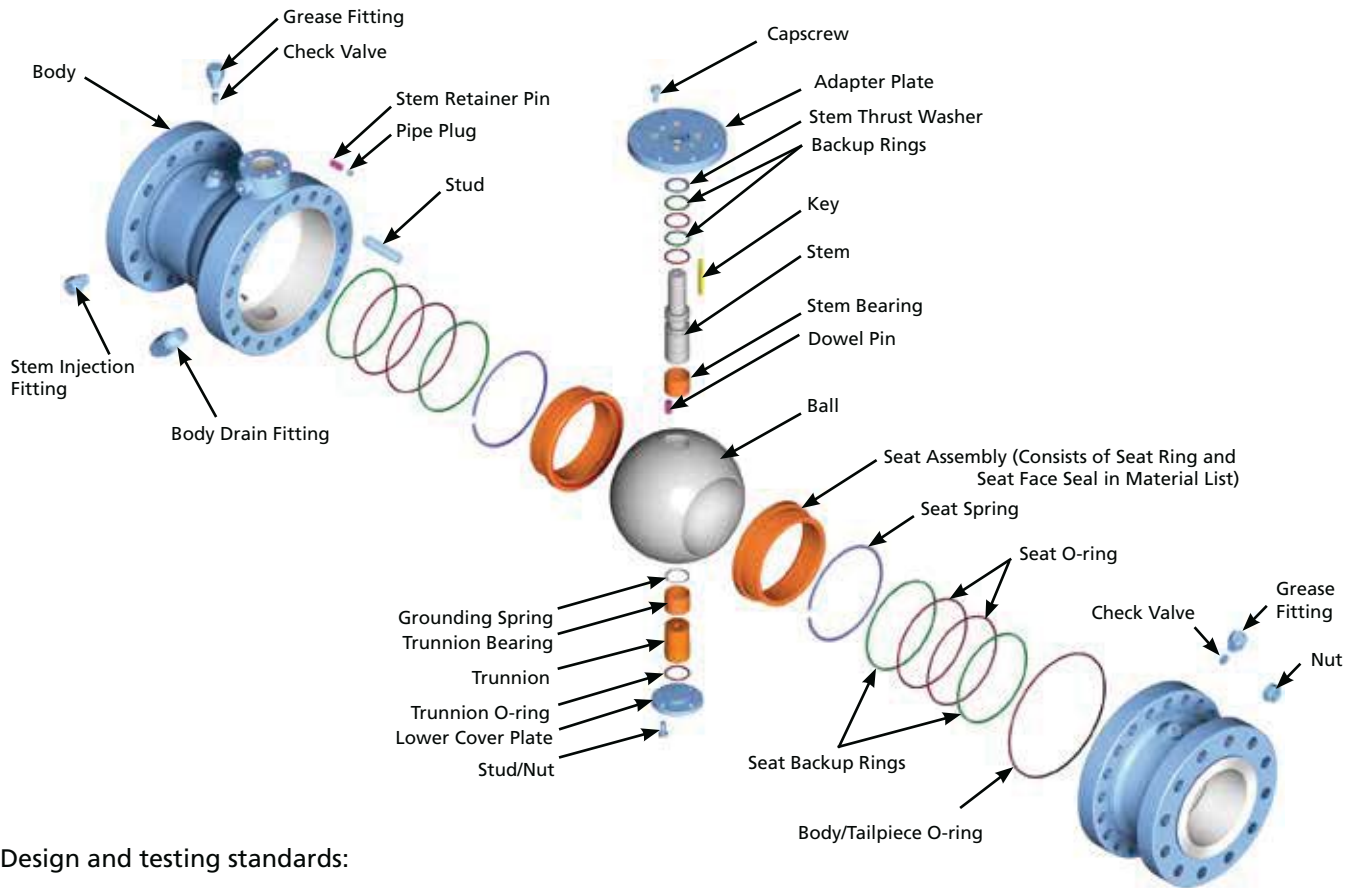
Size in.	A																
(mm)	RF	B	BB	H	J	K	L	M	N	P	Q	R	T	U	V	W	X
8 x 6 (200 x 150)	18 (457)	6.00 (152)	8.00 (203)	7.87 (200)	9.41 (239)	11.16 (283)	1.503 (38.18)	7.50 (191)	9.50 (241)	0.382 (9.70)	0.56-(8) -	0.88 (22)	10.91 (278.64)	12.59 (319.79)	3.00 (76.2)	11.77 (298.96)	12.00 (305)
10 x 8 (250 x 200)	21 (533)	8.00 (203)	10.00 (254)	9.32 (237)	10.98 (279)	12.79 (325)	1.503 (38.18)	7.50 (191)	9.50 (241)	0.382 (9.70)	0.56-(8) -	0.63 (16)	12.49 (317.25)	14.17 (360)	3.00 (76.2)	11.64 (295.6)	14.00 (356)
12 x 10 (300 x 250)	24 (610)	10.00 (254)	12.00 (305)	11.21 (285)	13.11 (333)	16.17 (411)	1.685 (42.80)	8.00 (203)	9.25 (235)	0.382 (9.70)	0.66-(8) -	0.80 (20)	15.36 (390.14)	17.82 (452.6)	4.63 (117.6)	14.96 (380)	12.00 (305)

#### ASME Class 300

Size in.	A																
(mm)	RF	B	BB	H	J	K	L	M	N	P	Q	R	T	U	V	W	X
8 x 6 (200 x 150)	19.75 (502)	6.00 (152)	8.00 (203)	7.87 (200)	9.41 (239)	11.16 (283)	1.503 (38.18)	7.50 (191)	9.50 (241)	0.382 (9.70)	0.56-(8) -	0.88 (22)	10.91 (278.64)	12.59 (319.79)	3.00 (76.2)	11.77 (298.96)	12.00 (305)
10 x 8 (250 x 200)	22.38 (568)	8.00 (203)	10.00 (254)	9.32 (237)	10.98 (279)	12.79 (325)	1.503 (38.18)	7.50 (191)	9.50 (241)	0.382 (9.70)	0.56-(8) -	0.63 (16)	12.67 (322)	14.56 (370)	4.11 (104)	12.89 (327)	16.00 (508)
12 x 10 (300 x 250)	25.50 (648)	10.00 (254)	12.00 (305)	11.21 (285)	13.11 (333)	16.17 (411)	1.685 (42.80)	8.00 (203)	9.25 (235)	0.382 (9.70)	0.66-(8) -	0.80 (20)	15.07 (388)	17.44 (443)	5.25 (133)	14.96 (380)	16.00 (508)

**ASME Classes 600 Through 1500 and 5000# MOP  
6" to 16" (150 mm to 400 mm)**

**STANDARDS AND SPECIFICATIONS**



**Design and testing standards:**

- API 6D
- NACE MR0175/ISO 15156
- ASME B16.34 (valves, flange end)
- ASME B16.5 (steel pipe flanges and flange fitting)
- MSS-SP-6 (standard finishes for pipe flanges)
- MSS-SP-25 (standard marking system for valves)
- MSS-SP-55 (quality standards for steel castings)
- API 607/6FA (fire-test specification)
- SIL 3

In addition, WKM DynaSeal 370D4 trunnion mounted ball valves can be supplied to comply with these standards:

- ASME B31.1 (power piping)
- API 598 (valve inspection and testing)
- ASME B31.3 (chemical plant and petroleum refinery piping)
- MSS-SP-61 (pressure testing of steel valves)
- CE/PED
- ABS
- DNV

**ASME Pressure Classes**

Size		Classes		
in.	mm	600	900	1500
6	150	•	•	•
8 x 6	200 x 150	•	•	•
8	200	•	•	
10 x 8	250 x 200	•	•	
10	250	•	•	
12 x 10	300 x 250	•	•	
12	300	•	•	
14	350	•		
16	400	•		

Size		Classes		
in.	mm	5000# MOP		
7-1/6 x 6	179 x 152		•	

## MATERIALS LIST

### Body Group Trim Number

Part	Carbon Steel (NACE) 24	Carbon Steel Low Temp. (NACE) 37	Stainless Steel (NACE) 23	Stainless Steel (NACE) 41
Body Classes 600 through 1500	A216 Gr. WCC	A352 Gr. LCC	A351 Gr. CF8M	-
Body 5000# MOP	A487 Gr. 4	A487 Gr. 4	N/A	-
Tailpiece Classes 600 through 1500	A216 Gr. WCC	A352 Gr. LCC	A351 Gr. CF8M	-
Tailpiece 5000# MOP	A487 Gr. 4	A487 Gr. 4	N/A	-
Lower Cover Plate Classes 600 through 1500	Carbon Steel	4130	316 SS	-
Lower Cover Plate 5000# MOP	4130	4130	N/A	-
Studs	A193 Gr. B7M	A320 Gr. L7M	A193 Gr. B7M Zinc Plate	-
Nuts	A194 Gr. 2HM	A194 Gr. 7M	A194 Gr. 2HM Zinc Plate	-
Capscrews	A574M	A320 Gr. L7M	A193 Gr. B7M Zinc Plate	-
Pipe Plug	Stainless Steel	Stainless Steel	Stainless Steel	-
Adapter Plate	Carbon Steel	A350 Gr LF2	316 SS	-

NACE indicates compliance with NACE MR0175/ISO 15156.

### Internal Group Trim Number

Ball Classes 600 through 900	A216 Gr. WCC/A105 CS ENP	A216 Gr. WCC/A105 CS ENP	A182 Gr. 316 SS	A182 Gr. F6A/A479 Gr. 410 ENP
Ball Class 1500 and 5000# MOP	4130/4140 ENP	4130/4140 ENP	A564 Type 630	A182 Gr. F6A/A479 Gr. 410 ENP
Dowel Pin	A564 Type 630	A564 Type 630	A564 Type 630	A182 Gr. F6A/A479 Gr. 410 ENP
Stem/Trunnion	4130/4140 ENP	4130/4140 ENP	A564 Type 630 ENP**	A182 Gr. F6A/A479 Gr. 410 ENP
Seat Rings Classes 600 and 900	A 216 Gr. WCC/A105 ENP	126 Gr. WCC/A105 ENP	A182 Gr. 316/A351 Gr. CF8M	A182 Gr. F6A/A479 Gr. 410 ENP
Seat Rings Class 1500	A 216 Gr. WCC/A105 ENP	126 Gr. WCC/A105 ENP	A564 Type 630	A182 Gr. F6A/A479 Gr. 410 ENP
Seat Rings 5000# MOP	4130	4130	A564 Type 630	A182 Gr. F6A/A479 Gr. 410 ENP
Seat Spring	B637 N07500	B637 N07500	B637 N07500	B637 N07500
Stem and Trunnion Bearings	SS/Filled PTFE	SS/Filled PTFE	SS/Filled PTFE	SS/Filled PTFE
Thrust Washer	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
Ground Spring	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
Stem Retainer Pin	A564 Type 630	A564 Type 630	A564 Type 630	A564 Type 630

Note: Trims 23 and 24 are suitable for ambient temperatures from -20° F to 400° F (-29° C to 204° C). Trim 37 is suitable for ambient temperatures from -50° F to 400° F (-46° C to 204° C).

