

TORQUE VALUES FOR RESILIENT SEATED AND METAL SEATED GATE VALVES

Operation

To avoid increased operation torque or seizure of the internal parts, it is recommended to operate the valve on a regular basis; this will ensure long life and durability.

AVK recommends:

- Valves for water and gas once every year
- Valves for wastewater and industry once every three months

After operation, the valve should be left in either fully open position with the stem released from stress or in fully closed position with closing torque as stated in the table on the following pages. Do not over torque the valve as this may cause permanent damage.

Content / Definitions

AVK offers resilient seated gate valves (**RSGV**) and metal seated gate valves (**MSGV**) to different standards worldwide. Due to the different design demands, depending on the relevant standard, the characteristics of the valves are different with respect to strength, closing torque, number of turns etc.

Table 1.	Resilient seated gate valves according to European standards, drinking water applications, hand wheel operation.
Table 2.	Resilient seated gate valves according to European standards, drinking water applications, ring key and bar application.
Table 3.	Resilient seated gate valves according to US standards, for water supply service and fire protection service.
Table 4.	Resilient seated gate valves according to Australian standards, for waterworks purpose.
Table 5.1 and 5.2.	Service connection valves European design.
Table 6.	Metal seated gate valves according to European standards, drinking water applications.
Table 7.1 and 7.2.	Resilient seated gate valves according to European standards, designed for gas applications.
MOT:	Maximum Operating Torque as given in the standards; the valve must be able to close against full unbalanced pressure at MOT or below
AVK – Operating:	The actual ‘Maximum Operating Torque’ required to close the valve against full unbalanced pressure
MST:	Minimum Strength Torque, given in the standards; the valve must be able to withstand MST or above without damage
AVK – Rupture:	The actual ‘Minimum Strength Torque’, i.e. the actual highest torque that can be applied without causing damage
AVK – Free:	Free running torque, required to rotate the spindle at no flow
AVK – Turns:	No. of turns between completely open and completely closed

TORQUE VALUES, RSGV, PN16

AVK Technical Information – Water Valves

European Standards

Table 1: Water – EN 1074-2 Annex A, EN 1171-Cat. 2, DIN 3352-4, BS 5163-Type A

	DN [mm]	Standards		AVK							
		MOT [Nm]	MST [Nm]	Operating [Nm]	Rupture [Nm]	Free [Nm]	Turns	New generation gate valve ^{*)}			
								Operating [Nm]	Rupture [Nm]	Free [Nm]	Turns
	40	40	90	40	400	6	11	25	250	3	12
	50	50	100	40	400	6	11	25	250	3	12
	65	65	130	60	400	6	14	25	250	3	17
	80	80	160	60	400	6	17	35	400	3	17
	100	100	200	80	400	6	21	35	400	3	21
	125	125	250	80	500	6	26	40	500	3	26
	150	150	300	80	600	12	26	40	600	3	26
	200	200	400	120/100 ⁴⁾	800	12	33/35 ⁴⁾	80	800	3	33
	250	250	500	180/150 ⁵⁾	1000	12	37	90	1000	12	37
	300	300	600	200/150 ⁵⁾	1200	16	44	120	1200	12	44
	350	350	700	300	1400	24	59	250	1400	24	59
	400	400	800	300	1600	24	59/50 ³⁾	250	1600	24	59
	450	450	900	300 ¹⁾ /500 ²⁾	1600	25	59 ¹⁾ /39 ²⁾	450	1600	25	43
	500	500	1000	300 ¹⁾ /500 ²⁾	1600	25	59 ¹⁾ /43 ²⁾	450	1600	25	43
	600	NA	1200	700	1600	25	53	500	1600	25	52
	700	NA	1400					850	3000	60	60
	800	NA	1600					850	3000	60	70
	900	NA	1800					800/800/1100 ⁶⁾	4000	300	85
	1000	NA	2000					800/800/1100 ⁶⁾	4000	300	85
	1200	NA	2400					1200/1500/1800 ⁶⁾	5000	300	102

¹⁾ Series 02, 20

²⁾ Series 55

³⁾ Series 36

⁴⁾ Series 15

⁵⁾ Series 18/00

⁶⁾ 6 bar/10bar/16bar

^{*)} For actuator sizing on series 21/37 and 21/38 new generation gate valves type A, use Table 2.

