

Serie L (UNI EU 57)

Classe acciaio S 235

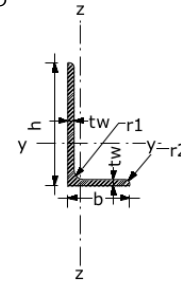
Designazione L 60 x 60 x 6

$A = 6,91 \text{ cm}^2$

$P = 5,42 \text{ kg/m}$

$h = 60 \text{ mm}$

$b = 60 \text{ mm}$



$t_w = 6 \text{ mm}$

Classe della sezione : Classe 3

$r_1 = 8 \text{ mm}$

$r_2 = 4 \text{ mm}$

$c/t = 7,67 \text{ flangia}$

$h/t = 10,00 \text{ angolari}$

$(b+h)/2t = 10,00 \text{ angolari}$

$J_y = 22,79 \text{ cm}^4$

$J_z = 22,79 \text{ cm}^4$

$W_y = 5,29 \text{ cm}^3$

$W_z = 5,29 \text{ cm}^3$

$i_y = 1,82 \text{ cm}$

$i_z = 1,82 \text{ cm}$

$J_u = 36,14 \text{ cm}^4$

$J_v = 9,44 \text{ cm}^4$

$i_u = 2,29 \text{ cm}$

$i_v = 1,17 \text{ cm}$

$e_y = 1,69 \text{ cm}$

$e_z = 1,69 \text{ cm}$

Resistenza

$f_{yk} = 235 \text{ mm}$

$f_{tk} = 360 \text{ mm}$

$A_{net,lim} = 5,97 \text{ cm}^2$

$N_{t,Rd} = 154652 \text{ N}$

$N_{pl,Rd} = 154652 \text{ N}$

$N_{u,Rd} = 179107 \text{ N}$

$M_{el,Rd,y} = 1183 \text{ N m}$

$M_{el,Rd,z} = 1183 \text{ N m}$

$M_{pl,Rd,y} = 0 \text{ N m}$

$M_{pl,Rd,z} = 0 \text{ N m}$

$V_{c,Rd,z} = 0 \text{ N}$

$N_{c,Rd} = 154652 \text{ N}$

Stabilità

$L_{o,y} = 500,00 \text{ cm}$

$L_{o,z} = 500,00 \text{ cm}$

$\alpha_y = 0,34$

$\alpha_z = 0,34$

$N_{CR,y} = 18894 \text{ N}$

$N_{CR,z} = 18894 \text{ N}$

$\lambda_y = 275$

$\lambda_z = 275$

$\lambda^*_y = 2,93$

$\lambda^*_z = 2,93$

$\Phi_y = 5,26$

$\Phi_z = 5,26$

$\chi_y = 0,104$

$\chi_z = 0,104$

$N_{b,Rd,y} = 16057 \text{ N}$

$N_{b,Rd,z} = 16057 \text{ N}$



Serie L (UNI EU 57)

