

GROVE B4, B5, and B7 Side-Entry Ball Valves

TECHNOLOGY



Table of Contents

GROVE B4, B5, AND B7 SIDE-ENTRY BALL VALVES

Features and Benefits

Applications.....1

GROVE B4

Design Features2
Materials Specifications.....4
Optional Features5
Special Applications.....6

GROVE B4-B4.D

Valve Assembly and Cross Section.....7
Dimensions and Weights8

GROVE B5

Design Features11
Valve Assembly and Cross Section.....14
Dimensions and Weights15

GROVE B7

Design Features21

GROVE B7.B

Valve Assembly and Cross Section.....22

GROVE B7.1 AND B7.B

Dimensions and Weights23

Quality System24

Qualification Testing.....25

Services for Valves and Actuation26

Trademark Information27

GROVE B4, B5, & B7 Side-entry Ball Valves

FEATURES AND BENEFITS

Cameron's Valves & Measurement business segment is a leading provider of valves, valve automation, and measurement systems to the oil and gas industry.

We provide large-diameter valves for use in natural gas, LNG, crude oil, and refined products transmission lines as well as in many other general industrial applications.

Rigorously tested, field-proven, and backed by our services team, Cameron's GROVE® valves are among the best known valves in the world.

Applications

GROVE split-body side-entry ball valves are manufactured in a wide range of diameters and pressure classes.

In the standard versions, the valves are specified for transmission pipelines, pumping, compression and reinjection units, offshore platforms, onshore terminals, pig traps, measuring stations, and surge-relief skids.

These valves also can be built for speciality applications, such as subsea installations and LNG plants.

Split-body construction allows the use of forged materials in various grades of carbon steel, stainless steel, and high alloys, equipping the valves for some of the most severe service conditions.



Size		ASME CLASS						
(in.)	(mm)	150	300	400	600	900	1500	2500
1-1/2	(40)	●	●	●	●	●	●	▲
2	(50)	●	●	●	●	●	●	▲
3	(80)	●	●	●	●	●	●	▲
4	(100)	●	●	●	●	●	●	▲
6	(150)	■	■	■	■	■	■	▲
8	(200)	■	■	■	■	■	■	◆
10	(250)	■	■	■	■	■	■	◆
12	(300)	■	■	■	■	■	■	◆
14	(350)	■	■	■	■	■	■	◆
16	(400)	■	■	■	■	■	■	◆
18	(450)	■	■	■	■	■	■	◆
20	(500)	■	■	■	■	■	■	◆
22	(550)	■	■	■	■	■	■	
24	(600)	■	■	■	■	■	■	
26	(650)	■	■	■	■	■	■	
28	(700)	■	■	■	■	■	■	
30	(750)	■	■	■	■	■	■	
32	(800)	■	■	■	■	■	■	
34	(850)	■	■	■	■	■	■	
36	(900)	■	■	■	■	■	■	
40	(1000)	■	■	■	■	■		
42	(1050)	■	■	■	■	■		
46	(1150)	■	■	■	■	■		
48	(1200)	■	■	■	■	■		
56	(1400)	■	■	■	■			
60	(1500)	■	■	■	■			

B4 ● B5 ■ B7.1 ▲ B7.B ◆

GROVE B5

DESIGN FEATURES

Standard Features

- Double-barrier stem seals
- Stem separated from the ball; anti-blowout design; no side load on the stem
- Bearing blocks absorb the pressure load on the ball
- Primary metal-to-metal seal and secondary protected synthetic O-ring seal
- Double-sealing barrier in both directions (DPE)
- Body relief valve for overpressure due to liquid thermal expansion
- Built-in sealant injection system for emergency seat seal
- Metal-backed, self-lubricating PTFE sleeve bearing and thrust washers reduce torque and extend service life
- Nickel plating for trim parts
- Trunnion mounted ball for ease of operation at high pressure
- Large-diameter, short coupled trunnions to reduce unit bearing loads and operating torque
- Bolted construction permits disassembly in the field for repairs
- Integral stop in the adapter plate for a permanent reference to open and closed position
- Antistatic device

Options

- Triple-barrier stem seals
- Emergency grease fitting for stem
- Self-relieving seats
- Plastic polymer O-ring or insert for primary seat sealing
- Double block-and-bleed capabilities
- PTFE various grades of reinforced gaskets, spring energized, for stem and seat sealing
- Metal-to-metal seat
- Explosive decompression-resistant seal



DESIGN FEATURES (CONT.)

Body Construction

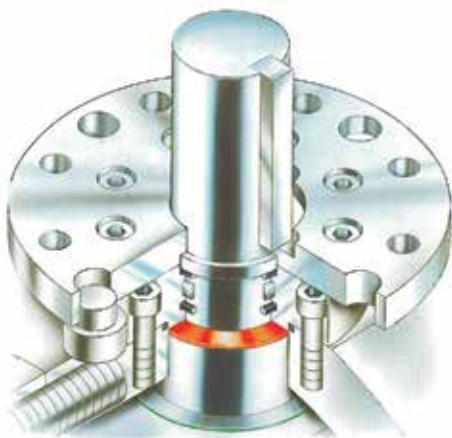
The body is made of three forged parts, and the bolted construction allows disassembly in the field for repairs. The bolts threads areas are per ISO metric or ASME imperial, depending on the market request. The tightening of the bolts is made by hydraulic tools with a predetermined torque. The body drain is located in the lowest part of the body cavity and consists of an NPT drain valve with safety plug.

Stem Construction

The stem of Cameron's GROVE B5 valve is separated from the ball and is connected to the upper ball trunnion by steel pins. Bearing blocks are located on the upper and lower ball trunnions, which absorb all the pressure load on the ball.

The stem is a free member and carries no side thrust. The absence of this side load and friction drag on the stem ensures lower operating torque and long service life.

The stem is sealed by means of two O-rings. If leakage should ever occur through both stem seals, the outer O-ring can be replaced with the valve in the line, under pressure with the ball in the closed position. With no pressure in-line, it is possible to remove the gland plate for replacement of both primary and outer stem O-rings. The stem also can be removed and replaced if necessary.



Torque

Cameron's GROVE B5 valve's low operating torque is due to a combination of factors:

- The design of the stem, which is separated from the ball
- The side loads, brought on by differential pressure, are absorbed by two (upper and lower) rigid bearing retainers and large-diameter, short coupled trunnions to reduce unit bearing loads
- The metal-backed, self-lubricating sleeve bearing and the thrust washers reduce the torque and extend service life

Ball Position

The ball's open and closed positions are ensured by corresponding stops on the adapter plate.

The valve normally is mounted with the actuator stops or the gear stops set at the factory as primary stops. An "open/closed" indicator also is provided.



Seat Seals

The GROVE B5 seat design ensures double-barrier sealing in both directions (the normal self-relieving seats are a simple barrier of sealing). The sealing is performed by both a primary metal-to-metal seal and a secondary protected O-ring seal.

