

Adhesive Joint - Lap Joint

Sample document - numeric values are only included in the purchased Pro export.

Project: _____ Part/Position: _____ Prepared by: _____

Overall assessment: fail - the existing overlap length is not sufficient for the required safety factor.

Inputs

Overlap length l_{ov}	??? mm
Bond width b	??? mm
Load F	??? N
Adhesive	???
Shear strength τ_B	??? N/mm ²
required safety factor S	???
Adherend thickness s	???

Results

Bond area $A = l_{ov} \cdot b$	???	mm ²
mean shear stress $\tau = F/A$	???	N/mm ²
Adhesive shear strength τ_B	???	N/mm ²
allowable shear stress $\tau_{allow} = \tau_B/S$	???	N/mm ²
Utilization τ/τ_{allow}	???	
required overlap length $l_{ov,req}$	???	mm

Verification against the mean shear stress

Criterion	Value	Limit	Status
$\tau \leq \tau_{allow}$	???	???	● FAIL

Calculation basis

Simplified method: mean shear stress of the single-lap joint per DIN EN 1465, $\tau = F/A$ with the bond area $A = l_{ov} \cdot b$. The real stress distribution along the overlap length is not constant - stress peaks occur at the overlap ends (Volkersen theory, amplified by bending effects in compliant adherends per Goland-Reissner), hence the comparatively high safety factor $S \geq 2$. Peel and cleavage loading (tensile forces perpendicular to the bond area) must be avoided by design. The shear strength τ_B depends on temperature, aging and curing - the manufacturer's data sheet governs the final design. A preliminary sizing tool, not a calculation of the real non-uniform stress distribution.

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.