Interference Fit 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

Joint Ø45 mm, Ø45 H7/u6

Overall assessment: OK (slip and yield checks satisfied)

Inputs

Joint diameter D_F	45 mm
Hub outer diameter D_Aa	76 mm
Shaft bore diameter D_Ii	0 (solid shaft)
Joint length L_F	65 mm
Fit / interference	Ø45 H7/u6
Surface roughness Rz bore / shaft	6 / 4 µm
Hub: E / ν / Re	210,000 N/mm² / 0.3 / 600 N/mm²
Shaft: E / ν / Re	210,000 N/mm² / 0.3 / 300 N/mm²
Friction coefficient ν_H	0.07
Required torque M_t	500 Nm
Required axial force F_ax	0 N
Required safety factors S_R / S_F	1.5 / 1.2

Interference and interface pressure

Quantity	Value
Interference U_g / U_k	86 / 45 µm
Smoothing allowance U_V (0.8·(Rz_A + Rz_I))	8 µm
Effective interference U_wg / U_wk	78 / 37 µm
Diameter ratios Q_A / Q_I	0.5921 / 0
Auxiliary quantity K	3.0797
Interface pressure p at minimum interference	56.1 N/mm²
Interface pressure p at maximum interference	118.2 N/mm²
Required interface pressure p_req (incl. S_R)	51.8 N/mm²
Allowable interface pressure hub / shaft	187.5 / 288.7 N/mm²
Required minimum interference U_req	42.2 µm
Allowable maximum interference U_allow	131.7 µm

Verification

Criterion	Value	Limit	Status
Slip safety S_R >= S_R,req (minimum interference)	1.62 -	1.5 -	● borderline
Safety against yielding S_F >= S_F,req (maximum interference)	1.9 -	1.2 -	● OK

Transmittable load and stress

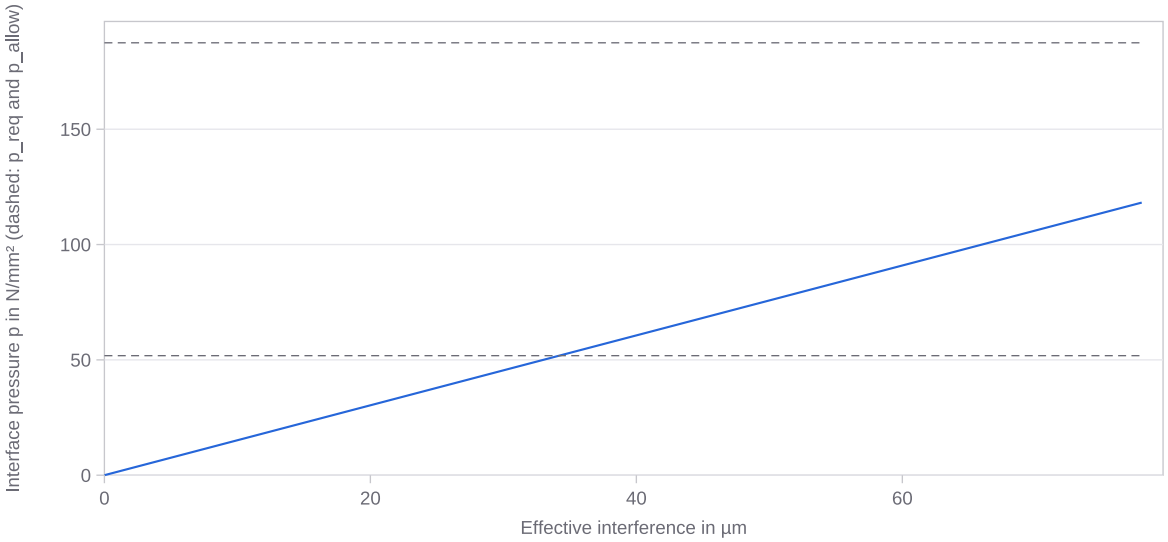
Transmittable torque (incl. S_R)	541 Nm
Transmittable axial force (incl. S_R)	24,043 N
Equivalent stress hub (MSH)	364 N/mm²
Equivalent stress shaft (MSH)	118.2 N/mm²

Assembly (transverse interference fit)

Required hub temperature	285 °C
Shaft temperature during assembly	20 °C

Assembly clearance	45 µm

Interface pressure over effective interference



Calculation basis

Verification of a cylindrical interference fit per DIN 7190-1 in the purely elastic range. The interface pressure follows from the effective interference (interference minus smoothing allowance 0.8·(Rz_A + Rz_I)) via the elastic properties of both mating parts. The slip check is carried out with the minimum interference (transmittable torque and axial force via the coefficient of friction), the yield check with the maximum interference via the modified shear stress theory (MSH). The hub assembly temperature is sized for the maximum interference plus the assembly clearance.

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