Classe acciaio S 235

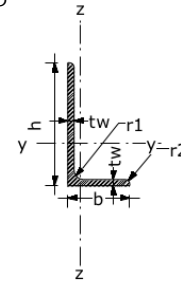
Designazione L 80 x 80 x 10

$A = 15,10 \text{ cm}^2$

$P = 11,90 \text{ kg/m}$

$h = 80 \text{ mm}$

$b = 80 \text{ mm}$



$t_w = 10 \text{ mm}$

Classe della sezione : Classe 3

$r_1 = 10 \text{ mm}$

$r_2 = 5 \text{ mm}$

$c/t = 6,00 \text{ flangia}$

$h/t = 8,00 \text{ angolari}$

$(b+h)/2t = 8,00 \text{ angolari}$

$J_y = 87,50 \text{ cm}^4$

$J_z = 87,50 \text{ cm}^4$

$W_y = 15,45 \text{ cm}^3$

$W_z = 15,45 \text{ cm}^3$

$i_y = 2,41 \text{ cm}$

$i_z = 2,41 \text{ cm}$

$J_u = 138,60 \text{ cm}^4$

$J_v = 36,38 \text{ cm}^4$

$i_u = 3,03 \text{ cm}$

$i_v = 1,55 \text{ cm}$

$e_y = 2,34 \text{ cm}$

$e_z = 2,34 \text{ cm}$

Resistenza

$f_{yk} = 235 \text{ mm}$

$f_{tk} = 360 \text{ mm}$

$A_{net,lim} = 13,04 \text{ cm}^2$

$N_{t,Rd} = 337952 \text{ N}$

$N_{pl,Rd} = 337952 \text{ N}$

$N_{u,Rd} = 391392 \text{ N}$

$M_{el,Rd,y} = 3458 \text{ N m}$

$M_{el,Rd,z} = 3458 \text{ N m}$

$M_{pl,Rd,y} = 0 \text{ N m}$

$M_{pl,Rd,z} = 0 \text{ N m}$

$V_{c,Rd,z} = 0 \text{ N}$

$N_{c,Rd} = 337952 \text{ N}$

Stabilità

$L_{o,y} = 500,00 \text{ cm}$

$L_{o,z} = 500,00 \text{ cm}$

$\alpha_y = 0,34$

$\alpha_z = 0,34$

$N_{CR,y} = 72542 \text{ N}$

$N_{CR,z} = 72542 \text{ N}$

$\lambda_y = 208$

$\lambda_z = 208$

$\lambda^*_y = 2,21$

$\lambda^*_z = 2,21$

$\Phi_y = 3,29$

$\Phi_z = 3,29$

$\chi_y = 0,175$

$\chi_z = 0,175$

$N_{b,Rd,y} = 59067 \text{ N}$

$N_{b,Rd,z} = 59067 \text{ N}$

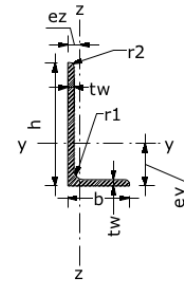


Serie L (UNI EN 10056-1)

Classe acciaio S 235

Designazione L EN 10056-1-80 x 80 x 10

$A = 15,10 \text{ cm}^2$   
 $P = 11,90 \text{ kg/m}$   
 $h = 80 \text{ mm}$   
 $b = 80 \text{ mm}$



$t_w = 10 \text{ mm}$

Classe della sezione : Classe 3

$r_1 = 10 \text{ mm}$

$r_2 = 5 \text{ mm}$

$c/t = 6,00$  flangia

$h/t = 8,00$  angolari

$(b+h)/2t = 8,00$  angolari

$J_y = 87,50 \text{ cm}^4$   
 $W_y = 15,40 \text{ cm}^3$   
 $i_y = 2,41 \text{ cm}$

$J_z = 87,50 \text{ cm}^4$   
 $W_z = 15,40 \text{ cm}^3$   
 $i_z = 2,41 \text{ cm}$

$J_u = 139,00 \text{ cm}^4$   
 $i_u = 3,03 \text{ cm}$   
 $e_y = 2,32 \text{ cm}$

$J_v = 36,40 \text{ cm}^4$   
 $i_v = 1,55 \text{ cm}$   
 $e_z = 2,32 \text{ cm}$

Resistenza

$f_{yk} = 235 \text{ mm}$

$f_{tk} = 360 \text{ mm}$

$A_{net,lim} = 13,04 \text{ cm}^2$

$N_{t,Rd} = 337952 \text{ N}$

$N_{pl,Rd} = 337952 \text{ N}$

$N_{u,Rd} = 391392 \text{ N}$

$M_{el,Rd,y} = 3447 \text{ N m}$

$M_{el,Rd,z} = 3447 \text{ N m}$

$M_{pl,Rd,y} = 0 \text{ N m}$

$M_{pl,Rd,z} = 0 \text{ N m}$

$V_{c,Rd,z} = 0 \text{ N}$

$N_{c,Rd} = 337952 \text{ N}$

Stabilità

$L_{o,y} = 200,00 \text{ cm}$

$L_{o,z} = 200,00 \text{ cm}$

$\alpha_y = 0,34$

$\alpha_z = 0,34$

$N_{CR,y} = 453385 \text{ N}$

$N_{CR,z} = 453385 \text{ N}$

$\lambda_y = 83$

$\lambda_z = 83$

$\lambda^*_y = 0,88$

$\lambda^*_z = 0,88$

$\Phi_y = 1,01$

$\Phi_z = 1,01$

$\chi_y = 0,672$

$\chi_z = 0,672$

$N_{b,Rd,y} = 226992 \text{ N}$

$N_{b,Rd,z} = 226992 \text{ N}$



Serie L (UNI EU 57)

