



77CLF-100 Series

Lead-Free* Bronze Full Port Ball Valve (Threaded)

Threaded, 600 psig CWP, 150 psig SWP. (See referenced P/T chart)
 Vacuum Service to 29 inches Hg.
 MSS SP-110; Ball Valves
 ANS/NSF 61-8 (Mechanical Devices) -Pending
 CRN: OC10908.5C

* LEAD FREE: The wetted surfaces of this product shall contain no more than 0.25% lead by weighted average. Complies with CA AB1953, VT Act 193, MD HB372, LA HB471 and Federal Public Law 111-380.

FEATURES



- Lead-Free Brass & Bronze Materials
- Multi-Fill PTFE Seats & Seals
- Blow-out Proof Stem Design
- Adjustable stem packing
- Full Port "Solid Ball" Design
- 100% Factory Tested

STANDARD MATERIAL LIST

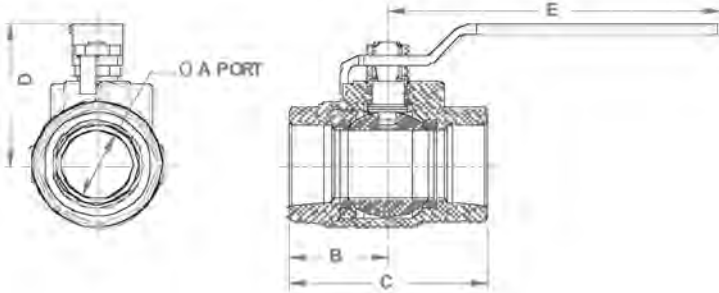
1. Packing	MPTFE	6. Retainer	C69430 Lead-Free*
2. Seat	MPTFE		Silicone Brz (1/4"-1/2")
3. Stem	C27450 Lead-Free* Brass		C89836 Lead-Free*
4. Ball	C27450 Lead-Free* Brass Cr. Plated		Bronze (3/4"-2")
		7. Body	C89836 Lead Free* Brz
		8. Handle	Zinc Plated Steel/Vinyl

VARIATIONS AVAILABLE:

77CLF-140 Series (316 SS Ball & Stem)

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-04-	2-1/4" CS Stem Extension	1/4" to 2"
-07-	Steel Tee Handle	1/4" to 2"
-10-	S.S. Handle and Nut	1/4" to 2"
-11-	Therma-Seal™ Insulating Tee Handle	1/4" to 2"
-27-	Locking Handle	1/4" to 2"
-47-	Oval Locking Handle	1/4" to 2"
-92-	Balancing Stop	1/4" to 2"
-94-	2-1/4" Stem Ext. & Balancing Stop	1/4" to 2"
-A3-	Plain Grip	1/4" to 2"



**For Pressure/Temperature Ratings,
Refer to Page M-8, Graph No. 4**

BRONZE LEAD-FREE* FULL PORT BALL VALVE

NUMBER	SIZE	A	B	C	D	E	F	G	Cv	Wt.**
77CLF-101-01	1/4	0.37	0.95	1.97	1.76	3.74	-	-	4.5	0.6
77CLF-102-01	3/8	0.37	1.07	2.09	1.76	3.74	-	-	7.2	0.6
77CLF-103-01	1/2	0.50	1.15	2.25	1.79	3.74	-	-	15.5	0.6
77CLF-104-01	3/4	0.75	1.32	2.65	2.00	4.88	-	-	35.6	1.1
77CLF-105-01	1	1.00	1.53	3.07	2.19	4.88	-	-	68.1	1.8
77CFL-106-01	1-1/4	1.25	2.04	4.08	3.13	7.06	-	-	125.0	4.4
77CLF-107-01	1-1/2	1.50	2.12	4.43	3.29	7.06	-	-	177.0	4.6
77CLF-108-01	2	2.00	2.43	4.85	3.83	7.06	-	-	389.0	7.9
77CLF-109-01	2-1/2	2.50	3.12	6.37	4.51	8.06	-	-	503.0	16.2

