

# Design of steel I section beam

According to **Eurocode**: EN 1993-1-1

## Dimensions

Section type - **IPN 550**

$h = 550$  mm,  $t_w = 19$  mm  
 $b_{f1} = 200$  mm,  $t_{f1} = 30$  mm  
 $b_{f2} = 200$  mm,  $t_{f2} = 30$  mm  
 $r = 19$  mm,  
 $h_w = h - t_{f1} - t_{f2} = 550 - 30 - 30 = 490$  mm

Section type - Rolled

## Steel properties

Yield strength -  $f_y = 235$  MPa

Tensile strength -  $f_u = 360$  MPa

Modulus of elasticity -  $E = 210000$  MPa

Private factors of safety:

$\gamma_{M0} = 1.05$  ,  $\gamma_{M2} = 1.25$

## Section properties

$A = 21619.88505$ mm <sup>2</sup>	$y_c = 100$ mm	$z_c = 275$ mm		
$I_y = 1016343525$ mm <sup>4</sup>	$r_y = 216.81712$ mm	$W_{el_y} = 3695794.637$ mm <sup>3</sup>	$W_{pl_y} = 4335081.688$ mm <sup>3</sup>	
$I_z = 40342545.43$ mm <sup>4</sup>	$r_z = 43.197136$ mm	$W_{el_z} = 403425.4543$ mm <sup>3</sup>	$W_{pl_z} = 648481.5573$ mm <sup>3</sup>	
$I_t = 5216559.421$ mm <sup>4</sup>	$I_w = 2704000000000$ mm <sup>6</sup>	$W_t = 98566.08232$ mm <sup>3</sup>		

