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M16 · English · bolt-torque-chart-m16-en

Bolt Torque Chart — M16

M16 · **6 property classes** · **5 friction states** · **N·m (typ / min–max)** · **coarse + fine thread**

M16

N·m · As 157 mm²

Class	Rp0.2 (MPa)	Target preload (kN)	Dry / Black K 0.18–0.22 · N·m	Electro Zinc K 0.15–0.2 · N·m	Hot-Dip Galv. K 0.18–0.25 · N·m	Oiled K 0.12–0.15 · N·m	Wax / PTFE / Anti-seize K 0.08–0.12 · N·m
4.8	340	**37.4**	120 108–132	102 90–120	132 108–149	78 72–90	60 48–72
8.8	640	**70.3**	225 203–248	191 169–225	248 203–281	146 135–169	113 90–135
10.9	940	**103.3**	331 298–364	281 248–331	364 298–413	215 198–248	165 132–198
12.9	1100	**120.9**	387 348–426	329 290–387	426 348–484	251 232–290	193 155–232
A2-70	450	**49.5**	158 142–174	135 119–158	174 142–198	103 95–119	79 63–95
A4-80	600	**65.9**	211 190–232	179 158–211	232 190–264	137 127–158	106 84–127

Torque follows the K-factor (nut factor) method T = K·D·F: D is the nominal diameter and F the target preload = 70% of Rp0.2 × thread stress area (M16 As = 157 mm²). Yield strengths are published values from ISO 898-1 (carbon/alloy steel) and ISO 3506-1 (stainless A2/A4). K follows published empirical ranges per friction condition (Machinery's Handbook; the wax/PTFE/anti-seize band K≈0.10 follows Machine Design test data). The grease/MoS_2 band (K≈0.11) nearly overlaps anti-seize and is available in the calculator instead of a separate column.

Fine-Thread Torque Matrix

Class	Rp0.2 (MPa)	Target preload (kN)	Dry / Black K 0.18–0.22 · N·m	Electro Zinc K 0.15–0.2 · N·m	Hot-Dip Galv. K 0.18–0.25 · N·m	Oiled K 0.12–0.15 · N·m	Wax / PTFE / Anti-seize K 0.08–0.12 · N·m
4.8	340	**39.7**	127 114–140	108 95–127	140 114–159	83 76–95	64 51–76
8.8	640	**74.8**	239 215–263	203 180–239	263 215–299	156 144–180	120 96–144
10.9	940	**109.9**	352 316–387	299 264–352	387 316–440	229 211–264	176 141–211
12.9	1100	**128.6**	411 370–453	350 309–411	453 370–514	267 247–309	206 165–247
A2-70	450	**52.6**	168 152–185	143 126–168	185 152–210	109 101–126	84 67–101
A4-80	600	**70.1**	224 202–247	191 168–224	247 202–281	146 135–168	112 90–135

Cell shows the typical value; the small line below is the range (min–max).

Basis of Calculation & Sources

Boundary: this chart is a simplified K-factor estimate, not a full VDI 2230 analysis (which accounts for joint resilience, embedment and assembly method). Friction is the dominant variable — no single torque value exists without its friction state. Always follow the design specification or manufacturer torque table.

References

- ISO 898-1:2013 — Mechanical properties of fasteners made of carbon and alloy steel — https://www.iso.org/standard/60610.html
- ISO 3506-1:2020 — Mechanical properties of corrosion-resistant stainless steel fasteners (A2/A4) — https://www.iso.org/standard/70045.html
- GB/T 3098.1-2010 — Mechanical properties of bolts, screws and studs (CN national standard, official full text) — https://openstd.samr.gov.cn/bzgk/gb/std?std_no=GB%2FT%203098.1-2010
- GB/T 3098.6-2014 — Mechanical properties of stainless steel bolts, screws and studs (CN, official full text) — https://openstd.samr.gov.cn/bzgk/gb/std?std_no=GB%2FT%203098.6-2014
- ISO 16047:2005 — Fasteners: torque/clamp force testing (K-factor measurement method)
- Machinery's Handbook (30th ed.) — empirical K-factor ranges
- Machine Design — anti-seize compound friction test (K≈0.10)

Disclaimer: This chart is an engineering estimation for selection and budgeting only. It does not constitute assembly instructions or acceptance criteria.

Bolt Torque Chart — M16 — Yaxiio full-range reference PDF, pack v1 · generated 2026-09-10 · data source: yaxiio-customer/utils/fastenerCalc.ts (single source of truth) · methodology matches the online tool pages · https://www.yaxiio.com/en/tools/bolt-torque-chart/m16