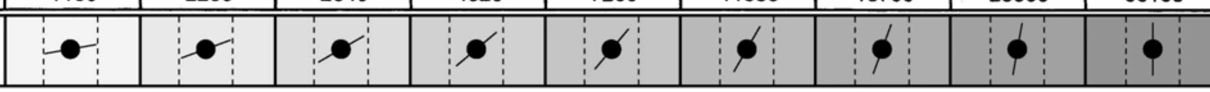
Cv Values

Valve Size	10°	20°	30°	40°	50°	60°	70°	80°	90°
1	0.5	1.5	3.4	7.1	11.5	24	46	61	72
1.5	1	2.2	6.5	13	31	56	93	135	159
2	2	3.5	8	21	40	87	108	141	170
2.5	3	5	11	27	52	121	172	253	332
3	8	16	23	50	92	147	224	420	473
4	17	33	57	110	182	297	462	773	913
5	47	94	143	231	380	578	908	1485	1650
6	91	182	248	396	627	902	1386	2063	2178
8	116	231	330	528	858	1452	2508	4158	4257
10	223	446	633	935	1320	2090	3630	6710	7095
12	303	605	825	1320	2063	3135	5528	10230	10780
14	358	715	908	1650	2530	3850	6820	10670	11550
16	440	880	1100	2035	3190	5060	8250	11660	14850
18	605	1210	1540	2695	4180	5500	10670	15235	19800
20	770	1540	1815	3355	5280	8140	13750	19525	25300
24	1100	2200	2640	4620	7260	11550	18700	25300	36108
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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