\*\* 14" (350 mm) and 16" (400 mm) Material A182 Gr. 316 SS.

### Seal Group Trim Code

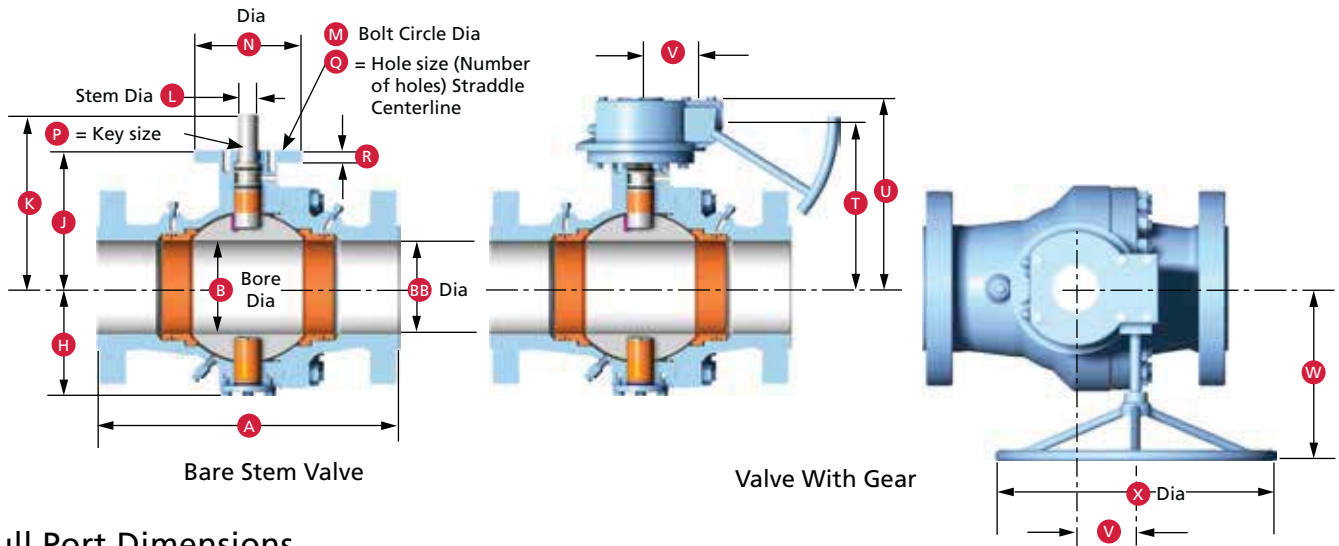
Part	Classes	YFF	TFF*	YRF****	PFF
		600/1500	600	600/1500 & 5000# MOP	900/1500
		Fire-Tested	Fire-Tested*	Fire-Tested	Fire-Tested
Temperature Limits		-0° F to 250° F (-18° C to 121° C)	-0° F to 400° F (-18° C to 204° C)	-50° F to 250° F (-46° C to 121° C)***	0° F to 400° F (-18° C to 204° C)
Seat Face Seals		Nylon (N6)	Filled PTFE*	Nylon (N6)	PEEK
Stem Seal O-rings		FKM	FKM	HNBR	FKM
Body/Tailpiece O-rings		FKM	FKM	HNBR	FKM
Seat O-rings		FKM	FKM	HNBR	FKM
Trunnion O-ring		FKM	FKM	HNBR	FKM
Seat Backup Rings		Nylon (N6)	PEEK	Nylon (N6)	PEEK
Stem Backup Rings		Nylon (N6)	PEEK	Nylon (N6)	PEEK

\* Note: TFF trim code does not apply to Classes 900, 1500, 2500 and 5000# MOP.

\*\*\* With 37 body group and 23/37 internal group.

\*\*\*\*Standard trim 24YRF23/24 are suitable for ambient temperatures from -20° F to 250° F (-29° C to 121° C).

# ASME CLASSES 600 THROUGH 1500 and 5000# MOP DIMENSIONS 6" through 16" (150 mm through 400 mm)



## Full Port Dimensions ASME Class 600

Size in.	A		B	BB	H	J	K	L	M	N	P	Q	R	T	U	V	W	X
	RF	RJ																
6 (150)	22.00 (559)	22.12 (562)	6.00 (152)	6.00 (152)	7.75 (197)	9.41 (239)	11.25 (286)	1.503 (38.18)	7.50 (191)	9.00 (229)	0.375 (9.53)	0.56-(8) -	0.88 (22)	10.91 (278.64)	12.59 (319.79)	3.00 (76.2)	13.39 (340.1)	20.00 (508)
8 (200)	26.00 (660)	26.12 (663)	8.00 (203)	8.00 (203)	9.69 (246)	11.75 (298)	14.81 (376)	1.685 (42.80)	8.00 (203)	9.25 (235)	0.375 (9.53)	0.66-(8) -	1.05 (27)	13.99 (355.35)	16.45 (417.8)	4.63 (117.6)	16.58 (421.1)	20.00 (508)
10 (250)	31.00 (787)	31.12 (790)	10.00 (254)	10.00 (254)	11.86 (301)	13.69 (348)	16.93 (430)	2.003 (50.88)	7.50 (191)	9.50 (241)	0.500 (12.70)	0.56-(8) -	1.16 (29)	15.94 (404.88)	18.40 (467.36)	4.63 (117.6)	18.08 (459.23)	24.00 (610)
12 (300)	33.00 (838)	33.12 (841)	12.00 (305)	12.00 (305)	14.46 (367)	16.13 (410)	19.50 (495)	2.560 (65.02)	10.25 (260)	12.50 (318)	0.625 (15.88)	0.66-(8) -	1.28 (33)	21.25 (539.75)	22.64 (575.06)	5.67 (144.02)	19.78 (502.41)	20.00 (508)
14 (350)	35.00 (889)	35.13 (892)	13.25 (337)	13.25 (337)	15.56 (395)	17.50 (445)	21.46 (545)	3.400 (86.36)	10.00 (254)	11.81 (300)	0.63 (16)	0.687-(8) (17.45-(8))	1.50 (38)	19.77 (502)	23.71 (602)	6.78 (172)	16.89 (429)	20.00 (508)
16 (400)	39.00 (991)	39.13 (994)	15.25 (387)	15.25 (387)	18.03 (458)	20.00 (508)	23.75 (603)	3.937 (100)	11.73 (298)	13.78 (350)	0.63 (16)	0.787-(8) (19.98-(8))	1.57 (40)	25.27 (641.86)	26.65 (676.91)	7.30 (185.42)	24.16 (613.66)	30.00 (762)

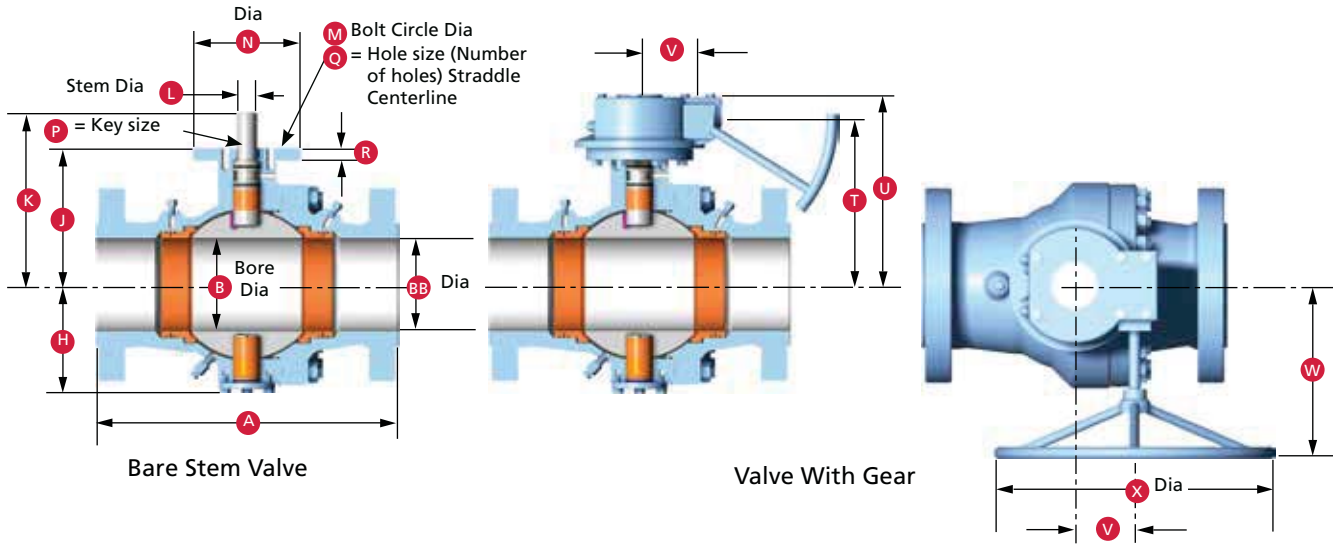
## ASME Class 900

Size in.	A		B	BB	H	J	K	L	M	N	P	Q	R	T	U	V	W	X
	RF	RJ																
6 (150)	24.00 (610)	24.12 (613)	6.00 (152)	6.00 (152)	8.50 (216)	10.09 (256)	13.12 (333)	1.685 (42.80)	8.00 (203)	9.25 (235)	0.375 (9.53)	0.66-(8) -	1.05 (27)	12.33 (313.2)	14.79 (375.67)	4.63 (117.6)	15.46 (392.68)	16.00 (406.4)
8 (200)	29.00 (737)	29.12 (740)	8.00 (203)	8.00 (203)	10.50 (267)	12.31 (313)	15.31 (389)	2.003 (50.88)	7.50 (191)	9.50 (241)	0.500 (12.70)	0.56-(8) -	1.16 (29)	14.56 (370)	17.02 (436.9)	4.63 (117.6)	19.17 (486.9)	28.00 (700)
10 (250)	33.00 (838)	33.12 (841)	10.00 (254)	10.00 (254)	12.74 (324)	14.47 (368)	17.82 (453)	2.560 (65.02)	10.25 (260)	12.50 (318)	0.625 (15.88)	0.66-(8) -	1.28 (33)	19.59 (497.6)	20.98 (432.9)	5.67 (144.12)	18.66 (473.96)	16.00 (406.4)
12 (300)	38.00 (965)	38.12 (968)	12.00 (305)	12.00 (305)	15.40 (391)	17.78 (452)	21.56 (548)	2.745 (69.72)	10.25 (260)	12.50 (318)	0.625 (15.88)	0.69-(8) -	1.63 (41)	20.10 (511)	24.04 (611)	10.36 (263)	19.69 (500)	20.00 (508)

