FLOW COEFFICIENTS

C_V VALUES

The valve flow coefficient (C_V) is a number which represents a valve's ability to pass flow. The bigger the C_V, the more flow a valve can pass with a given pressure drop. A C_V of 1 means a valve will pass 1 gallon per minute (gpm) of 60°F water with a pressure drop (Δp) of 1 (PSI) across the valve. A C_V of 350 means a valve will pass 350 gpm of 60°F water with a Δp of 1 PSI.

Valve Size (in.)	C_V @ VARIOUS DISC ANGLES							Full 90° Open (C_V)
	20°	30°	40°	50°	60°	70°	80°	
2	4.06	14.2	26.3	44.5	70.6	105	135	159
2-1/2	6.17	20.9	38.6	65.3	140	156	215	266
3	13.6	31.4	57.9	98.0	156	240	342	457
4	23.9	55.1	102	173	274	423	625	860
5	37.2	85.6	158	268	426	656	970	1,320
6	53.3	123	227	384	610	941	1,420	2,020
8	94.3	217	401	679	1,080	1,660	2,500	3,540
10	145	334	617	1,040	1,660	2,560	3,830	5,580
12	209	481	888	1,500	2,390	3,690	5,620	8,080
14	335	670	1,226	1,935	2,893	4,406	6,752	9,578
16	443	886	1,622	2,560	3,827	5,829	8,933	12,671
18	567	1,138	2,075	3,275	4,896	7,457	11,429	16,211
20	711	1,422	2,609	4,116	6,156	9,377	14,371	20,385
24	1,038	2,078	3,792	5,985	8,947	13,628	20,887	29,627
30	9,583	14,375	19,167	23,958	28,750	33,542	38,333	43,125
36	14,163	21,245	28,326	35,408	42,289	49,571	56,652	63,734
42	19,832	29,748	36,964	49,581	59,497	69,413	79,329	89,245
48	25,903	38,855	51,806	64,758	77,709	90,661	103,612	116,564

GENERAL NOTES

1. Liquid flow data is based on pressure drop and flow rate with viscosity similar to water at 60°F using flow coefficient.

2. Nomograph flow rate for gases is in cubic feet per minute (cfm) at flowing conditions. To convert flow rate from standard cu. ft. per minute to cfm, use the following formula:

$$\text{CFM} : \frac{(\text{SCFM} \times 14.7) \times (460 + {}^{\circ}\text{F})}{(\text{line pressure, psia}) \times 520}$$

3. Gas density in lbs./cu. ft., equals:

$$\frac{\left(\begin{array}{c}2.70 \times \\ \text{line pressure, psia}\end{array}\right) \times \left(\begin{array}{c}\text{specific gravity of} \\ \text{gas (relative to air)}\end{array}\right)}{460 + {}^{\circ}\text{F}}$$

4. ***Limitations:***
   Do not use equations for any of the conditions listed below, please consult factory.

a) For compressible fluids, where pressure (Δp) exceeds half of inlet pressure.

b) For non-compressible fluids, where pressure drop causes cavitation or flashing.

c) For dual-phase flow such as steam-water mixtures.

C_v = Flow coefficient for valves; expresses flow rate in gallons per minute of 60F water with 1.0 psi pressure drop across valve.

$$C_v = Q\sqrt{\frac{SQ}{(62.34)(dp)}}$$

K = resistance coefficient.

$$K = d\sqrt{\frac{29.9}{C_v}}$$

SQ = weight density of fluid, in pounds per cubic feet.

d = internal diameter of pipe, in inches.

Q = rate of flow, in gallons per minute.

dp = differential pressure, in pounds per square inch gauge.

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