TORQUE VALUES, RSGV, PN16

AVK Technical Information – Water Valves

European Standards

Table 2: Water – EN1074-2 Annex B, EN 1171-Cat. 4, BS 5163-Type B

	DN [mm]	Standards		AVK							
		MOT [Nm]	MST [Nm]	Operating [Nm]	Rupture [Nm]	Free [Nm]	Turns	New generation gate valve			
								Operating [Nm]	Rupture [Nm]	Free [Nm]	Turns
	40	100	500	90	500	6	4	-	-	-	-
	50	110	550	90	550	6	5	40	550	6	5
	65	125	625	90	625	6	7	50	625	6	7
	80	140	700	120	700	6	8	60	700	6	8
	100	160	800	135	800	6	9	70	800	6	9
	125	185	925	155	925	12	12	-	-	-	-
	150	210	1050	180	1050	12	14	110	1050	12	14
	200	260	1300	210	1300	12	18	190	1300	12	18
	250	310	1550	210	1550	16	22	200	1550	16	22
	300	360	1800	210	1800	24	26	200	1800	24	26
	350	410	2050	300	2050	24	31	300	2050	24	31
	400	460	2300	450	2300	25	35	370	2300	25	35
	450	510	2550	500	2550	25	39	450	2550	25	39
	500	560	2800	500	2800	25	43	450	2800	25	43
	600	NA	3300	700	3300	25	53	500	3300	25	53

TORQUE VALUES, RSGV, PN16/250PSI

AVK Technical Information – Water Valves

US Standards

Table 3: Water – AWWA C509 & C515, UL-262

	DN [inch]	Standards		AVK			
		MOT [ft-lbs]	MST [ft-lbs]	Operating [ft-lbs]	Rupture [ft-lbs]	Free [ft-lbs]	Turns
	3"	52	250	55	294	4,5	12 ¹⁾ /15.5 ²⁾ /18.5 ³⁾
	4"	75	250	74	294	4,5	14 ¹⁾ /17.5 ²⁾ /22 ³⁾
	6"	110	350	111	441	9	21 ¹⁾ /24.5 ²⁾ /27 ³⁾
	8"	150	350	147	588	9	26 ¹⁾ /27.5 ²⁾ /35 ³⁾
	10"	185	350	184	735	12	32 ¹⁾ /34.5 ²⁾
	12"	225	350	221	882	18	38 ¹⁾ /41.5 ²⁾
	14"	225	400	221	1029	18	48
	16"	275	400	221	1176	18,5	51
	18"	NA	400	370	1176	18,5	39
	20"	NA	400	370	1176	18,5	43
	24"	NA	400	516	1176	18,5	53
	30"	NA	500	625	1838	44	60
	36"	NA	600	809	1838	220	70
	42" ⁴⁾	NA	700	888/1110/1332 ⁵⁾	3700	222	92
	48" ⁴⁾	NA	800	888/1110/1332 ⁵⁾	3700	222	102