## ASME Class 1500 and 5000# MOP

Size in.	A		B	BB	H	J	K	L	M	N	P	Q	R	T	U	V	W	X
	RF	RJ																
6 (150)	27.75 (705)	28.00 (711)	6.00 (152)	6.00 (152)	10.25 (260)	11.53 (293)	15.15 (385)	2.003 (50.88)	8.00 (203)	9.75 (248)	0.500 (12.70)	0.78-(4) -	1.50 (38)	13.70 (348)	16.10 (409)	5.12 (130)	15.25 (387)	24.00 (610)

ASME CLASSES 600 THROUGH 1500 and 5000# MOP DIMENSIONS  
 8" X 6" (200 MM X 150 MM) THROUGH 12" X 12" (300 MM X 300 MM)



Reduced Port Dimensions

ASME Class 600

Size in. (mm)	A		B	BB	H	J	K	L	M	N	P	Q	R	T	U	V	W	X
	RF	RJ																
8 x 6 (200 x 150)	26.00 (660)	26.12 (663)	6.00 (152)	8.00 (203)	7.75 (197)	9.41 (239)	11.25 (286)	1.503 (38.18)	7.50 (191)	9.00 (228.6)	0.375 (9.53)	0.56-(8) -	0.88 (22)	10.91 (278.64)	12.59 (319.79)	3.00 (76.2)	13.39 (340.1)	20.00 (508)
10 x 8 (250 x 200)	31.00 (787)	31.12 (790)	8.00 (203)	10.00 (254)	9.69 (246)	11.75 (298)	14.81 (376)	1.685 (42.80)	8.00 (203)	9.25 (235)	0.375 (9.53)	0.66-(8) -	1.05 (27)	13.99 (355.35)	16.45 (417.8)	4.63 (117.6)	16.58 (421.1)	20.00 (508)
12 x 10 (300 x 250)	33.00 (838)	33.12 (841)	10.00 (254)	12.00 (305)	11.86 (301)	13.69 (348)	16.93 (430)	2.003 (50.88)	7.50 (191)	9.50 (241.3)	0.500 (12.70)	0.56-(8) -	1.16 (29)	15.94 (404.88)	18.40 (467.36)	4.63 (117.6)	18.08 (459.23)	24.00 (610)

ASME Class 900

Size in. (mm)	A		B	BB	H	J	K	L	M	N	P	Q	R	T	U	V	W	X
	RF	RJ																
8 x 6 (200 x 150)	29.00 (737)	29.12 (740)	6.00 (152)	8.00 (203)	8.50 (216)	10.09 (256)	13.12 (333)	1.685 (42.80)	8.00 (203)	9.25 (235)	0.375 (9.53)	0.66-(8) -	1.05 (27)	12.33 (313.2)	14.79 (375.67)	4.63 (117.6)	15.46 (392.68)	16.00 (406.4)
10 x 8 (250 x 200)	33.00 (838)	33.12 (841)	8.00 (203)	10.00 (254)	10.50 (267)	12.31 (313)	15.31 (389)	2.003 (50.88)	7.50 (191)	9.50 (241.3)	0.500 (12.70)	0.56-(8) -	1.16 (29)	14.56 (370)	17.02 (436.9)	4.63 (117.6)	19.17 (486.9)	28.00 (700)
12 x 10 (300 x 250)	38.00 (965)	38.12 (968)	10.00 (254)	12.00 (305)	12.74 (324)	14.47 (368)	17.82 (453)	2.560 (65.02)	10.25 (260)	12.50 (317.5)	0.625 (15.88)	0.69-(8) -	1.28 (33)	19.59 (497.6)	20.98 (532.9)	5.67 (144.02)	18.66 (473.96)	16.00 (406.4)

ASME Class 1500 and 5000# MOP

Size in. (mm)	A		B	BB	H	J	K	L	M	N	P	Q	R	T	U	V	W	X
	RF	RJ																
8 x 6 (200 x 150)	32.75 (832)	33.12 (841)	6.00 (152)	7.63 (194)	10.25 (260)	11.53 (293)	15.15 (385)	2.003 (50.88)	8.00 (203)	9.75 (247.7)	0.500 (12.70)	0.78-(4) -	1.50 (38)	13.70 (348)	16.10 (409)	5.12 (130)	15.25 (387)	24.00 (610)



## ASME CLASSES 150 THROUGH 2500 AND 5000# MOP WEIGHT, C<sub>v</sub> DATA

### Weights lb (kg) – Valve Only – Bare Stem

Valve Port		Valve Pressure Classes					
Size in.	mm	150	300	600	900	1500 (5000# MOP)	2500
2 x 2	50 x 50	33 (15.0)	45 (20.4)	65 (29.5)	94 (42.6)	120 (54.4)	107 (48.5)
3 x 2	75 x 50	-	-	82 (37.2)	107 (48.5)	-	-
3 x 3	75 x 75	60 (27.2)	78 (35.4)	128 (58.1)	175 (79.4)	215 (97.5)	410 (186.0)
4 x 3	100 x 75	-	-	175 (79.4)	240 (108.9)	-	-
4 x 4	100 x 100	105 (47.6)	145 (65.8)	200 (90.7)	276 (125.2)	400 (181.4)	670 (303.9)
6 x 4	150 x 100	155 (70.3)	200 (90.7)	275 (124.7)	366 (166.0)	640 (290.3)	1188 (538.9)
6 x 6	150 x 150	234 (106.1)	285 (129.3)	500 (226.8)	650 (294.8)	941 (426.8)	-
8 x 6	200 x 150	294 (133.4)	361 (163.7)	575 (260.8)	748 (339.3)	1220 (553.4)	-
8 x 8	200 x 200	470 (213.2)	590 (267.6)	800 (362.9)	1010 (458.1)	-	-
10 x 8	250 x 200	685 (310.7)	850 (385.6)	920 (417.3)	1162 (527.1)	-	-
10 x 10	250 x 250	850 (385.6)	1000 (453.6)	1270 (576.1)	1580 (716.7)	-	-
12 x 10	300 x 250	950 (430.9)	1150 (521.6)	1460 (662.2)	1817 (824.2)	-	-
12 x 12	300 x 300	1200 (544.3)	1520 (689.5)	1880 (852.8)	2450 (1111.3)	-	-
14	350	1440 (653.2)	1760 (798.3)	2420 (1097.7)	-	-	-
16	400	2160 (979.8)	2600 (1179.3)	3540 (1605.7)	-	-	-

### Weights lb (kg) – Worm Gear Actuator Only

Valve Port		Valve Pressure Classes					
Size in.	mm	150	300	600	900	1500 (5000# MOP)	2500
2	50	13.7 (6.2)	13.7 (6.2)	13.7 (6.2)	13.7 (6.2)	22.2 (10.1)	22.2 (10.1)
3	75	13.7 (6.2)	13.7 (6.2)	13.7 (6.2)	22.2 (10.1)	26.7 (12.1)	44.2 (20.1)
4	100	20.3 (9.2)	22.2(10.1)	22.2 (10.1)	26.7 (12.1)	44.2 (20.1)	67.0 (30.4)
6	150	32.7 (14.8)	32.7 (14.8)	36.7 (16.7)	86.2 (39.1)	79.5 (36.1)	-
8	200	35.7 (16.2)	58 (26.3)	87.7 (39.8)	90.5 (41.1)	-	-
10	250	85.7 (38.9)	79.0 (35.8)	90.0 (40.8)	110.0 (49.9)	-	-
12	300	86 (39.0)	94.0 (42.6)	120.0 (54.4)	163.5 (74.2)	-	-
14	350	70.5 (32.0)	70.5 (32.0)	123.5 (56.0)	-	-	-
16	400	81.6 (37.0)	110.5 (50.1)	115.3 (52.3)	-	-	-

Note: Weights shown are for worm gear actuator, handwheel and mounting hardware.

### Flow Characteristics (C<sub>v</sub>)\*

Valve Port		Valve Pressure Classes					
Size in.	mm	150	300	600	900	1500 (5000# MOP)	2500
2 x 2	50 x 50	473	429	369	328	328	207
3 x 2	75 x 50	-	-	136	136	-	-
3 x 3	75 x 75	1244	1055	940	908	818	490
4 x 3	100 x 75	-	-	407	406	-	-
4 x 4	100 x 100	2492	2158	1813	1762	1598	1014
6 x 4	150 x 100	432	432	552	551	593	414
6 x 6	150 x 150	5468	5403	4590	4394	4112	-
8 x 6	200 x 150	1294	1293	1642	1637	1652	-
8 x 8	200 x 200	10782	10293	8971	8494	-	-
10 x 8	250 x 200	2843	2848	3578	3569	-	-
10 x 10	250 x 250	17438	16892	14352	13911	-	-
12 x 10	300 x 250	5195	5187	6505	6454	-	-
12 x 12	300 x 300	16892	26702	22772	21221	-	-
14 x 14	350 x 350	22742	22254	21507	-	-	-
16 x 16	400 x 400	31823	31142	29902	-	-	-

\* Flow of water in U.S. gal/min per 1 psi pressure drop across a fully open valve.