Classe acciaio S 235

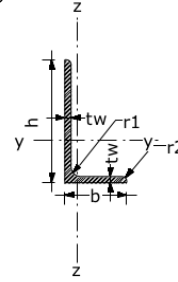
Designazione L 120 x 80 x 8

$A = 15,49 \text{ cm}^2$

$P = 12,20 \text{ kg/m}$

$h = 120 \text{ mm}$

$b = 80 \text{ mm}$



$t_w = 8 \text{ mm}$

Classe della sezione : Classe 4

$r_1 = 11 \text{ mm}$

$r_2 = 5,5 \text{ mm}$

$c/t = 12,63 \text{ flangia}$

$h/t = 15,00 \text{ angolari}$

$(b+h)/2t = 12,50 \text{ angolari}$

$J_y = 225,70 \text{ cm}^4$

$J_z = 80,76 \text{ cm}^4$

$W_y = 27,63 \text{ cm}^3$

$W_z = 13,17 \text{ cm}^3$

$i_y = 3,82 \text{ cm}$

$i_z = 2,28 \text{ cm}$

$J_u = 259,80 \text{ cm}^4$

$J_v = 46,63 \text{ cm}^4$

$i_u = 4,10 \text{ cm}$

$i_v = 1,74 \text{ cm}$

$e_y = 3,83 \text{ cm}$

$e_z = 1,87 \text{ cm}$

Resistenza

$f_{yk} = 235 \text{ mm}$

$f_{tk} = 360 \text{ mm}$

$A_{net,lim} = 13,38 \text{ cm}^2$

$N_{t,Rd} = 346681 \text{ N}$

$N_{pl,Rd} = 346681 \text{ N}$

$N_{u,Rd} = 401501 \text{ N}$

$M_{el,Rd,y} = 6184 \text{ N m}$

$M_{el,Rd,z} = 2948 \text{ N m}$

$M_{pl,Rd,y} = 0 \text{ N m}$

$M_{pl,Rd,z} = 0 \text{ N m}$

$V_{c,Rd,z} = 0 \text{ N}$

$N_{c,Rd} = 346681 \text{ N}$

Stabilità

$L_{o,y} = 500,00 \text{ cm}$

$L_{o,z} = 500,00 \text{ cm}$

$\alpha_y = 0,34$

$\alpha_z = 0,34$

$N_{CR,y} = 187116 \text{ N}$

$N_{CR,z} = 66954 \text{ N}$

$\lambda_y = 131$

$\lambda_z = 219$

$\lambda^*_y = 1,39$

$\lambda^*_z = 2,33$

$\Phi_y = 1,68$

$\Phi_z = 3,58$

$\chi_y = 0,384$

$\chi_z = 0,159$

$N_{b,Rd,y} = 133087 \text{ N}$

$N_{b,Rd,z} = 55027 \text{ N}$

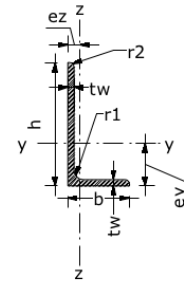


Serie L (UNI EN 10056-1)

Classe acciaio S 235

Designazione L EN 10056-1-120 x 120 x 12

$A = 27,50 \text{ cm}^2$   
 $P = 21,60 \text{ kg/m}$   
 $h = 120 \text{ mm}$   
 $b = 120 \text{ mm}$



$t_w = 12 \text{ mm}$

Classe della sezione : Classe 3

$r_1 = 13 \text{ mm}$

$r_2 = 6,5 \text{ mm}$

$c/t = 7,92$  flangia

$h/t = 10,00$  angolari

$(b+h)/2t = 10,00$  angolari

$J_y = 368,00 \text{ cm}^4$   
 $W_y = 42,70 \text{ cm}^3$   
 $i_y = 3,65 \text{ cm}$

$J_z = 368,00 \text{ cm}^4$   
 $W_z = 42,70 \text{ cm}^3$   
 $i_z = 3,65 \text{ cm}$

$J_u = 584,00 \text{ cm}^4$   
 $i_u = 4,60 \text{ cm}$   
 $e_y = 3,38 \text{ cm}$

$J_v = 152,00 \text{ cm}^4$   
 $i_v = 2,35 \text{ cm}$   
 $e_z = 3,38 \text{ cm}$

Resistenza

$f_{yk} = 235 \text{ mm}$

$f_{tk} = 360 \text{ mm}$

$A_{net,lim} = 23,75 \text{ cm}^2$

$N_{t,Rd} = 615476 \text{ N}$

$N_{pl,Rd} = 615476 \text{ N}$

$N_{u,Rd} = 712800 \text{ N}$

$M_{el,Rd,y} = 9557 \text{ N m}$

$M_{el,Rd,z} = 9557 \text{ N m}$

$M_{pl,Rd,y} = 0 \text{ N m}$

$M_{pl,Rd,z} = 0 \text{ N m}$

$V_{c,Rd,z} = 0 \text{ N}$

$N_{c,Rd} = 615476 \text{ N}$

Stabilità

$L_{o,y} = 200,00 \text{ cm}$

$L_{o,z} = 200,00 \text{ cm}$

$\alpha_y = 0,34$

$\alpha_z = 0,34$

$N_{CR,y} = 1906808 \text{ N}$

$N_{CR,z} = 1906808 \text{ N}$

$\lambda_y = 55$

$\lambda_z = 55$

$\lambda^*_y = 0,58$

$\lambda^*_z = 0,58$

$\Phi_y = 0,74$

$\Phi_z = 0,74$

$\chi_y = 0,845$

$\chi_z = 0,845$

$N_{b,Rd,y} = 520245 \text{ N}$

$N_{b,Rd,z} = 520245 \text{ N}$



Serie L (UNI EU 57)