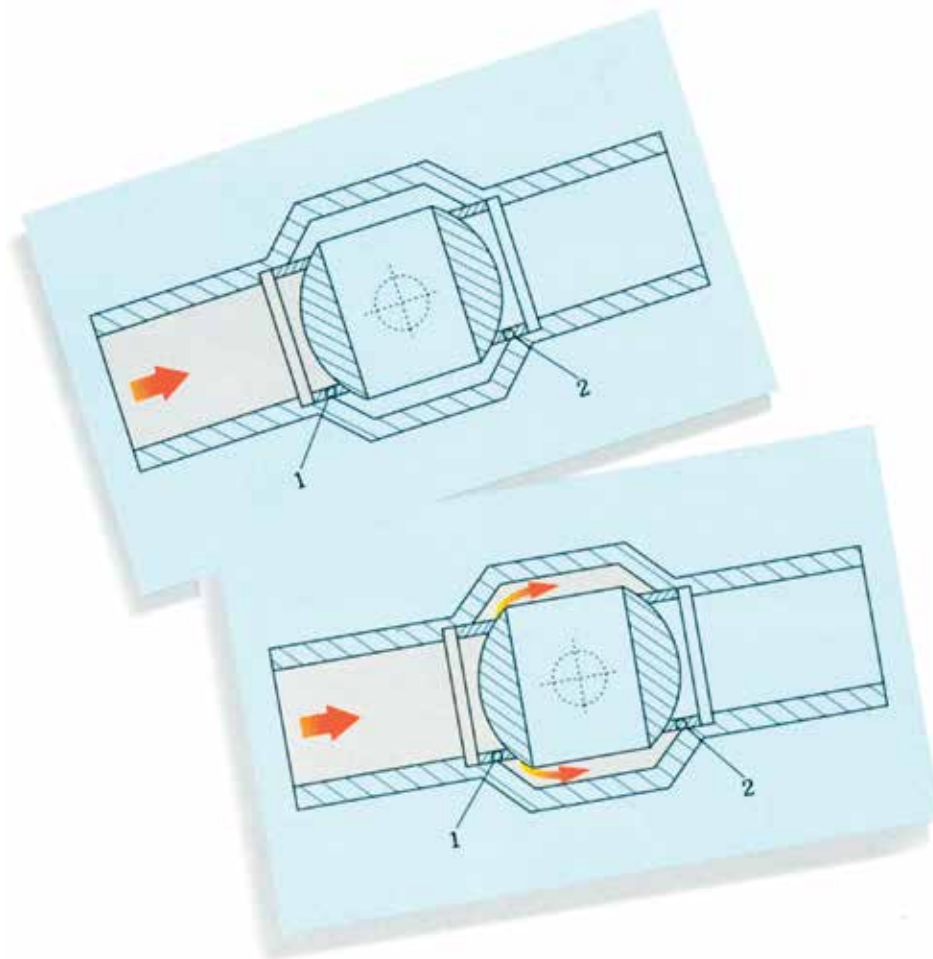
Double Piston Effect (DPE)

The DPE seat design was invented and patented by Cameron's GROVE team. The DPE seat design allows for both seats to seal with pressure acting from the same side of the valve. In the event one seat becomes damaged, the user has the added advantage of the opposite seat sealing. By means of this double barrier, the sealing is ensured regardless of the direction of the flow through the valve.

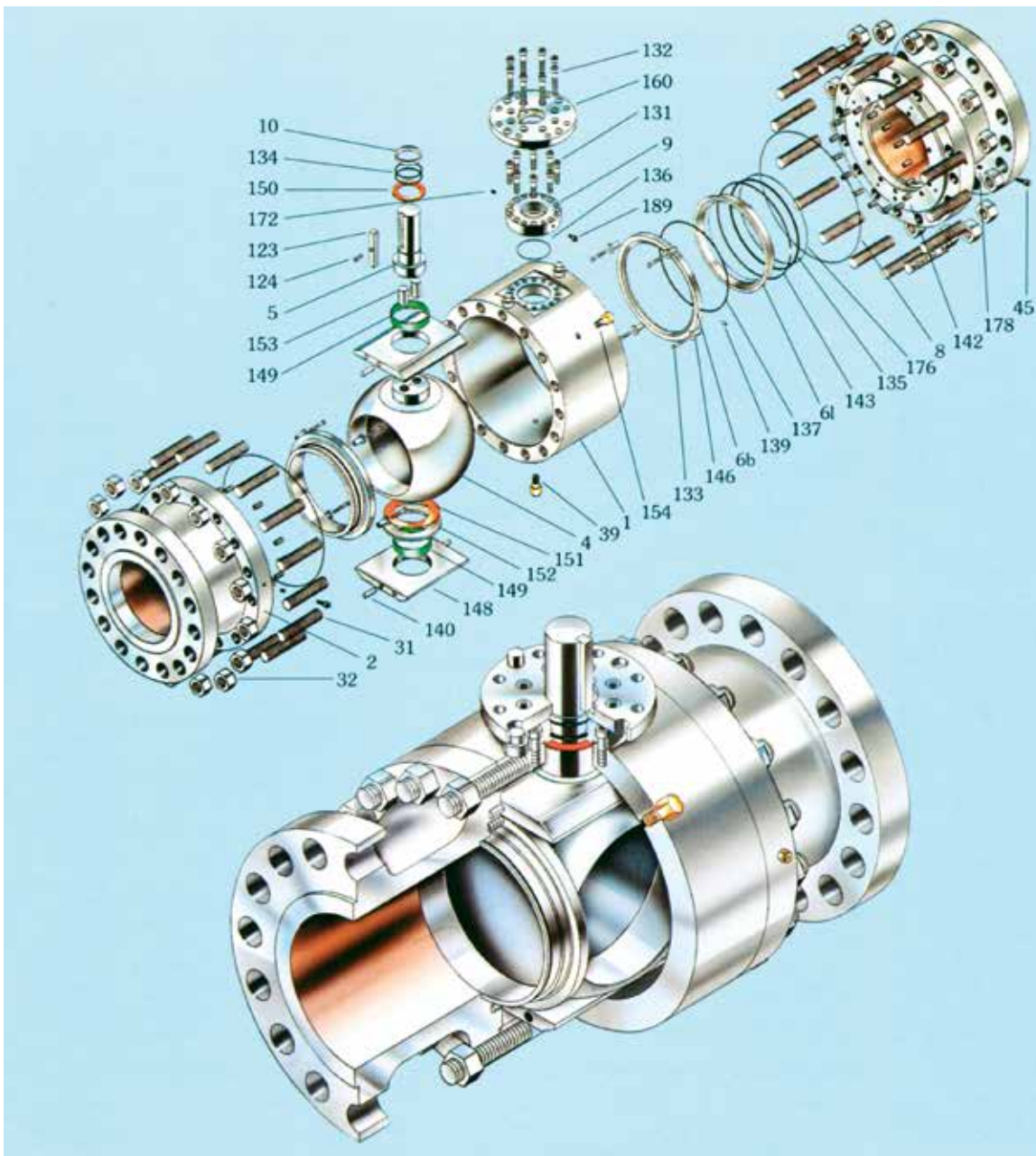
If the upstream seat (1) becomes damaged and leaks, the pressure entering the body cavity acts on the downstream seat (2), sealing the downstream seat tightly against the ball.

Note: The DPE feature and the double block-and-bleed feature are not to be confused with one another.

The initial seal, at extremely low pressure differential or vacuum conditions, is obtained with spring-loaded floating seats, which are free to move slightly along the longitudinal axis of the valve. Line pressure behind the seat ring supplements the seat spring load to force the seat tightly against the ball.



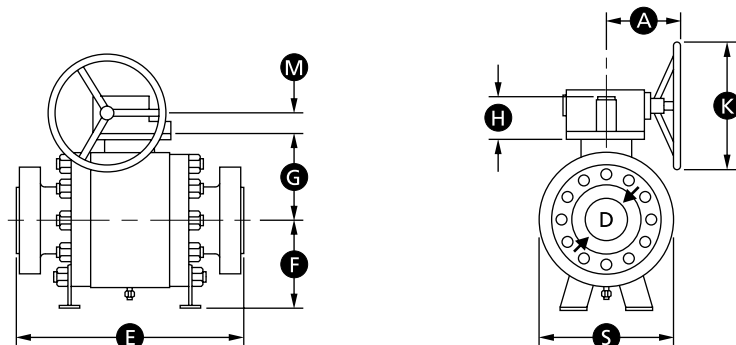
VALVE ASSEMBLY AND CROSS SECTION



Item	Description	Item	Description	Item	Description
1	Body	45	Grease Fitting	146	Puller Bushing
2	Closure	123	Stem Key	148	Bearing Retainer
4	Ball	124	Stem Key Capscrew	149	Bearing
5	Stem	131	Gland Plate Capscrew	150	Upper Thrust Washer
6b	Outer Seat Ring	132	Adapter Plate Capscrew	151	Lower Thrust Washer
6l	Inner Seat Ring	134	Stem O-ring	152	Spacer
8	Body O-ring	135	Seat O-ring	153	Drive Pin
9	Gland Plate	136	Gland Plate O-ring	154	Relief Valve
10	Gland Bushing	137	Seal O-ring	160	Adapter Plate
31	Body Stud	139	Seat Spring Pin	172	Vent Plug
32	Body Stud Nut	140	Bearing Retainer Pin	176	U-cup Packing
39	Drain Valve	142	Spring	178	Check Valve
		143	Seat Lock Ring	189	Gland Vent