**Weights are based on standard configuration.



77CLF-200 Series

Lead-Free* Bronze Full Port Ball Valve (Solder)

Solder, 600 psig CWP, 150 psig SWP. (See referenced P/T chart)
 Vacuum Service to 29 inches Hg.
 MSS SP-110; Ball Valves
 ANSI/NSF 61-8 (Mechanical Devices) -Pending
 CRN: OC10908.5C

* LEAD FREE: The wetted surfaces of this product shall contain no more than 0.25% lead by weighted average. Complies with CA AB1953, VT Act 193, MD HB372, LA HB471 and Federal Public Law 111-380.

FEATURES



- Lead-Free Brass & Bronze Materials
- Multi-Fill PTFE Seats & Seals
- Blow-out Proof Stem Design
- Adjustable stem packing
- Full Port "Solid Ball" Design
- 100% Factory Tested

STANDARD MATERIAL LIST

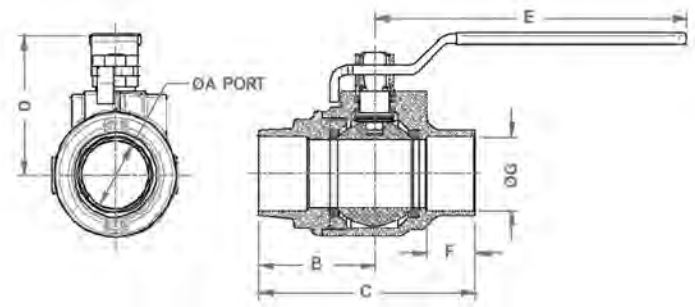
1. Packing	MPTFE	6. Retainer	C69430 (3/8"-1/2")
2. Seat	MPTFE	7. Body	UNS C89836 (3/4"-2-1/2")
3. Stem	C27450 Lead-Free* Brass	8. Handle	UNS C89836
4. Ball	C27450 Lead-Free* Brass Cr. Plated		Zinc Plated Steel/Vinyl

VARIATIONS AVAILABLE:

77CLF-240 Series (316 SS Ball & Stem)

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-04-	2-1/4" CS Stem Extension	3/8" to 2-1/2"
-07-	Steel Tee Handle	3/8" to 2-1/2"
-10-	S.S. Handle and Nut	3/8" to 2-1/2"
-11-	Therma-Seal™ Insulating Tee Handle	3/8" to 2-1/2"
-27-	Locking Handle	3/8" to 2-1/2"
-47-	Oval Locking Handle	3/8" to 2-1/2"
-92-	Balancing Stop	3/8" to 2-1/2"
-94-	2-1/4" Stem Ext. & Balancing Stop	3/8" to 2-1/2"
-A3-	Plain Grip	3/8" to 2-1/2"



**For Pressure/Temperature Ratings,
Refer to Page M-8, Graph No. 4**

BRONZE FULL PORT BALL VALVE

NUMBER	SIZE	A	B	C	D	E	F	G	Cv	Wt.**
77CLF-202-01	3/8	0.37	1.30	2.21	1.76	3.74	0.41	0.50	7.2	0.6
77CLF-203-01	1/2	0.50	1.41	2.56	1.76	3.74	0.50	0.63	15.5	0.6
77CLF-204-01	3/4	0.75	1.64	3.03	2.00	4.88	0.75	0.88	35.6	1.1
77CLF-205-01	1	1.00	1.92	3.61	2.19	4.88	0.90	1.13	68.1	1.8
77CFL-206-01	1-1/4	1.25	2.36	4.44	3.13	7.06	0.97	1.38	125.0	4.4
77CLF-207-01	1-1/2	1.50	2.63	4.89	3.29	7.06	1.09	1.63	177.0	4.6
77CLF-208-01	2	2.00	3.17	6.06	3.83	7.06	1.34	2.13	389.0	7.9
77CLF-209-01	2-1/2	2.50	3.77	7.14	4.51	8.06	1.43	2.63	503.0	15.9

