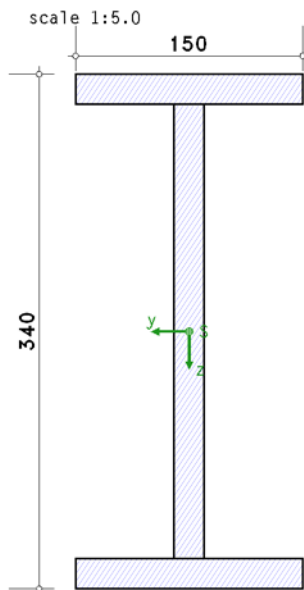


POS. 11: KINDMANN/KRÜGER 5.6.3

verification of cross-section EC 3-1-8 (12.10), NA: Deutschland

1. input report



steel

steel grade S235

material safety factor

resistance of cross-sections $\gamma_{M0} = 1.00$

geometry

parameter (I-section):

overall depth $h = 340.0$ mm, web thickness $t_w = 20.0$ mm

flange width $b_f = 150.0$ mm, flange thickness $t_f = 20.0$ mm

welded section, full penetrated (DHV-weld)

resistance

plastic verification acc. to EC 3-1-1, 6.2

internal forces and moments referring to local axes of cross-section

σ -generating forces (N, M) work at centroid, τ -generating forces (V, T_t) work at shear center

Lk 1: $N_{Ed} = 1410.00$ kN, $M_{z,Ed} = 5000.00$ kNcm

notes

buckling is not investigated.

2. Lk 1

2.1. verification of cross-section

internal forces and moments: $N = 1410.00$ kN, $M_z = 5000.00$ kNcm

2.1.1. plastic verification

plastic verification for $N = 1410.00$ kN, $M_z = 50.00$ kNm

plate buckling: section class of the section $1 \leq 2$ **ok**

plastic values: $N_{pl,Rd} = A \cdot f_y / \gamma_{M0} = 2820.00$ kN, $M_{pl,z,Rd} = W_{pl,z} \cdot f_y / \gamma_{M0} = 59.89$ kNm

bending and axial force

deduction M_z : $N_{c,lim} = A_w \cdot f_y / \gamma_{M0} = 1410.00$ kN, $A_w = h_w \cdot t_w = 6000.00$ cm²

$N_{Ed} \leq N_{c,lim}$ or $n \leq a$: $f_{N,z} = 1 \Rightarrow M_{pl,z,Rd} = M_{pl,z,Rd} \cdot f_{N,z} = 59.89$ kNm

bending

verification: $|M_{z,Ed}| / M_{pl,z,Rd} = 0.835 < 1$ **ok**

3. final result

maximum utilization: resistance max $U = 0.835 < 1$ **ok**

verification succeeded