DIMENSIONS AND WEIGHTS

ASME CLASS 150



ASME CLASS 150

SIZE	in.	D	E			F	G	S	H	L	A	K	M	WEIGHT		lb (kg)
	(mm)		WE	RF	RTJ									WE	RF/RTJ	
6	6	18	15-1/2	16	11-7/8	8-1/2	11-7/8	2-3/4	-	8-3/4	13-3/4	2-5/8	440	520		
(150)	(152)	(457)	(394)	(406)	(302)	(108)	(302)	(70)	-	(222)	(349)	(67)	(200)	(236)		
8	8	20-1/2	18	18-1/2	13-3/8	9-7/8	15-5/8	2-3/4	-	8-3/4	13-3/4	2-5/8	720	850		
(200)	(203)	(521)	(457)	(470)	(340)	(108)	(397)	(70)	-	(222)	(349)	(67)	(327)	(386)		
10	10	22	21	21-1/2	14-7/8	11-5/8	18-1/4	2-3/4	-	8-3/4	13-3/4	2-5/8	1050	1250		
(250)	(254)	(559)	(533)	(546)	(378)	(118)	(464)	(70)	-	(222)	(349)	(67)	(476)	(567)		
12	12	25	24	24-1/2	16-3/8	13-1/2	21-5/8	2-3/4	-	8-3/4	13-3/4	2-5/8	1450	1740		
(300)	(305)	(635)	(610)	(622)	(416)	(118)	(549)	(70)	-	(222)	(349)	(67)	(658)	(789)		
14	13-1/4	30	27	27-1/2	18-3/8	14-5/8	23	3-3/4	-	11-1/2	13-3/4	3	1800	2160		
(350)	(337)	(762)	(686)	(699)	(467)	(143)	(584)	(95)	-	(292)	(349)	(76)	(816)	(980)		
16	15-1/4	33	30	30-1/2	19-7/8	16-1/4	26-3/8	3-3/4	-	11-1/2	13-3/4	3	2160	2570		
(400)	(387)	(838)	(762)	(775)	(505)	(143)	(670)	(95)	-	(292)	(349)	(76)	(980)	(1166)		
18	17-1/4	36	34	34-1/2	21-1/2	18	29-7/8	4-1/2	-	11-1/2	13-3/4	3	3020	3610		
(450)	(438)	(914)	(864)	(876)	(546)	(168)	(759)	(114)	-	(292)	(349)	(76)	(1370)	(1637)		
20	19-1/4	39	36	36-1/2	23-1/8	19-3/8	32-7/8	4-1/2	-	11-1/2	13-3/4	3	4050	4850		
(500)	(489)	(991)	(914)	(927)	(587)	(168)	(835)	(114)	-	(292)	(349)	(76)	(1837)	(2200)		
22	21-1/4				24-7/8	21-1/8	36-1/4	4-1/2	-	15-3/4	23-5/8	4-3/8	5020	6010		
(550)	(540)	(1)	(1)	(1)	(632)	(537)	(921)	(114)		(400)	(600)	(111)	(2277)	(2726)		
24	23-1/4	45	42	42-1/2	26-3/8	22-1/2	38-7/8	7-1/8	-	21-5/8	31-1/2	4-3/8	6010	7200		
(600)	(591)	(1143)	(1067)	(1080)	(670)	(572)	(988)	(181)		(549)	(800)	(111)	(2726)	(3266)		
26	25	49	45		28-1/4	24-1/2	41-3/4	7-1/8	-	21-5/8	31-1/2	4-3/8	7600	9120		
(650)	(635)	(1245)	(1143)	(1)	(718)	(622)	(1060)	(181)		(549)	(800)	(111)	(3447)	(4137)		
28	27	53	49		29-5/8	25-7/8	44-3/4	7-1/8	-	21-5/8	31-1/2	4-3/8	8700	10440		
(700)	(686)	(1346)	(1245)	(1)	(753)	(657)	(1137)	(181)		(549)	(800)	(111)	(3946)	(4736)		
30	29	55	51		31-3/4	27-1/2	48-5/8	7-1/8	-	21-5/8	31-1/2	4-3/8	10,420	12,500		
(750)	(737)	(1397)	(1295)	(1)	(806)	(699)	(1235)	(181)		(549)	(800)	(111)	(4726)	(5670)		
32	30-3/4	60	54		33-1/4	29	51	8-1/8	-	21-5/8	23-5/8	5-3/8	11,860	14,210		
(800)	(781)	(1524)	(1372)	(1)	(845)	(737)	(1295)	(206)		(549)	(600)	(137)	(5380)	(6446)		
34	32-3/4	64	58		34-3/8	30-7/8	53-3/8	8-1/8	-	21-3/4	23-5/8	5-3/8	14,500	17,390		
(850)	(832)	(1626)	(1473)	(1)	(873)	(784)	(1356)	(206)		(552)	(600)	(137)	(6577)	(7888)		
36	34-1/2	68	60		35-3/4	32-3/8	56-3/4	8-1/8	-	21-3/4	23-5/8	5-3/8	16,880	20,260		
(900)	(876)	(1727)	(1524)	(1)	(908)	(822)	(1441)	(206)		(552)	(600)	(137)	(7657)	(9190)		
40	38-1/2				39-3/8	35-5/8	63-7/8	8-1/8	-	21-3/4	23-5/8	5-3/8	21,560	25,850		
(1000)	(978)	(1)	(1)	(1)	(1000)	(905)	(1623)	(206)		(552)	(600)	(137)	(9779)	(11,725)		
42	40-1/4				40-3/4	38-1/8	67-3/8	8-1/8	-	21-3/4	23-5/8	5-3/8	25,390	30,460		
(1050)	(1022)	(1)	(1)	(1)	(1035)	(968)	(1711)	(206)		(552)	(600)	(137)	(11,517)	(13,816)		
46	44				44-5/8	42-1/2	74-1/2	8-1/8	-	22-7/8	23-5/8	6-1/4	30,860	37030		
(1150)	(1118)	(1)	(1)	(1)	(1134)	(1080)	(1892)	(206)		(581)	(600)	(159)	(13,998)	(16,797)		
48	46				46-3/8	44-3/8	77-1/2	8-1/8	-	22-7/8	23-5/8	6-1/4	35270	42320		
(1200)	(1168)	(1)	(1)	(1)	(1178)	(1127)	(1969)	(206)		(581)	(600)	(159)	(15,998)	(19,196)		
56	54-1/2				52-3/4	50-3/8	89-3/4	9-5/8	-	-	-	-	54010	64810		
(1400)	(1384)	(1)	(1)	(1)	(1321)	(1280)	(2280)	(245)					(24,499)	(29,397)		
60	57-1/2				56-3/8	55-1/8	96-3/8	9-5/8	-	-	-	-	66130	79,360		
(1500)	(1461)	(1)	(1)	(1)	(1432)	(1400)	(2448)	(245)					(29,996)	(35,997)		

