

# WKM 370D6 Trunnion Mounted Ball Valves

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

TECHNOLOGY



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## WKM 370D6 Trunnion Mounted Ball Valves



Oklahoma City, Okla.,  
USA

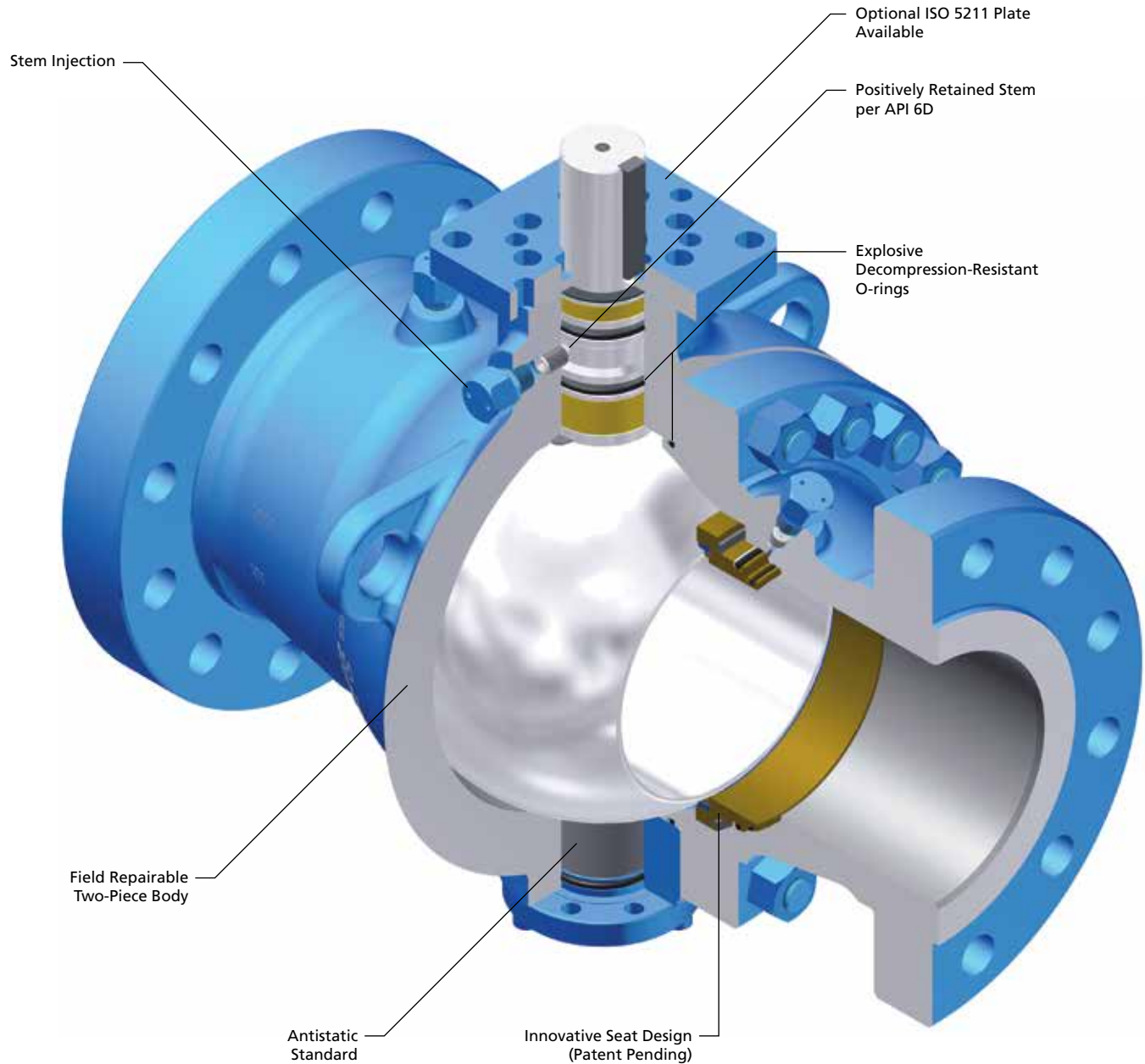
Cameron is a leading provider of valve, valve automation, and measurement systems to the oil and gas industry. We offer products primarily used to control, direct, and measure the flow of oil and gas as it is moved to refineries, petrochemical plants, and industrial centers for processing.

We provide 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®, DOUGLAS CHERO™, 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. Our WKM product line offers a broad portfolio of valves including gate valves, trunnion mounted and floating ball valves, and DynaCentric™ butterfly valves, all built to standards for demanding applications.

**ASME Classes 150 through 2500**  
**2" to 16" (50 mm to 400 mm)**

Cameron's WKM 370D6 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 can be specified for more demanding applications.





## FEATURES AND BENEFITS

### Fire-Tested for Safety

The WKM 370D6 trunnion mounted ball valves are qualified under API 607 standards.

### Actuation-Friendly

Valves can come with a DYNATORQUE™ gear operator or an ISO 5211 mounting pad for easy actuation.

### End Connections

Flanged

### Body Style

Two-piece

### Standard Materials

Carbon steel, stainless steel, and low-temperature carbon steel

### Optional Stem Materials

316 SS, 410 SS, and INCONEL®

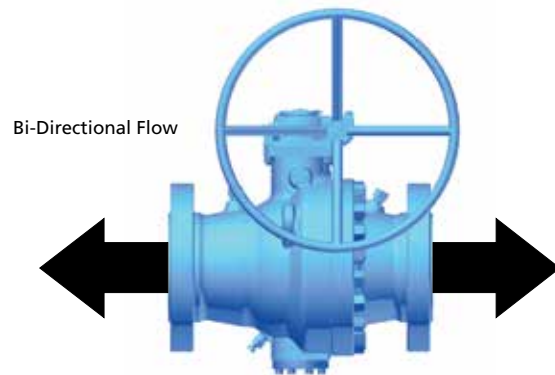
### Double Block-and-Bleed Operation

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. All sizes can block-and-bleed in both the open and closed position.

### NACE Trim Standard\*

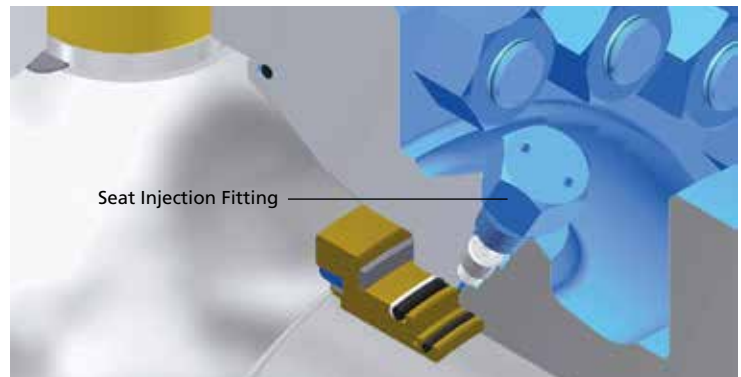
Compliant with NACE MR0175/ISO 15156 for buried service.

*\* 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.*



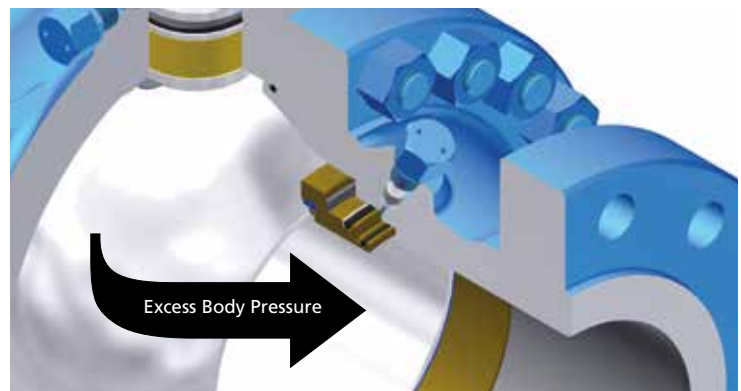
### Bi-Directional Flow

This valve uses pressure-actuated seats with locked-in, non-metallic face seals. To help ensure 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

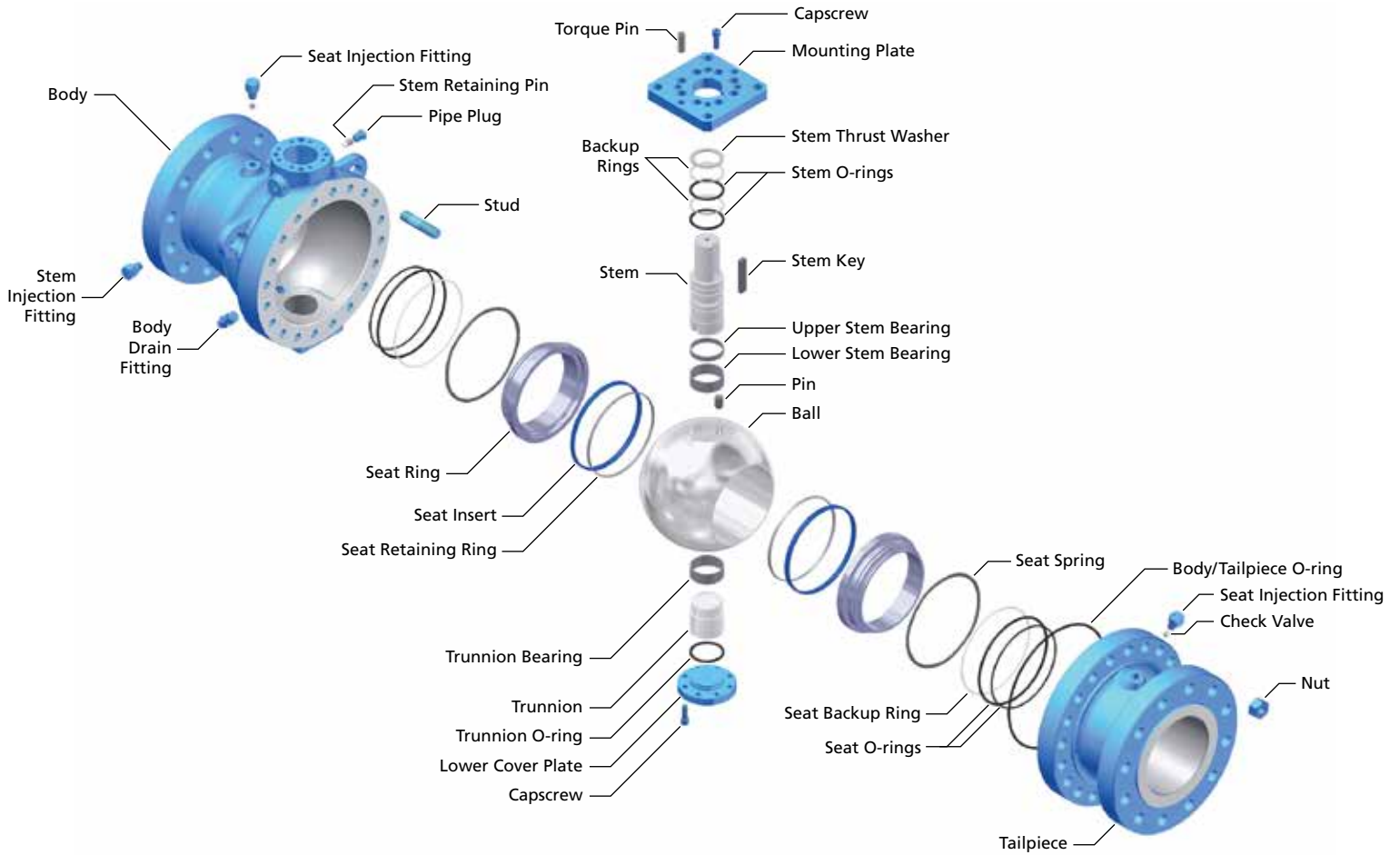
In the event of damage to the valve seat, sealant can be injected to temporarily seal the valve.



