

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

$A = 21619.88505$ mm² $y_c = 100$ mm

$z_c = 275$ mm

$I_y = 1016343525$ mm⁴ $r_y = 216.81712$ mm

$W_{el,y} = 3695794.637$ mm³

$W_{pl,y} = 4335081.688$ mm³

$I_z = 40342545.43$ mm⁴ $r_z = 43.197136$ mm

$W_{el,z} = 403425.4543$ mm³

$W_{pl,z} = 648481.5573$ mm³

$I_t = 5216559.421$ mm⁴ $I_w = 2704000000000$ mm⁶

$W_t = 98566.08232$ mm³