

# FLOW DATA AKIŞKAN VERİLERİ

## FLOW COEFFICIENT, $K_v$

may be defined as the rate of flow of water in cubic metres per hour, that will generate a pressure drop of one bar across the valve.

## FLOW COEFFICIENT, $C_v$

may be defined as the rate of flow of water in US gallons per minute, at 60 °F (15,6 °C), that will generate a pressure drop of one pound-force per square inch across the valve.

### BASIC FORMULAS

#### Liquid flow:

$$K_v = \frac{Q\sqrt{G}}{\sqrt{(P)}} ; P = G \frac{Q}{K_v}^2$$

where  
Q = flow rate in cubic metres per hour;  
G = specific gravity of liquid (water = 1);  
P = pressure drop across valve in bar.

$$C_v = \frac{Q\sqrt{G}}{\sqrt{(P)}} ; P = G \frac{Q}{C_v}^2$$

where  
Q = flow rate in US gal/min;  
G = specific gravity of liquid (water = 1);  
P = pressure drop across valve in lbf/in<sup>2</sup>

#### Gases flow:

$$P = P_1 \sqrt{P_1^2 - 2S_G T \frac{W_G}{1360 \frac{K_v}{0.86}}}$$

where  
P<sub>1</sub> = inlet pressure (PSIA);  
S<sub>G</sub> = specific gravity of gas at standard conditions (air = 1);  
T = absolute temperature of gas (-460 °F)  
W<sub>G</sub> = Volumetric flow of gas

#### Steam flow:

$$P = P_1 \sqrt{P_1^2 - \frac{1}{2.1} \frac{0.0007 T_s}{K_v} W^2}$$

where  
W = pound per hour of Steam;  
T<sub>s</sub> = degree of superheat (°F);  
P<sub>1</sub> = inlet pressure  
P = pressure drop across valve in lbf/in<sup>2</sup>

Each type and size of valve has a particular flow coefficient and the general formulas indicate how a knowledge of this can be used to establish the pressure drop across a valve for a given flow rate or, alternatively, to determine the flow rate through a valve which will generate a given pressure drop.

Flow coefficient values are determined by testing and may not be valid for all conditions of flow.

### CAST STEEL VALVES - FLOW COEFFICIENT $K_v$ (m<sup>3</sup>/h) ( $C_v$ (US gal/minute) = $K_v/0.86$ )

Type	Class	Nominal dimension											
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
GATE VALVES	150	204	510	893	2074	3808	6035	8840	12325	16320	20825	23290	37060
	300	204	510	893	2074	3808	6035	8840	11339	15014	19159	21427	34095
	600	204	510	893	2074	3808	6035	10880	13065	17145	22330	27319	39704
	900	188	469	821	1908	3504	5552	10010	12019	15773	20543	25134	36527
	1500	173	432	756	1755	3223	5108	9209	11058	14511	18900	23123	33605
	2500	159	432	756	1755	3223	5108	9209	11058	--	--	--	--
GLOBE VALVES	150	38	102	174	400	740	1190	1700	2380	3188	4080	5015	7225
	300	38	102	174	400	740	1190	1700	2380	3188	3754	4614	6647
	600	35	86	149	352	633	985	1415	2190	2268	--	--	--
	900	32	79	137	324	582	906	1302	2015	2087	--	--	--
	1500	30	73	126	298	536	834	1198	1853	1920	--	--	--
	2500	27	67	116	275	493	768	1102	1705	1766	--	--	--
SWING CHECK VALVES F.B.	150	80	204	349	799	1479	2380	3400	4760	6375	8160	9350	14875
	300	77	198	338	775	1435	2309	3298	4617	6184	7915	9070	14429
	600	73	188	321	736	1363	2193	3133	4386	5874	7519	8616	13707
	900	70	179	305	700	1295	2083	2977	4167	5580	7143	8186	--
	1500	66	170	290	665	1231	1979	2828	3958	5301	6786	7777	--
	2500	63	162	275	632	1170	1880	2687	3760	5036	6447	7388	--
STRAINERS	150	56	127	200	494	675	944	1378	1916	2874	4311	6467	9700
	300	56	127	200	494	675	944	1378	1916	2874	4311	6467	9700
	600	49	111	176	434	594	830	1213	1686	2529	3794	5691	8536
	900	48	109	172	426	582	814	1188	1652	2479	3718	5577	8365
	1500	47	107	169	417	570	797	1165	1619	2429	3643	5466	8198
	2500	46	105	165	409	559	781	1141	1587	2380	3571	5356	8034