### Automatic Body Pressure Relief

Seats will internally relieve excess body pressure.

## STANDARDS AND SPECIFICATIONS



### Design and testing standards:

- API 6D
- API 598
- API 608
- API 607 6th Ed. fire-test
- NACE MR0175/ISO 15156
- ASME B16.34 (valves, flange end)
- MSS-SP-6 (standard finishes for pipe flanges)
- MSS-SP-25 (standard marking system for valves)
- MSS-SP-55 (quality standards for steel castings)

**In addition, WKM 370D6 trunnion mounted ball valves can be supplied to comply with these standards:**

- CE/PED
- ISO 5211 top works
- CRN

### ASME Pressure Classes

		ASME Class					
Size (in)	Size (mm)	150	300	600	900	1500	2500
2	50	•	•	•	•	•	•
3 x 2	80 x 50	–	–	•	•	–	–
3	80	•	•	•	•	•	•
4 x 3	100 x 80	–	–	•	•	–	–
4	100	•	•	•	•	•	•
6 x 4	150 x 100	•	•	•	•	•	•
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	•	•	•	–	–	–

## MATERIALS LIST

### Body Group Trim Number

Part	Carbon Steel (NACE) 24	Carbon Steel Low Temp. (NACE) 37	Stainless Steel (NACE) 23	Carbon Steel 3 mil ENP (NACE) 27
Body	A216 Gr. WCC	A352 Gr. LCC	A351 Gr. CF8M	N/A
Tailpiece	A216 Gr. WCC	A352 Gr. LCC	A351 Gr. CF8M	N/A
Lower Cover Plate	Carbon Steel	4130	316 SS	N/A
Studs	A320 Gr. L7M	A320 Gr. L7M	A320 Gr. L7M Zinc Plate	N/A
Nuts	A194 Gr. 7M	A194 Gr. 7M	A194 Gr. 7M Zinc Plate	N/A
Capscrews	A574M	A320 Gr. L7M	A193 Gr. B7M Zinc Plate	N/A
Pipe Plug	Stainless Steel	Stainless Steel	Stainless Steel	N/A
Adapter Plate	Carbon Steel	A350 Gr LF2	316 SS	N/A

NACE indicates compliance with NACE MR0175/ISO 15156.

### Internal Group Trim Number

Ball	A216 Gr. WCC/A105 CS ENP	A216 Gr. WCC/A105 CS ENP	A182 Gr. 316 SS	A216 Gr. WCC/A105 CS 3 mil ENP
Dowel Pin	Alloy Steel	Alloy Steel	Alloy Steel	Alloy Steel
Stem/Trunnion	A105CS ENP	A105CS ENP	A182 Gr. 316 SS	A105CS 3 mil ENP
Seat Rings	A 216 Gr. WCC/A105 ENP	A126 Gr. WCC/A105 ENP	A182 Gr. 316/A351 Gr. CF8M	A216 Gr. WCC/A105 CS 3 mil ENP
Seat Spring	B637 N07500	B637 N07500	B637 N07500	B637 N07500
Stem and Trunnion Bearings	CS/Filled PTFE	CS/Filled PTFE	CS/Filled PTFE*	CS/Filled PTFE
Thrust Washer	CS/Filled PTFE	CS/Filled PTFE	CS/Filled PTFE*	CS/Filled PTFE
Ground Spring	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
Stem Retainer Pin	4130/4140	4130/4140	316 SS	4130/4140

Note: Trim 24 is suitable for ambient temperatures from -20° F to 400° F (-29° C to 204° C).

Trim 23 and 37 are suitable for ambient temperatures from -50° F to 400° F (-46° C to 204° C) (must be combined with appropriate seal code).

\* 23-23 Full stainless steel gets stainless steel thrust washer and bearings.

### Seal Group Trim Code

Part	YXF* Fire-Tested	TFF Classes 150 to 600 Fire-Tested	YRF Fire-Tested	PWF* Fire-Tested
Temperature Limits	-50° F* to 250° F (-40° C to 121° C)	0° F to 400° F (-18° C to 204° C)	-20° F to 250° F (-29° C to 121° C)	-50° F* to 400° F (-18° C to 204° C)
Seat Face Seals	Nylon (N6)	Filled PTFE	Nylon (N6)	PEEK
Stem Seal O-rings	JW HNBR	FKM	HNBR	FKM GLT
Body/Tailpiece O-rings	JW HNBR	FKM	HNBR	FKM GLT
Seat O-rings	JW HNBR	FKM	HNBR	FKM GLT
Trunnion O-ring	JW HNBR	FKM	HNBR	FKM GLT
Backup Rings	Nylon/PEEK	Nylon/PEEK	Nylon/PEEK	Nylon/PEEK

\* When combined with trim 23 or 37, body and internal group code. Consult Cameron for a complete list of trim temperature ranges.

## TRIM CODES

2	D6	600	RF x RF	24	Y	R	F	24	LG	
Size Inches (mm)	Valve Model	Pressure Class	End Connections	Body Group	Seat Group	Seal Group	Fire-Tested	Internal Group	Actuation	
2" to 16" (50 mm to 400 mm)	370D6	150 to 2500	Stainless Steel NACE	23	Devlon	FKM	F	Stainless Steel NACE	Less Gear	LG
	370D6P-PED		Carbon Steel NACE	24		James 985	X		Carbon Steel NACE	Worm Gear
			Carbon Low Temp NACE	37	Nylon 6	HNBR	R	3 mil ENP Carbon Steel NACE	Wrench Head	WR
					Filled PTFE	James Walker 101	S	Low-Temp. Carbon Steel NACE		
					PEEK	FKM GLT	W			
						James Walker FR58	V			

## PART NUMBER CODE / HOW TO ORDER

Pressure Class

End Connection

Body/Tailpiece Material

Seat Insert Material

Seal Material

Trim Material

Actuation

- 1 Class 150
- 2 Class 300
- 3 Class 600
- 4 Class 900
- 5 Class 1500
- 6 Class 2500

- 1 RF Flange
- 5 RTJ Flange (Class 600 and Above)

- 1 Carbon Steel (24)
- 2 Stainless Steel (23)
- 3 Low-Temp. Carbon Steel (37)
- 4 Carbon Steel Endurobond (26)
- 5 PED Carbon Steel (24)
- 6 PED Stainless Steel (23)
- 7 PED Low-Temp. Carbon Steel (37)

- 1 Nylon 6 (Y)
- 2 Filled PTFE (T)
- 3 Peek (P)
- 4 Nylon 12 (N)
- 5 Devlon V (D)

- 1 Hi Fluorine FKM (F) 0° F (-18° C)
- 2 AFLAS (L) 30° F (-1° C)
- 3 HNBR (R) -20° F (-29° C)
- 4 James Walker Elasto-Lion 101 (HNBR) (S) -20° F (-29° C)
- 5 James Walker FR58/90 (V) -15° F (-26° C)
- 6 Fluoroelastomer GLT (W) -50° F (-46° C)
- 7 James Walker Elasto-Lion 985 (HNBR) (X) -50° F (-46° C)
- 8 Fluoroelastomer GFLT (G) -30° F (-34° C)
- 9 James Walker FR25/90 (U) -40° F (-40° C)

- 1 Carbon Steel/1 mil ENP (24)
- 2 Stainless Steel (23)
- 3 Low-Temp. Carbon Steel (37)
- 4 Carbon Steel/3 mil ENP (27)

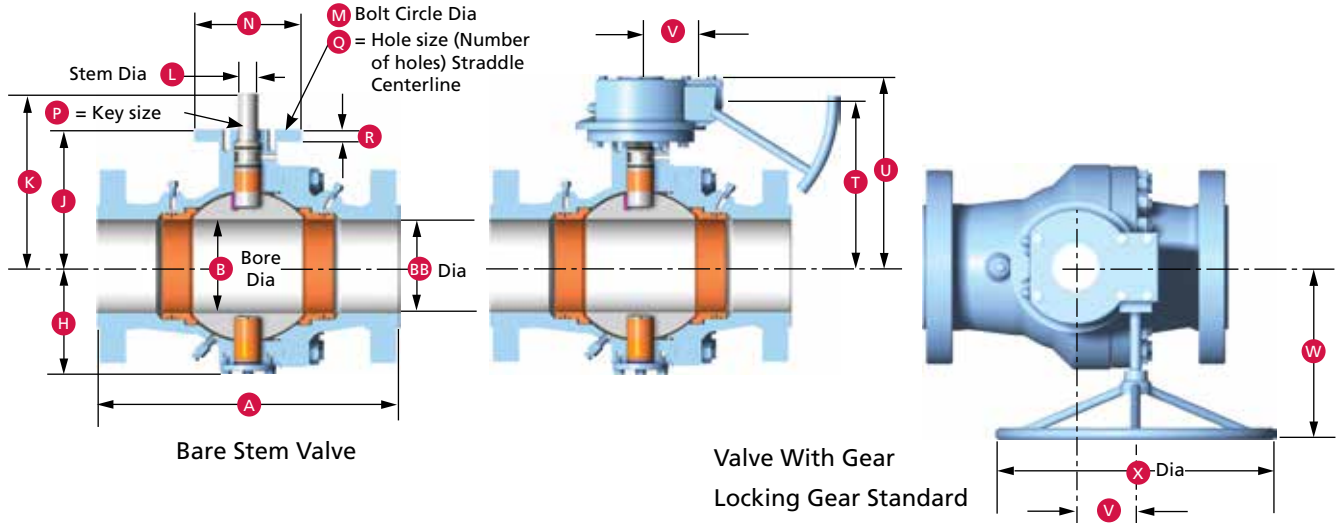
- 1 Less Gear (LG)
- 2 Wrench Head (WR) 2", 150 to 4", 900; 2" and 3" 1500/2500; and 6" 150/300 only.
- 3 Gear Operator with Lock Device (WG)
- 4 Less Gear (LG ISO) ISO Top Works
- 5 Gear Operator with Lock Device (ISO WG)
- 6 Wrench Head with Pipe (WP) 2", 150 to 4" 900; 2" and 3" 1500/2500; and 6" 150/300 only.

