Metric Bolt Torque Chart

Metric bolt torque chart, classes 8.8, 10.9 and 12.9

Torque = K × diameter × clamp load, with clamp load at 75% of proof load (a reusable joint). K is 0.20 for dry threads and 0.15 for lubricated threads. Proof load is tensile stress area times proof strength: grade 2 at 55 ksi, grade 5 at 85 ksi, grade 8 at 120 ksi, and ISO classes 8.8, 10.9 and 12.9 at 580, 830 and 970 MPa. Stress area is π/4 × (D − 0.9743/TPI)² for inch threads and π/4 × (D − 0.9382 × pitch)² for metric.

Bolt (size×pitch)	Stress area (mm²)	Class 8.8 clamp load (kN)	Class 8.8 dry (N·m)	Class 8.8 lubricated (N·m)	Class 8.8 dry (ft-lb)	Class 8.8 lubricated (ft-lb)	Class 10.9 clamp load (kN)	Class 10.9 dry (N·m)	Class 10.9 lubricated (N·m)	Class 10.9 dry (ft-lb)	Class 10.9 lubricated (ft-lb)	Class 12.9 clamp load (kN)	Class 12.9 dry (N·m)	Class 12.9 lubricated (N·m)	Class 12.9 dry (ft-lb)	Class 12.9 lubricated (ft-lb)
M6×1	20.1	8.8	11	8	8	6	12.5	15	11	11	8	14.6	18	13	13	10
M8×1.25	36.6	15.9	25	19	19	14	22.8	36	27	27	20	26.6	43	32	31	24
M10×1.5	58.0	25.2	50	38	37	28	36.1	72	54	53	40	42.2	84	63	62	47
M12×1.75	84.3	36.7	88	66	65	49	52.5	126	94	93	70	61.3	147	110	109	81
M14×2	115.4	50.2	141	105	104	78	71.9	201	151	148	111	84.0	235	176	173	130
M16×2	156.7	68.2	218	164	161	121	97.5	312	234	230	173	114.0	365	274	269	202
M20×2.5	244.8	106.5	426	319	314	236	152.4	610	457	450	337	178.1	712	534	525	394
M24×3	352.5	153.3	736	552	543	407	219.4	1053	790	777	583	256.4	1231	923	908	681

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