Technical Information

TYPICAL Cv VALUE FOR CONTROL VALVES

NOMINAL VALVE SIZE	TUBE O.D.	Cv VALUE
3/8	1/2	1.6
1/2	5/8	2.2 - 2.5
3/4	7/8	4.0

RECOMMENDED VELOCITY RANGE FOR BRANCH PIPING

	FPS	
	MAX	MIN
Residential	3.0	1.5
Commercial	6.0	1.5

3/8 has 3.4 times the resistance of 1/2”

3/8 will carry 50% of flow in 1/2 with same P.D.

PRESSURE DROP (PD) & VELOCITY (FPS) IN COPPER TUBE - TYPE “L”

FLOW USGPM	P.D. IN FT. OF WATER PER 10 FT. LENGTHS					
	3/8 (1/2 OD)		1/2 (5/8 OD)		3/4 (7/8 OD)	
	P.D.	FPS	P.D.	FPS	P.D.	FPS
1.0	0.8	2.2	0.3	1.4	0.05	0.66
1.4	1.6	3.1[R]	0.5	1.9		
1.5	1.8	3.3	0.6	2.1		
2.5	4.0	5.5	1.3	3.4[R]		
3.0	5.5	6.6[C]	1.8	4.1	0.32	2.0
4.5			3.7	6.2[C]		
5.0			4.4	6.9	0.8	3.3[R]
6.0			5.1	8.3	1.1	4.0
7.0					1.4	4.6
8.0					1.7	5.3
9.0					2.1	6.0[C]
10.0					2.5	6.6

R - Recommended Velocity Limit Residential
C - Recommended Velocity Limit Commercial

FLOW & PRESSURE DROP CALCULATIONS

The Cv value tells how many USGPM of water will flow through a valve with a pressure drop of 1 psi (= 2.31 feet water column).

If the Cv of a valve is 6.0. it means that we can measure a pressure drop of 2.31 feet of water across the valve when the flow is 6 USGPM.

The basic flow formula tells us that the pressure drop (Δ p) varies with the square of the flow (F):

$$\frac{\Delta p_1}{\Delta p_2} = \left(\frac{F_1}{F_2}\right)^2 \qquad \text{Hence:} \quad \Delta p_2 = \left(\frac{F_2}{F_1}\right)^2 \Delta p_1 \quad \text{and} \quad F_2 = \sqrt{\frac{\Delta p_2}{\Delta p_1}}\, F_1$$

EXAMPLE: What is the pressure drop of a valve, Cv 6.0 with 9 USGPM?

Solution: $$\Delta p_2 = \left(\frac{F_2}{F_1}\right)^2 \Delta p_1 = \left(\frac{9}{6}\right)^2 2.31 \text{ Ft.} = 5.2 \text{ Ft.}$$

Technical Information

METRIC CONVERSION OF IMPERIAL UNITS IN THIS CATALOGUE

200 PSI/250w	1379.0 kPa/121°C
150 PSI/300w	1034.2 kPa/148.9°C
250 PSI/250°F	1723.7 kPa/121°C
1500 PSI	10.342 MPa
1800 PSI	12.411 MPa
3000 PSI	20.684 MPa
3500 PSI	24.132 MPa
1-7/8″	47.6 mm
3-3/8″	85.7 mm
4″	101.6 mm
6″	152.4 mm
1 USGPM	0.0631 L/s
1 PSI	6.895 kPa
1 FPS	0.305 m/s
1 INCH	25.4 mm

FLOW RATES

Convert m^3/hour with 1 bar (= 14.5 psi) to USGPM/1 psi by multiplying with 1.17
1.0 M^3/ hour with 1 bar = 1.17 USGPM/1 psi

VALVE SIZES

1/2	13 mm
3/4	20 mm
1	25 mm
1-1/4	32 mm
1-1/2	38 mm
2	50mm

SHOULD DIELECTRIC FITTINGS BE USED WITH DAHL VALVES?

Millions of Dahl castings have been installed in plumbing and heating systems in Canada during the past fifty years between steel riser connections and copper terminal circuitry.

Very few of these have been isolated with dielectric fittings, and we have not yet had a single report of galvanic corrosion problems. The casting alloy has a copper content between 80 and 85%, and the brass union or fittings have approximately 60%. These alloys are between the steel and the pure copper on the galvanic scale. The farther apart on the galvanic scale, the greater the risk of galvanic corrosion. Since these brass alloys are closer to steel than to copper, the risk of such corrosion is reduced.

Any survey of major installations in Ontario over the past 20 years would indicate that most of them have been made without dielectric fittings. This is because of the performance record of brass and also because dielectric unions are expensive and result in more joints, and hence, potential leaks in the system.