

CALCULATION OF HECO MULTI-MONTI-Therm MMS-T

1) Design Resistance N_d for MMS-7,5 according ETA 05/0010 and ETAG 001 Annex C

Calculation of N_d

	NRk,p [kN]	y_{mc}	$N_{d,p} = N_d$ [kN]
cracked concrete C20/25	5	1,8	2,78
uncracked concrete C20/25	7,5	1,8	4,17

Remarks:

NRk,p acc. ETA 05/0010 Annex 4
 steel-failure, concrete cone failure and splitting are not relevant
 no edge or spacing influence possible

2) Design Resistance $F_{ax,d}$ for tensile loads for MMS-T in the counterbatton according Eurocode 5

Inputs		Input	Remarks: embedment depth of thread in the counter button $l_{ef,min} = 4 \times l_{ef}$ acc. EAD-draft for wood construction screws, annex 1) acc. Eurocode 5 (wood)
Thread diameter d	[mm]	7,5	
Effective length thread l	[mm]	30	
fax,k	[N/mm ²]	13,7	
Number of screws nef	[pcs]	1	
Timber class			
Timber density	[kg/m ³]	350	
Load direction to fibre	[°]	90	
kmod		0,8	
Safety factor γ_m		1,3	

Calculation formula acc. EC 5 chapter 8.7.2

$$F_{ax, \alpha, Rd} = \frac{n_{ef} f_{ax, k} d l_{ef}}{1,2 \cos^2 \alpha + \sin^2 \alpha} \left(\frac{\rho_k}{\rho_a} \right)^{0,8} \quad \text{eq. 8.40(a)}$$

Interim Value

sin alpha	0,999999683
cos alpha	0,000796327

Charact. axial capacity of the thread

$$F_{ax, \alpha, Rk} = \quad \quad \quad \mathbf{3091 \text{ N}}$$

Design value thread-pull-out

$$F_{ax, \alpha, Rd} = F_{ax, \alpha, Rk} \cdot k_{mod}/\gamma_m$$

$$\mathbf{F_{ax, \alpha, Rd} = \quad \quad \quad 1,90 \text{ kN}}$$

Annex 1) calculation characteristic withdrawal parameter $f_{ax, k}$

$$f_{ax, k} = 0.52 \cdot d^{-0.5} \cdot l_{ef}^{-0.1} \cdot \rho_k^{0.8} \cdot k_d \quad \text{N/mm}^2$$

where:

$$k_d = \min \left\{ \begin{array}{l} \frac{d}{8} \\ 1.0 \end{array} \right.$$

d	outer thread diameter in mm
l_{ef}	maximum penetration length of the threaded part of the screw per screw type and outer thread diameter in mm
ρ_k	characteristic density of the relevant strength class in kg/m ³