

KES

Standard Tightening Torque

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1. Scope of Application

This standard specifies the tightening torque for the threaded parts whose diameter is in the range of 3 mm to 24 mm, including bolt, nut, stud, etc. for which no tightening torque is specified in drawing.

2. Classification

Classification and application of threaded parts shall conform to Table 1 as a rule.

Table 1

Classification	Applicable Parts		Tightening Torque
	Threaded Parts	Material of Parts to be Tightened	
General Bolts	(1) General bolt x General nut General bolt x Internal threads in structure Stud x General nut External threads of structure x General nut	Ferrous and nonferrous metals	Table 2
General Bolts with Lubricant of "Neji Lock" (Trade name of thread seal)	Same as above (But threaded portions are applied with "Neji Lock", etc.	Ferrous and nonferrous metals	Table 2-1
Packing Gasket tightening Bolt	Same as general bolt	Ferrous and nonferrous metals, packing and gasket	Table 3
Flaring Nut	Flaring nut x Internal thread in structure	—	Table 3
Bolt with Split Pin Hole	Bolt with split pin hole x Slotted nut (1)	Ferrous and nonferrous metals	Table 4
Short Nut	General bolt x Short nut External threads of structure x Short nut	Ferrous and nonferrous metals	
Lock Nut	General bolt x Lock nut External threads of structure x Lock nut	Ferrous and nonferrous metals	Table 5
Stud	Stud(Tap end) x Internal threads in structure	Ferrous and nonferrous metals	Table 6
Taper Pipe Screw	Taper Pipe External threads x Taper pipe internal threads	—	Table 7

Note: 1. General bolts are tightening bolts with over 4T in tensile strength, including various types of bolts such as hexagon head bolt, hexagon socket bolt, square head bolt, stud, welding bolt, welding stud, screw, etc. Incidentally, the screw is regarded as 4T bolt.

2. Short nut is a nut which is shorter than the nut in Table 2 in each size.

3. Tightening Torque

3.1 General Bolt Tightening Torque

General bolt tightening torque shall conform to Table 2. For M8 fine threads and over M10 coarse threads, torque values for corresponding thread diameter in Table 2 shall be applied.

Table 2 General Bolt Tightening Torque

Unit: kg-cm

Nominal Size of Threads	Height of Stan- dard Nut (mm)	4T			6T			8T		
		S.V.	T.R.	(Ref.) T.F. (kg)	S.V.	T.R.	(Ref.) T.F. (kg)	S.V.	T.R.	(Ref.) T.F. (kg)
M3 x 0.5	2.4	7	8 6	90	10	13 9	140	--	--	--
M4 x 0.7	3.2	15	19 13	150	24	20 30	240	--	--	--
M5 x 0.8	4	30	36 25	240	46	60 40	390	--	--	--
M6 x1	5	50	63 43	350	80	100 70	550	90	120 80	640
M8 x1.25	6.5	120	150 100	620	190	230 160	1000	220	270 180	1160
M10x1.25	8	240	290 200	1050	380	470 320	1680	440	550 370	1940
M12x1.5	10	410	510 350	1510	650	820 560	2410	760	950 640	2790
M14x1.5	11	--	--	--	910	1050 770	2960	1220	1400 1040	3950
M16x1.5	13	--	--	--	1390	1600 1180	3980	1870	2150 1590	5310
M18x1.5	16	--	--	--	2000	2300 1700	5150	2650	3050 2250	6870
M20x1.5	16	--	--	--	2780	3200 2360	6480	3690	4250 3140	8630
M22x1.5	18	--	--	--	3760	4320 3200	7950	5000	5750 4250	10600
M24x1.5	18	--	--	--	4850	5570 4120	9570	6440	7410 5470	12800

Note: 1. S.V. = Standard Value

T.R. = Tolerable Range

T.F. = Tightening Force

2. For 10T bolt, 10/8 of 8T bolt standard tightening torque can be applied. In this case, 7T nut (over S45C) and hard washer (over HRC36) shall be used as a rule.
3. If the torque in Table 2 is too high (which causes the breakage of bolt) for 6T bolt due to application of "Neji Lock", refer to Table 2-1.

Tabel 2-1 Tightening Torque for the Bolt
Applied with "Neji Lock"

Unit: kg-cm

Nominal Size of Threads	6T		Nominal Size of Threads	6T	
	Standard Value	Tolerable Range		Standard Value	Tolerable Range
M3x0.5	9	7 - 11	M 8 x 1.25	160	130 - 200
M4x0.7	20	17 - 25	M10 x 1.25	310	270 - 390
M5x0.8	39	33 - 48	M12 x 1 .5	540	460 - 680
M6x1	65	55 - 80			

Remarks: Values in this table have been calculated on the basis of $\mu = 0.13$.

4. If it is difficult for 6T bolt to hold the torque within the tolerable range given in Table 2 due to tightening work such as impact, refer to Table 2-2.

Table 2-2

Unit: kg-cm

Nominal Size of Threads	Tolerable Range	Nominal Size of Threads	Tolerable Range
M3 x 0.5	8 - 14	M 6 x 1	70 - 120
M4 x 0.7	20 - 35	M 8 x 1.25	160 - 280
M5 x 0.8	40 - 70	M10 x 1.25	330 - 570

3.2 Tightening torques for packing and gasket tightening bolt and flaring nut are shown in Table 3.