Classe acciaio S 235

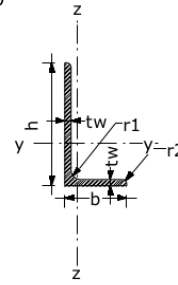
Designazione L 120 x 80 x 14

$$A = 26,20 \text{ cm}^2$$

$$P = 20,50 \text{ kg/m}$$

$$h = 120 \text{ mm}$$

$$b = 80 \text{ mm}$$



$$t_w = 14 \text{ mm}$$

Classe della sezione : Classe 3

$$r_1 = 11 \text{ mm}$$

$$r_2 = 5,5 \text{ mm}$$

$$c/t = 6,79 \text{ flangia}$$

$$h/t = 8,57 \text{ angolari}$$

$$(b+h)/2t = 7,14 \text{ angolari}$$

$$J_y = 367,70 \text{ cm}^4$$

$$J_z = 129,50 \text{ cm}^4$$

$$W_y = 46,44 \text{ cm}^3$$

$$W_z = 21,96 \text{ cm}^3$$

$$i_y = 3,75 \text{ cm}$$

$$i_z = 2,23 \text{ cm}$$

$$J_u = 421,00 \text{ cm}^4$$

$$J_v = 76,25 \text{ cm}^4$$

$$i_u = 4,01 \text{ cm}$$

$$i_v = 1,71 \text{ cm}$$

$$e_y = 4,08 \text{ cm}$$

$$e_z = 2,10 \text{ cm}$$

### Resistenza

$$f_{yk} = 235 \text{ mm}$$

$$f_{tk} = 360 \text{ mm}$$

$$A_{net,lim} = 22,62 \text{ cm}^2$$

$$N_{t,Rd} = 586381 \text{ N}$$

$$N_{pl,Rd} = 586381 \text{ N}$$

$$N_{u,Rd} = 679104 \text{ N}$$

$$M_{el,Rd,y} = 10394 \text{ N m}$$

$$M_{el,Rd,z} = 4915 \text{ N m}$$

$$M_{pl,Rd,y} = 0 \text{ N m}$$

$$M_{pl,Rd,z} = 0 \text{ N m}$$

$$V_{c,Rd,z} = 0 \text{ N}$$

$$N_{c,Rd} = 586381 \text{ N}$$

### Stabilità

$$L_{o,y} = 500,00 \text{ cm}$$

$$L_{o,z} = 500,00 \text{ cm}$$

$$\alpha_y = 0,34$$

$$\alpha_z = 0,34$$

$$N_{CR,y} = 304840 \text{ N}$$

$$N_{CR,z} = 107362 \text{ N}$$

$$\lambda_y = 133$$

$$\lambda_z = 225$$

$$\lambda^*_y = 1,42$$

$$\lambda^*_z = 2,39$$

$$\Phi_y = 1,72$$

$$\Phi_z = 3,74$$

$$\chi_y = 0,373$$

$$\chi_z = 0,151$$

$$N_{b,Rd,y} = 218811 \text{ N}$$

$$N_{b,Rd,z} = 88788 \text{ N}$$

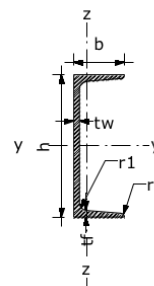


Serie UPN (UNI 5680)

Classe acciaio S 235

Designazione UPN 120

$A = 17,00 \text{ cm}^2$   
 $P = 13,40 \text{ kg/m}$   
 $h = 120 \text{ mm}$   
 $b = 55 \text{ mm}$



