

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

