



# FLOW, KV VALUES AND ZETA VALUES FOR GATE VALVES, RESILIENT- AND METAL SEATED APPENDIX 6

Calculated flow (m<sup>3</sup>/hr) going through a nominal valve size (DN40 = inside dia of 40 mm) at different flow velocities

Water velocity (m/sec)	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500	DN600	DN700	DN800	DN900	DN1000	DN1200
1	5	7	12	18	28	44	64	113	177	254	346	452	573	707	1018	1385	1810	2290	2827	4072
1,5	7	11	18	27	42	66	95	170	265	382	520	679	859	1060	1527	2078	2714	3435	4241	6107
2	9	14	24	36	57	88	127	226	353	509	693	905	1145	1414	2036	2771	3619	4580	5655	8143
2,5	11	18	30	45	71	110	159	283	442	636	866	1131	1431	1767	2545	3464	4524	5726	7069	10179
3	14	21	36	54	85	133	191	339	530	763	1039	1357	1718	2121	3054	4156	5429	6871	8482	12215
3,5	16	25	42	63	99	155	223	396	619	891	1212	1583	2004	2474	3563	4849	6333	8016	9896	14250
4	18	28	48	72	113	177	254	452	707	1018	1385	1810	2290	2827	4072	5542	7238	9161	11310	16286
4,5	20	32	54	81	127	199	286	509	795	1145	1559	2036	2576	3181	4580	6234	8143	10306	12723	18322
5	23	35	60	90	141	221	318	565	884	1272	1732	2262	2863	3534	5089	6927	9048	11451	14137	20358

## Hydraulic values, fully open valve

	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500	DN600	DN700	DN800	DN900	DN1000	DN1200
<b>Kvs (m<sup>3</sup>/hr - 1 bar)</b>	310	555	650	1050	1945	2770	5715	7755	15405	27295	37150	48520	61410	75815	109175	148600	194090	245640	303260	436695
<b>Cv (Usg/min - 1 psi)</b>	363	649	761	1229	2276	3241	6687	9073	18024	31935	43466	56768	71850	88704	127735	173862	227085	287399	354814	510933
<b>Zeta</b>	0.04	0.03	0.07	0.06	0.04	0.05	0.02	0.04	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

NOTE: Hydraulic figures are based on tests or calculations, depending on size. Value uncertainty as per ref EN1267

### Definitions / formulas:

**Kv-value:** Actual flow of water (m<sup>3</sup>/ hr) creating pressure loss of 1 bar.

**Kvs-value:** Actual flow of water (m<sup>3</sup>/ hr) creating pressure loss of 1 bar and valve fully open.

**Pressure loss coefficient Zeta (K)** value: Ratio of static to dynamic pressure loss.

Zeta (K) = Diff pressure / (500 X V<sup>2</sup>)

Diff pressure (Pa)

V: Water flow velocity (m/sec)