Classe della sezione : Classe 1

$t_w = 7 \text{ mm}$

$t_f = 9 \text{ mm}$

$r_1 = 9 \text{ mm}$

$r_2 = 4,5 \text{ mm}$

$c/t = 4,33 \text{ flangia}$

$A_{Vy} = 9,86 \text{ cm}^2$

$J_y = 364,00 \text{ cm}^4$

$W_y = 60,70 \text{ cm}^3$

$i_y = 4,62 \text{ cm}$

$W_{ypl} = 72,60 \text{ cm}^3$

$A_{Vz} = 8,54 \text{ cm}^2$

$J_z = 43,20 \text{ cm}^4$

$W_z = 11,10 \text{ cm}^3$

$i_z = 1,59 \text{ cm}$

$W_{zpl} = 21,20 \text{ cm}^3$

$A_V = 8,80 \text{ cm}^2$

$J_t = 4,15 \text{ cm}^4$

$J_w = 900,00 \text{ cm}^4$

$e_z = 1,61 \text{ cm}$

Resistenza

$f_{yk} = 235 \text{ mm}$

$f_{tk} = 360 \text{ mm}$

$A_{net,lim} = 14,68 \text{ cm}^2$

$N_{t,Rd} = 380476 \text{ N}$

$N_{pl,Rd} = 380476 \text{ N}$

$N_{u,Rd} = 440640 \text{ N}$

$M_{el,Rd,y} = 13585 \text{ N m}$

$M_{el,Rd,z} = 2484 \text{ N m}$

$M_{pl,Rd,y} = 16249 \text{ N m}$

$M_{pl,Rd,z} = 4745 \text{ N m}$

$V_{c,Rd,z} = 113711 \text{ N}$

$N_{c,Rd} = 380476 \text{ N}$

Stabilità

$L_{o,y} = 500,00 \text{ cm}$

$L_{o,z} = 500,00 \text{ cm}$

$\alpha_y = 0,13$

$\alpha_z = 0,13$

$N_{CR,y} = 301773 \text{ N}$

$N_{CR,z} = 35815 \text{ N}$

$\lambda_y = 108$

$\lambda_z = 314$

$\lambda^*_y = 1,15$

$\lambda^*_z = 3,35$

$\Phi_y = 1,23$

$\Phi_z = 6,31$

$\chi_y = 0,608$

$\chi_z = 0,086$

$N_{b,Rd,y} = 231424 \text{ N}$

$N_{b,Rd,z} = 32631 \text{ N}$

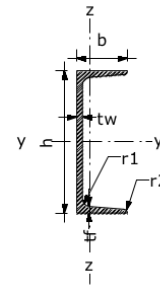


Serie UPN (UNI 5680)

Classe acciaio S 235

Designazione UPN 140

$A = 20,40 \text{ cm}^2$   
 $P = 16,00 \text{ kg/m}$   
 $h = 140 \text{ mm}$   
 $b = 60 \text{ mm}$



Classe della sezione : Classe 1

$t_w = 7 \text{ mm}$   
 $t_f = 10 \text{ mm}$   
 $r_1 = 10 \text{ mm}$

$r_2 = 5 \text{ mm}$

$c/t = 4,30$  flangia

$A_{Vy} = 12,00 \text{ cm}^2$	$A_{Vz} = 10,10 \text{ cm}^2$	$A_V = 10,41 \text{ cm}^2$
$J_y = 605,00 \text{ cm}^4$	$J_z = 62,70 \text{ cm}^4$	$J_t = 5,68 \text{ cm}^4$
$W_y = 86,40 \text{ cm}^3$	$W_z = 14,80 \text{ cm}^3$	
$i_y = 5,45 \text{ cm}$	$i_z = 1,75 \text{ cm}$	$J_w = 1800,00 \text{ cm}^4$
$W_{ypl} = 103,00 \text{ cm}^3$	$W_{zpl} = 28,30 \text{ cm}^3$	

$e_z = 1,76 \text{ cm}$

Resistenza

$f_{yk} = 235 \text{ mm}$

$f_{tk} = 360 \text{ mm}$

$A_{net,lim} = 17,61 \text{ cm}^2$

$N_{t,Rd} = 456571 \text{ N}$

$N_{pl,Rd} = 456571 \text{ N}$

$N_{u,Rd} = 528768 \text{ N}$

$M_{el,Rd,y} = 19337 \text{ N m}$

$M_{el,Rd,z} = 3312 \text{ N m}$

$M_{pl,Rd,y} = 23052 \text{ N m}$

$M_{pl,Rd,z} = 6334 \text{ N m}$

$V_{c,Rd,z} = 134514 \text{ N}$

$N_{c,Rd} = 456571 \text{ N}$

Stabilità

$L_{o,y} = 500,00 \text{ cm}$

$L_{o,z} = 500,00 \text{ cm}$

$\alpha_y = 0,13$

$\alpha_z = 0,13$

$N_{CR,y} = 501573 \text{ N}$

$N_{CR,z} = 51981 \text{ N}$

$\lambda_y = 92$

$\lambda_z = 286$

$\lambda^*_y = 0,98$

$\lambda^*_z = 3,04$

$\Phi_y = 1,03$

$\Phi_z = 5,31$

$\chi_y = 0,743$

$\chi_z = 0,103$

$N_{b,Rd,y} = 339040 \text{ N}$

$N_{b,Rd,z} = 47225 \text{ N}$



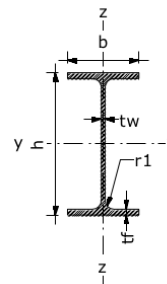


Serie IPE (UNI 5398)

Classe acciaio S 235

Designazione IPE 120

$A = 13,21 \text{ cm}^2$   
 $P = 10,40 \text{ kg/m}$   
 $h = 120 \text{ mm}$   
 $b = 64 \text{ mm}$



