

Pin/Bolt Joint - Verification

Sample document with complete example values. It shows the report the purchased export produces for YOUR input - it is not itself a report for any part.

Project: Sample project

Part/Position: no real part

Prepared by: Sample, not released

Overall assessment: OK - shear, bearing pressure and bending are all satisfied.

Inputs

Transverse force F	10,000 N
Pin diameter d	20 mm
Mounting type	double shear / clevis (2 shear planes)
Clevis thickness (load-carrying) t_G	10 mm
Rod thickness t_S	20 mm
Yield strength Re	355 N/mm ²
Required safety factor S_req	1.5

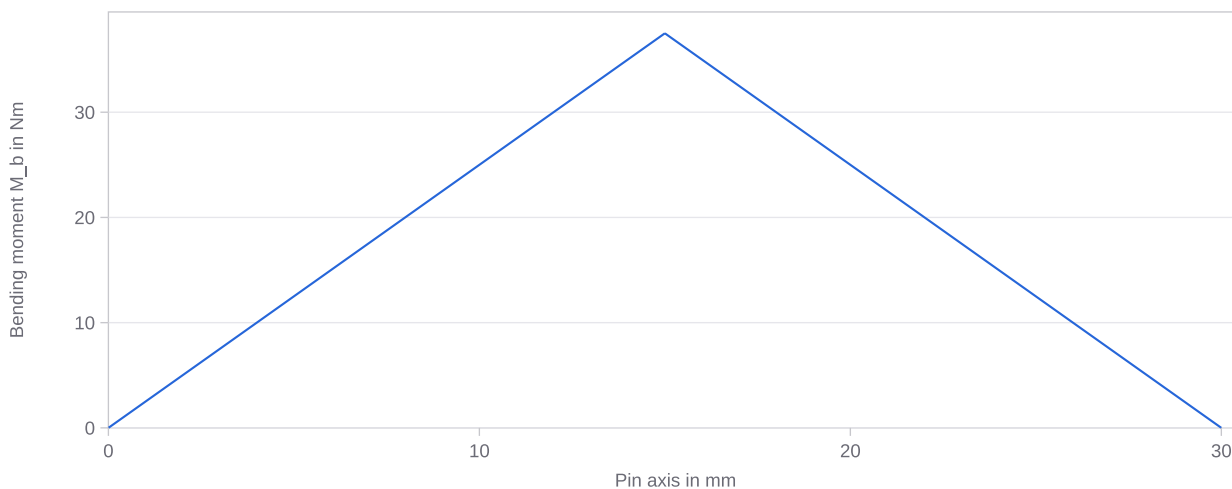
Results

Shear area $A = \pi \cdot d^2 / 4$	314.16 mm ²
Number of shear planes n	2
Shear stress $\tau = F / (n \cdot A)$	15.92 N/mm ²
Bearing pressure, clevis $p_G = F / (d \cdot t_G)$	50 N/mm ²
Bearing pressure, rod $p_S = F / (d \cdot t_S)$	25 N/mm ²
Section modulus $W = \pi \cdot d^3 / 32$	785.4 mm ³
Bending moment $M_b = F / 8 \cdot (t_S + t_G)$	37.5 Nm
Bending stress $\sigma_b = M_b / W$	47.75 N/mm ²

Verifications

Criterion	Value	Limit	Status
Shear $\tau \leq Re / \sqrt{3}$	12.88	1.5	● OK
Bearing pressure $p \leq Re$	7.1	1.5	● OK
Bending $\sigma_b \leq Re$	7.44	1.5	● OK

Bending moment diagram (schematic)



Calculation basis

The pin/bolt joint transfers a transverse force F perpendicular to the pin axis. The shear check compares the shear stress $\tau = F / (n \cdot A)$ with the shear yield strength $Re / \sqrt{3}$ (von Mises); n is the number of shear planes (single shear 1, double shear 2). The

bearing pressure check checks $p = F/(d \cdot t)$ for each part against the yield strength R_e ; the smaller load-carrying thickness governs. The pin is additionally subjected to bending: using the beam model (clevis as support, rod as load) gives $M_b = F/8 \cdot (t_S + t_G)$ and $\sigma_b = M_b/W$ with $W = \pi \cdot d^3/32$. All safety factors refer to the yield strength; fatigue, friction and clearance are not taken into account.

About this sample

All values on these pages come from a freely chosen example calculation and belong to no real part. The purchased export contains the same sections with your input, your header data (project, part, prepared by) and as searchable text. Pricing and scope: maschinenbaurechner.de/en/pricing

Note: The results are design and orientation aids. They do not replace independent verification, calculation and approval by a qualified person. The terms of use at maschinenbaurechner.de apply.