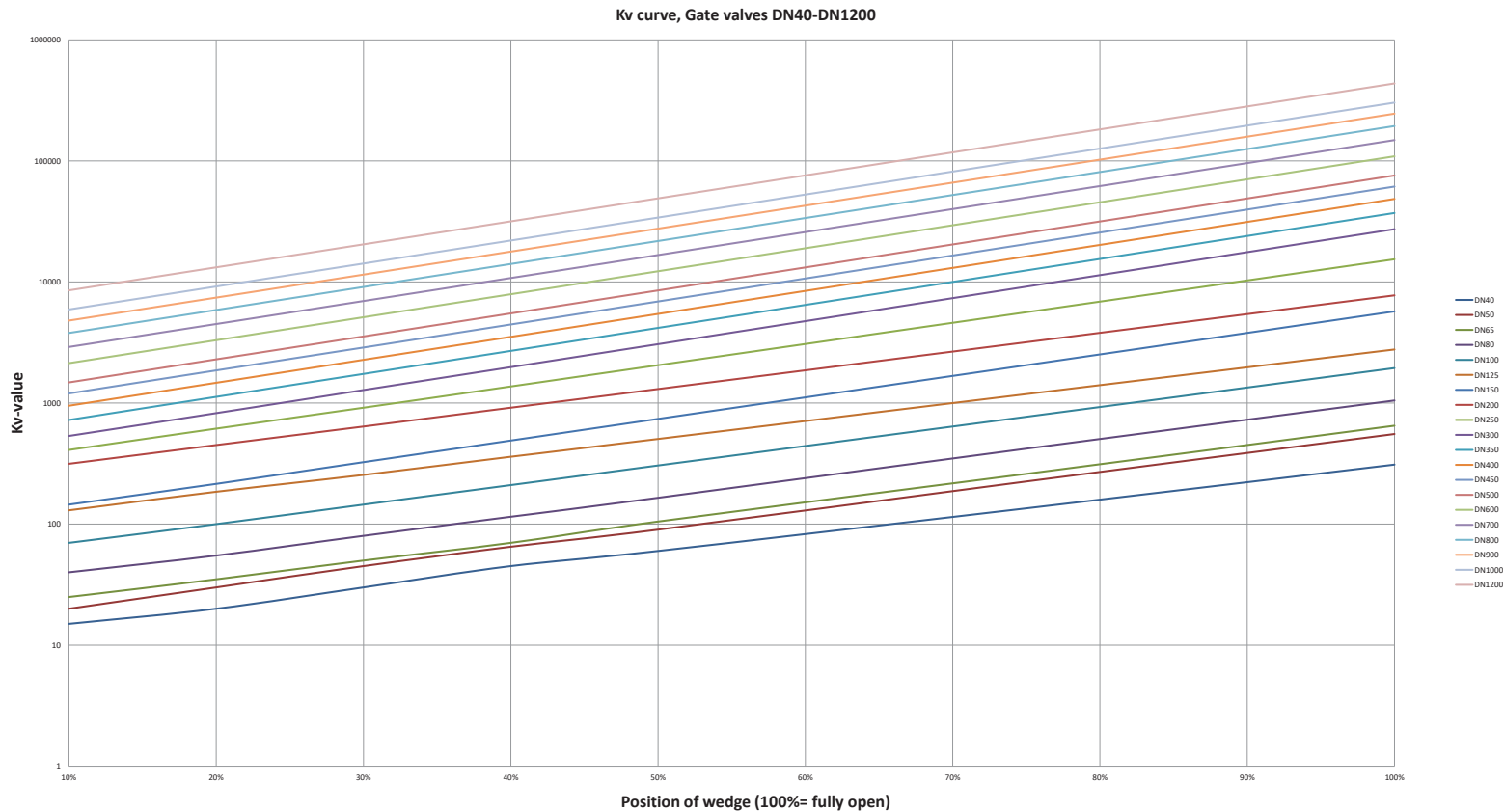
Actual diff pressure (bar) = (Q / Kv)<sup>2</sup>

Q: Actual water flow (m<sup>3</sup>/hr)

Kv values, valve in semi-open position. Percentage, based on turns of stem, from closed to fully open valve.

Opening of valve	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500	DN600	DN700	DN800	DN900	DN1000	DN1200
10%	15	20	25	40	70	130	145	315	410	535	725	950	1200	1480	2135	2905	3790	4800	5925	8530
20%	20	30	35	55	100	185	215	450	615	825	1125	1470	1860	2295	3305	4495	5870	7430	9175	13210
30%	30	45	50	80	145	255	325	640	915	1280	1740	2275	2875	3550	5115	6960	9095	11510	14205	20460
40%	45	65	70	115	210	360	490	915	1370	1980	2695	3520	4455	5500	7920	10780	14080	17820	22000	31680
50%	60	90	105	165	305	505	740	1305	2055	3065	4175	5450	6900	8515	12265	16690	21800	27595	34065	49055
75%	135	225	260	420	770	1185	2055	3180	5625	9150	12450	16260	20580	25410	36590	49805	65050	82330	101640	146360
100%	310	555	650	1050	1945	2770	5715	7755	15405	27295	37150	48520	61410	75815	109175	148600	194090	245640	303260	436695

NOTE: Hydraulic figures are based on tests or calculations, depending on size. Value uncertainty as per ref EN1267



Zeta (K) values, valve in semi-open positions. Percentage, is based on turns of stem, from closed to fully open valve.

Opening of valve	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500	DN600	DN700	DN800	DN900	DN1000	DN1200
10%	18	25	46	41	33	23	39	26	37	45	46	45	46	46	46	46	46	46	46	46
20%	10	11	23	22	16	11	18	13	17	19	19	19	19	19	19	19	19	19	19	19
30%	5	5	11	10	8	6	8	6	7	8	8	8	8	8	8	8	8	8	8	8
40%	2	2	6	5	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
50%	1	1	3	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1
75%	0.23	0.20	0.42	0.37	0.27	0.28	0.19	0.25	0.20	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
100%	0.04	0.03	0.07	0.06	0.04	0.05	0.02	0.04	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

NOTE: Hydraulic figures are based on both tests and calculations, depending on size. Value uncertainty, ref EN1267

Valve Headloss Coefficient (Zeta), Gate valves DN40-DN1200