## ASME CLASSES 150 THROUGH 2500 AND 5000# MOP TORQUE CHART

### Ball Valve Torque Chart

Valve Port Size in. (mm)	Pressure (P) (psig)	TORQUE Expressions		Break Torque at Max. P (in-lb)	RUN Torque at Max. P (in-lb)	Reseat Torque at Max. P (in-lb)
		Break Torque (in-lb)	Run Torque (in-lb)			
2 (50)	0 to 285	213 + (0.24 x P)	107 + (0.12 x P)	281	141	211
	286 to 740	213 + (0.41 x P)	107 + (0.20 x P)	516	255	387
	741 to 1480	213 + (0.52 x P)	107 + (0.26 x P)	983	492	737
	1481 to 2220	213 + (0.56 x P)	107 + (0.27 x P)	1456	706	1092
	2221 to 3705	213 + (0.58 x P)	107 + (0.29 x P)	2362	1181	1772
3 (75)	3706 to 6170	213 + (0.59 x P)	107 + (0.29 x P)	3853	1896	2890
	0 to 285	383 + (0.44 x P)	191 + (0.22 x P)	508	254	381
	286 to 740	383 + (1.03 x P)	191 + (0.52 x P)	1145	576	859
	741 to 1480	383 + (1.21 x P)	191 + (0.61 x P)	2174	1094	1631
	1481 to 2220	383 + (1.28 x P)	191 + (0.65 x P)	3225	1634	2419
4 (100)	2221 to 3705	383 + (1.23 x P)	191 + (0.61 x P)	4940	2451	3705
	3706 to 6170	383 + (1.23 x P)	191 + (0.62 x P)	7972	4016	5979
	0 to 285	822 + (0.94 x P)	411 + (0.47 x P)	1090	545	818
	286 to 740	822 + (1.92 x P)	411 + (0.96 x P)	2243	1121	1682
	741 to 1480	822 + (2.23 x P)	411 + (1.12 x P)	4122	2069	3092
6 (150)	1481 to 2220	822 + (2.33 x P)	411 + (1.17 x P)	5995	3008	4496
	2221 to 3705	822 + (1.97 x P)	411 + (0.99 x P)	8121	4079	6091
	3706 to 6170	822 + (2.01 x P)	411 + (1.00 x P)	13224	6581	9918
	0 to 285	1661 + (7.50 x P)	1026 + (2.18 x P)	3670	1636	2753
	286 to 740	1661 + (5.00 x P)	1026 + (1.30 x P)	5361	1988	4021
8 (200)	741 to 1480	1661 + (5.00 x P)	1026 + (1.23 x P)	9061	2846	6796
	1481 to 2220	1661 + (5.80 x P)	1026 + (1.58 x P)	14537	4534	10903
	2221 to 3705	1661 + (5.69 x P)	1026 + (1.75 x P)	22742	7510	17057
	0 to 285	2899 + (13.92 x P)	1834 + (3.13 x P)	6866	2726	5150
	286 to 740	2899 + (11.71 x P)	1834 + (2.15 x P)	11564	3425	8673
10 (250)	741 to 1480	2899 + (10.15 x P)	1834 + (1.89 x P)	17921	4631	13441
	1481 to 2220	2899 + (9.78 x P)	1834 + (1.78 x P)	24611	5786	18458
	0 to 285	2916 + (26.43 x P)	2041 + (12.28 x P)	10449	5541	7837
	286 to 740	2916 + (18.02 x P)	2041 + (5.67 x P)	16251	6237	12188
	741 to 1480	2916 + (14.82 x P)	2041 + (3.55 x P)	24850	7295	18638
12 (300)	1481 to 2220	2916 + (14.82 x P)	2041 + (2.69 x P)	35816	8013	26862
	0 to 285	5728 + (36.46 x P)	4421 + (5.20 x P)	16119	5903	12089
	286 to 740	5728 + (19.43 x P)	4421 + (2.45 x P)	20106	6232	15080
	741 to 1480	5728 + (17.31 x P)	4421 + (1.92 x P)	31347	7263	23510
	1481 to 2220	5728 + (15.23 x P)	4421 + (1.68 x P)	39539	8151	29654
14 (350)	0 to 285	13,535 + (18.75 x P)	9475 + (2.81 x P)	18879	10275	14159
	286 to 740	13,535 + (18.75 x P)	9475 + (2.81 x P)	27410	11555	20558
	741 to 1480	13,535 + (18.75 x P)	9475 + (2.81 x P)	41285	13634	30964
16 (400)	0 to 285	16,100 + (27.50 x P)	11270 + (4.13 x P)	23938	12447	17954
	286 to 740	16,100 + (27.50 x P)	11270 + (4.13 x P)	36450	14326	27338
	741 to 1480	16,100 + (27.50 x P)	11270 + (4.13 x P)	56800	17382	42600

The above values are new valve torque values, where P is the maximum operating pressure (psig) of the valve.

The above torque values do not contain service factors.

Soaking effects and/or particle matter in the valve may cause an increase in the torque.

For intermediate pressure use the torque expressions for the stated pressure range.

For example, an intermediate pressure of 1000 psig uses the torque equations that correspond to the 751 to 1500 psig pressure range.

The re-seat torque is taken as 0.75 times the break torque.

For power operation, multiply all of the above values by a factor of 1.25 or customer specified factor whichever is larger.

For operating temperatures between -20° F to -50° F (-29° C to -46° C) multiply these values by 1.20.

Actuator selection should be made on customer experience and appropriate service factors.

# WKM DynaSeal 370D4 Trunnion Mounted Ball Valves

## MATERIAL SELECTION GUIDE

A selection of body, stem and seat/seal materials for the WKM DynaSeal 370D4 trunnion mounted ball valves are available. The following list is intended as a guide in the selection of materials for corrosive service. Material suitability is based on ladings at ambient temperatures. Other temperatures may render a given material/lading combination inappropriate. No material can be expected to resist all the many ladings found in modern industry. Experience has shown that certain materials can perform satisfactorily within certain limits. The physical properties of a material are affected differently by each corrosive medium. Therefore, it sometimes becomes necessary to sacrifice value in another property. As a result, the user must decide which property is of prime importance for his application. Internal moving parts, in contact with the lading, should always carry an "A" rating. Body materials with exposure to corrosive ladings can sometimes carry a "B" rating because metal loss due to corrosive is not as critical.

We strongly recommend that tests be run under actual operating conditions to obtain a material's performance ability in any one corrosive medium.

Rating interpretation:  
 "A" – Excellent  
 "B" – Good (slightly attacked)  
 "C" – Fair (moderately attacked)  
 "D" – Not recommended

Lading	External Valve Body Material				Seal Code Trim					Internal Valve Trim			
	Std Body 23	Std Body 24	Spl Body 27	Spl Body 37	Std YRF	Spl YFF	Spl TFF	Spl PFF	Spl PLF	Std Int 23	Std Int 24	Spl Int 27	Spl Int 37
ACETALDEHYDE	A	C	A	C	C	D	D	D	C	A	C	A	C
ACETATE SOLVENTS	A	A	A	A		D	D	D		A	A	A	A
ACETIC ACID (10%)	-	-	-	-	D	D	A	A	A				-
ACETIC ACID (Glacial)	-	-	-	-	B	C	C	C	C				-
ACETIC ACID (Conc)	-	-	-	-	D	D	A	A	C				-
ACETIC ANHYDRIDE	B	D	B	D	D	D	D	D	D	B	D	B	D
ACETONET	A	A	A	A	D	D	D	D	D	A	A	A	A
ACETYLENE	A	A	A	A	A	A	A	A	A	A	A	A	A
ACRYLONITRILE	A	A	A	A	D	A	A	A	B	A	A	A	A
ALCOHOL-AMYL	A	B	A	B	B	A	A	A	A	A	B	A	B
ALCOHOL-BUTYL	A	B	A	B	A	A	A	A	A	A	B	A	B
ALCOHOL-ETHYL (ETHANOL)	A	B	A	B	A	A	A	A	A	A	B	A	B
ALCOHOL-METHYL (METHANOL)	A	B	A	B	B	B	A	A	A	A	B	A	B
ALUMINUM CHLORIDE (dry)	A	B	A	B	A	A	A	A	A	A	B	A	B
ALUMINUM SULFATE (ALUMS)	A	C	A	C	A	A	A	A	A	A	C	A	C
ALUM'S	A	C	A	C	A	A	A	A	B	A	C	A	C
AMINES	A	B	A	B	D	B	B	B	B	A	B	A	B
AMINES BASED-CORROSION INHIBITOR	A	A	A	A	A	A	A	A	A	A	A	A	A
AMINES RICH	A	B	A	B	D	B	B	B	B	A	B	A	B
AMMONIA (AQUEOUS)	A	A	A	A	A	A	A	A	A	A	A	A	A
AMMONIA ANHYDROUS	A	A	A	A	B	D	D	D	A	A	A	A	A
AMMONIA SOLUTIONS	A	B	A	B	-	-	-	-	-	A	B	A	B
AMMONIUM BICARBONATE	B	C	B	C	-	B	A	-	-	B	C	B	C
AMMONIUM CARBONATE	B	B	B	B	D	A	A	A	A	B	B	B	B
AMMONIUM CHLORIDE	C	D	C	D	B	B	A	A	A	C	D	C	D
AMMONIUM HYDROXIDE (28%)	B	C	B	C	D	A	A	A	B	B	C	B	C
AMMONIUM HYDROXIDE CONCENTRATED	B	C	B	C	B	A	A	A	B	B	C	B	C
AMMONIUM MONOPHOSPHATE	B	D	B	D	C	B	A	A	-	B	D	B	D
AMMONIUM NITRATE	A	D	A	D	C	C	A	A	A	A	D	A	D
AMMONIUM PHOSPHATE (DIBASIC)	B	D	B	D	C	C	A	A	A	B	D	B	D
AMMONIUM PHOSPHATE (TRIBASIC)	B	D	B	D	B	B	A	A	B	B	D	B	D
AMMONIUM SULFATE	B	C	B	C	A	A	A	A	A	B	C	B	C
AMYL ACETATE	B	C	B	C	D	B	A	A	C	B	C	B	C
ANILINE	B	A	A	A	C	C	A	D	A	B	A	A	A
ANILINE DYES	A	C	A	C	D	A	A	A	A	A	C	A	C
ANTIMONY TRICHLORIDE	D	D	D	D	D	D	A	A	A	D	D	-	D

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Reference:  
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## MATERIAL SELECTION GUIDE (CONTINUED)

