

# FLOW INFORMATION FOR BALL AND BUTTERFLY VALVES

The information provided in this section allows the user specifying valves to determine rates of flow through, or pressure drops across Jamesbury valves. To accurately determine the flow capacity of a valve, a valve constant ( $C_v$ ) value is customarily used. The  $C_v$  value, determined by experimental testing, represents the rate of water at 60°F in U.S. gallons per minute through the valve when the downstream pressure is 1 psi lower than the upstream pressure. The friction loss resulting from flow through a valve is expressed as  $D_p$  in terms of psi or can also be expressed in terms of the nominal size, schedule 40, straight pipe that creates the same friction loss as the valve.

## DOUBLE-SEAL® BALL VALVES

As shown in the product bulletins valves are venturi-port or full-port design. As a rule of thumb, the venturi is a 25% reduction of the inside pipe diameter. This minor reduction has the characteristic of a venturi effect with very low friction loss. Series 6000 and Series 9000 valves are fullport design; all others are venturi design.

### Style A Valves

Valve Size		$C_v$	Length of Equivalent Pipe (feet)
inches	DN		
1/4	06	8.3	1.1
3/8	10	8.3	1.1
1/2	15	8.3	3.7
3/4	20	14	6.0
1	25	35	3.3
1-1/4	30	55	5.9
1-1/2	40	94	4.6
2	50	115	11.0
3	80	350	9.7

### Series 300 Valves

Valve Size		$C_v$	Length of Equivalent Pipe (feet)
inches	DN		
1/4	06	6.5	2.3
3/8	10	6.5	2.3
1/2	15	9.5	2.6
3/4	20	20	2.6
1	25	33	3.5
1-1/4	30	45	8.0
1-1/2	40	74	6.9
2	50	99	14.2

### Series 200 Clincher® Valves

Valve Size		$C_v$	Length of Equivalent Pipe (feet)
inches	DN		
1/4	06	11	0.13
3/8	10	16	0.30
1/2	15	16	1.0
3/4	20	37	0.9
1	25	49	1.7
1-1/4	30	49	7.4
1-1/2	40	100	4.0
2	50	115	11.0

### Style 5H & Eliminator® Valves

Valve Size		$C_v$	Length of Equivalent Pipe (feet)
inches	DN		
1/4	06	6	0.33
3/8	10	10	0.61
1/2	15	13	1.5
3/4	20	33	1.1
1	25	44	2.1
1-1/4	30	46	8.4
1-1/2	40	95	4.5
2	50	111	12.0

### Series 3000 Valves

Valve Size		$C_v$	Length of Equivalent Pipe (feet)
inches	DN		
1/4	06	3.0	7.6
3/8	10	3.0	7.6
1/2	15	3.0	7.6
3/4	20	9	13.1
1	25	14	19.7
1-1/4	30	19	44.9
1-1/2	40	33	34.7
2	50	52	51

### Series 3A & 3C Valves

Valve Size		$C_v$	Length of Equivalent Pipe (feet)
inches	DN		
1/2	15	13	1.52
3/4	20	33	1.1
1	25	44	2.1
1-1/4	30	46	8.4
1-1/2	40	95	4.5
2	50	111	12.0

\*  $C_v = 1.167 K_v$ .

### Series 4000 Valves

Valve Size		Standard Port		Full Port	
inches	DN	C <sub>v</sub>	Length of Equivalent Pipe (feet)	C <sub>v</sub>	Length of Equivalent Pipe (feet)
1/2	15	13	1.52	13	1.52
3/4	20	33	1.1	40	0.61
1	25	44	2.1	65	1.9
1-1/4	30	46	8.4	90	2.0
1-1/2	40	95	4.5	135	3.2
2	50	111	12.0	251	3.2
2-1/2	65	216	8.2	—	—

### Series 7000 Flanged Valves

Valve Size		Type 7150, 730S		Type 7300	
inches	DN	C <sub>v</sub>	Length of Equivalent Pipe (feet)	C <sub>v</sub>	Length of Equivalent Pipe (feet)
3	80	350	9	350	9
4	100	550	14	550	14
6	150	765	61	765	61
8	200	1890	45	1890	45
10	250	3900	35	4400	28
12	300	6700	29	6700	29

### Series 9000 Flanged Valves

Valve Size		Type 9150		Type 9300	
inches	DN	C <sub>v</sub>	Length of Equivalent Pipe (feet)	C <sub>v</sub>	Length of Equivalent Pipe (feet)
2	50	490	0.6	490	0.6
3	80	1160	0.8	1160	0.8
4	100	2200	0.9	2200	0.9
6	150	5100	1.6	5100	1.6
8	200	9300	2.0	9300	2.0
10	250	15200	2.3	15200	2.3
12	300	22400	2.8	22400	2.8