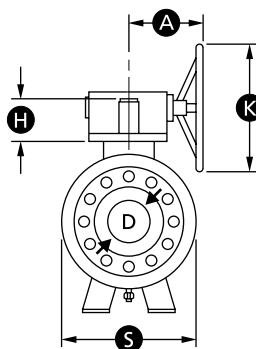
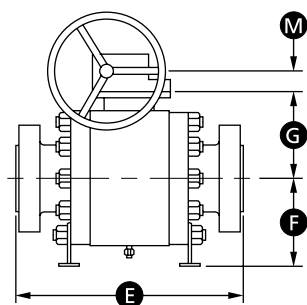
(1) Upon request

Flanges in accordance with ASME B16.5

Shaded bore sizes (D) according to API 6D
Shaded end-to-end dimensions (E) according to API 6D
Butt welding ends according to ASME B16.25

Larger sizes available on request
Reduced-bore valves also available

ASME CLASS 300



ASME CLASS 300

SIZE	in. (mm)	D	E			F	G	S	H	L	A	K	M	WEIGHT	
			WE	RF	RTJ									WE	lb (kg) RF/RTJ
6		6	18	15-7/8	16-1/2	11-7/8	8-1/2	12	2-3/4	-	8-3/4	13-3/4	2-5/8	460	550
(150)		(152)	(457)	(403)	(419)	(302)	(108)	(305)	(70)	-	(222)	(349)	(67)	(209)	(249)
8		8	20-1/2	19-3/4	20-3/8	13-3/8	9-7/8	15-7/8	2-3/4	-	8-3/4	13-3/4	2-5/8	740	880
(200)		(203)	(521)	(502)	(518)	(340)	(108)	(403)	(70)	-	(222)	(349)	(67)	(336)	(399)
10		10	22	22-3/8	23	14-7/8	11-5/8	18-3/8	3-3/4	-	11-1/2	13-3/4	3	1100	1320
(250)		(254)	(559)	(568)	(584)	(378)	(118)	(467)	(95)	-	(292)	(349)	(76)	(499)	(599)
12		12	25	25-1/2	26-1/8	16-3/8	13-1/2	21-3/4	3-3/4	-	11-1/2	13-3/4	3	1520	1800
(300)		(305)	(635)	(648)	(664)	(416)	(118)	(552)	(95)	-	(222)	(349)	(67)	(689)	(816)
14		13-1/4	30	30	30-5/8	18-3/8	14-5/8	23-1/4	4-1/2	-	11-1/2	13-3/4	3	1890	2270
(350)		(337)	(762)	(762)	(778)	(467)	(143)	(591)	(114)	-	(292)	(349)	(76)	(857)	(1030)
16		15-1/4	33	33	33-5/8	19-7/8	16-1/4	26-3/4	4-1/2	-	11-1/2	13-3/4	3	2240	2680
(400)		(387)	(838)	(838)	(854)	(505)	(143)	(679)	(114)	-	(292)	(349)	(76)	(1016)	(1216)
18		17-1/4	36	36	36-5/8	21-1/2	18	30-1/4	4-1/2	-	15-3/4	23-5/8	4-3/8	3150	3760
(450)		(438)	(914)	(914)	(930)	(546)	(168)	(768)	(114)	-	(400)	(600)	(111)	(1429)	(1706)
20		19-1/4	39	39	39-3/4	23-1/8	16-7/8	33-1/4	7-1/8	-	21-5/8	31-1/2	4-3/8	4250	5090
(500)		(489)	(991)	(991)	(1010)	(587)	(429)	(845)	(181)	-	(549)	(800)	(111)	(1928)	(2309)
22		21-1/4	43	43	43-7/8	24-7/8	21-1/8	36-5/8	7-1/8	-	21-5/8	31-1/2	4-3/8	5260	6300
(550)		(540)	(1092)	(1092)	(1115)	(632)	(537)	(930)	(181)	-	(549)	(800)	(111)	(2386)	(2858)
24		23-1/4	45	45	45-7/8	26-3/8	22-1/2	39-1/4	7-1/8	-	21-5/8	31-1/2	4-3/8	6300	7560
(600)		(591)	(1143)	(1143)	(1165)	(670)	(572)	(997)	(181)	-	(549)	(800)	(111)	(2858)	(3429)
26		25	49	49	50	28-1/4	24-1/2	42-1/8	8-1/8	-	21-3/4	23-5/8	5-3/8	7980	9560
(650)		(635)	(1245)	(1245)	(1270)	(718)	(622)	(1070)	(206)	-	(552)	(600)	(137)	(3620)	(4336)
28		27	53	53	54	29-5/8	25-7/8	45-1/4	8-1/8	-	21-3/4	23-5/8	5-3/8	9120	10,930
(700)		(686)	(1346)	(1346)	(1372)	(753)	(657)	(1149)	(206)	-	(552)	(600)	(137)	(4137)	(4958)
30		29	55	55	56	31-3/4	27-1/2	49-1/8	8-1/8	-	21-3/4	23-5/8	5-3/8	10,930	13,110
(750)		(737)	(1397)	(1397)	(1422)	(806)	(699)	(1248)	(206)	-	(552)	(600)	(137)	(4958)	(5947)
32		30-3/4	60	60	61-1/8	33-1/4	29	51-1/2	8-1/8	-	21-3/4	23-5/8	5-3/8	12,430	14,900
(800)		(781)	(1524)	(1524)	(1553)	(845)	(737)	(1308)	(206)	-	(552)	(600)	(137)	(5638)	(6759)
34		32-3/4	64	64	65-1/8	34-3/8	30-7/8	53-7/8	8-1/8	-	21-3/4	23-5/8	5-3/8	15,210	18,250
(850)		(832)	(1626)	(1626)	(1654)	(873)	(784)	(1369)	(206)	-	(552)	(600)	(137)	(6899)	(8278)
36		34-1/2	68	68	69-1/8	35-3/4	32-3/8	57-3/8	8-1/8	-	22-7/8	23-5/8	6-1/4	17,720	21,250
(900)		(876)	(1727)	(1727)	(1756)	(908)	(822)	(1457)	(206)	-	(581)	(600)	(159)	(8038)	(9639)
40		38-1/2	(1)	(1)	(1)	39-3/8	35-5/8	64-1/2	8-1/8	-	22-7/8	23-5/8	6-1/4	22,610	27,130
(1000)		(978)	(1)	(1)	(1)	(1000)	(905)	(1638)	(206)	-	(581)	(600)	(159)	(10,256)	(12,306)
42		40-1/4	(1)	(1)	(1)	40-3/4	38-1/8	68-1/8	9-5/8	-	22-7/8	23-5/8	6-1/4	26,650	31,960
(1050)		(1022)	(1)	(1)	(1)	(1035)	(968)	(1730)	(245)	-	(581)	(600)	(159)	(12,088)	(14,497)
46		44	(1)	(1)	(1)	44-5/8	42-1/2	75-1/4	9-5/8	-	22-7/8	23-5/8	6-1/4	32,400	38,880
(1150)		(1118)	(1)	(1)	(1)	(1134)	(1080)	(1911)	(245)	-	(581)	(600)	(159)	(14,696)	(17,636)
48		46	(1)	(1)	(1)	46-3/8	44-3/8	78-1/4	9-5/8	-	25-5/8	47-1/4	6-5/8	37,030	44,440
(1200)		(1168)	(1)	(1)	(1)	(1178)	(1127)	(1988)	(245)	-	(651)	(1200)	(168)	(16,797)	(20,158)
56		54-1/2	(1)	(1)	(1)	52-3/4	50-3/8	90-3/4	9-5/8	-	-	-	-	56,700	68,030
(1400)		(1384)	(1)	(1)	(1)	(1321)	(1280)	(2305)	(245)	-	-	-	-	(25,719)	(30,858)
60		57-1/2	(1)	(1)	(1)	56-3/8	55-1/8	97-1/2	9-5/8	-	-	-	-	69,440	83,330
(1500)		(1461)	(1)	(1)	(1)	(1432)	(1400)	(2477)	(245)	-	-	-	-	(31,497)	(37,798)

(1) Upon request

Shaded bore sizes (D) according to API 6D

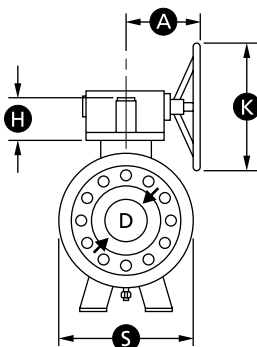
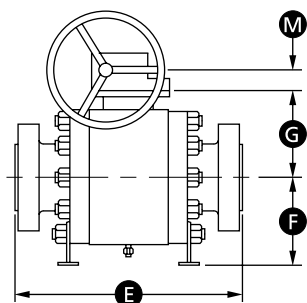
Shaded end-to-end dimensions (E) according to API 6D

Flanges in accordance with ASME B16.5

Butt welding ends according to ASME B16.25

DIMENSIONS AND WEIGHTS (CONT.)

