

Fillet Weld Design Check

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

T-joint with double fillet weld, tension perpendicular to the plate plane

Overall assessment: OK (both checks satisfied)

Inputs

Joint case	T-joint with double fillet weld, tension perpendicular to the plate plane
Force F_{Ed}	300 kN
Weld throat thickness a	4 mm
Weld length l (per weld)	200 mm
Number of parallel welds	2
Weld over full length (including ends)	yes
Plate thicknesses t_1 / t_2	12 / 20 mm
Steel grade	S235
Tensile strength f_u	360 N/mm ²
Correlation factor β_w	0.8
Partial safety factor γ_{M2}	1.25

Stress components in the effective weld area

Quantity	Value
Effective weld length l_{eff}	200 mm
Effective weld area A_w	1,600 mm ²
Normal stress σ_{perp}	132.6 N/mm ²
Shear stress τ_{perp}	132.6 N/mm ²
Shear stress τ_{par}	0 N/mm ²
Equivalent stress σ_{wv} (von Mises)	265.2 N/mm ²

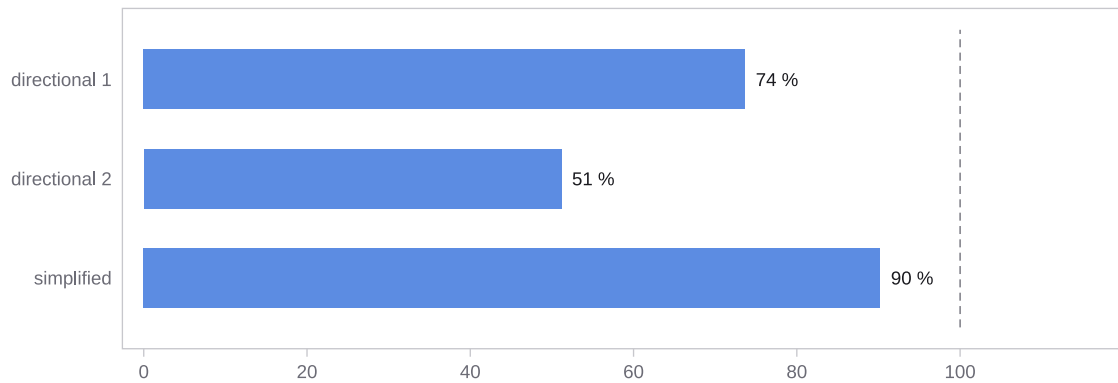
Design checks

Criterion	Value	Limit	Status
Directional method, condition 1: $\sigma_{wv} \leq f_u / (\beta_w \cdot \gamma_{M2})$	265.2 N/mm ²	360 N/mm ²	● OK
Directional method, condition 2: $\sigma_{perp} \leq 0.9 \cdot f_u / \gamma_{M2}$	132.6 N/mm ²	259.2 N/mm ²	● OK
Simplified method: $F_{w,Ed} \leq F_{w,Rd}$	750 N/mm	831.4 N/mm	● borderline

Results

Utilization, directional method, η	0.737
Utilization, simplified method, η	0.902
Shear strength of the weld $f_{vw,d}$	207.8 N/mm ²
Required weld throat thickness a_{req} ($\eta = 1$)	2.9 mm

Utilization diagram



Calculation basis

Fillet weld design check per DIN EN 1993-1-8, Section 4. In the directional method, the stress components are determined in the effective weld area inclined at 45 degrees, and the von Mises equivalent stress is checked against $f_u/(\beta_w \cdot \gamma_{M2})$, with the normal stress additionally checked against $0.9 \cdot f_u/\gamma_{M2}$. In the simplified method, the resultant force per unit length is verified against the design resistance $f_{vw,d} \cdot a$. Tensile strength and correlation factor follow German practice per EN 10025-2 and the German National Annex.

About this sample

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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.