

MARYLAND METRICS

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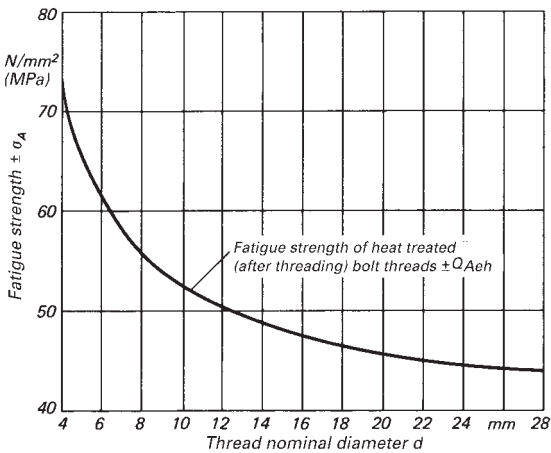
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TECHNICAL INFORMATION and DATA

Fatigue strength

In the first loaded thread of a screw there is a strong notch effect. Dynamic stress (may it be from axial, bending or torque load) reduces the capacity of a threaded fasteners to a fraction of the strength under static conditions. Independent from value of the static load and independent from the property class of the screw, the fatigue strength of threaded fasteners is between ± 40 and ± 70 N/mm².

Thread	Fatigue strength (N/mm ²)	Range (standard value only)	Preload depending
heat treated after threading (eh)	$\pm Q_{Aeh} < 0,75 \left(\frac{180}{d} + 52 \right)$	$0,2F_{0,2} < F_V < 0,8F_{0,2}$	no
threaded after heat treating (et)	$\pm Q_{Aet} < \left(2 \frac{F_V}{F_{0,2}} \right) \cdot Q_{Aeh}$		yes



Fatigue strength of bolt threads of fasteners of property class 8.8, 10.9 and 12.9

By appropriate design of the threaded joint and controlled tightening the dynamic component of the load has to be eliminated or at least reduced to an acceptable minimum:

- Use smaller screw diameters (higher property classes)
- Increase preload (use higher property classes and a controlled tightening method)
- Keep the screw elastic and the joint parts rigid (use long, thin screws or bolts with reduced shank)
- Use sufficient thread engagement
- Use "special" nuts (e.g. stretch nuts of conical shape, nuts of lower property class)
- Keep (or move) the operating force as near to the parting plane as possible.
- Reduce eccentricity of the external force relative to the joint center.
- (Also, see page T 78 "Locking of fasteners")