ASME CLASS 400



ASME CLASS 400

SIZE	in.	D	E			F	G	S	H	L	A	K	M	WEIGHT	lb (kg)
	(mm)		WE	RF	RTJ									WE	RF/RTJ
6		6	19-1/2	19-1/2	19-5/8	12-1/8	8-1/2	12-1/8	2-3/4	-	8-3/4	13-3/4	2-5/8	520	610
(150)		(152)	(495)	(495)	(499)	(308)	(108)	(308)	(70)	-	(222)	(349)	(67)	(236)	(277)
8		8	23-1/2	23-1/2	23-5/8	13-5/8	9-7/8	16	3-3/4	-	11-1/2	13-3/4	3	850	1010
(200)		(203)	(597)	(597)	(600)	(346)	(108)	(406)	(95)	-	(292)	(349)	(76)	(386)	(458)
10		10	26-1/2	26-1/2	26-5/8	15-1/4	11-5/8	18-5/8	3-3/4	-	11-1/2	13-3/4	3	1250	1490
(250)		(254)	(673)	(673)	(676)	(387)	(118)	(473)	(95)	-	(292)	(349)	(76)	(567)	(676)
12		12	30	30	30-1/8	16-3/4	13-1/2	22	3-3/4	-	11-1/2	13-3/4	3	1740	2070
(300)		(305)	(762)	(762)	(765)	(425)	(118)	(559)	(95)	-	(292)	(349)	(67)	(789)	(939)
14		13-1/4	32-1/2	32-1/2	32-5/8	18-3/4	14-5/8	23-1/2	4-1/2	-	11-1/2	13-3/4	3	2160	2570
(350)		(337)	(826)	(826)	(829)	(476)	(143)	(597)	(114)	-	(292)	(349)	(76)	(980)	(1166)
16		15-1/4	35-1/2	35-1/2	35-5/8	20-3/8	16-1/4	27	4-1/2	-	11-1/2	13-3/4	3	2570	3080
(400)		(387)	(902)	(902)	(905)	(518)	(143)	(686)	(114)	-	(292)	(349)	(76)	(1166)	(1397)
18		17-1/4	38-1/2	38-1/2	38-5/8	21-7/8	18	30-1/2	7-1/8	-	21-5/8	31-1/2	4-3/8	3610	4320
(450)		(438)	(978)	(978)	(981)	(556)	(168)	(775)	(181)	-	(549)	(800)	(111)	(1637)	(1960)
20		19-1/4	41-1/2	41-1/2	41-3/4	23-1/2	19-3/8	33-1/2	7-1/8	-	21-5/8	31-1/2	4-3/8	4870	5840
(500)		(489)	(1054)	(1054)	(1056)	(597)	(492)	(851)	(181)	-	(549)	(800)	(111)	(2209)	(2649)
22		21-1/4	45	45	45-3/8	25-3/8	21-1/8	37	7-1/8	-	21-5/8	31-1/2	4-3/8	6040	7230
(550)		(540)	(1143)	(1143)	(1153)	(645)	(537)	(940)	(181)	-	(549)	(800)	(111)	(2740)	(3279)
24		23-1/4	48-1/2	48-1/2	48-7/8	26-7/8	22-1/2	39-5/8	8-1/8	-	21-3/4	23-5/8	5-3/8	7230	8660
(600)		(591)	(1232)	(1232)	(1242)	(683)	(572)	(1007)	(206)	-	(552)	(600)	(137)	(3279)	(3928)
26		25	51-1/2	51-1/2	51	28-7/8	24-1/2	42-1/2	8-1/8	-	21-3/4	23-5/8	5-3/8	9170	11,000
(650)		(635)	(1308)	(1308)	(1295)	(734)	(622)	(1080)	(206)	-	(552)	(600)	(137)	(4159)	(4990)
28		27	55	55	55-1/2	30-1/4	25-7/8	45-5/8	8-1/8	-	21-3/4	23-5/8	5-3/8	10,490	12,580
(700)		(686)	(1397)	(1397)	(1410)	(768)	(657)	(1159)	(206)	-	(552)	(600)	(137)	(4758)	(5706)
30		29	60	60	60-1/2	32-3/8	27-1/2	49-5/8	8-1/8	-	21-3/4	23-5/8	5-3/8	12,560	15,070
(750)		(737)	(1524)	(1524)	(1537)	(822)	(699)	(1261)	(206)	-	(552)	(600)	(137)	(5697)	(6836)
32		30-3/4	65	65	65-5/8	33-7/8	29	52	8-1/8	-	22-7/8	23-5/8	6-1/4	14,280	17,120
(800)		(781)	(1651)	(1651)	(1667)	(861)	(737)	(1321)	(206)	-	(581)	(600)	(159)	(6477)	(7766)
34		32-3/4	70	70	70-5/8	35-1/8	30-7/8	54-1/2	8-1/8	-	22-7/8	23-5/8	6-1/4	17,480	20,960
(850)		(832)	(1778)	(1778)	(1794)	(892)	(784)	(1384)	(206)	-	(581)	(600)	(159)	(7929)	(9507)
36		34-1/2	74	74	74-5/8	36-1/2	32-3/8	58	8-1/8	-	22-7/8	23-5/8	6-1/4	20,370	24,420
(900)		(876)	(1880)	(1880)	(1896)	(927)	(822)	(1473)	(206)	-	(581)	(600)	(159)	(9240)	(11,077)
40		38-1/2	(1)	(1)	(1)	40-1/8	35-5/8	65-1/8	9-5/8	-	22-7/8	23-5/8	6-1/4	25,990	31,170
(1000)		(978)	(1)	(1)	(1)	(1019)	(905)	(1654)	(245)	-	(581)	(600)	(159)	(11,789)	(14,138)
42		40-1/4	(1)	(1)	(1)	41-1/2	38-1/8	68-3/4	9-5/8	-	22-7/8	23-5/8	6-1/4	30,640	36,770
(1050)		(1022)	(1)	(1)	(1)	(1054)	(968)	(1746)	(245)	-	(581)	(600)	(159)	(13,898)	(16,679)
46		44	(1)	(1)	(1)	45-5/8	42-1/2	76	9-5/8	-	22-7/8	23-5/8	6-1/4	37,250	44,700
(1150)		(1118)	(1)	(1)	(1)	(1159)	(1080)	(2007)	(245)	-	(581)	(600)	(159)	(16,896)	(20,276)
48		46	(1)	(1)	(1)	47-3/8	44-3/8	79	9-5/8	-	25-5/8	47-1/4	6-5/8	42,590	51,100
(1200)		(1168)	(1)	(1)	(1)	(1203)	(1127)	(1988)	(245)	-	(651)	(1200)	(168)	(19,319)	(23,179)
56		54-1/2	(1)	(1)	(1)	53-3/4	50-3/8	91-5/8	11	-	-	-	-	65,180	78,210
(1400)		(1384)	(1)	(1)	(1)	(1365)	(1280)	(2327)	(279)	-	-	-	-	(29,565)	(35,475)
60		57-1/2	(1)	(1)	(1)	57-1/2	55-1/8	98-3/8	11	-	-	-	-	79,850	95,810
(1500)		(1461)	(1)	(1)	(1)	(1461)	(1400)	(2499)	(279)	-	-	-	-	(36,219)	(43,459)