¹⁾ Series 45

1 ft-lbs = 1,36 Nm

²⁾ Series 65

³⁾ Series 145

⁴⁾ Series 55/02, 55/11, 55/52

⁵⁾ 85/150/250psi

Australian Standards

Table 4: Water – AS 2638.2

	DN [mm]	Standards		AVK			
		MOT [Nm]	MST [Nm]	Operating [Nm]	Rupture [Nm]	Free [Nm]	Turns
	80	75	100	60	400	6	17
	100	100	300	80	400	6	21
	150	150	450	120	600	12	26
	200	200	600	160	800	12	33
	225	200	600	180	1000	16	37
	250	250	750	200	1000	16	37
	300	300	900	240	1200	16	44
	375	500	1500	500	1500	24	59
	400	550	1650	500	1650	24	59
	450	600	1800	450	2400	25	43
	500	660	1980	450	2400	25	43
	600	800	2400	500	2400	25	52
	750	1000	3000	850	3000	60	65
	900	NA	NA	800/800/1100 ^{*)}	4000	300	85
	1000	NA	NA	800/800/1100 ^{*)}	4000	300	85

^{*)} 6 bar/10bar/16bar

TORQUE VALUES, RSGV, PN16

AVK Technical Information – Water Valves

European design

Table 5.1: Water – Service Connection Valves
Ductile iron Series 03, Brass Series 16

	DN [mm]	AVK			
		Operating [Nm]	Rupture [Nm]	Free [Nm]	Turns
	25	40	200	3	7
	32	45	200	3	9
	40	50	200	4	11
	50	50	200	4	14

Table 5.2: Water – Service Connection Valves
POM Series 16

	DN [mm]	AVK			
		Operating [Nm]	Rupture [Nm]	Free [Nm]	Turns
	25	40	200	3	7
	32	40	200	3	9
	40	40	200	4	11
	50	40	200	4	14

TORQUE VALUES, MSGV, PN16

AVK Technical Information – Water Valves

European Standards

Table 6: Water - Metal Seated Gate Valves, EN 1074-2 Annex A

	DN [mm]	Operating Torque [Nm]							
		2 bar	4 bar	6 bar	8 bar	10 bar	12 bar	14 bar	16bar
 DN350-450 DN700-1200	350	50	100	160	210	270	320	380	430
	400	100	170	250	320	400	470	550	630
	450	90	190	300	400	510	620	720	830
	500	90	200	310	420	530	640	750	860
	600	230	370	500	640	780	920	1060	1200
	700	390	640	880	1120	1370	1610	1850	2100
	800	590	940	1280	1630	1970	2320	2660	3010
	900	690	1030	1370	1710	2050	2380	2720	3060
	1000	780	1260	1740	2220	2690	3170	3650	4130
	1200	1860	2850	3840	4840	5830	6820	7810	8800

TORQUE VALUES, RSGV, PN16

AVK Technical Information – Gas Valves

European Standards

Table 7.1: Gas - RSGV – EN 13774, EN 1171- Cat. 2 (DIN 3230-5)

	DN [mm]	Standards		AVK			
		MOT [Nm]	MST [Nm]	Operating [Nm]	Free [Nm]	Rupture [Nm]	Turns
	40	40	90	40	9	400	11
	50	50	100	40	9	400	11
	65	65	130	60	9	400	14
	80	80	160	60	9	400	17
	100	100	200	80	9	400	21
	125	125	250	80	9	500	26
	150	150	300	80	18	600	26
	200	200	400	120	18	800	33
	250	250	500	180	18	1000	37
	300	300	600	200	18	1200	44
	350	350	700	300	24	1400	59
	400	400	800	300	24	1600	50 ¹⁾ /59
	450	450	900	300 ²⁾ /450 ³⁾	25	1600	59 ²⁾ /39 ³⁾
	500	500	1000	300 ²⁾ /450 ³⁾	25	1600	59 ²⁾ /43 ³⁾
	600	600	NA	500	25	1600	53 ²⁾ /52 ³⁾

¹⁾ Series 36

²⁾ Series 02

³⁾ Series 06, 15 and 46

Table 7.2: Gas – Service Connection Valves (RSGV)
Ductile Iron Series 03

	DN [mm]	Standard	AVK			
		MST [Nm]	Operating [Nm]	Free [Nm]	Rupture [Nm]	Turns
	25	80	40	3	200	7
	32	90	45	3	200	9
	40	100	50	4	200	11
	50	100	50	4	200	14