**Weights are based on standard configuration.

FLOW DATA

For Apollo® Ball Valves

The listed Cv "factors" are derived from actual flow testing, in the Apollo® Ball Valve Division, Conbraco Industries, Inc., Pageland, South Carolina. These tests were completed using standard "off the shelf" valves with no special preparation and utilizing standard schedule 40 pipe. It should be understood that these factors are for the valve only and also include the connection configuration. The flow testing is done utilizing water as a fluid media and is a direct statement of the gallons of water flowed per minute with a 1 psig pressure differential across the valve/connection unit. Line pressure is not a factor. Because the Cv is a factor, the formula can be used to estimate flow of most media for valve sizing.

Flow of Liquid

$$Q = Cv \sqrt{\frac{\Delta P}{SpGr}}$$

$$\text{or } \Delta P = \frac{(Q)^2 (SpGr)}{(Cv)^2}$$

Where:

Q = flow in US gpm
 ΔP = pressure drop (psig)
 SpGr = specific gravity at flowing temperature
 Cv = valve constant

Flow of Gas

$$Q = 1360 Cv \sqrt{\frac{(\Delta P) (P_1)}{(SpGr) (T)}}$$

$$\text{or } \Delta P = \frac{5.4 \times 10^{-7} (SpGr) (T) (Q)^2}{(Cv)^2 (P_2)}$$

Where:

Q = flow in SCFH
 ΔP = pressure drop (psig)
 SpGr = specific gravity (based on air = 1.0)
 P₂ = outlet pressure—psia (psig + 14.7)
 T = (temp. °F + 460)
 Cv = valve constant