Valve SE	Base Number
2	2365466
3X2	2365467
3	2365468
4X3	2365469
4	2365470
6X4	2365471
6	2365472
8X6	2365473
8	2365474
10X8	2365475
10	2365476
12X10	2365477
12	2365478
14	2365480
16	2365481

XXXXXXXX-XXXXXXXX



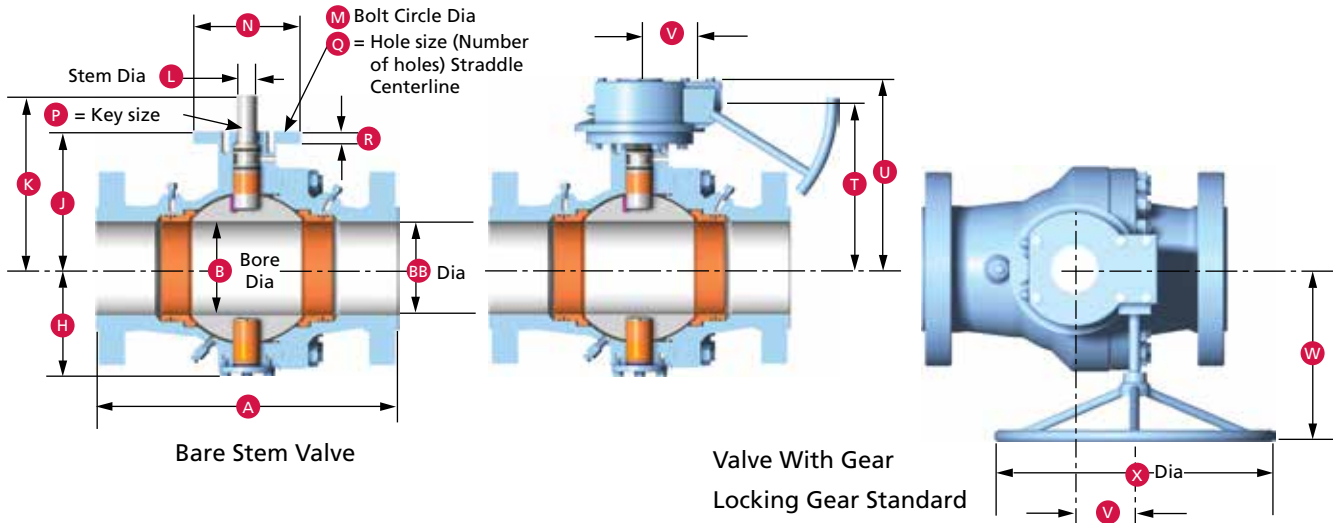
# ASME CLASS 150 DIMENSIONS 2" to 16" (50 mm to 400 mm)



## Dimensions

Size in. (mm)	A		B	BB	H	J	K	L	M	N	P	Q	R	T	U	V	W	X
	RF	RJ																
2 (50)	7.00 (178)	-	2.00 (51)	2.00 (51)	4.31 (109.5)	4.67 (118.6)	6.31 (160.3)	1.098 (27.89)	4.016 (102.00)	4.90 (124.4)	0.318 (8.08)	0.43-[4]	0.59 (14.99)	5.77 (146.6)	7.32 (185.9)	1.75 (44.5)	9.06 (230.12)	6.00 (154.4)
3 (80)	8.00 (203)	-	3.00 (76)	3.00 (76)	5.19 (131.8)	5.54 (140.7)	7.14 (181.4)	1.098 (27.89)	4.016 (102.00)	4.90 (124.4)	0.318 (8.08)	0.43-[4]	0.59 (14.99)	6.64 (168.7)	8.19 (208.0)	1.75 (44.5)	9.06 (230.12)	6.00 (154.4)
4 (100)	9.00 (229)	-	4.00 (102)	4.00 (102)	6.65 (168.9)	7.11 (180.6)	9.14 (232.2)	1.413 (35.89)	5.512 (140.00)	6.90 (175.00)	0.398 (10.11)	0.67-[4]	0.77 (19.56)	8.48 (215.4)	10.18 (258.6)	2.51 (63.8)	9.06 (230.12)	6.00 (154.4)
6 x 4 (150 x 100)	15.50 (394)	-	4.00 (102)	6.00 (152)	6.65 (168.9)	7.11 (180.6)	9.14 (232.2)	1.413 (35.89)	5.512 (140.00)	6.90 (175.00)	0.398 (10.11)	0.67-[4]	0.77 (19.56)	8.48 (215.4)	10.18 (258.6)	2.51 (63.8)	9.06 (230.12)	6.00 (154.4)
6 (150)	15.50 (394)	-	6.00 (152)	6.00 (152)	8.25 (209.5)	9.17 (232.9)	11.50 (292.1)	1.650 (41.91)	6.00 (152.40)	7.00 (177.8)	0.476 (12.09)	0.56-[4]	0.84 (21.3)	10.54 (267.7)	12.24 (310.9)	2.51 (63.8)	12.19 (309.6)	12.00 (304.8)
8 x 6 (200 x 150)	18.00 (457)	-	6.00 (152)	8.00 (203)	8.25 (209.5)	9.17 (232.9)	11.50 (292.1)	1.650 (41.91)	6.00 (152.40)	7.00 (177.8)	0.476 (12.09)	0.56-[4]	0.84 (21.3)	10.54 (267.7)	12.24 (310.9)	2.51 (63.8)	12.19 (309.6)	12.00 (304.8)
8 (200)	18.00 (457)	-	8.00 (203)	8.00 (203)	10.06 (255.5)	11.52 (292.6)	14.00 (355.6)	1.886 (47.90)	6.496 (165.00)	8.00 (203.2)	0.556 (14.12)	0.81-[4]	0.94 (23.88)	13.02 (330.7)	14.79 (375.7)	3.00 (76.2)	12.19 (309.6)	16.00 (406.4)
10 x 8 (250 x 200)	21.00 (533)	-	8.00 (203)	10.00 (254)	10.06 (255.5)	11.52 (292.6)	14.00 (355.6)	1.886 (47.90)	6.496 (165.00)	8.00 (203.2)	0.556 (14.12)	0.81-[4]	0.94 (23.88)	13.02 (330.7)	14.79 (375.7)	3.00 (76.2)	12.19 (309.6)	16.00 (406.4)
10 (250)	21.00 (533)	-	10.00 (254)	10.00 (254)	12.00 (304.8)	13.42 (340.9)	16.52 (419.6)	2.357 (59.87)	8.00 (203.20)	9.50 (241.3)	0.712 (18.08)	0.81-[4]	0.94 (23.9)	15.30 (388.6)	17.28 (438.9)	3.63 (92.08)	14.94 (379.5)	20.00 (508.0)
12 x 10 (300 x 250)	24.00 (610)	-	10.00 (254)	12.00 (305)	12.00 (304.8)	13.42 (340.9)	16.52 (419.6)	2.357 (59.87)	8.00 (203.20)	9.50 (241.3)	0.712 (18.08)	0.81-[4]	0.94 (23.9)	15.30 (388.6)	17.28 (438.9)	3.63 (92.08)	14.94 (379.5)	20.00 (508.0)
12 (300)	24.00 (610)	-	12.00 (305)	12.00 (305)	13.27 (337.0)	14.85 (377.2)	19.75 (501.6)	2.357 (59.87)	8.00 (203.20)	9.50 (241.3)	0.712 (18.08)	0.81-[4]	0.94 (23.9)	16.73 (424.9)	18.71 (475.2)	3.63 (92.08)	14.94 (379.5)	20.00 (508.0)
14 (350)	27.00 (686)	-	13.25 (337)	13.25 (337)	15.28 (388.1)	16.97 (431.0)	21.04 (534.4)	2.830 (71.88)	10.00 (254.00)	11.90 (302.00)	0.792 (20.12)	0.67-[8]	1.25 (31.80)	19.22 (488.2)	21.68 (550.7)	4.63 (117.5)	18.09 (459.5)	24.00 (609.6)
16 (400)	30.00 (762)	-	15.25 (387)	15.25 (387)	16.91 (429.5)	18.6 (472.4)	22.67 (575.8)	2.830 (71.88)	10.00 (254.00)	11.90 (302.00)	0.792 (20.12)	0.67-[8]	1.25 (31.80)	20.85 (529.6)	23.31 (592.1)	4.63 (117.5)	19.72 (500.9)	30.00 (762.0)

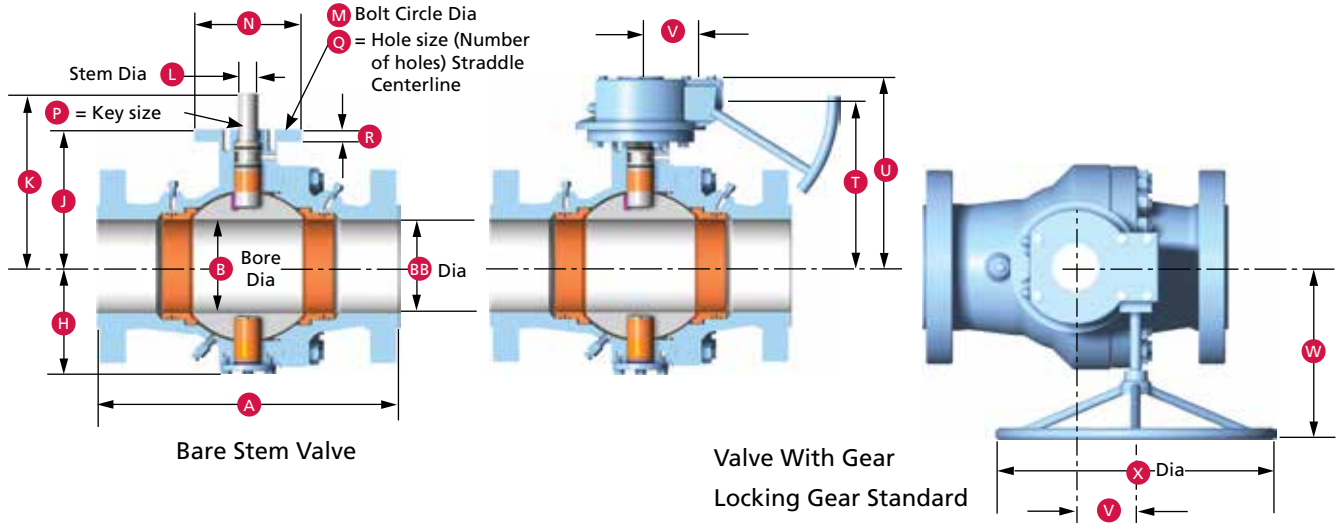
## ASME CLASS 300 DIMENSIONS 2" to 16" (50 mm to 400 mm)