$t_w = 4,4 \text{ mm}$   
 $t_f = 6,3 \text{ mm}$   
 $r_1 = 7 \text{ mm}$

Classe della sezione : Classe 1

$c/t = 21,23$  anima

$c/t = 3,62$  flangia

$A_{Vy} = 8,48 \text{ cm}^2$	$A_{Vz} = 6,31 \text{ cm}^2$	$A_V = 6,31 \text{ cm}^2$
$J_y = 317,80 \text{ cm}^4$	$J_z = 27,67 \text{ cm}^4$	$J_t = 1,74 \text{ cm}^4$
$W_y = 52,96 \text{ cm}^3$	$W_z = 8,65 \text{ cm}^3$	$J_w = 890,00 \text{ cm}^4$
$i_y = 4,90 \text{ cm}$	$i_z = 1,45 \text{ cm}$	
$W_{ypl} = 60,73 \text{ cm}^3$	$W_{zpl} = 13,58 \text{ cm}^3$	

Resistenza

$f_{yk} = 235 \text{ mm}$

$f_{tk} = 360 \text{ mm}$

$A_{net,lim} = 11,41 \text{ cm}^2$

$N_{t,Rd} = 295652 \text{ N}$

$N_{pl,Rd} = 295652 \text{ N}$

$N_{u,Rd} = 342403 \text{ N}$

$M_{el,Rd,y} = 11853 \text{ N m}$

$M_{el,Rd,z} = 1936 \text{ N m}$

$M_{pl,Rd,y} = 13592 \text{ N m}$

$M_{pl,Rd,z} = 3039 \text{ N m}$

$V_{c,Rd,z} = 81536 \text{ N}$

$N_{c,Rd} = 295652 \text{ N}$

Stabilità

$L_{o,y} = 500,00 \text{ cm}$

$L_{o,z} = 500,00 \text{ cm}$

$\alpha_y = 0,21$

$\alpha_z = 0,34$

$N_{CR,y} = 263471 \text{ N}$

$N_{CR,z} = 22940 \text{ N}$

$\lambda_y = 102$

$\lambda_z = 345$

$\lambda^*_y = 1,09$

$\lambda^*_z = 3,67$

$\Phi_y = 1,18$

$\Phi_z = 7,83$

$\chi_y = 0,605$

$\chi_z = 0,068$

$N_{b,Rd,y} = 178944 \text{ N}$

$N_{b,Rd,z} = 20047 \text{ N}$

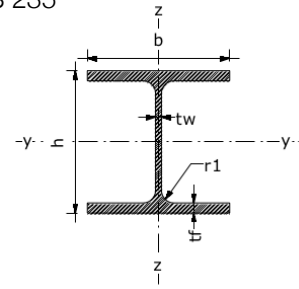


Serie HE (UNI 5397)

Classe acciaio S 235

Designazione HE 120 B

$A = 34,01 \text{ cm}^2$   
 $P = 26,70 \text{ kg/m}$   
 $h = 120 \text{ mm}$   
 $b = 120 \text{ mm}$



$t_w = 6,5 \text{ mm}$   
 $t_f = 11 \text{ mm}$   
 $r_1 = 12 \text{ mm}$

Classe della sezione : Classe 1

$c/t = 11,38$  anima

$c/t = 4,07$  flangia

$A_{Vy} = 27,64 \text{ cm}^2$	$A_{Vz} = 10,97 \text{ cm}^2$	$A_V = 10,96 \text{ cm}^2$
$J_y = 864,40 \text{ cm}^4$	$J_z = 317,50 \text{ cm}^4$	$J_t = 13,84 \text{ cm}^4$
$W_y = 144,10 \text{ cm}^3$	$W_z = 52,92 \text{ cm}^3$	
$i_y = 5,04 \text{ cm}$	$i_z = 3,06 \text{ cm}$	$J_w = 9410,00 \text{ cm}^4$
$W_{ypl} = 165,20 \text{ cm}^3$	$W_{zpl} = 80,97 \text{ cm}^3$	