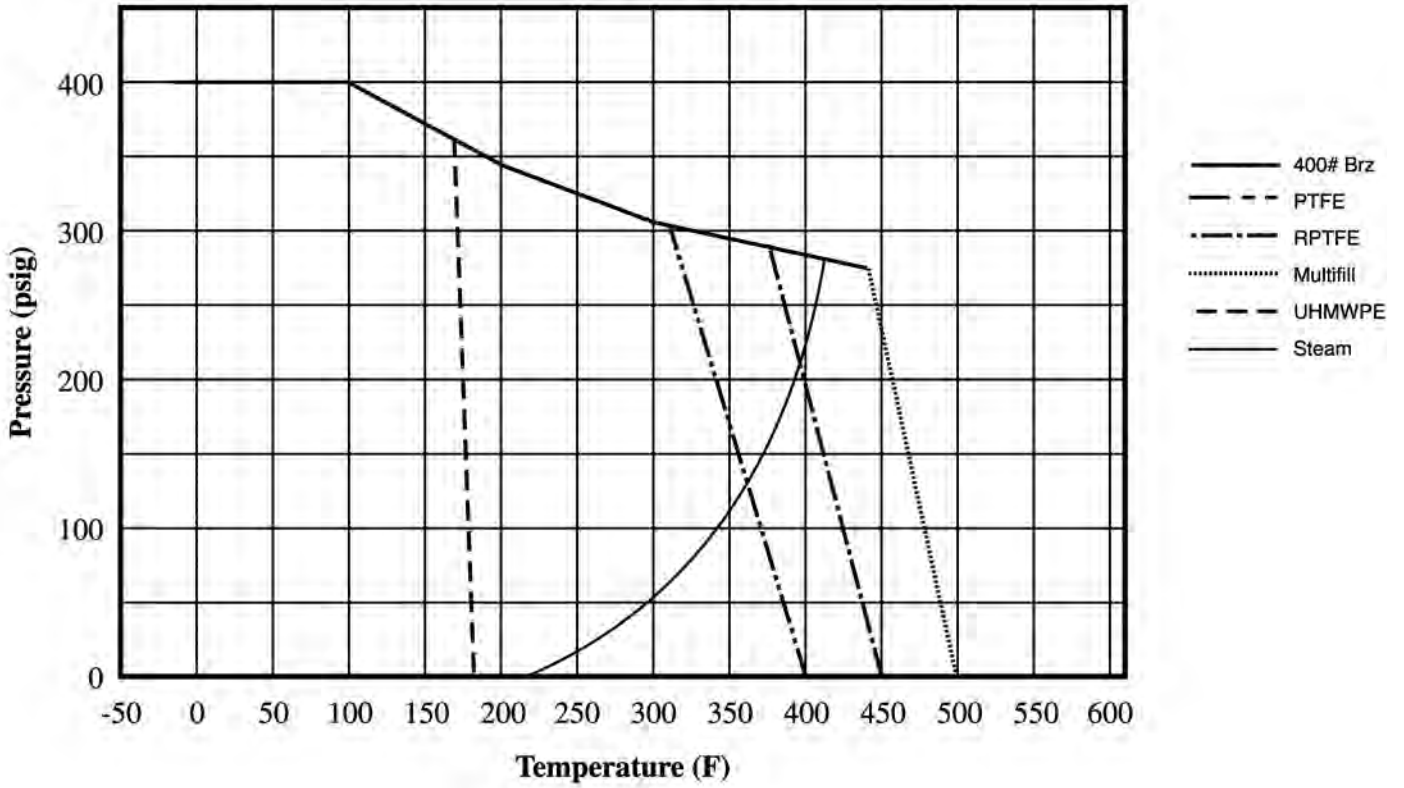
Cv FACTORS FOR APOLLO VALVES

Valve Size (inches)	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	6	8	10	12
Ball Valves															
32-100/200 Series	5.1	6.6	8	24	30	45	55	95	--	--	--	--	--	--	--
64-100/200 Series	6	7	19	34	50	104	268	309	629	1018	1622	--	--	--	--
64W Series	--	--	--	--	--	--	--	--	629	1018	1622	--	--	--	--
70B-140 Series	8.4	7.2	15	30	43	48	84	108	190	370	670	--	--	--	--
70-100/200 Series	8.4	7.2	15	30	43	48	84	108	190	370	670	--	--	--	--
70-300/400 Series	--	--	26	48	65	125	170	216	--	--	--	--	--	--	--
70-600 Series	2.3	4.5	5.4	12	14	21	34	47	--	--	--	--	--	--	--
70-800 Series	8.4	7.2	15	30	43	48	84	--	--	--	--	--	--	--	--
71AR Series	--	--	--	30	43	48	84	108	190	370	--	--	--	--	--
71-100/200 Series	--	--	--	30	43	48	84	108	190	370	--	--	--	--	--
72-100/900 Series	--	--	26	48	65	125	170	216	--	--	--	--	--	--	--
73A-100 Series	8.4	7.2	15	30	43	48	84	108	--	--	--	--	--	--	--
73-300/400 Series	--	--	26	48	65	125	170	216	--	--	--	--	--	--	--
74-100 Series	8.4	7.2	15	30	43	48	84	108	190	370	670	--	--	--	--
75-100 Series	8.4	7.2	15	30	43	48	84	108	190	370	670	--	--	--	--
76AR Series	8.4	7.2	15	30	43	48	84	108	190	370	670	--	--	--	--
76F-100 Series	8.1	15	15	51	68	125	177	389	--	--	--	--	--	--	--
76-100 Series	8.4	7.2	15	30	43	48	84	108	190	370	--	--	--	--	--
76-300/400 Series	--	--	26	48	65	125	170	216	--	--	--	--	--	--	--
76-600 Series	2.3	4.5	5.4	12	14	21	34	47	--	--	--	--	--	--	--
7K-100 Series	--	--	15	51	68	125	177	389	503	--	--	--	--	--	--
77AR Series	8.1	15	15	51	68	125	177	389	--	--	--	--	--	--	--
77C-100/200 Series	4.5	7.2	16	36	68	125	177	389	503	--	--	--	--	--	--
77D-140 Series	4.5	7.2	16	36	68	125	177	389	--	--	--	--	--	--	--
77D-640 Series	--	--	--	11	24	35	--	--	--	--	--	--	--	--	--
77G-UL Series	4.5	7.2	16	36	68	125	177	389	503	--	--	--	--	--	--
77W Series	--	--	16	36	68	125	177	389	--	--	--	--	--	--	--
77X Series	--	--	16	36	68	--	--	--	--	--	--	--	--	--	--
77-100/200 Series	8.1	15	15	51	68	125	177	389	503	--	--	--	--	--	--