Lading	External Valve Body Material				Seal Code Trim					Internal Valve Trim			
	Std Body 23	Std Body 24	Spl Body 27	Spl Body 37	Std YRF	Spl YFF	Spl TFF	Spl PFF	Spl PLF	Std Int 23	Std Int 24	Spl Int 27	Spl Int 37
APPLE JUICE	B	D	-	D	A	A	A	-	-	B	D	-	D
ARSENIC ACID	B	D	B	D	C	C	A	-	-	B	D	B	D
ASPHALT EMULSION	A	A	A	A	A	A	A	A	-	A	A	A	A
ASPHALT LIQUID	A	A	A	A	B	A	A	A	-	A	A	A	A
BARIUM CARBONATE	B	B	B	B	C	A	A	-	-	B	B	B	B
BARIUM CHLORIDE	C	C	C	C	A	A	A	A	A	C	C	C	C
BARIUM HYDROXIDE	B	C	B	C	A	A	A	A	A	B	C	B	C
BARIUM SULFATE	B	B	B	B	A	A	A	A	A	B	B	B	B
BARIUM SULFIDE	B	B	B	B	A	A	A	A	A	B	B	B	B
BEER (ALCOHOL INDUSTRY)	A	C	-	C	A	A	A	A	A	A	C	-	C
BEER (BEVERAGE INDUSTRY)	A	C	-	C	A	A	A	A	A	A	C	-	C
BEET SUGAR LIQUIDS	A	B	A	B	A	A	A	-	-	A	B	A	B
BENZALDEHYDE	A	A	A	A	D	A	A	A	B	A	A	A	A
BENZENE (BENZOL)	A	B	A	B	D	A	A	A	B	A	B	A	B
BENZOIC ACID	B	D	B	D	D	D	A	A	A	B	D	B	D
BORAX LIQUORS	B	C	B	C	A	A	A	A	A	B	C	B	C
BORIC ACID	A	D	A	D	B	B	A	A	A	A	D	A	D
BRINES	B	D	B	D	A	A	A	A	A	B	D	B	D
BROMINE	D	D	-	D	D	D	A	D	D	D	D	-	D
BUNKER OILS (FUEL OILS)	A	B	A	B	A	A	A	A	B	A	B	A	B
BUTADIENE	A	B	A	B	D	C	A	A	B	A	B	A	B
BUTANE	A	A	A	A	A	A	A	A	B	A	A	A	A
BUTTERMILK	A	D	-	D	A	A	A	A	A	A	D	-	D
BUTYLENE	A	A	A	A	D	B	A	A	B	A	A	A	A
BUTYRIC ACID	B	D	B	D	C	C	A	A	A	B	D	B	D
CALCIUM BISULFITE	B	D	B	D	A	A	A	A	A	B	D	B	D
CALCIUM CARBONATE	B	D	B	D	A	A	A	A	A	B	D	B	D
CALCIUM CHLORIDE	B	C	B	C	A	A	A	A	A	B	C	B	C
CALCIUM HYDROXIDE (20%)	B	B	B	B	A	A	A	A	A	B	B	B	B
CALCIUM HYPOCHLORITE	C	D	-	D	D	D	A	A	A	C	D	-	D
CALCIUM SULFATE	B	C	B	C	D	D	A	A	-	B	C	B	C
CARBON BISULFIDE	B	B	B	B	D	A	A	A	B	B	B	B	B
CARBON DIOXIDE (DRY)	A	A	A	A	A	A	A	A	A	A	A	A	A
CARBON DIOXIDE (WET)	A	C	B	C	A	A	A	B	B	A	C	B	C
CARBON TETRACHLORIDE (DRY)	B	A	B	A	B	A	A	A	B	B	A	B	A
CARBON TETRACHLORIDE (WET)	A	B	B	B	B	A	A	A	B	A	B	B	B
CARBONATED WATER	A	B	A	B	A	A	A	A	-	A	B	A	B
CARBONIC ACID	B	D	B	D	A	A	A	A	A	B	D	B	D
CASTOR OIL	A	B	A	B	A	A	A	A	A	A	B	A	B
CHINA WOOD OIL (TUNG)	A	B	A	B	A	A	A	-	-	A	B	A	B
CHLORINATED SOLVENTS (DRY)	A	A	A	A	D	B	B	B	B	A	A	A	A
CHLORINE (WET)	D	D	-	D	C	C	A	C	C	D	D	-	D
CHLORINE GAS (DRY)	B	B	B	B	D	D	A	A	-	B	B	B	B
CHLOROACETIC ACID	C	D	-	D	D	D	A	A	B	C	D	-	D
CHLOROBENZENE	A	B	A	B	D	A	A	A	B	A	B	A	B
CHLOROFORM	A	B	A	B	D	C	A	A	B	A	B	A	B
CHLOROSULPHONIC ACID (DRY)	B	B	B	B	D	D	A	A	D	B	B	B	B
CHLOROSULPHONIC ACID (WET)	D	D	D	N	-	-	-	-	-	D	D	-	N
CHROME ALUM	A	B	A	B	A	A	A	A	A	A	B	A	B
CHROMIC ACID	C	D	-	D	D	D	A	D	D	C	D	-	D
CITRUS JUICES	B	D	B	D	A	A	A	A	A	B	D	B	D
COCONUT OIL	B	C	B	C	A	A	A	A	B	A	C	A	C

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COFFEE EXTRACTS (HOT)	A	C	A	C	A	A	A	-	-	A	B	A	C
COKE OVEN GAS	A	B	A	B	D	A	A	-	-	A	B	A	B
COOKING OIL	A	B	A	B	A	A	A	A	-	A	B	A	B
COPPER ACETATE (10%)	B	C	B	C	-	-	A	A	B	B	C	B	C
COPPER CHLORIDE	D	D	-	D	A	A	A	A	A	D	D	-	D
COPPER NITRATE	B	D	B	D	D	D	A	A	B	B	D	B	D
COPPER SULFATE	C	D	-	D	B	B	A	A	A	C	D	-	D
CORN OIL	A	B	C	B	A	A	A	-	-	A	B	B	B
CORROSION INHIBITOR- AMINE BASED	A	A	A	A	B	B	A	A	-	A	A	A	A
COTTONSEED OIL	B	C	B	C	A	A	A	A	A	B	C	B	C
CREOSOTE OIL	B	B	B	B	A	A	A	A	B	B	B	B	B
CRESYLIC ACID	B	B	B	B	D	D	A	A	B	B	B	B	B
CRUDE OIL SOUR	A	B	A	B	C	A	A	A	B	A	B	A	B
CRUDE OIL SWEET	A	B	A	B	B	A	A	A	B	A	B	A	B
CUTTING OILS, WATER EMULSIONS	A	B	A	B	A	A	A	A	A	A	B	A	B
CYCLOHEXANE	A	A	A	A	A	A	A	A	B	A	A	A	A
DIACETONE ALCOHOL	A	A	A	A	D	A	A	-	-	A	A	A	A
DIESEL FUEL	A	A	A	A	A	A	A	A	A	A	A	A	A
DIETHANOLAMINE (DEA)													
DIETHYLAMINE	A	A	A	A	B	A	D	A	B	A	A	A	A
DIETHYLENE GLYCOL					A	A	A	A	A				
DOWTHERMS (A-E)	A	B	A	B	D	A	A	A	B	A	B	A	B
DRILLING MUD	A	B	A	B	A	A	A	-	-	A	B	A	B
DRIP COCKS, GAS	A	B	A	B	-	-	-	-	-	A	B	A	B
DRY CLEANING FLUIDS	A	B	A	B	C	B	A	A	C	A	B	A	B
EPSOM SALT (Magnesium Sulfate)	B	C	B	C	-	A	A	A	A	B	C	B	C
ETHANE	A	A	A	A	A	A	A	A	A	A	A	A	A
ETHANOL (ALCOHOL-ETHYL)	A	B	A	B	A	A	A	A	A	A	B	A	B
ETHANOLAMINE (MEA)	A	A	A	A	B	A	A	-	-	A	A	A	A
ETHERS	A	B	A	B	D	A	A	A	D	A	B	A	B
ETHYL ACETATE	B	B	B	B	D	B	B	B	D	B	B	B	B
ETHYL ACRYLATE	A	A	A	A	D	A	A	A	D	A	A	A	A
ETHYL CHLORIDE (DRY)	A	B	A	B	A	A	A	A	B	A	B	A	B
ETHYL CHLORIDE (WET)	B	B	B	B	A	A	A	A	B	B	B	B	B
ETHYLENE (LIQUID OR GAS)	A	A	A	A	B	A	A	A	A	A	A	A	A
ETHYLENE GLYCOL	B	B	B	B	A	A	A	A	A	B	B	B	B
ETHYLENE OXIDE	B	B	B	B	D	A	A	A	D	B	B	B	B
ETHYLENE PROPYLENE	A	B	-	-						A	B	-	-
FATTY ACIDS	B	D	B	D	B	A	A	A	A	B	D	B	D
FERRIC CHLORIDE	D	D	-	D	A	A	A	B	B	D	D	-	D
FERRIC NITRATE	B	D	-	D	A	A	A	A	A	B	D	-	D
FERRIC SULFATE	B	D	B	D	A	A	A	A	A	B	D	B	D
FERROUS CHLORIDE	D	D	-	D	C	C	A	A	-	D	D	-	D
FERROUS SULFATE	B	D	B	D	D	D	A	A	A	B	D	B	D
FERROUS SULFATE (SAT)	A	C	A	C	-	-	A	A	-	A	C	S	C
FERTILIZER SOLUTIONS	B	B	B	B	D	D	D	D	D	B	B	B	B
FISH OILS	A	B	A	B	B	A	A	A	-	A	B	A	B
FLUORINE	A	B	A	B	D	D	D	C	-	A	B	A	B
FLUOSILICIC ACID	C	D	-	D	D	D	A	A	A	C	D	-	D
FOOD FLUIDS - PASTES	A	C	-	C	B	A	A	-	-	A	C	-	C
FORMALDEHYDE (100%)	A	C	-	C	B	B	A	A	C	A	C	-	C
FORMALDEHYDE (40%)	A	C	-	C	B	A	A	A	C	A	C	-	C
FORMIC ACID	B	D	B	D	D	D	A	B	C	B	D	B	D