### Dimensions

Size in. (mm)	A		B	BB	H	J	K	L	M	N	P	Q	R	T	U	V	W	X
	RF	RJ																
2 (50)	8.50 (216)	-	2.00 (51)	2.00 (51)	4.31 (109.5)	4.67 (118.6)	6.31 (160.3)	1.098 (27.89)	4.016 (102.00)	4.90 (124.4)	0.318 (8.08)	0.43-[4]	0.59 (14.99)	5.77 (146.6)	7.32 (185.9)	1.75 (44.5)	9.06 (230.12)	6.00 (154.4)
3 (80)	11.12 (282)	-	3.00 (76)	3.00 (76)	5.19 (131.8)	5.54 (140.7)	7.14 (181.4)	1.098 (27.89)	4.016 (102.00)	4.90 (124.4)	0.318 (8.08)	0.43-[4]	0.59 (14.99)	6.64 (168.7)	8.19 (208.0)	1.75 (44.5)	9.06 (230.12)	6.00 (154.4)
4 (100)	12.00 (305)	-	4.00 (102)	4.00 (102)	6.65 (168.9)	7.11 (180.6)	9.14 (232.2)	1.413 (35.89)	5.512 (140.00)	6.90 (175.00)	0.398 (10.11)	0.67-[4]	0.77 (19.56)	8.48 (215.4)	10.18 (258.6)	2.51 (63.8)	9.06 (230.12)	6.00 (154.4)
6 x 4 (150 x 100)	15.88 (403)	-	4.00 (102)	6.00 (152)	6.65 (168.9)	7.11 (180.6)	9.14 (232.2)	1.413 (35.89)	5.512 (140.00)	6.90 (175.00)	0.398 (10.11)	0.67-[4]	0.77 (19.56)	8.48 (215.4)	10.18 (258.6)	2.51 (63.8)	9.06 (230.12)	6.00 (154.4)
6 (150)	15.88 (403)	-	6.00 (152)	6.00 (152)	8.25 (209.5)	9.17 (232.9)	11.50 (292.1)	1.650 (41.91)	6.00 (152.40)	7.00 (177.8)	0.476 (12.09)	0.56-[4]	0.84 (21.3)	10.54 (267.7)	12.24 (310.9)	2.51 (63.8)	12.19 (309.6)	12.00 (304.8)
8 x 6 (200 x 150)	19.75 (502)	-	6.00 (152)	8.00 (203)	8.25 (209.5)	9.17 (232.9)	11.50 (292.1)	1.650 (41.91)	6.00 (152.40)	7.00 (177.8)	0.476 (12.09)	0.56-[4]	0.84 (21.3)	10.54 (267.7)	12.24 (310.9)	2.51 (63.8)	12.19 (309.6)	12.00 (304.8)
8 (200)	19.75 (502)	-	8.00 (203)	8.00 (203)	10.45 (265.4)	11.85 (301.0)	14.95 (379.7)	2.357 (59.87)	8.00 (203.20)	9.50 (241.3)	0.712 (18.08)	0.81-[4]	0.94 (23.9)	13.73 (348.7)	15.71 (399.0)	3.63 (92.08)	13.81 (350.8)	16.00 (406.4)
10 x 8 (250 x 200)	22.38 (568)	-	8.00 (203)	10.00 (254)	10.45 (265.4)	11.85 (301.0)	14.95 (379.7)	2.357 (59.87)	8.00 (203.20)	9.50 (241.3)	0.712 (18.08)	0.81-[4]	0.94 (23.9)	13.73 (348.7)	15.71 (399.0)	3.63 (92.08)	13.81 (350.8)	16.00 (406.4)
10 (250)	22.38 (568)	-	10.00 (254)	10.00 (254)	12.00 (304.8)	13.42 (340.9)	16.52 (419.6)	2.357 (59.87)	8.00 (203.20)	9.50 (241.3)	0.712 (18.08)	0.81-[4]	0.94 (23.9)	15.30 (388.6)	17.28 (438.9)	3.63 (92.08)	14.94 (379.5)	20.00 (508.0)
12 x 10 (300 x 250)	25.50 (648)	-	10.00 (254)	12.00 (305)	12.00 (304.8)	13.42 (340.9)	16.52 (419.6)	2.357 (59.87)	8.00 (203.20)	9.50 (241.3)	0.712 (18.08)	0.81-[4]	0.94 (23.9)	15.30 (388.6)	17.28 (438.9)	3.63 (92.08)	14.94 (379.5)	20.00 (508.0)
12 (300)	25.50 (648)	-	12.00 (305)	12.00 (305)	14.41 (366.0)	16.10 (408.9)	20.17 (512.3)	2.830 (71.88)	10.00 (254.00)	9.50 (241.3)	0.792 (20.12)	0.67-[8]	1.25 (31.80)	18.35 (466.1)	20.81 (528.6)	4.63 (117.5)	18.09 (459.5)	24.00 (609.6)
14 (350)	30.00 (762)	-	13.25 (337)	13.25 (337)	15.28 (388.1)	16.97 (431.0)	21.04 (534.4)	2.830 (71.88)	10.00 (254.00)	11.90 (302.00)	0.792 (20.12)	0.67-[8]	1.25 (31.80)	19.22 (488.2)	21.68 (550.7)	4.63 (117.5)	19.72 (500.9)	30.00 (762.0)
16 (400)	33.00 (838)	-	15.25 (387)	15.25 (387)	18.18 (461.8)	19.89 (505.2)	24.46 (621.3)	3.145 (79.88)	10.375 (263.53)	12.00 (305.00)	0.87 (22.10)	0.67-[8]	1.27 (32.3)	25.01 (635.3)	26.40 (670.6)	5.67 (144.1)	19.78 (502.4)	20.00 (508.0)

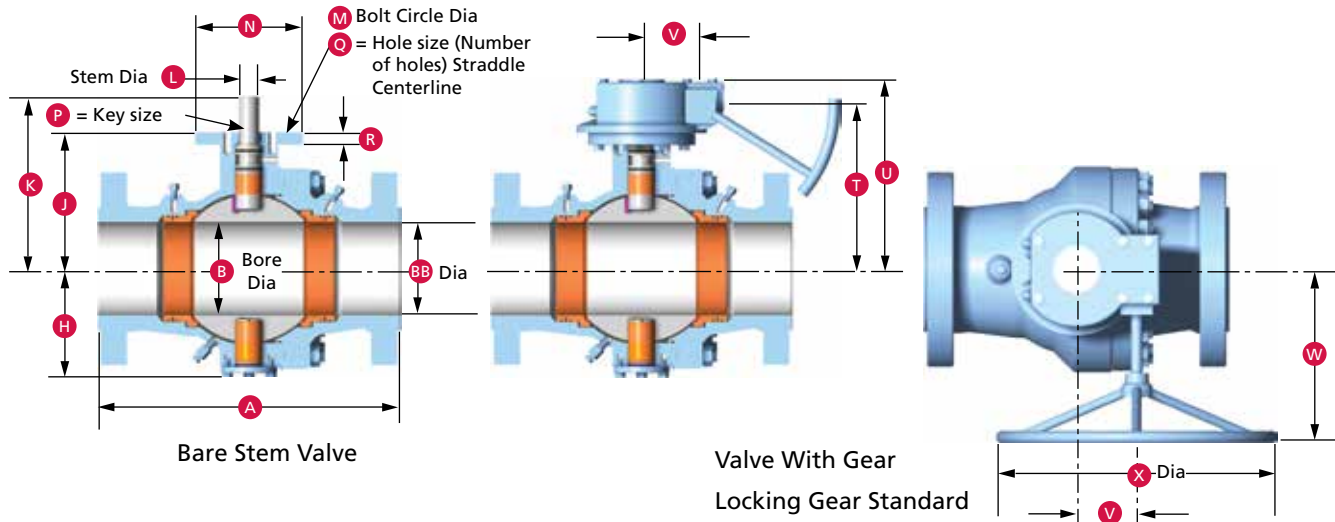
# ASME CLASS 600 DIMENSIONS 2" to 16" (50 mm to 400 mm)



## Dimensions

Size in. (mm)	A		B	BB	H	J	K	L	M	N	P	Q	R	T	U	V	W	X
	RF	RJ																
2 (50)	11.50 (292)	11.62 (295)	2.00 (51)	2.00 (51)	4.31 (109.5)	4.67 (118.6)	6.31 (160.3)	1.098 (27.89)	4.016 (102.00)	4.90 (124.4)	0.318 (8.08)	0.43-(4)	0.59 (14.99)	5.77 (146.6)	7.32 (185.9)	1.75 (44.5)	9.06 (230.12)	6.00 (154.4)
3 x 2 (80 x 50)	14.00 (356)	14.12 (359)	2.00 (51)	3.00 (76)	4.31 (109.5)	4.67 (118.6)	6.31 (160.3)	1.098 (27.89)	4.016 (102.00)	4.90 (124.4)	0.318 (8.08)	0.43-(4)	0.59 (14.99)	5.77 (146.6)	7.32 (185.9)	1.75 (44.5)	9.06 (230.12)	6.00 (154.4)
3 (80)	14.00 (356)	14.12 (359)	3.00 (76)	3.00 (76)	5.84 (148.3)	6.23 (158.2)	8.27 (210.1)	1.413 (35.89)	5.512 (140.00)	6.90 (175.00)	0.398 (10.11)	0.67-(4)	0.77 (19.56)	7.60 (193.0)	9.30 (236.2)	2.51 (63.8)	9.06 (230.12)	6.00 (154.4)
4 x 3 (100 x 80)	17.00 (432)	17.12 (435)	3.00 (76)	4.00 (102)	5.84 (148.3)	6.23 (158.2)	8.27 (210.1)	1.413 (35.89)	5.512 (140.00)	6.90 (175.00)	0.398 (10.11)	0.67-(4)	0.77 (19.56)	7.60 (193.0)	9.30 (236.2)	2.51 (63.8)	9.06 (230.12)	6.00 (154.4)
4 (100)	17.00 (432)	17.12 (435)	4.00 (102)	4.00 (102)	7.02 (178.3)	7.77 (197.4)	10.10 (256.5)	1.650 (41.91)	6.00 (152.40)	7.00 (177.8)	0.476 (12.09)	0.56-(4)	0.84 (21.3)	9.14 (232.2)	10.84 (275.3)	2.51 (63.8)	12.19 (309.6)	12.00 (304.8)
6 x 4 (150 x 100)	22.00 (559)	22.12 (562)	4.00 (102)	6.00 (152)	7.02 (178.3)	7.77 (197.4)	10.10 (256.5)	1.650 (41.91)	6.00 (152.40)	7.00 (177.8)	0.476 (12.09)	0.56-(4)	0.84 (21.3)	9.14 (232.2)	10.84 (275.3)	2.51 (63.8)	12.19 (309.6)	12.00 (304.8)
6 (150)	22.00 (559)	22.12 (562)	6.00 (152)	6.00 (152)	8.87 (225.3)	10.04 (255.0)	12.53 (318.3)	1.886 (47.90)	6.496 (165.00)	8.00 (203.2)	0.556 (14.12)	0.81-(4)	0.94 (23.88)	11.54 (293.1)	13.31 (338.1)	3.00 (76.2)	13.31 (338.1)	20.00 (508.0)
8 x 6 (200 x 150)	26.00 (660)	26.12 (663)	6.00 (152)	8.00 (203)	8.87 (225.3)	10.04 (255.0)	12.53 (318.3)	1.886 (47.90)	6.496 (165.00)	8.00 (203.2)	0.556 (14.12)	0.81-(4)	0.94 (23.88)	11.54 (293.1)	13.31 (338.1)	3.00 (76.2)	13.31 (338.1)	20.00 (508.0)
8 (200)	26.00 (660)	26.12 (663)	8.00 (203)	8.00 (203)	10.45 (265.4)	11.85 (301.1)	14.95 (379.7)	2.357 (59.87)	8.00 (203.20)	9.50 (241.3)	0.712 (18.08)	0.81-(4)	0.94 (23.9)	13.73 (348.7)	15.71 (399.0)	3.63 (92.08)	16.44 (417.6)	24.00 (609.6)
10 x 8 (250 x 200)	31.00 (787)	31.12 (790)	8.00 (203)	10.00 (254)	10.45 (265.4)	11.85 (301.1)	14.95 (379.7)	2.357 (59.87)	8.00 (203.20)	9.50 (241.3)	0.712 (18.08)	0.81-(4)	0.94 (23.9)	13.73 (348.7)	15.71 (399.0)	3.63 (92.08)	16.44 (417.6)	24.00 (609.6)
10 (250)	31.00 (787)	31.12 (790)	10.00 (254)	10.00 (254)	12.91 (327.9)	14.53 (369.1)	18.60 (472.4)	2.830 (71.88)	10.00 (254.00)	11.90 (302.00)	0.792 (20.12)	0.67-(8)	1.25 (31.80)	16.78 (426.2)	19.24 (488.7)	4.63 (117.5)	19.72 (500.9)	30.00 (762.0)
12 x 10 (300 x 250)	33.00 (838)	33.12 (841)	10.00 (254)	12.00 (305)	12.91 (327.9)	14.53 (369.1)	18.60 (472.4)	2.830 (71.88)	10.00 (254.00)	11.90 (302.00)	0.792 (20.12)	0.67-(8)	1.25 (31.80)	16.78 (426.2)	19.24 (488.7)	4.63 (117.5)	19.72 (500.9)	30.00 (762.0)
12 (300)	33.00 (838)	33.12 (841)	12.00 (305)	12.00 (305)	14.41 (366.0)	16.1 (408.9)	20.17 (512.3)	2.830 (71.88)	10.00 (254.00)	11.90 (302.00)	0.792 (20.12)	0.67-(8)	1.25 (31.80)	18.35 (466.1)	20.81 (528.6)	4.63 (117.5)	19.72 (500.9)	30.00 (762.0)
14 (350)	35.00 (889)	35.12 (892)	13.25 (337)	13.25 (337)	16.55 (420.4)	18.54 (470.9)	22.84 (580.1)	3.145 (79.88)	10.375 (263.53)	12.00 (305.00)	0.87 (22.10)	0.67-(8)	1.27 (32.3)	23.66 (601.0)	25.05 (636.3)	5.67 (144.1)	21.28 (540.5)	24.00 (609.6)
16 (400)	39.00 (991)	39.12 (994)	15.25 (387)	15.25 (387)	18.37 (466.6)	20.17 (512.3)	25.64 (651.3)	3.852 (97.84)	11.732 (298.00)	13.70 (348.00)	1.106 (28.09)	0.83-(8)	1.36 (34.5)	25.36 (644.1)	26.74 (679.2)	7.30 (185.5)	22.59 (573.8)	30.00 (762.0)

