

# AVCO

*Alloy Valves and Control*

## BALL VALVES 1900 SERIES



### Size

1/4" - 4" (Full Port)  
2000 WOG

### End Connections

NPT  
Butt Weld  
Socket Weld  
Flanged (150#, 300#, 600#)

### Valve Materials

316 Stainless Steel  
Carbon Steel  
Hastelloy C  
Monel

### Ball and Stem Materials

316 Stainless Steel  
Hastelloy B & C  
Monel 400  
Alloy 20

### Seat Materials

Teflon (PTFE)  
25% Carbon Filled Teflon  
15% Glass Filled Teflon  
Kel-F (PCTFE)  
PEEK  
UHMWPE  
Metals

### Service Applications

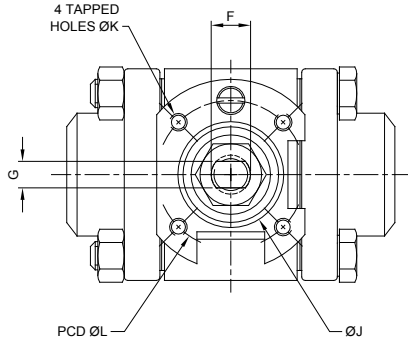
Chemical  
Dry/Liquid Chlorine  
Food Processing  
Hydraulic  
Oxygen  
Steam  
Thermal Fluids  
Vacuum  
Water/Oil/Gas

### Applicable Standards

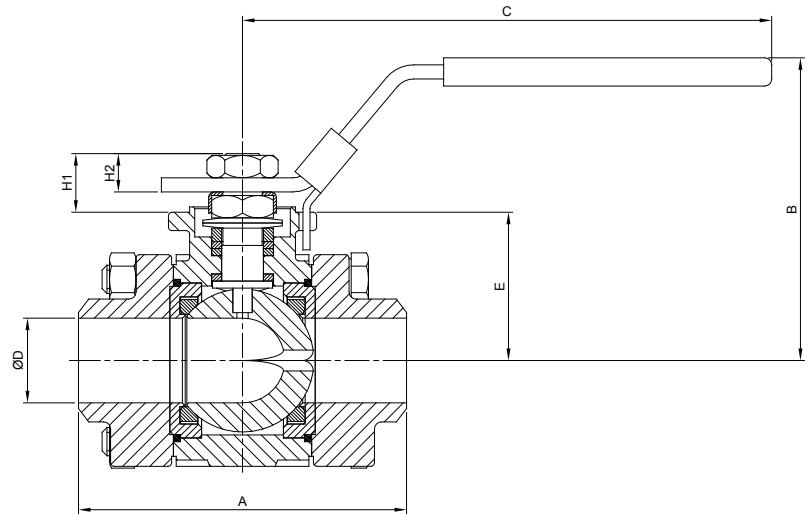
ASME B16.34  
API 598  
API 607 4th Edition

