Butterfly Valve Torque and CV
Selection Guide
Technical Bulletin FL 79-01
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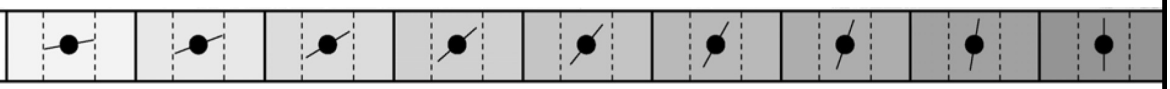
Torque (Inch-Pounds)

	Shut off Pressure	
Valve Size	**75psi**	**150psi**
30”	27832	31500
36”	39735	43969
42”	68215	75471
48”	94920	105000

Cv Values

Valve Size	10°	20°	30°	40°	50°	60°	70°	80°	90°
30”	35	1912	4050	8142	13152	20411	31226	47562	63328
36”	60	3021	6063	11055	17449	26086	39731	60895	86375
42”	93	4601	9235	16838	26575	39783	60592	92868	131725
48”	121	5981	12001	21890	34548	51718	78770	120728	171243

PHYSICAL VALVE POSITION



Rated Cv The volume of water in United States gallons per minute that will pass through a given valve opening with a pressure drop of 1lb. per sq. inch.

C_V values, given above, may be employed in the formula

$$Q = C_V \times \sqrt{\frac{\Delta P \times 62.4}{D}}$$

Where: Q = Gallons per minute of flow through the valve.
ΔP = Ponds per square inch of pressure drop across the valve.
D = Density of fluid in pounds per cubic foot.

Pressure drop is computed by rearranging the formula to:

$$\Delta P = \frac{Q^2 \times D}{C_V^2 \times 62.4}$$

Sample Computations:
What is the flow rate of water at ambient temperature through a 4" butterfly valve 70° open when pressure drop across the valve is 0.5 psi? (Density of water at 68° F is 62.4 pounds per cubic foot.)

$$Q = C_V \times \sqrt{\frac{\Delta P \times 62.4}{D}}$$
$$= 305 \times \sqrt{\frac{.5 \times 62.4}{62.4}}$$
$$= 305 \times .707$$
$$Q = 215.6 \text{ gallons per minute}$$

What is the pressure drop across an 8" butterfly valve fully open, flowing 2000 gallons per minute of solvent with a density of 55 pounds per cubic foot?

$$\Delta P = \frac{Q^2 \times D}{C_V^2 \times 62.4}$$
$$\Delta P = \frac{(2000)^2 \times 55}{(3250)^2 \times 62.4}$$
$$\Delta P = .33 \text{ pounds per square inch}$$

Basic Sizing Formulas

Liquid
$$Cv = Q\sqrt{\frac{S.G.}{\Delta P}}$$

Where:
Q = Flow (U.S. gallons per minute)
S.G. = Specific Gravity (water = 1)
ΔP = Pressure drop across valve (lbs. per sq. inch)

Gas
$$Cv = Q\sqrt{\frac{S.G.}{P_2 \Delta P}}$$

Where:
Q = Flow (STD. CU. ft per minute)
S.G. = Specific Gravity (Air + 1)
ΔP = Pressure drop across valve (lbs. per sq. inch)
P_2 = Outlet absolute pressure (lbs. per sq. in absolute)
ΔP 1/2 inlet absolute pressure

Liquid
$$Cv = \frac{W}{3\sqrt{P_2 \Delta P}}$$

Where:
Q = Flow (lbs. per hour)
ΔP = Pressure drop across valve (lbs. per square inch)
P_2 = Outlet absolute pressure (lbs. per sq. in. absolute)
ΔP 1/2 inlet absolute pressure

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