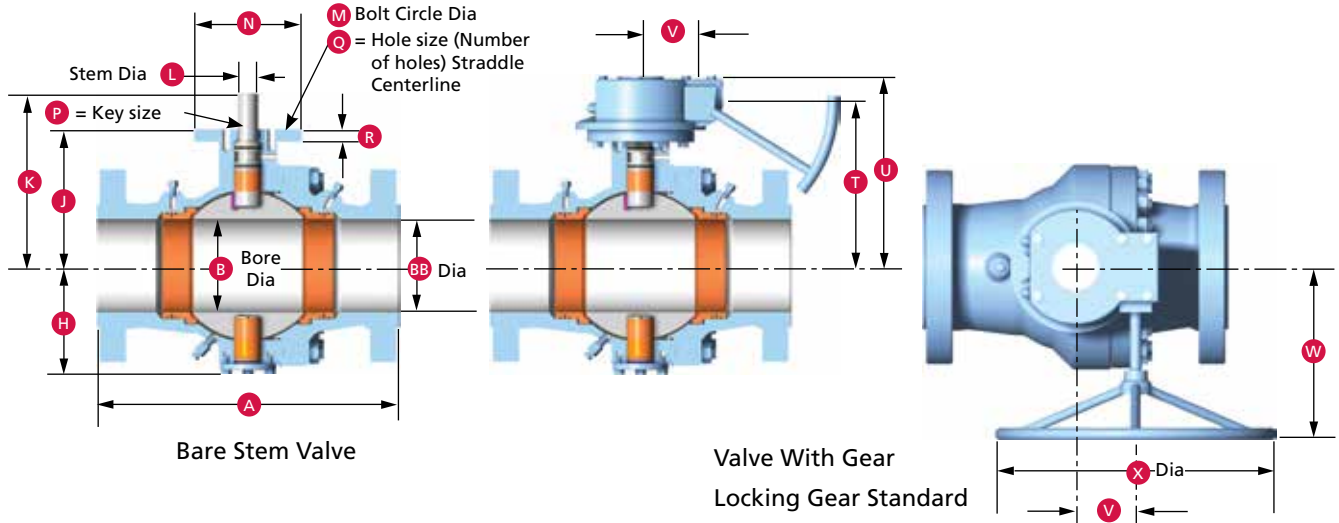
## ASME CLASS 900 DIMENSIONS 2" to 12" (50 mm to 300 mm)



### Dimensions

Size in. (mm)	A		B	BB	H	J	K	L	M	N	P	Q	R	T	U	V	W	X
	RF	RJ																
2 (50)	14.50 (368)	14.62 (371)	2.00 (51)	2.00 (51)	4.31 (109.5)	4.67 (118.6)	6.31 (160.3)	1.098 (27.89)	4.016 (102.00)	4.90 (124.4)	0.318 (8.08)	0.43-[4]	0.59 (14.99)	5.77 (146.6)	7.32 (185.9)	1.75 (44.5)	9.06 (230.12)	6.00 (154.4)
3 x 2 (80 x 50)	15.00 (381)	15.12 (384)	2.00 (51)	3.00 (76)	4.31 (109.5)	4.67 (118.6)	6.31 (160.3)	1.098 (27.89)	4.016 (102.00)	4.90 (124.4)	0.318 (8.08)	0.43-[4]	0.59 (14.99)	5.77 (146.6)	7.32 (185.9)	1.75 (44.5)	9.06 (230.12)	6.00 (154.4)
3 (80)	15.00 (381)	15.12 (384)	3.00 (76)	3.00 (76)	5.84 (148.3)	6.23 (158.2)	8.27 (210.1)	1.413 (35.89)	5.512 (140.00)	6.90 (175.00)	0.398 (10.11)	0.67-[4]	0.77 (19.56)	7.60 (193.0)	9.30 (236.2)	2.51 (63.8)	9.06 (230.12)	6.00 (154.4)
4 x 3 (100 x 80)	18.00 (457)	18.12 (460)	3.00 (76)	4.00 (102)	5.84 (148.3)	6.23 (158.2)	8.27 (210.1)	1.413 (35.89)	5.512 (140.00)	6.90 (175.00)	0.398 (10.11)	0.67-[4]	0.77 (19.56)	7.60 (193.0)	9.30 (236.2)	2.51 (63.8)	9.06 (230.12)	6.00 (154.4)
4 (100)	18.00 (457)	18.12 (461)	4.00 (102)	4.00 (102)	7.02 (178.3)	7.77 (197.4)	10.10 (256.5)	1.650 (41.91)	6.00 (152.40)	7.00 (177.8)	0.476 (12.09)	0.56-[4]	0.84 (21.3)	9.14 (232.2)	10.84 (275.3)	2.51 (63.8)	12.19 (309.6)	12.00 (304.8)
6 x 4 (150 x 100)	24.00 (610)	24.12 (613)	4.00 (102)	6.00 (152)	7.02 (178.3)	7.77 (197.4)	10.10 (256.5)	1.650 (41.91)	6.00 (152.40)	7.00 (177.8)	0.476 (12.09)	0.56-[4]	0.84 (21.3)	9.14 (232.2)	10.84 (275.3)	2.51 (63.8)	12.19 (309.6)	12.00 (304.8)
6 (150)	24.00 (610)	24.12 (613)	6.00 (152)	6.00 (152)	9.12 (231.6)	10.51 (267.0)	13.61 (345.7)	2.357 (59.87)	8.00 (203.20)	9.50 (241.3)	0.712 (18.08)	0.81-[4]	0.94 (23.9)	12.39 (314.7)	14.37 (365.0)	3.63 (92.08)	14.94 (379.5)	20.00 (508.0)
8 x 6 (200 x 150)	29.00 (737)	29.12 (740)	6.00 (152)	8.00 (203)	9.12 (231.6)	10.51 (267.0)	13.61 (345.7)	2.357 (59.87)	8.00 (203.20)	9.50 (241.3)	0.712 (18.08)	0.81-[4]	0.94 (23.9)	12.39 (314.7)	14.37 (365.0)	3.63 (92.08)	14.94 (379.5)	20.00 (508.0)
8 (200)	29.00 (737)	29.12 (740)	8.00 (203)	8.00 (203)	11.77 (299.0)	13.13 (333.5)	17.20 (436.9)	2.830 (71.88)	10.00 (254.00)	11.90 (302.00)	0.792 (20.12)	0.67-[8]	1.25 (31.80)	15.38 (390.7)	17.84 (453.1)	4.63 (117.5)	18.09 (459.5)	24.00 (609.6)
10 x 8 (250 x 200)	33.00 (838)	33.12 (841)	8.00 (203)	10.00 (254)	11.77 (299.0)	13.13 (333.5)	17.20 (436.9)	2.830 (71.88)	10.00 (254.00)	11.90 (302.00)	0.792 (20.12)	0.67-[8]	1.25 (31.80)	15.38 (390.7)	17.84 (453.1)	4.63 (117.5)	18.09 (459.5)	24.00 (609.6)
10 (250)	33.00 (838)	33.12 (841)	10.00 (254)	10.00 (254)	12.91 (327.9)	14.53 (369.1)	18.60 (472.4)	2.830 (71.88)	10.00 (254.00)	11.90 (302.00)	0.792 (20.12)	0.67-[8]	1.25 (31.80)	16.78 (426.2)	19.24 (488.7)	4.63 (117.5)	19.72 (500.9)	30.00 (762.0)
12 x 10 (300 x 250)	38.00 (965)	38.12 (968)	10.00 (254)	12.00 (305)	12.91 (327.9)	14.53 (369.1)	18.60 (472.4)	2.830 (71.88)	10.00 (254.00)	11.90 (302.00)	0.792 (20.12)	0.67-[8]	1.25 (31.80)	16.78 (426.2)	19.24 (488.7)	4.63 (117.5)	19.72 (500.9)	30.00 (762.0)
12 (300)	38.00 (965)	38.12 (968)	12.00 (305)	12.00 (305)	15.80 (401.3)	17.52 (445.0)	22.09 (561.1)	3.145 (79.88)	10.375 (263.53)	12.00 (305.00)	0.87 (22.10)	0.67-[8]	1.27 (32.3)	22.64 (575.1)	24.03 (610.4)	5.67 (144.1)	21.28 (540.5)	24.00 (609.6)