### Alloy Valves and Control

#### 1/4" THRU 2"

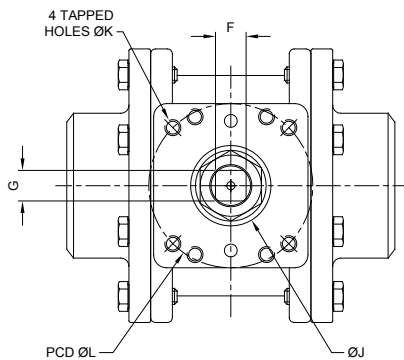


Plan View with Handle Removed

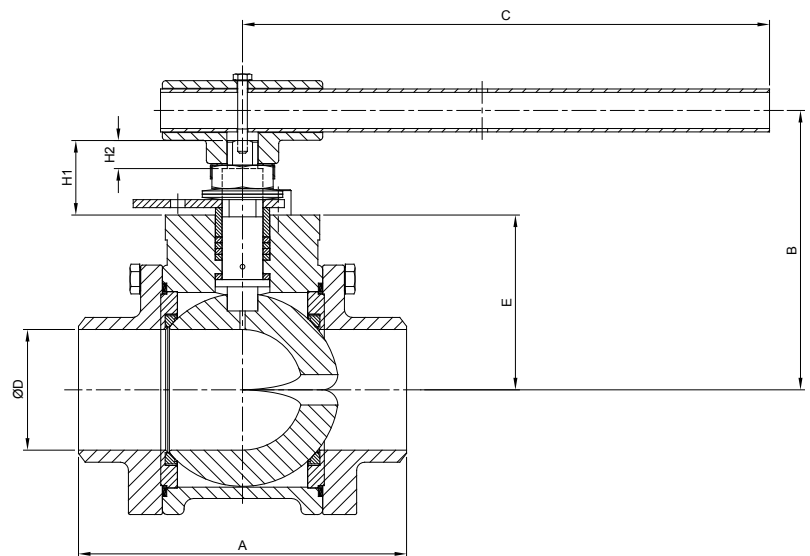


SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)	TORQUE (in-lbs)
1/4"	2.61	2.48	4.53	0.36	1.24	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2	65
3/8"	2.61	2.48	4.53	0.49	1.24	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2	65
1/2"	2.97	2.48	4.53	0.59	1.24	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2	65
3/4"	3.17	2.56	4.53	0.75	1.32	0.38	0.22	0.52	0.29	0.98	M5	1.42	F04	2.5	80
1"	3.67	3.38	5.91	0.95	1.65	0.44	0.30	0.65	0.43	1.18	M5	1.65	F04	4	120
1 1/4"	4.37	3.50	5.91	1.18	1.82	0.44	0.30	0.67	0.47	1.18	M5	1.65	F04	6	235
1 1/2"	4.72	3.92	6.85	1.50	1.90	0.57	0.34	1.14	0.60	1.38	M6	1.97	F05	8	290
2"	5.53	4.25	6.85	1.97	2.22	0.57	0.34	1.14	0.60	1.38	M6	1.97	F05	14	450

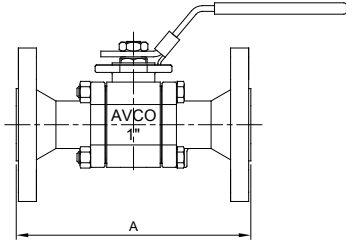
#### 2 1/2" THRU 4"



Plan View with Handle Removed



SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)	TORQUE (in-lbs)
2 1/2"	7.27	5.28	8.84	2.52	3.25	0.79	0.55	1.65	0.72	1.58	M8	2.76	F07	22	685
3"	8.02	6.84	13.74	2.95	4.28	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	35	1200
4"	9.46	7.37	13.74	3.78	4.81	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	55	2000



### Standard Flanged Ends (150#, 300#, 600#)

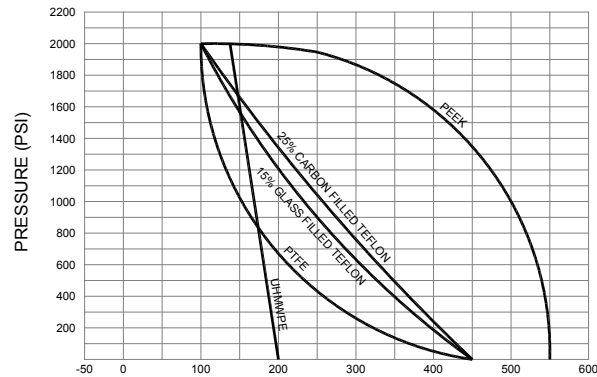
SIZE	A (in.)		
	150#	300#	600#
1/2"	5.50	5.50	6.50
3/4"	6.00	6.00	7.50
1"	6.50	6.50	8.50
1 1/4"	7.00	7.00	9.00
1 1/2"	7.50	7.50	9.50
2"	8.50	8.50	11.50
2 1/2"	9.50	9.50	13.00
3"	11.12	11.12	14.00
4"	12.00	12.00	17.00

See tables on pages 2 & 3 for all other dimensions

### Note

Please contact AVCO if you require flanged ends to be other than standard raised face.