(1) Upon request

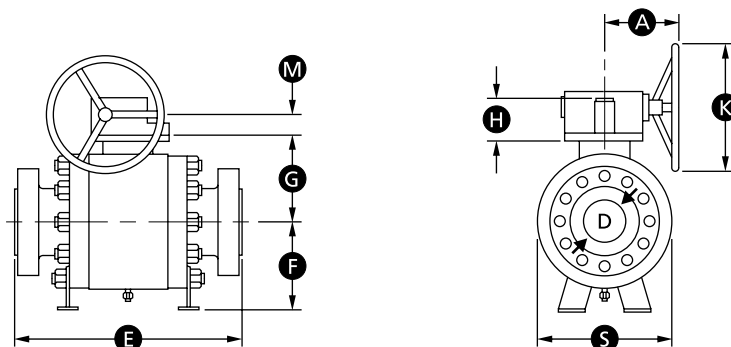
Flanges in accordance with ASME B16.5

Shaded bore sizes (D) according to API 6D

Shaded end-to-end dimensions (E) according to API 6D

Butt welding ends according to ASME B16.25

ASME CLASS 600



ASME CLASS 600

SIZE	in. (mm)	D	E			F	G	S	H	L	A	K	M	WEIGHT	
			WE	RF	RTJ									WE	lb (kg) RF/RTJ
6	6	6	22	22	22-1/8	12-1/4	8-1/2	12-1/4	2-3/4	-	8-3/4	13-3/4	2-5/8	570	680
(150)	(152)	(152)	(559)	(559)	(562)	(311)	(108)	(311)	(70)	-	(222)	(349)	(67)	(259)	(308)
8	8	8	26	26	26-1/8	13-3/4	9-7/8	16-1/8	3-3/4	-	11-1/2	13-3/4	3	920	1100
(200)	(203)	(203)	(660)	(660)	(664)	(349)	(108)	(410)	(95)	-	(292)	(349)	(76)	(417)	(500)
10	10	10	31	31	31-1/8	15-3/8	11-5/8	18-7/8	3-3/4	-	11-1/2	13-3/4	3	1360	1630
(250)	(254)	(254)	(787)	(787)	(790)	(391)	(118)	(480)	(95)	-	(292)	(349)	(76)	(617)	(739)
12	12	12	33	33	33-1/8	16-7/8	13-1/2	22-1/4	3-3/4	-	11-1/2	13-3/4	3	1890	2270
(300)	(305)	(305)	(838)	(838)	(841)	(429)	(118)	(565)	(95)	-	(292)	(349)	(67)	(857)	(1030)
14	13-1/4	13-1/4	35	35	35-1/8	18-7/8	14-5/8	23-3/4	4-1/2	-	11-1/2	13-3/4	3	2330	2790
(350)	(337)	(337)	(889)	(889)	(892)	(480)	(143)	(603)	(114)	-	(292)	(349)	(76)	(1057)	(1266)
16	15-1/4	15-1/4	39	39	39-1/8	20-1/2	16-1/4	27-1/4	4-1/2	-	15-3/4	23-5/8	4-3/8	2790	3350
(400)	(387)	(387)	(991)	(991)	(994)	(521)	(143)	(692)	(114)	-	(400)	(600)	(111)	(1266)	(1520)
18	17-1/4	17-1/4	43	43	43-1/8	22-1/8	18	30-7/8	7-1/8	-	21-5/8	31-1/2	4-3/8	3920	4690
(450)	(438)	(438)	(1092)	(1092)	(1095)	(562)	(168)	(784)	(181)	-	(549)	(800)	(111)	(1778)	(2127)
20	19-1/4	19-1/4	47	47	47-1/4	23-3/4	19-3/8	33-7/8	7-1/8	-	21-5/8	31-1/2	4-3/8	5290	6340
(500)	(489)	(489)	(1194)	(1194)	(1200)	(603)	(492)	(861)	(181)	-	(549)	(800)	(111)	(2400)	(2876)
22	21-1/4	21-1/4	51	51	51-3/8	25-5/8	21-1/8	37-3/8	8-1/8	-	21-5/8	23-5/8	5-3/8	6560	7870
(550)	(540)	(540)	(1295)	(1295)	(1305)	(651)	(537)	(949)	(206)	-	(549)	(600)	(137)	(2976)	(3570)
24	23-1/4	23-1/4	55	55	55-3/8	27-1/8	22-1/2	40-1/8	8-1/8	-	21-3/4	23-5/8	5-3/8	7870	9430
(600)	(591)	(591)	(1397)	(1397)	(1407)	(689)	(572)	(1019)	(206)	-	(552)	(600)	(137)	(3570)	(4277)
26	25	25	57	57	57-1/2	29-1/8	24-1/2	43	8-1/8	-	22-7/8	23-5/8	6-1/4	9980	11,970
(650)	(635)	(635)	(1448)	(1448)	(1461)	(740)	(622)	(1092)	(206)	-	(581)	(600)	(159)	(4527)	(5430)
28	27	27	61	61	61-1/2	30-1/2	25-7/8	46-1/8	8-1/8	-	22-7/8	23-5/8	6-1/4	11,410	13,690
(700)	(686)	(686)	(1549)	(1549)	(1562)	(775)	(657)	(1172)	(206)	-	(581)	(600)	(159)	(5175)	(6210)
30	29	29	65	65	65-1/2	32-5/8	27-1/2	50-1/8	9-5/8	-	22-7/8	23-5/8	6-1/4	13,690	16,420
(750)	(737)	(737)	(1651)	(1651)	(1664)	(829)	(699)	(1273)	(245)	-	(581)	(600)	(159)	(6210)	(7448)
32	30-3/4	30-3/4	70	70	70-5/8	34-1/4	29	52-1/2	9-5/8	-	22-7/8	23-5/8	6-1/4	15,560	18,670
(800)	(781)	(781)	(1778)	(1778)	(1794)	(870)	(737)	(1334)	(245)	-	(581)	(600)	(159)	(7058)	(8469)
34	32-3/4	32-3/4	76	76	76-5/8	35-3/8	30-7/8	55	9-5/8	-	22-7/8	23-5/8	6-1/4	19,040	22,830
(850)	(832)	(832)	(1930)	(1930)	(1946)	(899)	(784)	(1397)	(245)	-	(581)	(600)	(159)	(8636)	(10,356)
36	34-1/2	34-1/2	82	82	82-5/8	36-7/8	32-3/8	58-1/2	9-5/8	-	22-7/8	23-5/8	6-1/4	22,200	26,630
(900)	(876)	(876)	(2083)	(2083)	(2099)	(937)	(822)	(1486)	(245)	-	(581)	(600)	(159)	(10,070)	(12,079)
40	38-1/2	38-1/2	(1)	(1)	(1)	40-1/2	35-5/8	65-7/8	9-5/8	-	22-7/8	23-5/8	6-1/4	28,320	33,990
(1000)	(978)	(978)	(1)	(1)	(1)	(1029)	(905)	(1673)	(245)	-	(581)	(600)	(159)	(12,846)	(15,418)
42	40-1/4	40-1/4	(1)	(1)	(1)	42	38-1/8	69-1/2	9-5/8	-	25-5/8	47-1/4	6-5/8	33,390	40,070
(1050)	(1022)	(1022)	(1)	(1)	(1)	(1067)	(968)	(1765)	(245)	-	(651)	(1200)	(168)	(15,145)	(18,175)
46	44	44	(1)	(1)	(1)	46-1/8	42-1/2	76-3/4	9-5/8	-	25-5/8	47-1/4	6-5/8	40,600	48,720
(1150)	(1118)	(1118)	(1)	(1)	(1)	(1171)	(1080)	(1949)	(245)	-	(651)	(1200)	(168)	(18,416)	(22,099)
48	46	46	85-7/8	85-7/8	(1)	47-7/8	44-3/8	79-7/8	9-5/8	-	25-5/8	47-1/4	6-5/8	46,400	55,680
(1200)	(1168)	(1168)	(2181)	(2181)	(1)	(1216)	(1127)	(2029)	(245)	-	(651)	(1200)	(168)	(21,047)	(25,256)
56	54-1/2	54-1/2	(1)	(1)	(1)	54-3/8	50-3/8	92-5/8	11	-	-	-	-	71,050	85,250
(1400)	(1384)	(1384)	(1)	(1)	(1)	(1381)	(1280)	(2353)	(279)	-	-	-	-	(32,228)	(38,669)
60	57-1/2	57-1/2	(1)	(1)	(1)	58-1/8	55-1/8	99-3/8	11	-	-	-	-	87,010	104,400
(1500)	(1461)	(1461)	(1)	(1)	(1)	(1476)	(1400)	(2524)	(279)	-	-	-	-	(39,467)	(47,355)