Resistenza

$f_{yk} = 235 \text{ mm}$

$f_{tk} = 360 \text{ mm}$

$A_{net,lim} = 29,37 \text{ cm}^2$

$N_{t,Rd} = 761176 \text{ N}$

$N_{pl,Rd} = 761176 \text{ N}$

$N_{u,Rd} = 881539 \text{ N}$

$M_{el,Rd,y} = 32251 \text{ N m}$

$M_{el,Rd,z} = 11844 \text{ N m}$

$M_{pl,Rd,y} = 36973 \text{ N m}$

$M_{pl,Rd,z} = 18122 \text{ N m}$

$V_{c,Rd,z} = 141621 \text{ N}$

$N_{c,Rd} = 761176 \text{ N}$

Stabilità

$L_{o,y} = 500,00 \text{ cm}$

$L_{o,z} = 500,00 \text{ cm}$

$\alpha_y = 0,34$

$\alpha_z = 0,49$

$N_{CR,y} = 716628 \text{ N}$

$N_{CR,z} = 263222 \text{ N}$

$\lambda_y = 99$

$\lambda_z = 163$

$\lambda^*_y = 1,06$

$\lambda^*_z = 1,74$

$\Phi_y = 1,20$

$\Phi_z = 2,39$

$\chi_y = 0,562$

$\chi_z = 0,248$

$N_{b,Rd,y} = 427569 \text{ N}$

$N_{b,Rd,z} = 188842 \text{ N}$

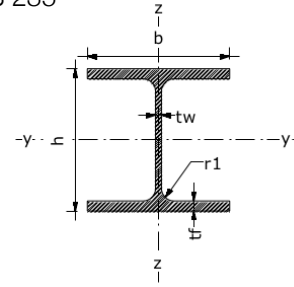


Serie HE (UNI 5397)

Classe acciaio S 235

Designazione HE 140 B

$A = 42,96 \text{ cm}^2$   
 $P = 33,70 \text{ kg/m}$   
 $h = 140 \text{ mm}$   
 $b = 140 \text{ mm}$



$t_w = 7 \text{ mm}$   
 $t_f = 12 \text{ mm}$   
 $r_1 = 12 \text{ mm}$

Classe della sezione : Classe 1

$c/t = 13,14$  anima

$c/t = 4,54$  flangia

$A_{Vy} = 34,84 \text{ cm}^2$	$A_{Vz} = 13,08 \text{ cm}^2$	$A_V = 13,08 \text{ cm}^2$
$J_y = 1509,00 \text{ cm}^4$	$J_z = 549,70 \text{ cm}^4$	$J_t = 20,06 \text{ cm}^4$
$W_y = 215,60 \text{ cm}^3$	$W_z = 78,52 \text{ cm}^3$	
$i_y = 5,93 \text{ cm}$	$i_z = 3,58 \text{ cm}$	$J_w = 22480,00 \text{ cm}^4$
$W_{ypl} = 245,40 \text{ cm}^3$	$W_{zpl} = 119,80 \text{ cm}^3$	

Resistenza

$f_{yk} = 235 \text{ mm}$

$f_{tk} = 360 \text{ mm}$

$A_{net,lim} = 37,09 \text{ cm}^2$

$N_{t,Rd} = 961486 \text{ N}$

$N_{pl,Rd} = 961486 \text{ N}$

$N_{u,Rd} = 1113523 \text{ N}$

$M_{el,Rd,y} = 48253 \text{ N m}$

$M_{el,Rd,z} = 17574 \text{ N m}$

$M_{pl,Rd,y} = 54923 \text{ N m}$

$M_{pl,Rd,z} = 26812 \text{ N m}$

$V_{c,Rd,z} = 169015 \text{ N}$

$N_{c,Rd} = 961486 \text{ N}$

Stabilità

$L_{o,y} = 500,00 \text{ cm}$

$L_{o,z} = 500,00 \text{ cm}$

$\alpha_y = 0,34$

$\alpha_z = 0,49$

$N_{CR,y} = 1251032 \text{ N}$

$N_{CR,z} = 455727 \text{ N}$

$\lambda_y = 84$

$\lambda_z = 140$

$\lambda^*_y = 0,90$

$\lambda^*_z = 1,49$

$\Phi_y = 1,02$

$\Phi_z = 1,92$

$\chi_y = 0,663$

$\chi_z = 0,319$

$N_{b,Rd,y} = 637064 \text{ N}$

$N_{b,Rd,z} = 306452 \text{ N}$

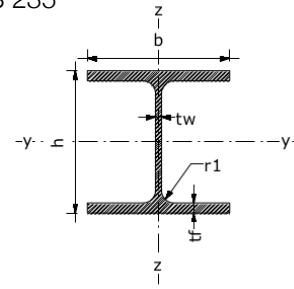


Serie HE (UNI 5397)

Classe acciaio S 235

Designazione HE 240 B

$A = 106,00 \text{ cm}^2$   
 $P = 83,20 \text{ kg/m}$   
 $h = 240 \text{ mm}$   
 $b = 240 \text{ mm}$



$t_w = 10 \text{ mm}$   
 $t_f = 17 \text{ mm}$   
 $r_1 = 21 \text{ mm}$

Classe della sezione : Classe 1

$c/t = 16,40$  anima

$c/t = 5,53$  flangia

$A_{Vy} = 85,40 \text{ cm}^2$	$A_{Vz} = 33,24 \text{ cm}^2$	$A_V = 33,23 \text{ cm}^2$
$J_y = 11260,00 \text{ cm}^4$	$J_z = 3923,00 \text{ cm}^4$	$J_t = 102,70 \text{ cm}^4$
$W_y = 938,30 \text{ cm}^3$	$W_z = 326,90 \text{ cm}^3$	$J_w = 486900,00 \text{ cm}^4$
$i_y = 10,31 \text{ cm}$	$i_z = 6,08 \text{ cm}$	
$W_{ypl} = 1053,00 \text{ cm}^3$	$W_{zpl} = 498,40 \text{ cm}^3$	