Cv FACTORS FOR APOLLO VALVES

Valve Size (inches)	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	6	8	10	12
Ball Valves															
79 Series	8.5	8.5	9.8	32	44	66	148	218	440	390	--	--	--	--	--
80/81 Series	8.4	7.2	15	30	43	48	84	108	190	370	--	--	--	--	--
82-100/200 Series	8.1	14	26	51	68	120	170	376	510	996	1893	--	--	--	--
83A/83B Series	8.1	14	26	51	68	120	170	376	--	--	--	--	--	--	--
83R-100/200 Series	--	--	--	--	--	--	170	376	--	996	1893	--	--	--	--
86A/86B Series	8.1	14	26	51	68	120	170	376	--	--	--	--	--	--	--
86R-100/200 Series	--	--	--	--	--	--	170	376	--	996	1893	--	--	--	--
87A-100 Series	--	--	--	--	--	--	86	104	234	375	673	1099	1902	3890	--
87A-200 Series	--	--	15	19	75	--	195	410	545	1021	2016	4837	9250	15170	22390
87A-700 Series	--	--	--	--	--	--	86	104	234	375	673	1099	1902	3890	--
87A-900 Series	--	--	15	19	75	--	195	410	545	1021	2016	4837	9250	15170	22390
87B-100 Series	--	--	--	--	--	--	86	104	234	375	673	1099	1902	3890	--
88A-100 Series	--	--	--	--	--	--	86	104	234	375	673	1099	1902	3890	--
88A-200 Series	--	--	15	19	75	--	195	410	545	1021	2016	4837	9250	15170	22390
88A-700 Series	--	--	--	--	--	--	86	104	234	375	673	1099	1902	3890	--
88A-900 Series	--	--	15	19	75	--	195	410	545	1021	2016	4837	9250	15170	22390
88B-100 Series	--	--	--	--	--	--	86	104	234	375	673	1099	1902	3890	--
89-100 Series	8.4	7.2	15	30	43	48	84	108	190	370	--	--	--	--	--
9A-100 Series	8.3	6.7	5.7	10	16	25	40	62	--	--	--	--	--	--	--
91-100 Series	8.3	6.7	5.7	10	16	25	40	62	--	--	--	--	--	--	--
92-100 Series	8.3	6.7	5.7	10	16	25	40	62	--	--	--	--	--	--	--
93-100 Series	8.3	6.7	5.7	10	16	25	40	62	--	--	--	--	--	--	--
94A-100/200 Series	6	7	19	34	50	104	268	309	629	1018	1622	--	--	--	--
95-100/200 Series	--	--	15	51	68	--	--	--	--	--	--	--	--	--	--
95A-300/400 Series	--	--	19	34	50	--	--	--	--	--	--	--	--	--	--
96-100 Series	8.3	6.7	5.7	10	16	25	40	62	--	--	--	--	--	--	--
399-100 Series	8.4	7.2	15	30	43	48	84	108	190	370	--	--	--	--	--
489-100 Series	8.4	7.2	15	30	43	48	84	108	190	370	--	--	--	--	--

400# Bronze P-T Rating (Graph 3)



600# Bronze P-T Rating (Graph 4)

