

FLOW PARAMETERS FOR GATE VALVES

RESILIENT AND METAL SEATED, FULL BORE

The parameter Kv is defined as the flow that will cause a 1 bar pressure drop across the valve. It serves to enable engineers to calculate pressure loss.

Flow parameters at fully open valve

Size mm	Kv m³/h/bar	Cv USG/min/psi	Zeta, ζ
DN40	310	365	0.04
DN50	555	650	0.03
DN65	650	760	0.07
DN80	1050	1230	0.06
DN100	1945	2275	0.04
DN125	2770	3240	0.05
DN150	5715	6685	0.02
DN200	7755	9075	0.04
DN250	15405	18025	0.03
DN300	27295	31935	0.02
DN350	37150	43465	0.02
DN375	42645	49895	0.02
DN400	48520	56770	0.02
DN450	61410	71850	0.02
DN500	75815	88705	0.02
DN600	109175	127735	0.02
DN700	148600	173860	0.02
DN750	170585	199585	0.02
DN800	194090	227085	0.02
DN900	245640	287400	0.02
DN1000	303260	354815	0.02
DN1200	436695	510935	0.02
DN1400	594395	695440	0.02
DN1500	682340	798340	0.02
DN1600	776350	908330	0.02
DN1800	982570	1149605	0.02
DN2000	1213050	1419270	0.02
DN2200	1467790	1717315	0.02

Below table shows the flow volume, Q [m³/h], passing through a pipeline, V [m/s], and valve diameters, DN [mm].

V [m/s]	1	1.5	2	2.5	3	3.5	4	4.5	5
DN40	5	7	9	11	14	16	18	20	23
DN50	7	11	14	18	21	25	28	32	35
DN65	12	18	24	30	36	42	48	54	60
DN80	18	27	36	45	54	63	72	81	90
DN100	28	42	57	71	85	99	113	127	141
DN125	44	66	88	110	133	155	177	199	221
DN150	64	95	127	159	191	223	254	286	318
DN200	113	170	226	283	339	396	452	509	565
DN250	177	265	353	442	530	619	707	795	884
DN300	254	382	509	636	763	891	1018	1145	1272
DN350	346	520	693	866	1039	1212	1385	1559	1732
DN375	398	596	795	994	1193	1392	1590	1789	1988
DN400	452	679	905	1131	1357	1583	1810	2036	2262
DN450	573	859	1145	1431	1718	2004	2290	2576	2863
DN500	707	1060	1414	1767	2121	2474	2827	3181	3534
DN600	1018	1527	2036	2545	3054	3563	4072	4580	5089
DN700	1385	2078	2771	3464	4156	4849	5542	6234	6927
DN750	1590	2386	3181	3976	4771	5567	6362	7157	7952
DN800	1810	2714	3619	4524	5429	6333	7238	8143	9048
DN900	2290	3435	4580	5726	6871	8016	9161	10306	11451
DN1000	2827	4241	5655	7069	8482	9896	11310	12723	14137
DN1200	4072	6107	8143	10179	12215	14250	16286	18322	20358
DN1400	5542	8313	11084	13854	16625	19396	22167	24938	27709
DN1500	6362	9543	12723	15904	19085	22266	25447	28628	31809
DN1600	7238	10857	14476	18096	21715	25334	28953	32572	36191
DN1800	9161	13741	18322	22902	27483	32063	36644	41224	45804
DN2000	11310	16965	22619	28274	33929	39584	45239	50894	56549
DN2200	13685	20527	27370	34212	41054	47897	54739	61581	68424

Formulas and definitions:

Kv is the flow in m³/h that creates a 1 bar pressure difference across the valve.

Cv is the same, but in units of US gallons/min and pounds per square inch.

Zeta, ζ , is the pressure loss coefficient defined as

$$\zeta = \frac{\Delta P}{500V^2}$$

where ΔP is measured in Pa and V in m/s.

IMPORTANT: A gate valve should never be operated at intermediate wedge positions as it is not designed as a throttling valve - throttling may cause cavitation. However, in case it is necessary to know the intermediate Kv values, please contact AVK for further information.

Below graph gives an estimate of Kv values for intermediate wedge positions:

