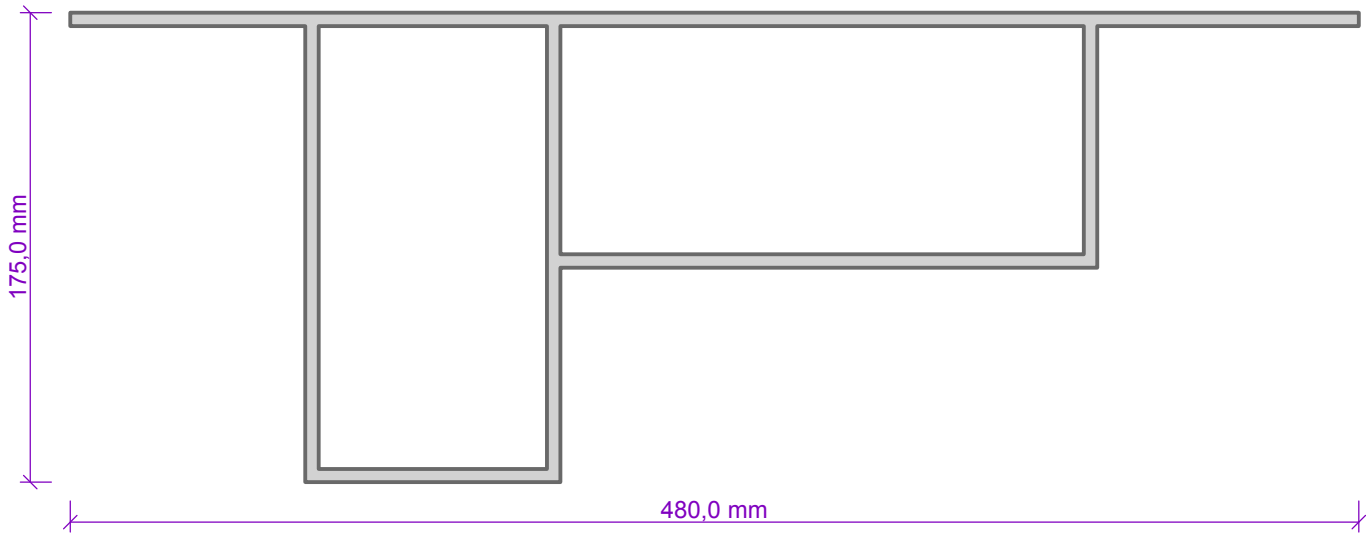
1 Project

Section name : Dvoukomorový nesymetrický průřez s konzolami

2 Section

Nodes count:9 Edges count:10 Cells count:2 Open branches count:2



2.1 Section nodes

no.	X [mm]	Y [mm]
1	-60,0	80,0
2	-60,0	-10,0
3	140,0	-10,0
4	140,0	80,0
5	-150,0	80,0
6	-150,0	-90,0
7	-60,0	-90,0
8	-240,0	80,0
9	240,0	80,0

2.2 Section edges

no.	Starting node	End node	Edge thickness [mm]
1	0	1	5,0
2	1	2	5,0
3	2	3	5,0
4	3	0	5,0
5	0	4	5,0
6	4	5	5,0
7	5	6	5,0
8	6	1	5,0
9	4	7	5,0
10	3	8	5,0

2.3 Section branches

no.	Branch type	List of branch edges
1	Closed cell	1,2,3,4
2	Closed cell	1,5,6,7,8
3	Open branch	9
4	Open branch	10

3 Results

Values	
Position of centre of gravity with respect to global coordinate system	
horizontal position of cetre of gravity with respect to origin of coordinate system	x_T = -20,4 mm
vertical position of centre of gravity with respect to origin of coordinate system	y_T = 24,5 mm
Shear centre position with respect to global coordinate system	
horizontal position of shear centre with respect to origin of coordinate system	x_A = -58,2 mm
vertical position of shear centre with respect to origin of coordinate system	y_A = 31,3 mm
Cross-sectional characteristics	
cross-sectional area	A = 5950,0 mm^2
overall cross-section area (including gussets, shims and holes)	A_{total} = 36550,0 mm^2
cross-section perimeter	P = 2370,0 mm
cross-section perimeter	P_{out} = 1310,0 mm
distance of centroid from left edge of min. cross-section envelope	y_{cg} = 219,6 mm
distance of centroid from bottom edge of min. cross-section envelope	z_{cg} = 117,0 mm
moment of inertia w.r.t. horizontal centroidal axis	I_y = 20,30E+06 mm^4
moment of inertia w.r.t. vertical centroidal axis	I_z = 84,21E+06 mm^4
mixed moment of inertia w.r.t. centroidal axes	D_{yz} = 9,982E+06 mm^4
inclination of principal centroidal axes	ϕ = 8,7 °
radius of gyration normal to horizontal centroidal axis	i_y = 58,4 mm
radius of gyration normal to vertical centroidal axis	i_z = 119,0 mm
moment of inertia w.r.t. principal Y-axis	I_{yh} = 18,78E+06 mm^4
moment of inertia w.r.t. principal Z-axis	I_{zh} = 85,74E+06 mm^4
radius of gyration normal to principal Y-axis	i_{yh} = 56,2 mm
radius of gyration normal to principal Z-axis	i_{zh} = 120,0 mm
polar moment of inertia	I_p = 104,5E+06 mm^4
polar moment of inertia	i_p = 132,5 mm
Sectional parameters	
y-coordinate of shear center in centroidal coordinate system	y_{sc} = -37,8 mm
z-coordinate of shear center in centroidal coordinate system	z_{sc} = 6,7 mm
rigidity moment in simple torsion	I_k = 24,12E+06 mm^4
sectorial moment of inertia w.r.t. shear center	$I_{w.s}$ = 43,16E+09 mm^6
sectorial moment of inertia w.r.t. centroid	$I_{w.c}$ = 81,30E+09 mm^6

4 Main warping coordinate ω in section nodes:

Node no.	Pole in origin ω_P [mm^2]	Pole in centre of gravity ω_T [mm^2]	Pole in shear centre ω_S [mm^2]
1	-2,361E+03	-2,206E+03	-385,6E+00
2	2,890E+03	1,213E+03	-369,7E+00
3	-9,743E+03	-6,517E+03	-6,750E+03
4	-3,728E+03	1,330E+03	4,500E+03
5	-1,597E+03	-3,649E+03	-2,435E+03
6	11,75E+03	6,234E+03	1,020E+03
7	13,41E+03	10,10E+03	5,498E+03
8	5,603E+03	1,345E+03	1,951E+03
9	-11,73E+03	-4,218E+03	-373,0E+00

5 Extremes of first moment of area S_ω on section edges:

Edge no.	Pole in origin $S_{\omega,P}$ [mm^4]	Pole in centre of gravity $S_{\omega,T}$ [mm^4]	Pole in shear centre $S_{\omega,S}$ [mm^4]
1	-2,476E+06	-1,781E+06	306,9E+03
2	6,866E+06	3,157E+06	1,899E+06
3	3,109E+06	-808,2E+03	-2,572E+06
4	-6,830E+06	-1,229E+06	937,6E+03
5	-5,483E+06	-1,774E+06	615,4E+03
6	-4,662E+06	-2,865E+06	-857,9E+03
7	5,393E+06	2,483E+06	736,3E+03
8	8,654E+06	4,746E+06	1,767E+06
9	-981,2E+03	-81,50E+03	-195,2E+03
10	3,864E+06	801,7E+03	7,136E+03