Resistenza

$f_{yk} = 235 \text{ mm}$

$f_{tk} = 360 \text{ mm}$

$A_{net,lim} = 91,53 \text{ cm}^2$

$N_{t,Rd} = 2372381 \text{ N}$

$N_{pl,Rd} = 2372381 \text{ N}$

$N_{u,Rd} = 2747520 \text{ N}$

$M_{el,Rd,y} = 210000 \text{ N m}$

$M_{el,Rd,z} = 73163 \text{ N m}$

$M_{pl,Rd,y} = 235671 \text{ N m}$

$M_{pl,Rd,z} = 111547 \text{ N m}$

$V_{c,Rd,z} = 429386 \text{ N}$

$N_{c,Rd} = 2372381 \text{ N}$

Stabilità

$L_{o,y} = 500,00 \text{ cm}$

$L_{o,z} = 500,00 \text{ cm}$

$\alpha_y = 0,34$

$\alpha_z = 0,49$

$N_{CR,y} = 9335067 \text{ N}$

$N_{CR,z} = 3252350 \text{ N}$

$\lambda_y = 48$

$\lambda_z = 82$

$\lambda^*_y = 0,52$

$\lambda^*_z = 0,88$

$\Phi_y = 0,69$

$\Phi_z = 1,05$

$\chi_y = 0,877$

$\chi_z = 0,615$

$N_{b,Rd,y} = 2080291 \text{ N}$

$N_{b,Rd,z} = 1458660 \text{ N}$



Serie HE (UNI 5397)

Classe acciaio S 235

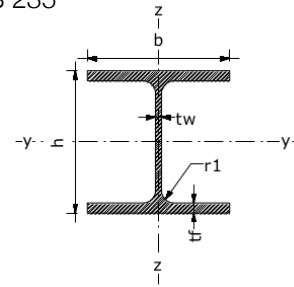
Designazione HE 320 B

$A = 161,30 \text{ cm}^2$

$P = 127,00 \text{ kg/m}$

$h = 320 \text{ mm}$

$b = 300 \text{ mm}$



$t_w = 11,5 \text{ mm}$

$t_f = 20,5 \text{ mm}$

$r_1 = 27 \text{ mm}$

Classe della sezione : Classe 1

$c/t = 19,57 \text{ anima}$

$c/t = 5,72 \text{ flangia}$

$A_{Vy} = 129,22 \text{ cm}^2$	$A_{Vz} = 51,73 \text{ cm}^2$	$A_V = 51,77 \text{ cm}^2$
$J_y = 30820,00 \text{ cm}^4$	$J_z = 9239,00 \text{ cm}^4$	$J_t = 225,10 \text{ cm}^4$
$W_y = 1926,00 \text{ cm}^3$	$W_z = 615,90 \text{ cm}^3$	$J_w = 2069000,00 \text{ cm}^4$
$i_y = 13,82 \text{ cm}$	$i_z = 7,57 \text{ cm}$	
$W_{ypl} = 2149,00 \text{ cm}^3$	$W_{zpl} = 939,10 \text{ cm}^3$	

Resistenza

$f_{yk} = 235 \text{ mm}$

$f_{tk} = 360 \text{ mm}$

$A_{net,lim} = 139,28 \text{ cm}^2$

$N_{t,Rd} = 3610048 \text{ N}$

$N_{pl,Rd} = 3610048 \text{ N}$

$N_{u,Rd} = 4180896 \text{ N}$

$M_{el,Rd,y} = 431057 \text{ N m}$

$M_{el,Rd,z} = 137844 \text{ N m}$

$M_{pl,Rd,y} = 480967 \text{ N m}$

$M_{pl,Rd,z} = 210180 \text{ N m}$

$V_{c,Rd,z} = 668954 \text{ N}$

$N_{c,Rd} = 3610048 \text{ N}$

Stabilità

$L_{o,y} = 500,00 \text{ cm}$

$L_{o,z} = 500,00 \text{ cm}$

$\alpha_y = 0,34$

$\alpha_z = 0,49$

$N_{CR,y} = 25551221 \text{ N}$

$N_{CR,z} = 7659563 \text{ N}$

$\lambda_y = 36$

$\lambda_z = 66$

$\lambda^*_y = 0,39$

$\lambda^*_z = 0,70$

$\Phi_y = 0,61$

$\Phi_z = 0,87$

$\chi_y = 0,932$

$\chi_z = 0,723$

$N_{b,Rd,y} = 3364155 \text{ N}$

$N_{b,Rd,z} = 2608754 \text{ N}$

