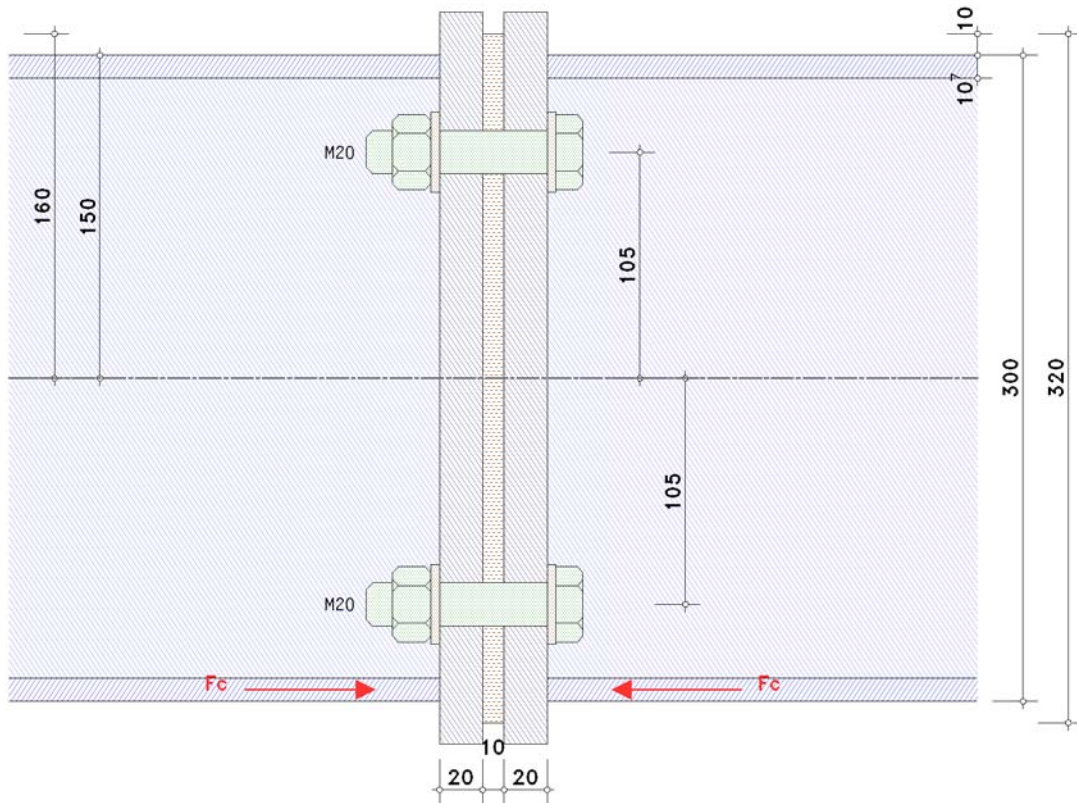


POS. 85: END-PLATE WITH SEPARATION LAYER

bc 15, end-plate with thermal separation layer
EC 3-1-8 (04.25), NA: Deutschland

4H-EC3GK version: 10/2012-3k

1. input report



thermal separation layer (according to Kerncompactlager of Calenberg Ingenieure GmbH, approval until 2029):

thickness $t_e = 10.0$ mm, width $b_e = 130.0$ mm, length $l_e = 320.0$ mm

material safety factor $\gamma_{Me} = 1.00$

beam: height $h_b = 300.0$ mm, flange thickness $t_{fb} = 10.7$ mm

end-plate: plate thickness $t_p = 20.0$ mm

connection device:

bolts, bolt class 10.9, bolt size M20

$n_s = 2$ bolt-rows with $n_{sr} = 2$ bolts per row

uniform bolt forces

preload force per bolt $F_{p,c} = 80.0$ kN

internal forces and moments (sign EC3-compliant):

distance of the system axis to the upper edge of the separation layer $z_{se} = 160.0$ mm

axial force, internal moment in the system axis (characteristic) $N_k = 20.0$ kN, $M_k = -30.0$ kNm

stress:

no design forces exists !

2. calculation

2.1. resistance

calculation is for structural bearings according to Kerncompactlager of Calenberg Ingenieure GmbH,

approval as structural bearings until 2029.

calculation method is also appropriate for the connection of a steel girder to a reinforced concrete column

bolts are verified with the thread in the shear joint.

a preload force of the bolts of $F_{p,c} = 80.0$ kN is taken into account in the calculation.

effective length of separation layer $h_m = 167.0$ mm

mean compressive stress $\sigma_m = 16.67$ N/mm²

verification of the separation layer

shape factor $S = 2.861$ for 2 bolts in compression zone

permissible mean compressive stress $\sigma_{md,zul} = 35.64$ N/mm²

utilization of the separation layer $0.655 < 1$ **ok**

resistance of an end-plate connection with thermal separation layer:

$F_{c,e,Rd} = A_{eff} \cdot f_e / \gamma_{Me} = 167.8$ kN, $A_{eff} = 65.91$ cm², $f_e = \sigma_{m,zul} = 25.46$ N/mm², $\gamma_{Me} = 1.00$

3. Regulations

EN 1990, Eurocode 0: Grundlagen der Tragwerksplanung;

Deutsche Fassung EN 1990:2002 + A1:2005 + A1:2005/AC:2010, Ausgabe Dezember 2010

EN 1990/NA, Nationaler Anhang zur EN 1990, Ausgabe Dezember 2010

EN 1993-1-1, Eurocode 3: Bemessung und Konstruktion von Stahlbauten -

Teil 1-1: Allgemeine Bemessungsregeln und Regeln für den Hochbau;

Deutsche Fassung EN 1993-1-1:2022, Ausgabe April 2025

EN 1993-1-1/A1, Ergänzungen zur EN 1993-1-1, Ausgabe Juli 2014

EN 1993-1-1/NA, Nationaler Anhang zur EN 1993-1-1, Ausgabe Oktober 2022

EN 1993-1-8, Eurocode 3: Bemessung und Konstruktion von Stahlbauten -

Teil 1-8: Bemessung von Anschlüssen;

Deutsche Fassung EN 1993-1-8:2024, Ausgabe April 2025

EN 1993-1-8/NA, Nationaler Anhang zur EN 1993-1-8, Ausgabe November 2020

Druckschrift Kerncompactlager, Calenberg Ingenieure GmbH, Salzhemmendorf,
www.calenberg-ingenieure.de