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FREON 12	A	B	A	B	A	B	B	B	D	A	B	A	B
FRUIT JUICES	A	D	-	D	A	A	A	A	-	A	D	A	D
FUEL JET JP-4	A	A	A	A	A	A	A	A	B	A	A	A	A
FUEL JET JP-5 100F	A	A	A	A	A	A	A	A	B	A	A	A	A
FUEL JET JP-6 100F	A	A	A	A	A	A	A	A	B	A	A	A	A
FUEL OIL	A	B	A	B	A	A	A	A	A	A	B	A	B
FUEL RP-1	A	A	A	A	A	A	A	A	A	A	A	A	A
FURFURAL	B	A	A	A	D	A	A	A	C	B	A	A	A
GALLIC ACID	B	D	B	D	B	A	B	-	-	B	D	B	D
GAS (MANUFACTURED)	B	B	B	B	A	A	A	A	A	B	B	B	B
GAS ODORIZERS (VTFFP)	A	B	A	B	A	A	A	A	A	A	B	A	B
GAS, NATURAL	A	B	A	B	A	A	A	A	A	A	B	A	B
GASOLINE, AVIATION	A	A	A	A	A	A	A	A	A	A	A	A	A
GASOLINE, SOUR	A	B	A	B	C	A	A	A	A	A	B	A	B
GASOLINE, LEADED, LOW OCTANE	A	A	A	A	A	A	A	A	B	A	A	A	A
GASOLINE, UNLEADED, LOW OCTANE	A	A	A	A	A	A	A	A	B	A	A	A	A
GELATIN	A	B	B	B	A	A	A	A	A	A	B	B	B
GLUCOSE	A	B	A	B	A	A	A	A	A	A	B	A	B
GLUE	A	A	A	A	-	A	A	-	-	A	A	A	A
GLYCERINE - GLYCEROL	A	B	A	B	A	A	A	A	A	A	B	A	B
GLYCOLS	B	B	B	B	A	A	A	A	A	B	B	B	B
GREASE	A	A	A	A	-	A	A	A	B	A	A	A	A
HEPTANE	A	A	A	A	A	A	A	A	C	A	A	A	A
HEXANE	A	A	A	A	A	A	A	A	C	A	A	A	A
HEXANOL, TERTIARY	A	A	A	A	-	A	-	-	-	A	A	A	A
HYDRAULIC OIL PHOSPHATE ESTER	A	A	A	A	C	A	A	A	A	A	A	A	A
HYDRAULIC OIL PETROLEUM BASE	A	A	A	A	A	A	A	A	A	A	A	A	A
HYDROBROMIC ACID	D	D	-	D	D	D	A	C	C	D	D	-	D
HYDROCHLORIC ACID 37% AIR FREE	D	D	-	D	D	D	A	A	B	D	D	-	D
HYDROCYANIC ACID	B	D	B	D	B	B	A	A	A	B	D	B	D
HYDROFLUORIC ACID	D	D	-	D	D	D	A	D	D	D	D	-	D
HYDROFLUOSILICIC ACID	C	D	-	D	D	D	A	-	-	C	D	-	D
HYDROGEN GAS	A	B	A	B	A	A	A	A	A	A	B	A	B
HYDROGEN PEROXIDE 30% (DILUTE)	B	D	B	D	D	D	A	A	A	B	D	B	D
HYDROGEN PEROXIDE	B	D	B	D	D	D	A	A	A	B	D	B	D
HYDROGEN SULFIDE (dry)	A	A	A	A	A	A	A	A	A	A	A	A	A
HYDROGEN SULFIDE (wet)	A	D	B	D	B	A	A	A	A	A	D	B	D
HYPO (SODIUM THIOSULFATE)	A	D	A	D	B	A	A	A	A	A	D	A	D
HYPOCHLORITES, SODIUM	C	D	-	D	B	A	A	A	A	C	D	-	D
ILLUMINATING GAS (coal gas)	A	A	A	A	-	-	A	A	-	A	A	A	A
INK	A	D	A	D	-	-	-	-	-	A	D	A	D
IODINE	D	D	-	D	A	A	A	B	B	D	D	-	D
ISOBUTANE (methylpropane)					-	-	A	A	-				
ISO-OCTANE	A	A	A	A	A	A	A	A	C	A	A	A	A
ISOCYANIDE	A	A	A	A	-	-	-	-	-	A	A	A	A
ISODOFORM	B	B	B	B	-	-	-	-	-	B	B	B	B
ISOPROPYL ALCOHOL (isopropanol)	B	B	B	B	B	B	A	A	A	B	B	B	B
ISOPROPYL ETHER	A	A	A	A	B	A	A	A	D	A	A	A	A
KEROSENE	A	B	A	B	A	A	A	A	B	A	B	A	B
KETCHUP	A	D	-	D	A	A	A	A	-	D	A	-	D
KETONES	A	A	A	A	D	D	D	D	D	A	A	A	A
LACQUERS (SOLVENTS)	A	C	A	C	D	A	A	-	D	A	C	A	C
LACTIC ACID	A	D	-	D	-	B	A	A	A	B	D	-	D

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LARD OIL	A	C	-	C	A	A	A	A	A	A	C	-	C
LEAD ACETATE	B	C	-	C	B	B	A	A	D	B	D	-	C
LINOLEIC ACID	A	B	A	B	C	C	A	A	A	A	B	A	B
LINSEED OIL	A	A	A	A	A	A	A	A	A	A	A	A	A
LIQUEFIED PET GAS (LPG)	A	B	A	B	A	A	A	A	B	A	B	A	B
LITHIUM BROMIDE	A	D	-	D	-	-	A	B	A	A	D	-	D
LUBRICATING OIL	A	A	A	A	A	A	A	A	A	A	A	A	A
MAGNESIUM BISULFATE	A	C	-	C	-	A	-	-	-	A	C	-	C
MAGNESIUM CHLORIDE	D	C	-	C	A	A	A	A	A	D	C	-	C
MAGNESIUM HYDROXIDE	A	B	A	B	B	B	A	A	A	A	B	A	B
MAGNESIUM SULFATE (Epson Salt)	B	B	B	B	-	A	A	A	A	B	B	-	B
MALEIC ACID	C	B	B	B	D	A	A	A	A	C	B	B	B
MALEIC ANHYDRIDE	A	D	-	D	-	-	A	A	A	A	D	-	D
MALIC ACID	A	D	-	D	A	A	A	A	A	A	D	-	D
MAYONNAISE	A	D	-	D	-	A	A	A	-	A	D	-	D
MERCAPTANS	A	A	A	A	A	A	A	-	-	A	A	A	A
MERCURIC CHLORIDE	D	D	-	D	D	D	A	A	A	D	D	-	D
MERCURIC CYANIDE (10%)	B	D	-	D	C	A	B	-	-	B	D	-	D
MERCURY	A	A	A	A	A	A	A	A	A	A	A	A	A
METHANE	A	A	A	A	A	A	A	A	B	A	A	A	A
METHANOL (ALCOHOL-METHYL)	A	B	A	B	B	A	A	A	D	A	B	A	B
METHYL ACETATE	A	A	A	A	D	B	B	B	D	A	A	A	A
METHYL ACETONE	A	A	A	A	-	D	D	D	-	A	A	A	A
METHYL CELLOSOLVE	B	B	B	B	C	A	A	-	-	B	B	B	B
METHYL CHLORIDE	A	B	A	B	D	B	A	A	D	A	B	A	B
METHYL ETHYL KETONE (MEK)	A	A	A	A	D	B	B	B	D	A	A	A	A
METHYL FORMATE	B	B	B	B	-	-	A	-	-	B	B	B	B
METHYLAMINE	B	B	B	B	-	-	A	A	-	B	B	B	B
METHYLENE CHLORIDE	B	B	B	B	D	C	A	A	-	B	B	B	B
MILK	A	D	-	D	A	A	A	A	A	A	D	-	D
MINE WATERS (ACID)	B	D	-	D	-	B	B	-	-	B	D	-	D
MINERAL SPRITS	B	B	B	B	-	A	A	A	-	B	B	B	B
MINERAL OIL	A	B	A	B	A	A	A	A	A	A	B	A	B
MIXED ACIDS (COLD)	A	C	-	C	-	-	-	-	-	A	C	-	C
MOLASSES - CRUDE	A	A	A	A	-	A	A	A	-	A	A	A	A
MOLASSES, EDIBLE	A	A	A	A	-	A	A	A	-	A	A	A	A
MTBE 100% MAX (methyl tertiary butyl ether)	A	B	-	B	-	-	B	B	B	A	D	B	B
MTBE 40% MAX	A	A	A	A	C	B	B	B	B	A	B	B	A
MURIATIC ACID (hydrochloric acid)	D	D	-	D	-	D	A	A	A	D	D	-	D
MUSTARD	A	B	A	B	A	A	A	-	-	A	B	A	B
NAPHTHA (Rubber Solvent)	A	B	A	B	B	A	B	B	B	A	B	A	B
NAPHTHALENE (COAL TAR DISTILLATE)	A	A	A	A	D	A	A	A	C	A	A	A	A
NICKEL AMMONIUM SULFATE (20%)	A	D	-	D	C	A	A	A	A	A	D	-	D
NICKEL CHLORIDE	B	D	-	D	A	A	A	A	A	C	D	-	D
NICKEL NITRATE (30%)	B	D	-	D	B	B	A	A	-	B	D	-	D
NICKEL SULFATE	C	D	-	D	A	A	A	A	A	C	D	-	D
NICOTINIC ACID	A	B	A	B	-	-	A	-	-	A	B	A	B
NITRIC ACID (10%)	A	D	-	D	D	D	A	B	D	A	D	-	D
NITRIC ACID (100%)	A	A	A	A	D	D	A	C	D	A	A	A	A
NITRIC ACID (30%)	A	D	-	D	D	D	A	C	D	A	D	-	D
NITRIC ACID (80%)	D	A	-	D	D	D	A	C	D	A	D	-	D
NITRIC ACID ANHYDROUS/AQUEOUS	A	A	A	A	D	D	A	B	-	A	A	A	A
NITROBENZENE	B	B	B	B	B	B	A	A	D	B	B	B	B