## ASME CLASSES 1500 AND 2500 DIMENSIONS 2" to 8" x 6" (50 mm to 200 x 150 mm)



### Dimensions

#### ASME Class 1500

Size in. (mm)	A		B	BB	H	J	K	L	M	N	P	Q	R	T	U	V	W	X
	RF	RJ																
2 (50)	14.50 (368)	14.62 (371)	2.00 (51)	2.00 (51)	5.21 (132.3)	5.54 (140.7)	7.57 (192.3)	1.413 (35.89)	5.512 (140.00)	6.90 (175.00)	0.398 (10.11)	0.67-[4]	0.77 (19.56)	6.91 (175.5)	8.61 (218.7)	2.51 (63.8)	9.06 (230.12)	6.00 (154.4)
3 (80)	18.50 (470)	18.62 (473)	3.00 (76)	3.00 (76)	6.36 (161.5)	7.13 (181.1)	9.44 (239.8)	1.650 (41.91)	6.00 (152.40)	7.00 (177.8)	0.476 (12.09)	0.56-[4]	0.84 (21.3)	8.50 (215.9)	10.20 (259.1)	2.51 (63.8)	12.19 (309.6)	12.00 (304.8)
4 (100)	21.50 (546)	21.63 (549)	4.00 (102)	4.00 (102)	7.59 (192.8)	8.70 (221.0)	11.19 (284.2)	1.886 (47.90)	6.496 (165.00)	8.00 (203.2)	0.556 (14.12)	0.81-[4]	0.94 (23.88)	10.20 (259.1)	11.97 (304.0)	3.00 (76.2)	11.56 (293.6)	14.00 (355.6)
6 x 4 (150 x 100)	27.75 (705)	28.00 (711)	4.00 (102)	6.00 (152)	7.59 (192.8)	8.70 (221.0)	11.19 (284.2)	1.886 (47.90)	6.496 (165.00)	8.00 (203.2)	0.556 (14.12)	0.81-[4]	0.94 (23.88)	10.20 (259.1)	11.97 (304.0)	3.00 (76.2)	11.56 (293.6)	14.00 (355.6)
6 (150)	27.75 (705)	28.00 (711)	6.00 (152)	6.00 (152)	10.25 (260.4)	10.83 (275.1)	13.61 (345.7)	2.357 (59.87)	8.00 (203.20)	9.50 (241.3)	0.712 (18.08)	0.81-[4]	1.04 (26.4)	12.71 (322.8)	14.69 (373.1)	3.63 (92.08)	16.44 (417.6)	24.00 (609.6)
8 x 6 (200 x 150)	32.75 (832)	33.12 (841)	6.00 (152)	7.62 (194)	10.25 (260.4)	10.83 (275.1)	13.61 (345.7)	2.357 (59.87)	8.00 (203.20)	9.50 (241.3)	0.712 (18.08)	0.81-[4]	1.04 (26.4)	12.71 (322.8)	14.69 (373.1)	3.63 (92.08)	16.44 (417.6)	24.00 (609.6)

#### ASME Class 2500

Size in. (mm)	A		B	BB	H	J	K	L	M	N	P	Q	R	T	U	V	W	X
	RF	RJ																
2 (50)	17.75 (451)	17.88 (454)	1.76 (45)	1.76 (45)	5.21 (132.3)	5.54 (140.7)	7.57 (192.3)	1.413 (35.89)	5.512 (140.00)	6.90 (175.00)	0.398 (10.11)	0.67-[4]	0.77 (19.56)	6.91 (175.5)	8.61 (218.7)	2.51 (63.8)	9.06 (230.12)	6.00 (154.4)
3 (80)	22.75 (578)	23.00 (584)	2.53 (64)	2.53 (64)	6.91 (175.5)	7.34 (186.4)	9.94 (252.5)	1.650 (41.91)	6.00 (152.40)	7.70 (195.6)	0.476 (12.09)	0.56-[4]	1.09 (27.7)	8.71 (221.2)	10.41 (264.4)	2.51 (63.8)	12.56 (319.0)	14.00 (355.6)
4 (100)	26.50 (673)	26.88 (683)	3.53 (90)	3.53 (90)	7.75 (196.9)	8.91 (226.3)	11.19 (284.2)	1.886 (47.90)	6.496 (165.00)	8.40 (213.4)	0.556 (14.12)	0.67-[4]	1.16 (29.50)	10.41 (264.4)	12.18 (309.4)	3.00 (76.2)	14.81 (376.02)	24.00 (609.6)
6 x 4 (150 x 100)	36.00 (914)	36.50 (927)	3.53 (90)	5.25 (133)	7.59 (192.8)	8.70 (221.0)	11.19 (284.2)	1.886 (47.90)	6.496 (165.00)	8.40 (213.4)	0.556 (14.12)	0.67-[4]	1.16 (29.50)	10.20 (259.1)	11.97 (304.0)	3.00 (76.2)	11.56 (293.6)	14.00 (355.6)



## WEIGHTS, 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	2500	
		RF	RF	RF	RTJ	RF	RTJ	RF	RTJ	RTJ	RF	RTJ
2	50	41 (19)	53 (24)	64 (29)	68 (31)	101 (46)	108 (49)	139 (63)	146 (66)	146 (66)	185 (84)	194 (88)
3 x 2	80 x 50	–	–	87 (40)	92 (42)	116 (52)	124 (56)	–	–	–	–	–
3	80	69 (31)	96 (44)	142 (64)	137 (62)	172 (78)	180 (81)	250 (113)	260 (118)	260 (118)	435 (197)	452 (205)
4 x 3	100 x 80	–	–	186 (84)	195 (89)	225 (102)	236 (107)	–	–	–	–	–
4	100	130 (59)	172 (78)	246 (112)	256 (116)	313 (142)	324 (147)	437 (198)	451 (204)	451 (204)	674 (306)	702 (318)
6 x 4	150 x 100	171 (78)	229 (104)	346 (157)	362 (164)	458 (208)	477 (216)	663 (301)	688 (312)	–	1171 (531)	1231 (558)
6	150	257 (116)	320 (145)	460 (209)	476 (216)	728 (330)	746 (339)	1039 (471)	1063 (482)	1063 (482)	–	–
8 x 6	200 x 150	304 (138)	410 (186)	582 (264)	602 (273)	926 (420)	956 (434)	1331 (604)	1377 (625)	–	–	–
8	200	475 (215)	632 (287)	846 (384)	867 (393)	1231 (558)	1260 (572)	–	–	–	–	–
10 x 8	250 x 200	532 (241)	719 (326)	1069 (485)	1103 (500)	1456 (660)	1494 (678)	–	–	–	–	–
10	250	783 (355)	965 (438)	1472 (668)	1503 (682)	1857 (842)	1818 (825)	–	–	–	–	–
12 x 10	300 x 250	880 (399)	1113 (505)	1589 (721)	1622 (736)	2115 (959)	2161 (980)	–	–	–	–	–
12	300	1165 (528)	1476 (670)	1993 (904)	2025 (918)	2861 (1298)	2905 (1318)	–	–	–	–	–
14	350	1663 (754)	1972 (895)	2539 (1152)	2576 (1168)	–	–	–	–	–	–	–
16	400	2441 (1107)	2940 (1334)	3870 (1755)	3919 (1778)	–	–	–	–	–	–	–

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

Valve Port		Valve Pressure Classes										
Size in.	(mm)	150	300	600		900		1500		5000	2500	
		RF	RF	RF	RTJ	RF	RTJ	RF	RTJ	RTJ	RF	RTJ
2	50	8 (4)	8 (4)	8 (4)	8 (4)	8 (4)	8 (4)	15 (7)	15 (7)	15 (7)	15 (7)	15 (7)
3 x 2	80 x 50	–	–	8 (4)	8 (4)	8 (4)	8 (4)	–	–	–	–	–
3	80	8 (4)	8 (4)	15 (7)	15 (7)	15 (7)	15 (7)	27 (12)	27 (12)	27 (12)	27 (12)	27 (12)
4 x 3	100 x 80	–	–	15 (7)	15 (7)	15 (7)	15 (7)	–	–	–	27 (12)	27 (12)
4	100	15 (7)	15 (7)	27 (12)	27 (12)	27 (12)	27 (12)	27 (12)	27 (12)	27 (12)	27 (12)	27 (12)
6 x 4	150 x 100	15 (7)	15 (7)	27 (12)	27 (12)	27 (12)	27 (12)	27 (12)	27 (12)	–	–	–
6	150	27 (12)	27 (12)	27 (12)	27 (12)	60 (27)	60 (27)	60 (27)	60 (27)	60 (27)	–	–
8 x 6	200 x 150	27 (12)	27 (12)	27 (12)	27 (12)	60 (27)	60 (27)	60 (27)	60 (27)	–	–	–
8	200	27 (12)	60 (27)	60 (27)	60 (27)	74 (34)	74 (34)	–	–	–	–	–
10 x 8	250 x 200	27 (12)	60 (27)	60 (27)	60 (27)	74 (34)	74 (34)	–	–	–	–	–
10	250	60 (27)	60 (27)	74 (34)	74 (34)	74 (34)	74 (34)	–	–	–	–	–
12 x 10	300 x 250	60 (27)	60 (27)	74 (34)	74 (34)	74 (34)	74 (34)	–	–	–	–	–
12	300	60 (27)	74 (34)	74 (34)	74 (34)	122 (55)	122 (55)	–	–	–	–	–
14	350	74 (34)	74 (34)	122 (55)	122 (55)	–	–	–	–	–	–	–
16	400	74 (34)	122 (55)	133 (60)	133 (60)	–	–	–	–	–	–	–

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

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

# ASME CLASSES 150 THROUGH 2500 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
	3706 to 6170	213 + (0.59 x P)	107 + (0.29 x P)	3853	1896	2890
3 (75)	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
	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
4 (100)	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
	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)	13,224	6581	9918
6 (150)	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
	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	10,903
	2221 to 3705	1661 + (5.69 x P)	1026 + (1.75 x P)	22,742	7510	17,057
	3706 to 6170	1661 + (5.69 x P)	1026 + (1.75 x P)	22,742	7510	17,057
8 (200)	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)	11,564	3425	8673
	741 to 1480	2899 + (10.15 x P)	1834 + (1.89 x P)	17,921	4631	13,441
	1481 to 2220	2899 + (9.78 x P)	1834 + (1.78 x P)	24,611	5786	18,458
10 (250)	0 to 285	2916 + (26.43 x P)	2041 + (12.28 x P)	10,449	5541	7837
	286 to 740	2916 + (18.02 x P)	2041 + (5.67 x P)	16,251	6237	12,188
	741 to 1480	2916 + (14.82 x P)	2041 + (3.55 x P)	24,850	7295	18,638
	1481 to 2220	2916 + (14.82 x P)	2041 + (2.69 x P)	35,816	8013	26,862
12 (300)	0 to 285	5728 + (36.46 x P)	4421 + (5.20 x P)	16,118	5903	12,089
	286 to 740	5728 + (19.43 x P)	4421 + (2.45 x P)	20,106	6232	15,080
	741 to 1480	5728 + (17.31 x P)	4421 + (1.92 x P)	31,347	7263	23,510
	1481 to 2220	5728 + (15.23 x P)	4421 + (1.68 x P)	39,539	8151	29,654
14 (350)	0 to 285	13,535 + (18.75 x P)	9475 + (2.81 x P)	18,879	10,275	14,159
	286 to 740	13,535 + (18.75 x P)	9475 + (2.81 x P)	27,410	11,555	20,558
	741 to 1480	13,535 + (18.75 x P)	9475 + (2.81 x P)	41,285	13,634	30,964
16 (400)	0 to 285	16,100 + (27.50 x P)	11270 + (4.13 x P)	23,938	12,447	17,954
	286 to 740	16,100 + (27.50 x P)	11270 + (4.13 x P)	36,450	14,326	27,338
	741 to 1480	16,100 + (27.50 x P)	11270 + (4.13 x P)	56,800	17,382	42,600

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° C (-29° C to -46° C) multiply these values by 1.20.

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

## WKM 370D6 Trunnion Mounted Ball Valves

### MATERIAL SELECTION GUIDE

A selection of body, stem and seat/seal materials for the WKM D Series 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.