### Pressure/Temperature Rating

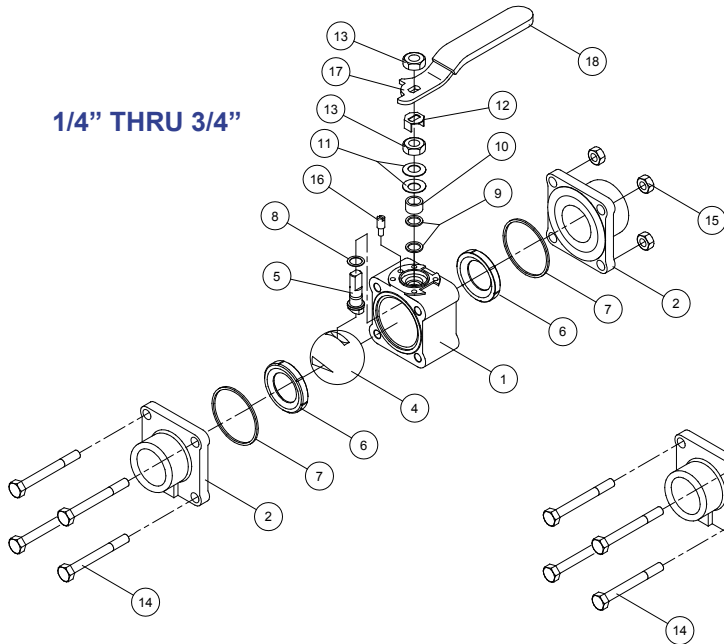


### Notes

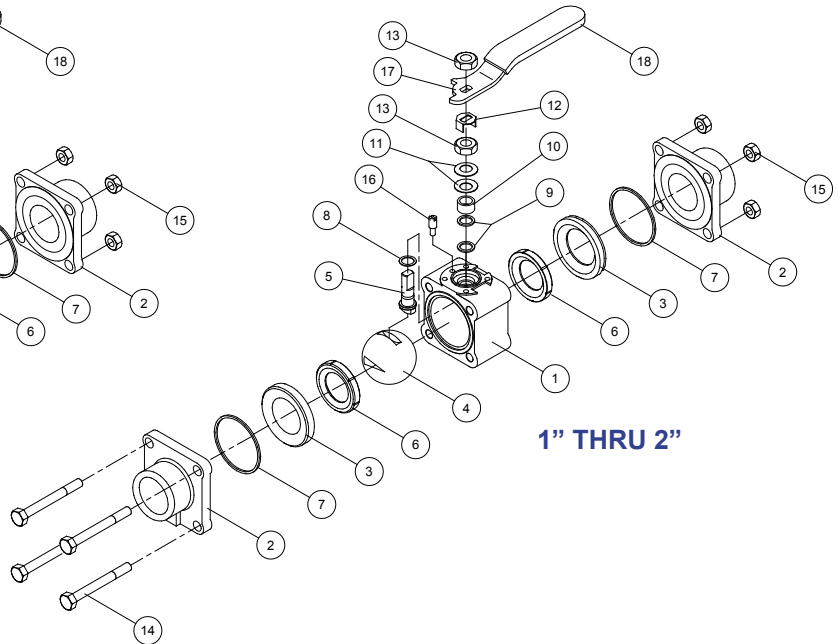
Please contact AVCO if you require customized versions of our valves. CAD drawings are available for most variations, including actuators etc.

