

POS. 135: FERMACELL S.8

1. Input parameters

2. general statements

single shear plane connection, exact verification acc. to DIN EN 1995, 8.2.2
duration of load: short-term

3. materials

3.1. outer timber member 1

service class 1, Fermacell 12,5 mm, $\rho_k = 1150 \text{ kg/m}^3$, $t = 12.5 \text{ mm}$, $k_{mod} = 0.80$
angle between force and the grain direction $\alpha = 0.0^\circ$

3.2. outer timber member 2

service class 1, solid coniferous timber, C24 (S10), $\rho_k = 350 \text{ kg/m}^3$, $t = 200.0 \text{ mm}$, $k_{mod} = 0.90$
angle between force and the grain direction $\alpha = 0.0^\circ$

4. fastener

smooth nail, $2.8 \times 42.5 \text{ mm}$, $d_k = 6.7 \text{ mm}$, not predrilled
 $F_{v,Rk}$ increased acc. to DIN EN 1995, 8.2.2(2)

5. results acc. to DIN EN 1995:2010, Deutschland, $\gamma_1 = 1.30$, $\gamma_2 = 1.30$

5.1. minimum spacings (DIN EN 1995:2010, Tab. 8.2) and strengths

member	a1 mm	a2 mm	a3t mm	a4t mm	a3c mm	a4c mm	f _{td} N/mm ²	f _{md} N/mm ²	f _{cd} N/mm ²	f _{vd} N/mm ²	f _{h,α,d} N/mm ²	f _{h,α,k} N/mm ²
out. t. m. 1	30.3	19.6	56.0	39.2	42.0	39.2	1.48	2.58	5.23	2.22	20.34	33.06
out. t. m. 2	28.0	14.0	42.0	28.0	28.0	28.0	9.69	16.62	14.54	1.38	14.59	21.07

minimum widths one fastener row: outer timber member 1 = 78 mm, outer timber member 2 = 56 mm
nail ends in outer timber member 2, penetration depth $t_{pen} = 30 \text{ mm} > 4 d = 11 \text{ mm}$, 1 shear plane
 $f_{uk} = 600 \text{ N/mm}^2$, $M_{yk} = 2617 \text{ Nmm}$

decisive is Eq. (d), $\gamma_M = 1.30$, $F_{v,Rk} = 543.8 \text{ N} + \Delta F_{v,Rk} (34.9 \text{ N}) = 578.7 \text{ N}$, $F_{v,Rd} = 377.7 \text{ N}$
per shear plane

$F_{ax,Rk} = 139.7 \text{ N}$, $F_{ax,Rd} = 91.2 \text{ N}$ withdrawal capacity