Lading	External Valve Body Material			Seal Code Trim					Internal Valve Trim			
	Std Body 23	Std Body 24	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	C	C	D	D	D	C	A	C	A	C
ACETATE SOLVENTS	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	D	D	D	D	D	D	B	D	B	D
ACETONET	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
ACRYLONITRILE	A	A	A	D	A	A	A	B	A	A	A	A
ALCOHOL-AMYL	A	B	B	B	A	A	A	A	A	B	A	B
ALCOHOL-BUTYL	A	B	B	A	A	A	A	A	A	B	A	B
ALCOHOL-ETHYL (ETHANOL)	A	B	B	A	A	A	A	A	A	B	A	B
ALCOHOL-METHYL (METHANOL)	A	B	B	B	B	A	A	A	A	B	A	B
ALUMINUM CHLORIDE (dry)	A	B	B	A	A	A	A	A	A	B	A	B
ALUMINUM SULFATE (ALUMS)	A	C	C	A	A	A	A	A	A	C	A	C
ALUM'S	A	C	C	A	A	A	A	B	A	C	A	C
AMINES	A	B	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
AMINES RICH	A	B	B	D	B	B	B	B	A	B	A	B
AMMONIA (AQUEOUS)	A	A	A	A	A	A	A	A	A	A	A	A
AMMONIA ANHYDROUS	A	A	A	B	D	D	D	A	A	A	A	A
AMMONIA SOLUTIONS	A	B	B	-	-	-	-	-	A	B	A	B
AMMONIUM BICARBONATE	B	C	C	-	B	A	-	-	B	C	B	C
AMMONIUM CARBONATE	B	B	B	D	A	A	A	A	B	B	B	B
AMMONIUM CHLORIDE	C	D	D	B	B	A	A	A	C	D	C	D
AMMONIUM HYDROXIDE (28%)	B	C	C	D	A	A	A	B	B	C	B	C
AMMONIUM HYDROXIDE CONCENTRATED	B	C	C	B	A	A	A	B	B	C	B	C
AMMONIUM MONOPHOSPHATE	B	D	D	C	B	A	A	-	B	D	B	D
AMMONIUM NITRATE	A	D	D	C	C	A	A	A	A	D	A	D
AMMONIUM PHOSPHATE (DIBASIC)	B	D	D	C	C	A	A	A	B	D	B	D
AMMONIUM PHOSPHATE (TRIBASIC)	B	D	D	B	B	A	A	B	B	D	B	D
AMMONIUM SULFATE	B	C	C	A	A	A	A	A	B	C	B	C
AMYL ACETATE	B	C	C	D	B	A	A	C	B	C	B	C
ANILINE	B	A	A	C	C	A	D	A	B	A	A	A
ANILINE DYES	A	C	C	D	A	A	A	A	A	C	A	C
ANTIMONY TRICHLORIDE	D	D	D	D	D	A	A	A	D	D	-	D

A	Excellent
B	Good (slightly attacked)
C	Fair (modestly attacked)
D	Not recommended
-	No data

Reference:

<http://www.coleparmer.com/techinfo/chemcomp.asp>  
Chemical Resistance Guide by Compass Publications.

## MATERIAL SELECTION GUIDE (Continued)

Lading	External Valve Body Material			Seal Code Trim					Internal Valve Trim			
	Std Body 23	Std Body 24	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	D	C	C	A	-	-	B	D	B	D
ASPHALT EMULSION	A	A	A	A	A	A	A	-	A	A	A	A
ASPHALT LIQUID	A	A	A	B	A	A	A	-	A	A	A	A
BARIUM CARBONATE	B	B	B	C	A	A	-	-	B	B	B	B
BARIUM CHLORIDE	C	C	C	A	A	A	A	A	C	C	C	C
BARIUM HYDROXIDE	B	C	C	A	A	A	A	A	B	C	B	C
BARIUM SULFATE	B	B	B	A	A	A	A	A	B	B	B	B
BARIUM SULFIDE	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
BEEF SUGAR LIQUIDS	A	B	B	A	A	A	-	-	A	B	A	B
BENZALDEHYDE	A	A	A	D	A	A	A	B	A	A	A	A
BENZENE (BENZOL)	A	B	B	D	A	A	A	B	A	B	A	B
BENZOIC ACID	B	D	D	D	D	A	A	A	B	D	B	D
BORAX LIQUORS	B	C	C	A	A	A	A	A	B	C	B	C
BORIC ACID	A	D	D	B	B	A	A	A	A	D	A	D
BRINES	B	D	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	B	A	A	A	A	B	A	B	A	B
BUTADIENE	A	B	B	D	C	A	A	B	A	B	A	B
BUTANE	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	D	B	A	A	B	A	A	A	A
BUTYRIC ACID	B	D	D	C	C	A	A	A	B	D	B	D
CALCIUM BISULFITE	B	D	D	A	A	A	A	A	B	D	B	D
CALCIUM CARBONATE	B	D	D	A	A	A	A	A	B	D	B	D
CALCIUM CHLORIDE	B	C	C	A	A	A	A	A	B	C	B	C
CALCIUM HYDROXIDE (20%)	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	C	D	D	A	A	-	B	C	B	C
CARBON BISULFIDE	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
CARBON DIOXIDE (WET)	A	C	C	A	A	A	B	B	A	C	B	C
CARBON TETRACHLORIDE (DRY)	B	A	A	B	A	A	A	B	B	A	B	A
CARBON TETRACHLORIDE (WET)	A	B	B	B	A	A	A	B	A	B	B	B
CARBONATED WATER	A	B	B	A	A	A	A	-	A	B	A	B
CARBONIC ACID	B	D	D	A	A	A	A	A	B	D	B	D
CASTOR OIL	A	B	B	A	A	A	A	A	A	B	A	B
CHINA WOOD OIL (TUNG)	A	B	B	A	A	A	-	-	A	B	A	B
CHLORINATED SOLVENTS (DRY)	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	D	D	A	A	-	B	B	B	B
CHLOROACETIC ACID	C	D	D	D	D	A	A	B	C	D	-	D
CHLOROBENZENE	A	B	B	D	A	A	A	B	A	B	A	B
CHLOROFORM	A	B	B	D	C	A	A	B	A	B	A	B
CHLOROSULPHONIC ACID (DRY)	B	B	B	D	D	A	A	D	B	B	B	B
CHLOROSULPHONIC ACID (WET)	D	D	N	-	-	-	-	-	D	D	-	N
CHROME ALUM	A	B	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	D	A	A	A	A	A	B	D	B	D
COCONUT OIL	B	C	C	A	A	A	A	B	A	C	A	C

A	Excellent
B	Good (slightly attacked)
C	Fair (modestly attacked)
D	Not recommended
-	No data

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## MATERIAL SELECTION GUIDE (Continued)

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	Std Body 23	Std Body 24	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
COFFEE EXTRACTS (HOT)	A	C	C	A	A	A	-	-	A	B	A	C
COKE OVEN GAS	A	B	B	D	A	A	-	-	A	B	A	B
COOKING OIL	A	B	B	A	A	A	A	-	A	B	A	B
COPPER ACETATE (10%)	B	C	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	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	B	A	A	A	-	-	A	B	B	B
CORROSION INHIBITOR - AMINE BASED	A	A	A	B	B	A	A	-	A	A	A	A
COTTONSEED OIL	B	C	C	A	A	A	A	A	B	C	B	C
CREOSOTE OIL	B	B	B	A	A	A	A	B	B	B	B	B
CRESYLIC ACID	B	B	B	D	D	A	A	B	B	B	B	B
CRUDE OIL SOUR	A	B	B	C	A	A	A	B	A	B	A	B
CRUDE OIL SWEET	A	B	B	B	A	A	A	B	A	B	A	B
CUTTING OILS, WATER EMULSIONS	A	B	B	A	A	A	A	A	A	B	A	B
CYCLOHEXANE	A	A	A	A	A	A	A	B	A	A	A	A
DIACETONE ALCOHOL	A	A	A	D	A	A	-	-	A	A	A	A
DIESEL FUEL	A	A	A	A	A	A	A	A	A	A	A	A
DIETHANOLAMINE (DEA)	-	-	-	-	-	-	-	-	-	-	-	-
DIETHYLAMINE	A	A	A	B	A	D	A	B	A	A	A	A
DIETHYLENE GLYCOL	-	-	-	A	A	A	A	A	-	-	-	-
DOWTHERMS (A-E)	A	B	B	D	A	A	A	B	A	B	A	B
DRILLING MUD	A	B	B	A	A	A	-	-	A	B	A	B
DRIP COCKS, GAS	A	B	B	-	-	-	-	-	A	B	A	B
DRY CLEANING FLUIDS	A	B	B	C	B	A	A	C	A	B	A	B
EPSOM SALT (Magnesium Sulfate)	B	C	C	-	A	A	A	A	B	C	B	C
ETHANE	A	A	A	A	A	A	A	A	A	A	A	A
ETHANOL (ALCOHOL-ETHYL)	A	B	B	A	A	A	A	A	A	B	A	B
ETHANOLAMINE (MEA)	A	A	A	B	A	A	-	-	A	A	A	A
ETHERS	A	B	B	D	A	A	A	D	A	B	A	B
ETHYL ACETATE	B	B	B	D	B	B	B	D	B	B	B	B
ETHYL ACRYLATE	A	A	A	D	A	A	A	D	A	A	A	A
ETHYL CHLORIDE (DRY)	A	B	B	A	A	A	A	B	A	B	A	B
ETHYL CHLORIDE (WET)	B	B	B	A	A	A	A	B	B	B	B	B
ETHYLENE (LIQUID OR GAS)	A	A	A	B	A	A	A	A	A	A	A	A
ETHYLENE GLYCOL	B	B	B	A	A	A	A	A	B	B	B	B
ETHYLENE OXIDE	B	B	B	D	A	A	A	D	B	B	B	B
ETHYLENE PROPYLENE	A	B	-	-	-	-	-	-	A	B	-	-
FATTY ACIDS	B	D	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	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	D	D	D	A	A	A	B	D	B	D
FERROUS SULFATE (SAT)	A	C	C	-	-	A	A	-	A	C	S	C
FERTILIZER SOLUTIONS	B	B	B	D	D	D	D	D	B	B	B	B
FISH OILS	A	B	B	B	A	A	A	-	A	B	A	B
FLUORINE	A	B	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	D	D	D	A	B	C	B	D	B	D