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NITROGEN	A	A	A	A	A	A	A	A	A	A	A	A	A
NITROUS ACID (10%)	B	D	-	D	A	A	A	A	A	B	D	-	D
NITROUS GASES	A	B	A	B	-	A	A	A	-	A	B	A	B
NITROUS OXIDE	B	A	A	A	A	A	A	A	-	B	A	B	A
OIL, COTTONSEED	B	C	B	C	B	B	A	B	A	B	C	B	C
OIL, PETROLEUM (REFINED)	A	A	A	A	A	A	A	A	A	A	A	A	A
OIL, PETROLEUM (SOUR) H2S & CO2	A	A	A	A	A	A	A	A	A	A	A	A	A
OIL, WATER MIXTURES	A	B	A	B	A	A	A	A	A	A	B	A	B
OIL, ANIMAL	A	A	A	A	A	A	A	A	A	A	A	A	A
OIL, FISH	A	B	A	B	B	A	A	A	B	A	B	A	B
OIL, FUEL	A	B	A	B	A	A	A	A	B	A	B	A	B
OIL, LUBE	A	A	A	A	A	A	A	A	A	A	A	A	A
OIL, MINERAL	A	B	A	B	A	A	A	A	A	A	B	A	B
OLEIC ACID	A	B	A	B	C	A	A	A	C	A	B	A	B
OLEUM	B	B	B	B	B	A	A	A	A	B	B	B	B
OLIVE OIL	A	B	A	B	A	A	A	A	A	A	B	A	B
OXALIC ACID	A	D	-	D	B	B	A	A	A	A	D	-	D
OXYGEN (GAS)	A	B	A	B	D	A	A	A	D	A	B	A	B
OXYGEN (LIQUID)	A	B	A	B	D	C	C	C	D	A	B	-	B
OZONE	A	C	A	C	D	A	A	A	D	A	C	A	C
PAINTS AND THINNERS	A	A	A	A	D	A	A	A	A	A	A	A	A
PALM OIL	B	C	B	C	D	A	A	A	-	B	C	B	C
PALMITIC ACID	A	C	A	C	A	A	A	A	A	A	C	A	C
PARAFIN	A	B	A	B	A	A	A	-	A	A	B	A	B
PARAFORMALDEHYDE	B	B	B	B	A	A	A	A	-	B	B	B	B
PENTANE	A	B	A	B	A	A	A	-	A	A	B	A	B
PERCHLOROETHYLENE	B	B	B	B	C	A	A	A	D	B	B	B	B
PETROLATUM	B	C	B	C	A	A	A	-	A	B	C	B	C
PHENOL (CARBOLIC ACID)	A	B	A	B	A	A	A	A	A	A	B	A	B
PHOSGENE (CARBONYL CHLORIDE)					-	B	A	-	-				
PHOSPHORIC ACID					-	B	A	A	A				
PHOSPHORIC ACID (40%)					-	B	A	A	A				
PHOSPHORIC ACID (>40%)					-	B	A	A	A				
PHOSPHORIC ACID (CRUDE)					-	B	A	A	A				
PHOSPHORIC ACID (MOLTEN)					-	B	-	-	-				
PHOSPHORIC ACID (ANHYDRIDGE)					D	B	A	-	-				
PHTHALIC ACID	B	C	B	C	C	B	A	A	-	B	C	B	C
PHTHALIC ANHYDRIDE	B	C	B	C	C	A	A	C	C	B	C	B	C
PICRIC ACID	B	C	B	C	A	A	A	A	-	B	C	B	C
PINE OIL	A	B	A	B	A	A	A	-	-	A	B	A	B
PINEAPPLE JUICE	A	C	-	C	A	A	A	-	-	A	C	-	C
POLYESTER RESIN	A	B	-	B	-	A	A	A	-	A	B	A	B
POLYETHYLENE GLYCOL					-	-	A	A	B				
POLYURETHANE	A	A	A	A	-	-	-	-	-	A	A	A	A
POTASSIUM BISULFITE (10%)	B	D	-	D	C	A	A	-	-	B	D	-	D
POTASSIUM BROMIDE	B	D	-	D	C	A	A	A	-	B	D	-	D
POTASSIUM CARBONATE	A	C	-	C	-	A	A	A	-	A	C	-	C
POTASSIUM CHLORATE	A	B	A	B	-	C	A	A	A	A	C	-	B
POTASSIUM CHLORIDE	A	C	-	C	A	A	A	A	A	A	C	-	C
POTASSIUM CYANIDE	B	B	B	B	A	A	A	-	-	B	B	B	B
POTASSIUM DICHROMATE	A	B	A	B	B	B	A	A	A	A	B	A	B
POTASSIUM DIPHOSPHATE	A	A	A	A	-	-	-	-	-	A	A	A	A
POTASSIUM FERRICYANIDE	A	B	A	B	C	B	A	A	C	B	B	B	B

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POTASSIUM FERROCYANIDE	A	B	A	B	B	B	A	A	-	A	B	A	B
POTASSIUM HYDROXIDE 70%	A	A	A	A	C	C	A	A	B	A	A	A	A
POTASSIUM HYDROXIDE-DILUTE	B	B	B	B	-	A	A	A	A	B	B	B	B
POTASSIUM IODIDE	B	C	B	C	C	A	A	-	-	B	C	B	C
POTASSIUM NITRATE	A	B	A	B	B	B	A	A	A	A	B	A	B
POTASSIUM PERMANGANATE	A	A	A	A	D	D	A	A	-	A	A	A	A
POTASSIUM SULFATE	A	B	A	B	A	A	A	A	A	A	B	A	B
POTASSIUM SULFIDE	B	C	B	C	A	A	A	C	-	B	C	B	C
POTASSIUM SULFITE	A	D	-	D	A	A	A	-	A	A	D	-	D
PRODUCER GAS	A	B	A	B	A	A	A	A	A	A	B	A	B
PROPANE	A	A	A	A	A	A	A	A	A	A	A	A	A
PROPYLENE	A	B	-	B	C	A	A	A	A	A	B	-	B
PROPYL ALCOHOL (PROPANOL)	A	A	A	A	A	A	A	A	A	A	A	A	A
PROPYLENE GLYCOL	A	A	A	A	C	A	A	A	A	A	A	A	A
PYROGALLIC ACID	B	B	B	B	B	A	A	D	-	B	B	B	B
QUENCH OIL (WATER SOLUBLE)	A	A	A	A	B	B	A	A	-	A	A	A	A
RESINS-ROSINS	A	C	-	C	B	A	A	A	-	A	C	-	C
RUBBER LATEX EMULSIONS	A	B	A	B	A	A	A	A	-	A	B	A	B
SALAD OIL	B	C	-	C	A	A	A	A	-	B	C	-	C
SALICYLIC ACID	A	D	-	D	B	A	A	A	A	A	D	A	D
SALT (BRINE (NaCl) saturated)	B	C	A	C	A	A	A	A	A	B	C	A	C
SEA WATER	A	D	A	D	A	A	A	A	A	A	D	A	D
SHELLAC (BLEACHED)	A	A	A	A	C	A	A	A	-	A	A	A	A
SHELLAC (ORANGE)	A	A	A	A	C	A	A	A	-	A	A	A	A
SILICONE OILS	A	A	A	A	A	A	A	A	A	A	A	A	A
SILVER NITRATE	B	D	-	D	B	A	A	A	A	B	D	-	D
SOAP SOLUTIONS (STEARATES)	A	A	A	A	A	A	A	A	A	A	A	A	A
SODIUM ACETATE	B	B	B	B	B	B	A	A	B	B	B	B	B
SODIUM ALUMINATE	A	C	-	C	C	A	A	A	-	A	C	-	C
SODIUM BICARBONATE	B	C	-	C	A	A	A	A	A	B	C	-	C
SODIUM BISULFATE	A	D	-	D	A	A	A	A	A	A	D	-	D
SODIUM BISULFITE	D	D	-	D	A	A	A	A	A	D	D	-	D
SODIUM BORATE (BORAX)	B	C	B	C	A	A	A	A	A	A	C	B	C
SODIUM BROMIDE	B	C	B	C	C	B	A	A	-	B	C	B	C
SODIUM CARBONATE	B	B	B	B	A	A	A	A	A	B	B	B	B
SODIUM CHLORATE	B	C	B	C	C	A	A	A	C	B	C	B	C
SODIUM CHLORIDE	B	C	B	C	A	A	A	A	A	B	C	B	C
SODIUM CHROMATE	B	B	B	B	C	C	A	A	-	B	B	B	B
SODIUM CYANIDE	A	A	A	A	A	A	A	A	A	A	A	A	A
SODIUM FLUORIDE	C	D	-	D	C	B	A	A	-	C	D	-	D
SODIUM HYDROXIDE 20%	A	A	A	A	-	A	A	A	A	A	A	A	A
SODIUM HYDROXIDE 50%	B	B	B	B	-	A	A	A	A	B	B	B	B
SODIUM HYDROXIDE 80%	B	B	B	B	-	B	A	A	A	B	B	B	B
SODIUM HYPOCHLORIDE	C	D	-	D	-	D	A	A	-	C	D	-	D
SODIUM METAPHOSPHATE	A	D	-	D	A	A	A	A	A	A	D	-	D
SODIUM METASILICATE	A	C	-	C	C	A	A	A	-	A	C	A	C
SODIUM NITRATE	A	B	B	B	-	A	A	A	A	A	B	B	B
SODIUM PERBORATE	B	C	B	C	B	B	A	A	A	B	C	B	C
SODIUM PEROXIDE	B	C	B	C	B	A	A	A	A	B	C	B	C
SODIUM PHOSPHATE (DIBASIC)	B	B	B	B	A	A	A	A	A	B	B	B	B
SODIUM PHOSPHATE (TRIBASIC)	B	B	B	B	B	B	A	A	A	B	B	B	B
SODIUM SILICATE	A	A	A	A	A	A	A	A	A	A	A	A	A
SODIUM SULFATE NA2S04	A	B	A	B	A	A	A	A	A	A	B	A	B