### 3-Way Side-Port Flanged Valves

Valve Size		C <sub>v</sub>	Length of Equivalent Pipe (feet)
inches	DN		
2	50	50	59
3	80	155	50
4	100	270	68
6	150	440	211
8	200	880	235
10	250	1500	270
12	300	2300	304

### Series 5000 Flanged Valves

Valve Size		Type 5150, 530S		Type 5300	
inches	DN	C <sub>v</sub>	Length of Equivalent Pipe (feet)	C <sub>v</sub>	Length of Equivalent Pipe (feet)
1/2	15	9	3.5	9	3.5
3/4	20	19	4.6	19	4.6
1	25	45	2.0	45	2.0
1-1/2	40	125	2.6	125	2.6
2	50	165	5.4	165	5.4
3	80	350	9.7	350	9.7
4	100	550	16.2	550	16.2
6	150	765	70	765	70
8	200	1890	51	1890	51
10	250	3900	40	3900	32
12	300	6700	31	6700	31
14	350	5100	68	5400	60
16	400	8100	47	8500	43
18	450	11000	42	9800	53
20	500	16000	31	13000	46

### Series 6000 Flanged Valves

Valve Size		Type 6150		Type 6300	
inches	DN	C <sub>v</sub>	Length of Equivalent Pipe (feet)	C <sub>v</sub>	Length of Equivalent Pipe (feet)
3/4	20	50	0.4	50	0.4
1	25	100	0.4	100	0.4
1-1/2	40	270	0.5	270	0.5
2	50	490	0.6	490	0.7
3	80	1160	0.7	1160	0.9
4	100	2200	0.7	2200	1.0
6	150	5100	1.3	5100	1.3
8	200	9300	1.5	9300	1.4
10	250	15200	1.8	15200	1.9
12	300	22400	2.0	22400	2.1
14	350	27000	2.3	26000	2.5
16	400	37000	2.5	35000	2.8
18	450	47000	2.8	45000	3.0
20	500	60000	3.0	58000	3.3

### Series 6F Valves

Valve Size		C <sub>v</sub>	Length of Equivalent Pipe (feet)
inches	DN		
1/2	15	13	1.52
3/4	20	40	0.61
1	25	65	1.9
1-1/4	30	90	2.0
1-1/2	40	135	3.2
2	50	251	3.2
3	80	1160	0.8

## WAFER-SPHERE® HIGH-PERFORMANCE BUTTERFLY VALVES

### C<sub>v</sub> values and equivalent pipe lengths

Flow values for butterfly valves vary by disc design and pressure class. For details consult the bulletins.

#### Series 815W AND 815L Valves

Valve Size		C <sub>v</sub>	Length of Equivalent Pipe (feet)
inches	DN		
2-1/2	65	78	33
3	80	165	24
4	100	400	20
5	125	650	23
6	150	1050	24
8	200	2200	23
10	250	3300	35
12	300	5100	37
14	350	5800	47
16	400	8000	49
18	450	10500	56
20	500	14000	55
24	600	21600	59
30	750	34000	84
36	900	55500	82
42	1050	82650	81
48	1200	108300	98
54	1350	133500	122
60	1500	159000	161

#### Series 830W and 830L Valves

Valve Size		C <sub>v</sub>	Length of Equivalent Pipe (feet)
inches	DN		
3	80	165	25
4	100	400	20
6	150	1050	25
8	200	1800	35
10	250	3150	39
12	300	4750	42
14	350	5200	58
16	400	6900	70
18	450	9300	69
20	500	11300	81
24	600	18500	81
30	750	29100	112

#### Series 835 Valves

Valve Size		C <sub>v</sub>	Length of Equivalent Pipe (feet)
inches	DN		
30	750	44000	52
36	900	78000	43
40	1000	93000	50
42	1050	102000	55
48	1200	137000	63
54	1350	181000	72
60	1500	219000	93

#### Series 845 Valves

Valve Size		C <sub>v</sub>	Length of Equivalent Pipe (feet)
inches	DN		
10	250	4300	21
12	300	6300	25
14	350	9100	21
16	400	13000	21
18	450	20000	16
20	500	28000	15
24	600	44000	16
28	700	50000	29
30	750	58000	31
32	800	73000	28
36	900	103000	25
42	1050	140000	30

#### Series 860W and 860L Valves

Valve Size		C <sub>v</sub>	Length of Equivalent Pipe (feet)
inches	DN		
3	80	155	28
4	100	260	40
6	150	750	45
8	200	1350	58
10	250	2100	79
12	300	2900	102
14	350	4000	91
16	400	5100	112
18	450	5500	177
20	500	7950	154
24	600	11300	198

## **Installation, Maintenance and Operation Instructions:**

IMO's (Installation, Maintenance and Operating instructions) or AMI's (Assembly, Mounting and Installation Instructions) are shipped with the products. Additional copies of these instructions are available. Call your local Metso Automation Distributor, or visit our web site.

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