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FREON 12	A	B	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	B	A	A	A	A
FUEL JET JP-5 100F	A	A	A	A	A	A	A	B	A	A	A	A
FUEL JET JP-6 100F	A	A	A	A	A	A	A	B	A	A	A	A
FUEL OIL	A	B	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
FURFURAL	B	A	A	D	A	A	A	C	B	A	A	A
GALLIC ACID	B	D	D	B	A	B	-	-	B	D	B	D
GAS (MANUFACTURED)	B	B	B	A	A	A	A	A	B	B	B	B
GAS ODORIZERS (VTFEP)	A	B	B	A	A	A	A	A	A	B	A	B
GAS, NATURAL	A	B	B	A	A	A	A	A	A	B	A	B
GASOLINE, AVIATION	A	A	A	A	A	A	A	A	A	A	A	A
GASOLINE, SOUR	A	B	B	C	A	A	A	A	A	B	A	B
GASOLINE, LEADED, LOW OCTANE	A	A	A	A	A	A	A	B	A	A	A	A
GASOLINE, UNLEADED, LOW OCTANE	A	A	A	A	A	A	A	B	A	A	A	A
GELATIN	A	B	B	A	A	A	A	A	A	B	B	B
GLUCOSE	A	B	B	A	A	A	A	A	A	B	A	B
GLUE	A	A	A	-	A	A	-	-	A	A	A	A
GLYCERINE – GLYCEROL	A	B	B	A	A	A	A	A	A	B	A	B
GLYCOLS	B	B	B	A	A	A	A	A	B	B	B	B
GREASE	A	A	A	-	A	A	A	B	A	A	A	A
HEPTANE	A	A	A	A	A	A	A	C	A	A	A	A
HEXANE	A	A	A	A	A	A	A	C	A	A	A	A
HEXANOL, TERTIARY	A	A	A	-	A	-	-	-	A	A	A	A
HYDRAULIC OIL PHOSPHATE ESTER	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
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	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	B	A	A	A	A	A	A	B	A	B
HYDROGEN PEROXIDE 30% (DILUTE)	B	D	D	D	D	A	A	A	B	D	B	D
HYDROGEN PEROXIDE	B	D	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
HYDROGEN SULFIDE (wet)	A	D	D	B	A	A	A	A	A	D	B	D
HYPON (SODIUM THIOSULFATE)	A	D	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
INK	A	D	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	C	A	A	A	A
ISOCYANIDE	A	A	A	-	-	-	-	-	A	A	A	A
ISODOFORM	B	B	B	-	-	-	-	-	B	B	B	B
ISOPROPYL ALCOHOL (isopropanol)	B	B	B	B	B	A	A	A	B	B	B	B
ISOPROPYL ETHER	A	A	A	B	A	A	A	D	A	A	A	A
KEROSENE	A	B	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	D	D	D	D	D	A	A	A	A
LACQUERS (SOLVENTS)	A	C	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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	Std Body 23	Std Body 24	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
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	B	C	C	A	A	A	A	B	A	B
LINSEED OIL	A	A	A	A	A	A	A	A	A	A	A	A
LIQUEFIED PET GAS (LPG)	A	B	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
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	B	B	B	A	A	A	A	B	A	B
MAGNESIUM SULFATE (Epson Salt)	B	B	B	-	A	A	A	A	B	B	-	B
MALEIC ACID	C	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
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
METHANE	A	A	A	A	A	A	A	B	A	A	A	A
METHANOL (ALCOHOL-METHYL)	A	B	B	B	A	A	A	D	A	B	A	B
METHYL ACETATE	A	A	A	D	B	B	B	D	A	A	A	A
METHYL ACETONE	A	A	A	-	D	D	D	-	A	A	A	A
METHYL CELLOSOLVE	B	B	B	C	A	A	-	-	B	B	B	B
METHYL CHLORIDE	A	B	B	D	B	A	A	D	A	B	A	B
METHYL ETHYL KETONE (MEK)	A	A	A	D	B	B	B	D	A	A	A	A
METHYL FORMATE	B	B	B	-	-	A	-	-	B	B	B	B
METHYLAMINE	B	B	B	-	-	A	A	-	B	B	B	B
METHYLENE CHLORIDE	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	-	A	A	A	-	B	B	B	B
MINERAL OIL	A	B	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
MOLASSES, EDIBLE	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	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	B	A	A	A	-	-	A	B	A	B
NAPHTHA (Rubber Solvent)	A	B	B	B	A	B	B	B	A	B	A	B
NAPHTHALENE (COAL TAR DISTILLATE)	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	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	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	D	D	A	B	-	A	A	A	A
NITROBENZENE	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
NITROUS ACID (10%)	B	D	D	A	A	A	A	A	B	D	-	D
NITROUS GASES	A	B	B	-	A	A	A	-	A	B	A	B
NITROUS OXIDE	B	A	A	A	A	A	A	-	B	A	B	A
OIL, COTTONSEED	B	C	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
OIL, PETROLEUM (SOUR) H <sub>2</sub> S & CO <sub>2</sub>	A	A	A	A	A	A	A	A	A	A	A	A
OIL, WATER MIXTURES	A	B	B	A	A	A	A	A	A	B	A	B
OIL, ANIMAL	A	A	A	A	A	A	A	A	A	A	A	A
OIL, FISH	A	B	B	B	A	A	A	B	A	B	A	B
OIL, FUEL	A	B	B	A	A	A	A	B	A	B	A	B
OIL, LUBE	A	A	A	A	A	A	A	A	A	A	A	A
OIL, MINERAL	A	B	B	A	A	A	A	A	A	B	A	B
OLEIC ACID	A	B	B	C	A	A	A	C	A	B	A	B
OLEUM	B	B	B	B	A	A	A	A	B	B	B	B
OLIVE OIL	A	B	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	B	D	A	A	A	D	A	B	A	B
OXYGEN (LIQUID)	A	B	B	D	C	C	C	D	A	B	-	B
OZONE	A	C	C	D	A	A	A	D	A	C	A	C
PAINTS AND THINNERS	A	A	A	D	A	A	A	A	A	A	A	A
PALM OIL	B	C	C	D	A	A	A	-	B	C	B	C
PALMITIC ACID	A	C	C	A	A	A	A	A	A	C	A	C
PARAFIN	A	B	B	A	A	A	-	A	A	B	A	B
PARAFORMALDEHYDE	B	B	B	A	A	A	A	-	B	B	B	B
PENTANE	A	B	B	A	A	A	-	A	A	B	A	B
PERCHLOROETHYLENE	B	B	B	C	A	A	A	D	B	B	B	B
PETROLATUM	B	C	C	A	A	A	-	A	B	C	B	C
PHENOL (CARBOLIC ACID)	A	B	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	C	C	B	A	A	-	B	C	B	C
PHTHALIC ANHYDRIDE	B	C	C	C	A	A	C	C	B	C	B	C
PICRIC ACID	B	C	C	A	A	A	A	-	B	C	B	C
PINE OIL	A	B	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
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	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	A	A	A	-	-	B	B	B	B
POTASSIUM DICHROMATE	A	B	B	B	B	A	A	A	A	B	A	B
POTASSIUM DIPHOSPHATE	A	A	A	-	-	-	-	-	A	A	A	A
POTASSIUM FERRICYANIDE	A	B	B	C	B	A	A	C	B	B	B	B

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POTASSIUM FERROCYANIDE	A	B	B	B	B	A	A	-	A	B	A	B
POTASSIUM HYDROXIDE 70%	A	A	A	C	C	A	A	B	A	A	A	A
POTASSIUM HYDROXIDE - DILUTE	B	B	B	-	A	A	A	A	B	B	B	B
POTASSIUM IODIDE	B	C	C	C	A	A	-	-	B	C	B	C
POTASSIUM NITRATE	A	B	B	B	B	A	A	A	A	B	A	B
POTASSIUM PERMANGANATE	A	A	A	D	D	A	A	-	A	A	A	A
POTASSIUM SULFATE	A	B	B	A	A	A	A	A	A	B	A	B
POTASSIUM SULFIDE	B	C	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	B	A	A	A	A	A	A	B	A	B
PROPANE	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
PROPYLENE GLYCOL	A	A	A	C	A	A	A	A	A	A	A	A
PYROGALLIC ACID	B	B	B	B	A	A	D	-	B	B	B	B
QUENCH OIL (WATER SOLUBLE)	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	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	C	A	A	A	A	A	B	C	A	C
SEA WATER	A	D	D	A	A	A	A	A	A	D	A	D
SHELLAC (BLEACHED)	A	A	A	C	A	A	A	-	A	A	A	A
SHELLAC (ORANGE)	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
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
SODIUM ACETATE	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	C	A	A	A	A	A	A	C	B	C
SODIUM BROMIDE	B	C	C	C	B	A	A	-	B	C	B	C
SODIUM CARBONATE	B	B	B	A	A	A	A	A	B	B	B	B
SODIUM CHLORATE	B	C	C	C	A	A	A	C	B	C	B	C
SODIUM CHLORIDE	B	C	C	A	A	A	A	A	B	C	B	C
SODIUM CHROMATE	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
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
SODIUM HYDROXIDE 50%	B	B	B	-	A	A	A	A	B	B	B	B
SODIUM HYDROXIDE 80%	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	-	A	A	A	A	A	B	B	B
SODIUM PERBORATE	B	C	C	B	B	A	A	A	B	C	B	C
SODIUM PEROXIDE	B	C	C	B	A	A	A	A	B	C	B	C
SODIUM PHOSPHATE (DIBASIC)	B	B	B	A	A	A	A	A	B	B	B	B
SODIUM PHOSPHATE (TRIBASIC)	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
SODIUM SULFATE NA <sub>2</sub> SO <sub>4</sub>	A	B	B	A	A	A	A	A	A	B	A	B

A	Excellent
B	Good (slightly attacked)
C	Fair (modestly attacked)
D	Not recommended
-	No data

Reference:

<http://www.coleparmer.com/techinfo/chemcomp.asp>  
 Chemical Resistance Guide by Compass Publications.

Lading	External Valve Body Material			Seal Code Trim					Internal Valve Trim			
	Std Body 23	Std Body 24	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
SODIUM SULFIDE NA2S02	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	A	A	A	A	A	A	B	B	B
STANNIC CHLORIDE	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
STEAM (212F)	A	B	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	A	A	A	A	B	B	B	B	B
STYRENE	A	A	A	-	A	A	A	B	A	A	A	A
SUGAR LIQUIDS	A	B	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	B	-	C	A	A	B	A	B	A	B
SULFURIC ACID (10% - 100%) H <sub>2</sub> SO <sub>4</sub>	D	D	D	-	D	A	D	B	D	D	-	D
SULFUROUS ACID	D	D	D	D	D	A	A	A	D	D	-	D
SULFUR	A	B	B	-	A	A	A	-	A	B	A	B
SULFUR DIOXIDE (DRY)	A	B	B	-	A	A	A	B	A	B	A	B
SULFUR TRIOXIDE (DRY)	B	B	B	-	A	A	A	B	B	B	B	B
SYNTHESIS GAS	B	B	B	-	A	A	A	-	B	B	B	B
TALL OIL	B	B	B	-	A	A	A	-	B	B	B	B
TANNIC ACID	B	B	B	A	A	A	A	A	B	B	B	B
TAR - TAR OIL	A	A	A	B	A	A	A	A	A	A	A	A
TARTARIC ACID	A	D	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	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
TRIBUTYL PHOSPHATE	A	A	A	D	D	A	-	-	A	A	A	A
TRICHLOROETHYLENE	B	B	B	C	B	A	A	D	B	B	B	B
TUNG OIL (China Wood Oil)	A	B	B	A	A	A	A	A	A	B	A	B
TURPENTINE	A	B	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	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	D	A	A	A	A	A	A	D	A	D
WATER, FRESH	A	C	C	A	A	A	A	A	A	C	A	C
WATER, SALT	A	D	D	A	A	A	A	A	A	D	A	D
WAX, EMULSIONS	A	A	A	-	A	A	A	-	A	A	A	A
WAXES	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	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	C	A	A	-	-	A	A	A	A
ZINC SULFATE	B	D	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

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#### HSE Policy Statement

At Cameron, we are committed ethically, financially and personally to a working environment where no one gets hurt and nothing gets harmed.