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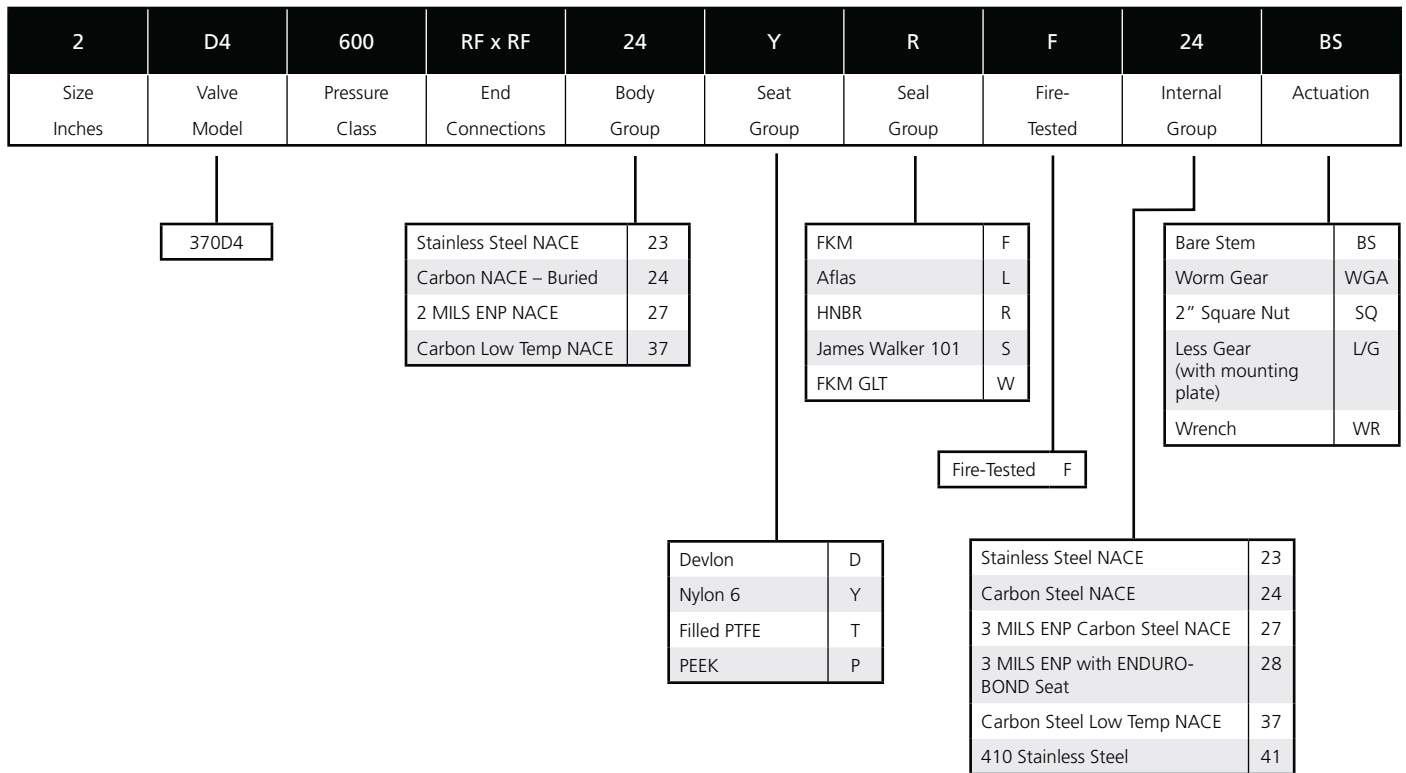
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SODIUM SULFIDE NA2S02	B	B	B	B	B	B	A	A	-	B	B	B	B
SODIUM THIOSULFATE	A	D	-	D	B	B	A	A	-	A	D	-	D
SOUR GAS AND OIL	A	A	-	A						A	A	-	A
SOYBEAN OIL	A	B	B	B	A	A	A	A	A	A	B	B	B
STANNIC CHLORIDE	D	D	D	D	B	B	A	A	A	D	D	D	D
STANNOUS CHLORIDE	C	D	-	D	C	C	A	A	A	C	D	-	D
STARCH	A	A	A	A	A	A	A	A	A	A	A	A	A
STEAM (212F)	A	B	A	B	D	C	A	A	A	A	B	A	B
STEARIC ACID	A	C	-	C	B	A	A	A	A	A	C	-	C
STODDARD SOLVENT	B	B	B	B	A	A	A	A	B	B	B	B	B
STYRENE	A	A	A	A	-	A	A	A	B	A	A	A	A
SUGAR LIQUIDS	A	B	A	B	-	A	A	A	-	A	B	A	B
SULFATE, BLACK LIQUORS	B	C	-	C	-	B	A	-	-	B	C	-	C
SULFATE, GREEN LIQUORS	B	C	-	C	-	B	A	-	-	B	C	-	C
SULFATE, WHITE LIQUORS	B	D	-	D	-	B	A	-	-	B	D	-	D
SULFURIC ACID (0-7%)	A	B	A	B	-	C	A	A	B	A	B	A	B
SULFURIC ACID (10% - 100%) H2S04	D	D	-	D	-	D	A	D	B	D	D	-	D
SULFUROUS ACID	D	D	-	D	D	D	A	A	A	D	D	-	D
SULPHUR	A	B	A	B	-	A	A	A	-	A	B	A	B
SULPHUR DIOXIDE (DRY)	A	B	A	B	-	A	A	A	B	A	B	A	B
SULPHUR TRIOXIDE (DRY)	B	B	B	B	-	A	A	A	B	B	B	B	B
SYNTHESIS GAS	B	B	B	B	-	A	A	A	-	B	B	B	B
TALL OIL	B	B	B	B	-	A	A	A	-	B	B	B	B
TANNIC ACID	B	B	B	B	A	A	A	A	A	B	B	B	B
TAR - TAR OIL	A	A	A	A	B	A	A	A	A	A	A	A	A
TARTARIC ACID	A	D	C	D	B	B	A	A	A	A	D	C	D
TETRAETHYL LEAD	B	C	-	C	B	B	A	A	C	B	C	-	C
TITANIUM TETRACHLORIDE T1-CL4					B	A	A	-	-				
TITANIUM TRICHLORIDE T1-CL3					B	A	A	-	-				
TOLUENE - TOLUOL	A	A	A	A	C	A	A	A	D	A	A	A	A
TOMATO JUICE	A	C	-	C	-	A	A	A	-	A	C	-	C
TRANSFORMER OIL	A	A	A	A	A	A	A	A	A	A	A	A	A
TRIBUTYL PHOSPHATE	A	A	A	A	D	D	A	-	-	A	A	A	A
TRICHLOROETHYLENE	B	B	B	B	C	B	A	A	D	B	B	B	B
TUNG OIL (China Wood Oil)	A	B	A	B	A	A	A	A	A	A	B	A	B
TURPENTINE	A	B	A	B	B	B	A	A	A	A	B	A	B
UREA	B	C	-	C	-	-	-	-	-	B	C	-	C
VARNISH	A	C	-	C	B	A	A	A	B	A	C	-	C
VEGETABLE OIL, EDIBLE	A	B	-	B	A	A	A	A	A	A	B	-	B
VEGETABLE OIL, NON-EDIBLE	A	B	A	B	A	A	A	A	A	A	B	A	B
VINEGAR	A	D	-	D	B	A	A	A	A	A	D	-	D
WATER, DISTILLED	A	D	A	D	A	A	A	A	A	A	D	A	D
WATER, FRESH	A	C	A	C	A	A	A	A	A	A	C	A	C
WATER, SALT	A	D	A	D	A	A	A	A	A	A	D	A	D
WAX, EMULSIONS	A	A	A	A	-	A	A	A	-	A	A	A	A
WAXES	A	A	A	A	-	A	A	A	-	A	A	A	A
WHISKEY AND WINE	A	D	-	D	A	A	A	A	A	A	D	-	D
XYLENE	A	A	A	A	D	A	A	A	D	A	A	A	A
ZINC CHLORIDE	D	D	-	D	C	C	A	A	A	D	D	-	D
ZINC HYDROSULFITE	A	A	A	A	C	A	A	-	-	A	A	A	A
ZINC SULFATE	B	D	B	D	A	A	A	A	A	B	D	B	D

A – Excellent  
 B – Good (slightly attacked)  
 C – Fair (modestly attacked)  
 D – Not Recommended  
 - - No Data

Reference:  
<http://www.coleparmer.com/techinfo/chemcomp.asp>  
[http://www.rlhudson.com/ChemGuide/chemical\\_window.html](http://www.rlhudson.com/ChemGuide/chemical_window.html)  
 Chemical Resistance Guide by Compass Publications.

# WKM DynaSeal 370D4 Trunnion Mounted Ball Valves

## HOW TO ORDER



The trim charts provide more specific application details including availability of fire-tested materials. Please contact Cameron for information concerning availability of trims other than those listed or for any additional information concerning the choice or guidance for application of the trims listed.

NACE MR0175/ISO 15156 Compliance – Materials of construction shall be in compliance with the pre-qualified material requirements specified by NACE MR0175/ISO 15156. According to NACE MR0175/ISO 15156, it is the manufacturer's responsibility to meet metallurgical requirements and the customer's/user's responsibility to ensure that a material will be satisfactory in the intended environment. When given the application requirements (environment) by the customer/user, Cameron can make technical recommendations in accordance with NACE MR0175/ISO 15156, but that in no way certifies or warrants the product or materials for the application.

## WKM DynaSeal 370D4 Trunnion Mounted Ball Valves

### ACTUATION INFORMATION

#### Valves are priced bare stem. Available options are:

- Wrench operation – Wrenches and multi-position wrench heads must be ordered separately. Wrenches are shipped separately with valves but wrench heads are installed on the valves
- Multi-position wrench heads are standard on ASME Classes 1500, 2500 and 5000# MOP valves
- Multi-position wrench heads are available as options on 4" (100 mm) size for other pressure classes
- Valves ordered with Worm Gears (WGA) are shipped with gears installed, but handwheels are not installed (shipped separately)
- Valves ordered Less Gear (LG) with gear mounting plate installed (for actuation by others)
- 4" (100 mm) size valve ordered for automation by others (LG) requires a special actuator flange at additional cost
- Locking devices are standard on wrench operated 2" and 3" (50 mm and 75 mm) bore sizes, 370D4 ball valves, Classes 150 through 900
- All worm gears come with locking device standard

# CAMSERV™ Services for Valves and Actuation

WE BUILD IT. WE BACK IT.



## Global Network and Local Support

Cameron is well-positioned to deliver total aftermarket support, quickly and efficiently, with unmatched OEM expertise. Our highly skilled engineers and technicians are available around the clock, seven days a week, to respond to customer queries, troubleshoot problems and offer reliable solutions.

## Easily Accessible Parts and Spare Valves

- OEM spare valves, actuators and parts (including non-Cameron brands)
- Handling, storage, packaging and delivery
- Dedicated stocking program

## Comprehensive Aftermarket Services Portfolio

- Parts and spare valves
- Repair
- Field services
- Preventative maintenance
- Equipment testing and diagnostics
- Remanufacturing
- Asset preservation
- Customer property management
- Training and recertification services
- Warranty

## Customized Total Valve Care<sup>SM</sup> (TVC) Programs

Customized asset management plans that optimize uptime, availability and dedicated services.

- Engineering consultancy
- Site management
- Flange management
- Startup and commissioning
- Spare parts and asset management
- Operational support



## Trademark Information

WKM is a registered trademark of Cameron. CAMSERV and DynaSeal are trademarks of Cameron.

This document contains references to registered trademarks or product designations that are not owned by Cameron.

Trademark	Owner	Common Name	Comparable Cameron Abbreviated Name (in trim charts)
AFLAS	ASAHI GLASS COMPANY	TFE PROPYLENE	FXM
DEVLON	DEVOL ENGINEERING LIMITED		
PEEK	VICTREX PLC CORP UNITED KINGDOM	POLYETHERETHERKETONE	PK
TEFLON	E.I.DUPONT DE NEMOURS & COMPANY	POLY TETRA FLUORO ETHYLENE	PTFE
VITON	E.I. DUPONT DE NEMOURS & COMPANY	FLUOROELASTOSMER	FKM
17-4PH	ARMCO ADVANCED MATERIALS CORP.	17-4PH STAINLESS STEEL	TYPE 630
		ELECTROLESS NICKEL PLATING	ENP



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