(1) Upon request

Flanges in accordance with ASME B16.5

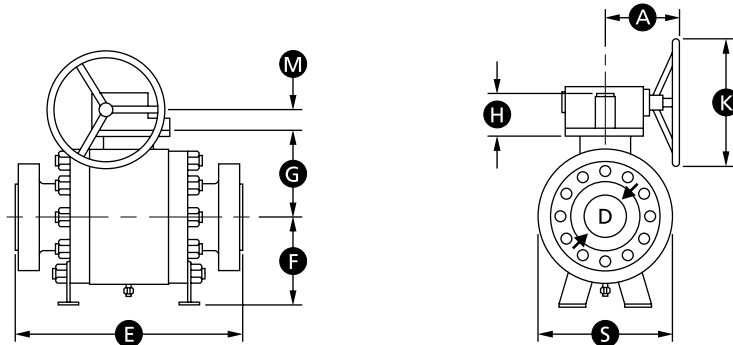
Shaded bore sizes (D) according to API 6D

Shaded end-to-end dimensions (E) according to API 6D

Butt welding ends according to ASME B16.25

DIMENSIONS AND WEIGHTS (CONT.)

ASME CLASS 900



ASME CLASS 900

SIZE	in.	D	E			F	G	S	H	L	A	K	M	WEIGHT	lb (kg)
	(mm)		WE	RF	RTJ									WE	RF/RTJ
6		6	24	24	24-1/8	9-7/8	9-1/2	13-1/4	3-3/4	-	11-1/2	13-3/4	3	720	850
	(150)	(152)	(610)	(610)	(613)	(251)	(241)	(337)	(95)	-	(292)	(349)	(76)	(327)	(386)
8		8	29	29	29-1/8	11-3/8	10-7/8	16-1/2	3-3/4	-	11-1/2	13-3/4	3	1190	1410
	(200)	(203)	(737)	(737)	(740)	(289)	(276)	(419)	(95)	-	(292)	(349)	(76)	(540)	(640)
10		10	33	33	33-1/8	13-5/8	12-1/2	20-1/8	4-1/2	-	11-1/2	13-3/4	3	1760	2110
	(250)	(254)	(838)	(838)	(841)	(346)	(318)	(511)	(114)	-	(292)	(349)	(76)	(798)	(957)
12		12	38	38	38-1/8	15-3/8	14-3/8	23-5/8	4-1/2	-	11-1/2	13-3/4	3	2440	2930
	(300)	(305)	(965)	(965)	(968)	(391)	(365)	(600)	(114)	-	(292)	(349)	(67)	(1107)	(1329)
14		12-3/4	40-1/2	40-1/2	40-7/8	17-3/4	15-3/8	26-3/4	4-1/2	-	15-3/4	23-5/8	4-3/8	3020	3610
	(350)	(324)	(1029)	(1029)	(1038)	(451)	(391)	(679)	(114)	-	(400)	(600)	(111)	(1370)	(1637)
16		14-3/4	44-1/2	44-1/2	44-7/8	19-5/8	16-7/8	30-3/8	7-1/8	-	21-5/8	31-1/2	4-3/8	3630	4360
	(400)	(375)	(1130)	(1130)	(1140)	(499)	(429)	(772)	(181)	-	(549)	(800)	(111)	(1647)	(1978)
18		16-3/4	48	48	48-1/2	21-5/8	19-1/8	33-1/2	7-1/8	-	21-5/8	31-1/2	5-3/8	5090	6100
	(450)	(425)	(1219)	(1219)	(1232)	(549)	(486)	(851)	(181)	-	(549)	(800)	(137)	(2309)	(2767)
20		18-5/8	52	52	52-1/2	23-1/4	20-7/8	36-1/4	8-1/8	-	21-3/4	23-5/8	6-1/4	6870	8240
	(500)	(473)	(1321)	(1321)	(1334)	(591)	(530)	(921)	(206)	-	(552)	(600)	(159)	(3116)	(3738)
22		20-5/8	(1)	(1)	(1)	25-3/4	21-7/8	40-1/2	8-1/8	-	22-7/8	23-5/8	6-1/4	8530	10,220
	(550)	(524)				(654)	(556)	(1029)	(206)		(581)	(600)	(159)	(3869)	(4636)
24		22-1/2	61	61	61-3/4	27-1/2	24-3/8	43-3/4	9-5/8	-	22-7/8	23-5/8	6-1/4	10,220	12,250
	(600)	(572)	(1549)	(1549)	(1568)	(699)	(619)	(1111)	(245)		(581)	(600)	(159)	(4636)	(5557)
26		24-3/8	(1)	(1)	(1)	29-7/8	26-1/4	47-1/4	9-5/8	-	22-7/8	23-5/8	6-1/4	12,960	15,540
	(650)	(619)				(759)	(667)	(1200)	(245)		(581)	(600)	(159)	(5879)	(7049)
28		26-1/4	(1)	(1)	(1)	31-7/8	27-7/8	50-3/4	9-5/8	-	22-7/8	23-5/8	6-1/4	14,830	17,790
	(700)	(667)				(810)	(708)	(1289)	(245)		(581)	(600)	(159)	(6727)	(8069)
30		28-1/8	(1)	(1)	(1)	32-3/4	29-5/8	53-3/8	9-5/8	-	22-7/8	23-5/8	6-1/4	17,790	21,340
	(750)	(715)				(832)	(753)	(1356)	(245)		(581)	(600)	(159)	(8069)	(9680)
32		30	(1)	(1)	(1)	35-7/8	31-7/8	57-1/2	9-5/8	-	22-7/8	23-5/8	6-1/4	20,210	24,250
	(800)	(762)				(911)	(810)	(1461)	(245)		(581)	(600)	(159)	(9167)	(11,000)
34		31-7/8	(1)	(1)	(1)	37-3/4	33-3/8	61	9-5/8	-	22-7/8	23-5/8	6-1/4	24,750	29,690
	(850)	(810)				(959)	(848)	(1549)	(245)		(581)	(600)	(159)	(11,226)	(13,467)
36		33-3/4	(1)	(1)	(1)	40-1/8	34-3/4	64-3/8	11	-	22-7/8	23-5/8	6-1/4	28,850	34,610
	(900)	(857)				(1019)	(883)	(1635)	(279)		(581)	(600)	(159)	(13,086)	(15,699)
40		37-5/8	(1)	(1)	(1)	44-1/8	38-1/4	71-1/4	11	-	22-7/8	23-5/8	6-1/4	36,810	44,170
	(1000)	(956)				(1121)	(972)	(1810)	(279)		(581)	(600)	(159)	(16,697)	(20,035)
42		39-5/8	(1)	(1)	(1)	47-1/4	41-3/4	74-3/4	11	-	22-7/8	23-5/8	6-1/4	43,400	52,070
	(1050)	(1007)				(1200)	(1060)	(1888)	(279)		(581)	(600)	(159)	(19,686)	(23,619)
46		43-3/8	(1)	(1)	(1)	50-3/8	43-3/4	81-1/2	11	-	22-7/8	23-5/8	6-1/4	52,770	63,310
	(1150)	(1102)				(1280)	(1111)	(2070)	(279)		(581)	(600)	(159)	(23,936)	(28,717)
48		45-1/4	(1)	(1)	(1)	52-3/8	45-1/4	85	11	-	25-5/8	47-1/4	6-5/8	60,310	72,370
	(1200)	(1149)				(1330)	(1149)	(2159)	(279)		(651)	(1200)	(168)	(27,356)	(32,826)

