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M24 · English · bolt-torque-chart-m24-en

Bolt Torque Chart — M24

M24 · 6 property classes · 5 friction states · N·m (typ / min–max) · coarse + fine thread

M24

N·m · As 353 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	**84**	403 363–444	343 302–403	444 363–504	262 242–302	202 161–242
8.8	640	**158.1**	759 683–835	645 569–759	835 683–949	493 455–569	380 304–455
10.9	940	**232.3**	1115 1003–1226	948 836–1115	1226 1003–1394	725 669–836	557 446–669
12.9	1100	**271.8**	1305 1174–1435	1109 979–1305	1435 1174–1631	848 783–979	652 522–783
A2-70	450	**111.2**	534 480–587	454 400–534	587 480–667	347 320–400	267 213–320
A4-80	600	**148.3**	712 640–783	605 534–712	783 640–890	463 427–534	356 285–427

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 (M24 As = 353 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	**91.4**	439 395–483	373 329–439	483 395–548	285 263–329	219 175–263
8.8	640	**172**	826 743–908	702 619–826	908 743–1032	537 495–619	413 330–495
10.9	940	**252.7**	1213 1092–1334	1031 910–1213	1334 1092–1516	788 728–910	606 485–728
12.9	1100	**295.7**	1419 1277–1561	1206 1064–1419	1561 1277–1774	923 852–1064	710 568–852
A2-70	450	**121**	581 523–639	494 435–581	639 523–726	377 348–435	290 232–348
A4-80	600	**161.3**	774 697–852	658 581–774	852 697–968	503 464–581	387 310–464

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 — M24 — 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/m24