### Alloy Valves and Control

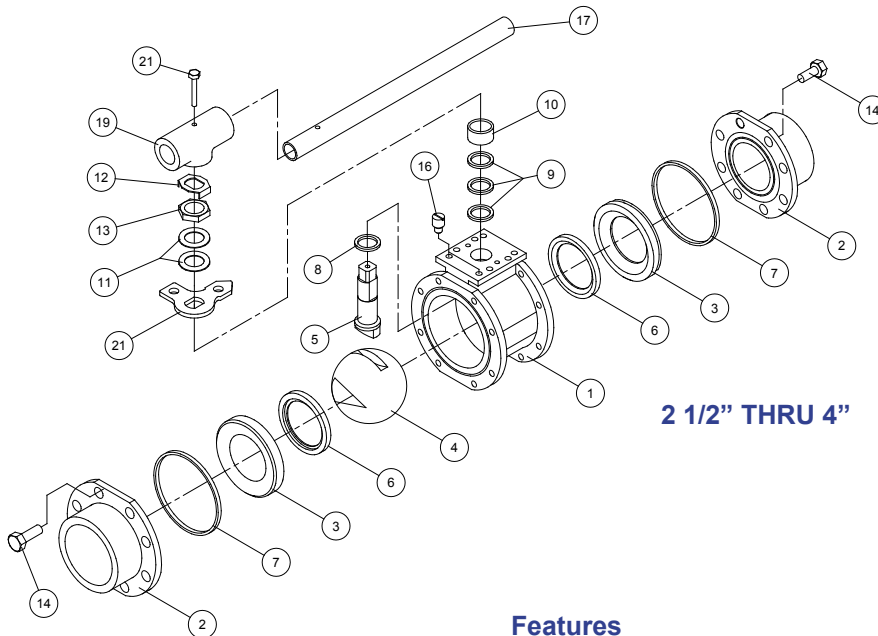
1/4" THRU 3/4"



1" THRU 2"



2 1/2" THRU 4"



#### Features

- ANSI Class 150#, 300# & 600#
- 2000 WOG
- Encapsulated Seats, Seals & Body Bolts
- Spring Loaded Stem Packing
- Bottom Entry Stem to Prevent Blow-Out
- ISO 5211 Mounting Pad
- Locking Handle
- Inter-Changeable End Connections

Item	Parts
1	Body
2	End Cap
3	Retainer
4	Ball
5	Stem
6	Ball Seat
7	Body Seal
8	Thrust Washer
9	Packing
10	Gland Ring
11	Disc Spring
12	Lock Tab
13	Stem Nut
14	Body Bolt
15	Body Nut
16	Stop Pin
17	Handle
18	Handle Sleeve
19	Wrench Block
20	Handle Bolt
21	Lock Pad

### 15° Vee Port - Cv Table

SIZE	PERCENTAGE OPEN								
	20	30	40	50	60	70	80	90	100
1/4"	N/A	0.01	0.03	0.10	0.22	0.40	0.62	0.90	1.23
3/8"	N/A	0.01	0.03	0.10	0.22	0.40	0.62	0.90	1.23
1/2"	N/A	0.01	0.03	0.10	0.22	0.40	0.62	0.90	1.23
3/4"	N/A	0.02	0.10	0.24	0.44	0.72	1.06	1.46	1.91
1"	N/A	0.03	0.16	0.38	0.70	1.13	1.68	2.31	3.02
1 1/4"	N/A	0.04	0.27	0.62	1.12	1.79	2.62	3.57	4.63
1 1/2"	N/A	0.16	0.50	1.07	1.90	2.99	4.32	5.87	7.57
2"	N/A	0.43	1.12	2.18	3.65	5.53	7.79	10.36	13.14
2 1/2"	N/A	0.84	2.02	3.80	6.23	9.29	12.92	17.02	21.39
3"	N/A	0.76	2.18	4.49	7.75	11.97	17.12	23.05	29.53
4"	N/A	1.89	4.53	8.53	13.97	20.82	28.96	38.10	47.88

Cv values below 20% open and marked N/A are negligible and not recommended.

### 30° Vee Port - Cv Table

SIZE	PERCENTAGE OPEN								
	20	30	40	50	60	70	80	90	100
1/4"	N/A	0.01	0.06	0.21	0.46	0.83	1.35	2.04	2.93
3/8"	N/A	0.01	0.06	0.21	0.46	0.83	1.35	2.04	2.93
1/2"	N/A	0.01	0.06	0.21	0.46	0.83	1.35	2.04	2.93
3/4"	N/A	0.05	0.21	0.49	0.92	1.51	2.29	3.26	4.42
1"	N/A	0.08	0.33	0.77	1.45	2.38	3.60	5.12	6.92
1 1/4"	N/A	0.15	0.55	1.26	2.31	3.74	5.56	7.77	10.34
1 1/2"	N/A	0.32	1.02	2.20	3.94	6.30	9.33	13.03	17.40
2"	0.17	0.88	2.28	4.49	7.61	11.73	16.93	23.18	30.43
2 1/2"	0.41	1.71	4.11	7.81	12.96	19.67	27.99	37.90	49.24
3"	N/A	1.54	4.44	9.21	16.10	25.35	37.12	51.52	68.46
4"	0.92	3.83	9.23	17.53	29.04	44.02	62.56	84.54	109.57

Cv values below 20% open and marked N/A are negligible and not recommended.