(1) Upon request

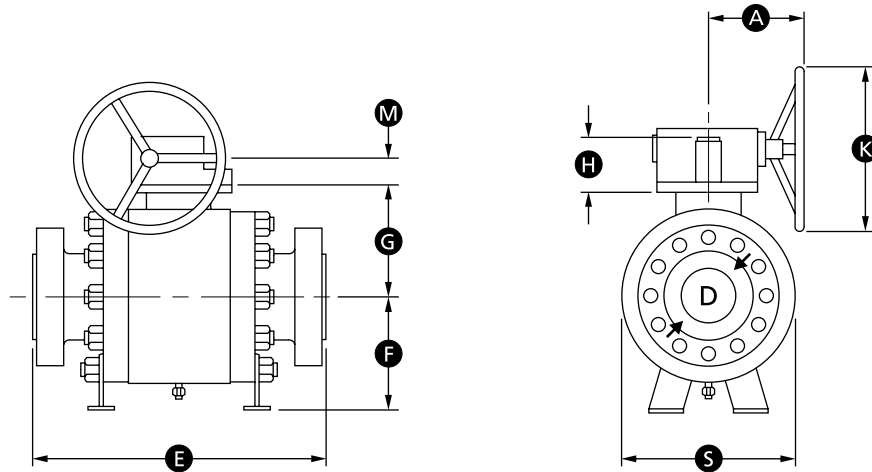
Shaded bore sizes (D) according to API 6D

Shaded end-to-end dimensions (E) according to API 6D

Flanges in accordance with ASME B16.5

Butt welding ends according to ASME B16.25

ASME CLASS 1500



ASME CLASS 1500

SIZE	in.	D	E			F	G	S	H	L	A	K	M	WEIGHT	lb (kg)
	(mm)		WE	RF	RTJ									WE	RF/RTJ
6		5-3/4	27-3/4	27-3/4	28	12-5/8	11	16-7/8	3-3/4	-	11-1/2	13-3/4	3	850	1010
(150)		(146)	(705)	(705)	(711)	(321)	(279)	(429)	(95)	-	(292)	(349)	(76)	(386)	(458)
8		7-5/8	32-3/4	32-3/4	33-1/8	14-5/8	12-7/8	21-1/8	4-1/2	-	11-1/2	13-3/4	3	1410	1670
(200)		(194)	(832)	(832)	(841)	(372)	(327)	(537)	(114)	-	(292)	(349)	(76)	(640)	(757)
10		9-1/2	39	39	39-3/8	17-3/8	15-3/8	25-3/4	4-1/2	-	11-1/2	13-3/4	3	2110	2530
(250)		(241)	(991)	(991)	(1000)	(441)	(391)	(654)	(114)	-	(292)	(349)	(76)	(957)	(1148)
12		11-3/8	44-1/2	44-1/2	45-1/8	19-5/8	16-5/8	30-1/4	4-1/2	-	11-1/2	13-3/4	3	2930	3500
(300)		(289)	(1130)	(1130)	(1146)	(499)	(422)	(768)	(114)	-	(292)	(349)	(67)	(1329)	(1610)
14		12-1/2	49-1/2	49-1/2	50-1/4	22-5/8	19-5/8	34-1/4	7-1/8	-	15-3/4	23-5/8	4-3/8	3610	4320
(350)		(318)	(1257)	(1257)	(1276)	(575)	(499)	(870)	(181)	-	(400)	(600)	(111)	(1637)	(1960)
16		14-1/4	54-1/2	54-1/2	55-3/8	25-1/4	22	38-3/4	7-1/8	-	21-5/8	31-1/2	4-3/8	4360	5220
(400)		(362)	(1384)	(1384)	(1407)	(641)	(559)	(984)	(181)	-	(549)	(800)	(111)	(1978)	(2368)
18		16-1/4	(1)	(1)	(1)	27-3/4	23-1/4	42-7/8	8-1/8	-	21-5/8	31-1/2	4-3/8	6100	7310
(450)		(413)	(1)	(1)	(1)	(705)	(591)	(1089)	(206)	-	(549)	(800)	(111)	(2767)	(3316)
20		18	(1)	(1)	(1)	29-7/8	28-1/2	46-3/8	9-5/8	-	21-3/4	23-5/8	5-3/8	8240	9870
(500)		(457)	(1)	(1)	(1)	(759)	(724)	(1178)	(245)	-	(552)	(600)	(137)	(3738)	(4477)
22		19-3/4	(1)	(1)	(1)	33	30-1/4	51-7/8	9-5/8	-	22-7/8	23-5/8	6-1/4	10,220	12,250
(550)		(502)	(1)	(1)	(1)	(838)	(768)	(1318)	(245)	-	(581)	(600)	(159)	(4636)	(5557)
24		21-5/8	(1)	(1)	(1)	35-1/8	32	55-7/8	9-5/8	-	22-7/8	23-5/8	6-1/4	12,250	14,700
(600)		(549)	(1)	(1)	(1)	(892)	(813)	(1419)	(245)	-	(581)	(600)	(159)	(5557)	(6668)
26		23-1/2	(1)	(1)	(1)	38-1/4	35-1/2	60-1/2	11	-	-	-	-	15,540	18,650
(650)		(597)	(1)	(1)	(1)	(972)	(902)	(1537)	(279)	-	-	-	-	(7049)	(8459)
28		25-1/4	(1)	(1)	(1)	40-7/8	37	65	11	-	-	-	-	17,790	21,340
(700)		(641)	(1)	(1)	(1)	(1038)	(940)	(1651)	(279)	-	-	-	-	(8069)	(9680)
30		27	(1)	(1)	(1)	42	40-3/4	68-3/8	11	-	-	-	-	21,340	25,590
(750)		(686)	(1)	(1)	(1)	(1067)	(1035)	(1737)	(279)	-	-	-	-	(9680)	(11,607)
32		28-3/4	(1)	(1)	(1)	45-7/8	41-3/4	73-5/8	11	-	-	-	-	24,250	29,100
(800)		(730)	(1)	(1)	(1)	(1165)	(1060)	(1870)	(279)	-	-	-	-	(11,000)	(31,200)
34		30-1/2	(1)	(1)	(1)	48-3/8	44-7/8	78-1/8	11	-	-	-	-	29,690	35,620
(850)		(775)	(1)	(1)	(1)	(1229)	(1137)	(1984)	(279)	-	-	-	-	(13,467)	(16,157)
36		32-1/4	(1)	(1)	(1)	51-3/8	46-1/2	82-3/8	11	-	-	-	-	34,610	41,530
(900)		(819)	(1)	(1)	(1)	(1305)	(1181)	(2092)	(279)	-	-	-	-	(15,699)	(18,838)

(1) Upon request

Shaded bore sizes (D) according to API 6D

Shaded end-to-end dimensions (E) according to API 6D

Flanges in accordance with ASME B16.5

Butt welding ends according to ASME B16.25

3250 Briarpark Drive, Suite 300

Houston, TX 77042

USA

Tel 1 281 499 8511

For more information on GROVE ball valves:

www.c-a-m.com/GROVE

GROVE@c-a-m.com



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.