PIPELINE COMPONENTS PRODUCT BULLETIN

Operating Torques for Gate Valves

AS2638 Gate Valves for waterworks purposes specifies a Maximum Functional Test Torque (MFTT) and a Minimum Strength Test Torque (MSTT) for each valve size.

MFTT is the maximum allowable torque to operate an ungeared gate valve at the allowable operating pressure.

MSTT is the maximum input torque an ungeared gate valve is designed to withstand, which is 3 times the MFTT.

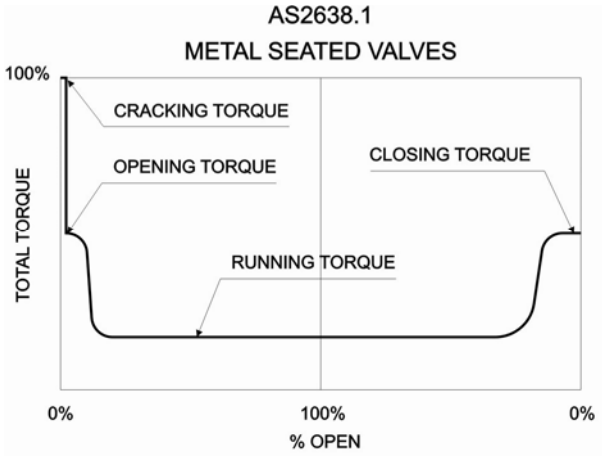
	Resilient Seated Gate Valve		Metal Seated Gate Valve	
Nominal size of valve DN	**Maximum Functional Test Torque, Nm**	**Minimum Strength Test Torque, Nm**	**Maximum Functional Test Torque, Nm**	**Minimum Strength Test Torque, Nm**
80	75	225	75	225
100	100	300	100	300
150	150	450	150	450
200	200	600	200	600
225	200	600	200	600
250	250	750	250	750
300	300	900	300	900
375	500	1500	325	975
450	600	1800	425	1275
500	660	1980	525	1575
600	800	2400	800	2400

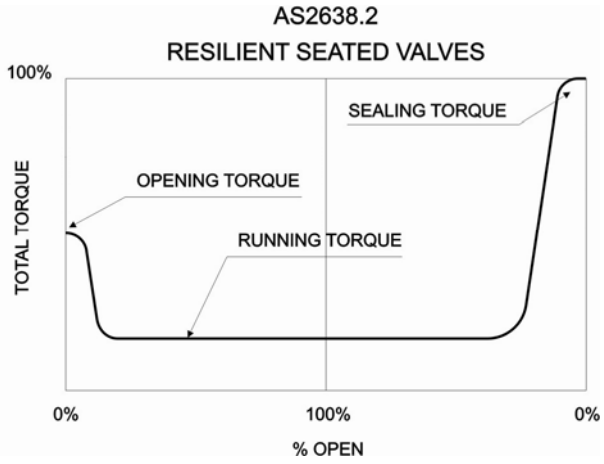
The effective sealing of a Resilient Seated Gate Valve (RSGV) requires the application of sufficient force to compress the gate rubber against the valve's internal body profile.

This sealing mechanism is quite different to that of a Metal Seated Gate Valve (MSGV), where the gate is simply lowered into body guides. Consequently a RSGV requires a higher torque to seal than a MSGV, particularly in the larger sizes.

Conversely the "cracking torque" of a RSGV is much less than a MSGV, as the resilience of the rubber assists in unseating the gate.

Thus the highest torque required for a RSGV is the torque to seal, whilst the highest torque required for a MSGV is the torque to unseat.





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Where the maximum functional torque is greater than the maximum desired operator input torque, consideration may be given to the incorporation of a gearbox. However AS2638 suggests that sizing a gearbox purely on the highest torque in the operating regime is not recommended, as high gearbox ratios may result in torques in excess of the MSTT, which may cause damage to the valve.

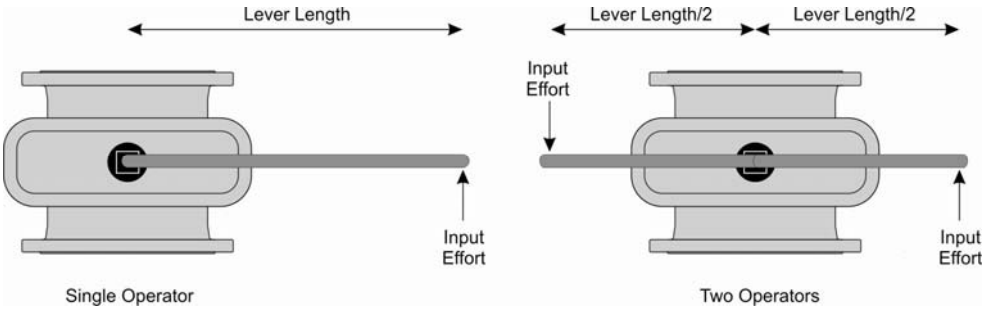
It should be accepted that the application of torques in excess of the nominated maximum operator input torque may be required to seal or crack a valve, however it is generally feasible to use other techniques to overcome the short duration, higher torque requirements, such as a longer lever, torque multiplier or extra operator, rather than utilise a gearbox.

The Table below is intended as a guide for specifiers and operators to determine the relevant lever length and input effort combinations to generate particular torque requirements.

CALCULATED LEVER LENGTH

Torque Nm	Input Effort					
	100N 10.2KgF	**150N** 15.3KgF	**200N** 20.4KgF	**250N** 25.5KgF	**300N** 30.6KgF	**350N** 35.7KgF
75	750	500	375	300	250	214
100	1000	667	500	400	333	286
150	1500	1000	750	600	500	429
200	2000	1333	1000	800	667	571
250	2500	1667	1250	1000	833	714
300	3000	2000	1500	1200	1000	857
325	3250	2167	1625	1300	1083	929
425	4250	2833	2125	1700	1417	1214
500	5000	3333	2500	2000	1667	1429
525	5250	3500	2625	2100	1750	1500
600	6000	4000	3000	2400	2000	1714
660	6600	4400	3300	2640	2200	1886
800	8000	5333	4000	3200	2667	2286

1. Calculations are based on the formulae: Torque = Effort x Lever Length
2. Assumed no loss of input due to mechanical inefficiency e.g. bending of lever
3. Dimensions for lever lengths are mm
4. For two operators the lever length is halved.



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