### 45° Vee Port - Cv Table

SIZE	PERCENTAGE OPEN								
	20	30	40	50	60	70	80	90	100
1/4"	N/A	0.02	0.10	0.32	0.71	1.32	2.21	3.52	5.52
3/8"	N/A	0.02	0.10	0.32	0.71	1.32	2.21	3.52	5.52
1/2"	N/A	0.02	0.10	0.32	0.71	1.32	2.21	3.52	5.52
3/4"	N/A	0.08	0.32	0.75	1.43	2.39	3.70	5.47	7.83
1"	N/A	0.12	0.50	1.19	2.25	3.76	5.81	8.53	12.10
1 1/4"	N/A	0.23	0.84	1.93	3.57	5.85	8.85	12.68	17.45
1 1/2"	N/A	0.49	1.56	3.40	6.14	9.97	15.10	21.85	30.62
2"	0.26	1.36	3.50	6.94	11.89	18.66	27.63	39.30	54.28
2 1/2"	0.63	2.62	6.32	12.07	20.24	31.25	45.59	63.88	86.84
3"	N/A	2.36	6.83	14.22	25.13	40.24	60.53	87.31	122.34
4"	1.41	5.89	14.19	27.07	45.29	69.77	101.53	141.78	191.75

Cv values below 20% open and marked N/A are negligible and not recommended.

### 60° Vee Port - Cv Table

SIZE	PERCENTAGE OPEN								
	20	30	40	50	60	70	80	90	100
1/4"	N/A	0.03	0.13	0.44	0.99	1.86	3.24	5.53	9.93
3/8"	N/A	0.03	0.13	0.44	0.99	1.86	3.24	5.53	9.93
1/2"	N/A	0.03	0.13	0.44	0.99	1.86	3.24	5.53	9.93
3/4"	N/A	0.11	0.44	1.03	1.98	3.36	5.36	8.27	12.74
1"	N/A	0.17	0.69	1.63	3.11	5.27	8.34	12.74	19.27
1 1/4"	N/A	0.32	1.16	2.65	4.91	8.12	12.50	18.40	26.37
1 1/2"	N/A	0.67	2.14	4.67	8.50	14.01	21.80	32.92	49.32
2"	0.36	1.86	4.81	9.55	16.54	26.42	40.29	60.08	89.17
2 1/2"	0.87	3.60	8.67	16.63	28.13	44.16	66.23	96.92	140.28
3"	0.41	3.25	9.37	19.58	34.88	56.88	88.14	133.45	201.90
4"	1.95	8.09	19.47	37.22	62.86	98.40	146.92	213.52	306.23

Cv values below 20% open and marked N/A are negligible and not recommended.

### 90° Vee Port - Cv Table

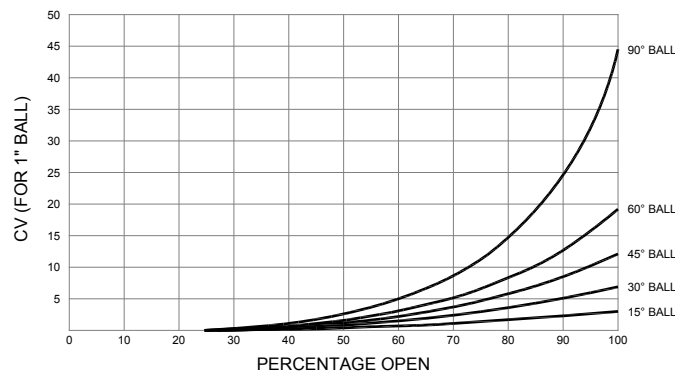
SIZE	PERCENTAGE OPEN								
	20	30	40	50	60	70	80	90	100
1/4"	N/A	0.04	0.22	0.71	1.57	2.95	5.23	9.43	19.04
3/8"	N/A	0.04	0.22	0.71	1.57	2.95	5.23	9.43	19.04
1/2"	N/A	0.04	0.22	0.71	1.57	2.95	5.23	9.43	19.04
3/4"	N/A	0.19	0.71	1.67	3.21	5.61	9.51	16.55	32.07
1"	N/A	0.30	1.12	2.63	5.03	8.72	14.55	24.57	44.53
1 1/4"	N/A	0.52	1.87	4.24	7.86	13.15	20.90	32.60	51.14
1 1/2"	N/A	1.10	3.47	7.52	13.81	23.41	38.66	65.10	118.69
2"	0.61	3.05	7.78	15.44	27.11	44.90	73.54	124.50	233.32
2 1/2"	1.45	5.89	14.06	27.04	46.66	76.59	124.94	211.29	398.80
3"	0.70	5.34	15.19	31.63	57.08	96.35	160.37	276.68	537.12
4"	3.25	13.20	31.39	59.96	102.46	165.40	262.05	421.05	711.22

Cv values below 20% open and marked N/A are negligible and not recommended.

### How to use tables

- Calculate required maximum and minimum Cv using appropriate formulas for gas or liquid (AVCO can provide assistance if required).
- Select a valve size based upon the maximum Cv whilst ensuring the percentage open is less than 90 percent.
- Check that the minimum Cv is greater than the figure for 30 percent open.
- If the values fall between these criteria then the valve should be suitable for the application.
- Please check with AVCO if further help or confirmation is required.

### Typical Ball Characteristics





### Electric Actuator

120 VAC  
12/24 VDC  
NEMA 4/7  
Positioners 4-20 mA  
Reversing  
Telemetry  
Battery Back-up  
Spring Return



### Pneumatic Actuator

Double Acting  
Spring Return  
Solenoid Valves  
Limit Switches  
Positioners 3-15 psi  
Positioners 4-20 mA  
Intelligent Positioner  
Decutchable Manual Override



### Manual Valves

Oval Handle  
Spring Return  
Fusible Link  
Lock Device  
Gear Operators

## HOW TO ORDER

1"	19	3	3	T	T	SE	BAV60
Size	Series	Body & End Material	Ball & Stem Material	Seat Material	Seal Material	End Style	Options
1/4"	1900 Series 3 Piece Vee Port Ball Valve	1 - Carbon Steel	2 - Alloy 20	T - Teflon (PTFE)	T - Teflon (PTFE)	SE - NPT	BAV15 - 15° Vee Port
3/8"		1L - Low Grade Carbon	3 - 316 SS	R - 15% Glass PTFE	C - 25% Carbon PTFE	SW - Socket Weld	BAV30 - 30° Vee Port
1/2"		2 - Alloy 20	4 - Monel 400	C - 25% Carbon PTFE	G - Graphoil	BW - Butt Weld	BAV45 - 45° Vee Port
3/4"		3 - 316 SS	5 - Hastelloy B	P - PEEK	B - BUNA N	GR - Grooved	BAV60 - 60° Vee Port
1"		4 - Monel 400	6 - Hastelloy C	U - UHMWPE	E - EPDM	FBT - Flush Bottom Tank	BAV90 - 90° Vee Port
1 1/4"		5 - Hastelloy B	7 - Inconel 625	K - Kel-F (PCTFE)	V - Viton	BSP - British Standard Pipe	BAVT - Vented Balls
1 1/2"		6 - Hastelloy C	8 - Titanium	B - Bronze	N - Neoprene	AN - Army Navy	BAHL - Hardened Ball
2"		7 - Inconel 625	9 - Aluminum	S - Stellite		150 - 150# Flange	BNIE - Emissions Bonnet
2 1/2"		8 - Titanium		I - Inconel		300 - 300# Flange	FS - Fire Safe
3"		9 - Aluminum				600 - 600# Flange	O2CB - O2 Clean/Bagged
4"							
						Variations of the above or special ends can be supplied upon request	Customized Ports are available upon request

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