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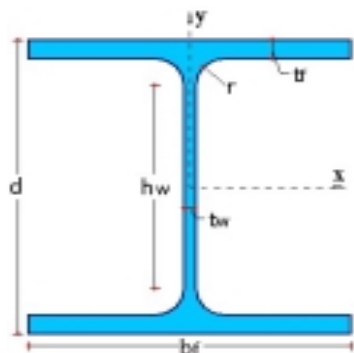
**CMM**

Departamento de  
Ingeniería Civil

[web.frm.utn.edu.ar/metlicas](http://web.frm.utn.edu.ar/metlicas)

## PERFILES DE ACERO

**I Según DIN 1026**



$A_g$

Area bruta

$I$

Momento de inercia referido al eje de flexión correspondiente

$S$

Módulo resistente elástico referido al eje de flexión correspondiente

$r$

Radio de giro referido al eje de flexión correspondiente

$Z_x$

Módulo resistente plástico referido al eje x

$J$

Módulo de torsión

$C_w$

Módulo de alabeo

$\bar{r}_o$

Radio de giro referido al centro de corte

$X$

Factor de pandeo lateral torsional

| Desig. | Peso   | Dimensiones |                |                |                |                |      | Propiedades Geométricas |                    |                    |                |                    |                    |                    |                | Parámetros de Torsión |                    |             |                |                     |
|--------|--------|-------------|----------------|----------------|----------------|----------------|------|-------------------------|--------------------|--------------------|----------------|--------------------|--------------------|--------------------|----------------|-----------------------|--------------------|-------------|----------------|---------------------|
|        |        | d           | h <sub>w</sub> | b <sub>f</sub> | t <sub>w</sub> | t <sub>f</sub> | r    | A <sub>g</sub>          | I <sub>x</sub>     | S <sub>x</sub>     | r <sub>x</sub> | Z <sub>x</sub>     | I <sub>y</sub>     | S <sub>y</sub>     | r <sub>y</sub> | J                     | C <sub>w</sub>     | $\bar{r}_o$ | X <sub>1</sub> | X <sub>2</sub>      |
| HEB    | [kg/m] | [mm]        | [mm]           | [mm]           | [mm]           | [mm]           | [mm] | [cm <sup>2</sup> ]      | [cm <sup>4</sup> ] | [cm <sup>3</sup> ] | [cm]           | [cm <sup>3</sup> ] | [cm <sup>4</sup> ] | [cm <sup>3</sup> ] | [cm]           | [cm <sup>4</sup> ]    | [cm <sup>6</sup> ] | [cm]        | [Mpa]          | [Mpa] <sup>-2</sup> |
| 100    | 20.41  | 100         | 56             | 100            | 6              | 10             | 12   | 26                      | 450                | 90                 | 4.16           | 104.2              | 167                | 33                 | 2.53           | 7.24                  | 3382               | 4.87        | 42516          | 2.06E-06            |
| 120    | 26.69  | 120         | 74             | 120            | 6.5            | 11             | 12   | 34                      | 864                | 144                | 5.04           | 165.2              | 318                | 53                 | 3.06           | 11.55                 | 9445               | 5.90        | 38365          | 3.04E-06            |
| 140    | 33.76  | 140         | 92             | 140            | 7              | 12             | 12   | 43                      | 1510               | 216                | 5.93           | 246                | 550                | 79                 | 3.58           | 17.45                 | 22528              | 6.92        | 35413          | 4.11E-06            |
| 160    | 42.63  | 160         | 104            | 160            | 8              | 13             | 15   | 54.3                    | 2490               | 311                | 6.77           | 354                | 889                | 111                | 4.05           | 25.72                 | 48026              | 7.89        | 33481          | 5.20E-06            |
| 180    | 51.26  | 180         | 122            | 180            | 8.5            | 14             | 15   | 65.3                    | 3830               | 426                | 7.66           | 482                | 1360               | 151                | 4.56           | 36.04                 | 93690              | 8.92        | 31787          | 6.32E-06            |
| 200    | 61.31  | 200         | 134            | 200            | 9              | 15             | 18   | 78.1                    | 5700               | 570                | 8.54           | 642                | 2000               | 200                | 5.06           | 49.13                 | 171125             | 9.93        | 30303          | 7.57E-06            |
| 220    | 71.44  | 220         | 152            | 220            | 9.5            | 16             | 18   | 91                      | 8090               | 735                | 9.43           | 828                | 2840               | 258                | 5.59           | 65.45                 | 295474             | 10.96       | 29260          | 8.64E-06            |
| 240    | 83.21  | 240         | 164            | 240            | 10             | 17             | 21   | 106                     | 11260              | 938                | 10.31          | 1054               | 3920               | 327                | 6.08           | 85.47                 | 487344             | 11.97       | 28286          | 9.85E-06            |
| 260    | 92.63  | 260         | 177            | 260            | 10             | 17.5           | 24   | 118                     | 14920              | 1148               | 11.24          | 1282               | 5130               | 395                | 6.59           | 100.40                | 754190             | 13.04       | 26444          | 1.26E-05            |
| 280    | 102.84 | 280         | 196            | 280            | 10.5           | 18             | 24   | 131                     | 19270              | 1376               | 12.13          | 1534               | 6590               | 471                | 7.09           | 118.28                | 1130910            | 14.05       | 25217          | 1.53E-05            |
| 300    | 116.97 | 300         | 208            | 300            | 11             | 19             | 27   | 149                     | 25170              | 1678               | 13.00          | 1868               | 8560               | 571                | 7.58           | 148.80                | 1689765            | 15.05       | 24744          | 1.65E-05            |
| 320    | 126.39 | 320         | 225            | 300            | 11.5           | 20.5           | 27   | 161                     | 30820              | 1926               | 13.84          | 2140               | 9240               | 616                | 7.58           | 186.45                | 2072076            | 15.77       | 25080          | 1.57E-05            |
| 340    | 134.24 | 340         | 243            | 300            | 12             | 21.5           | 27   | 171                     | 36660              | 2156               | 14.64          | 2400               | 9690               | 646                | 7.53           | 215.87                | 2457439            | 16.46       | 24844          | 1.66E-05            |
| 360    | 142.09 | 360         | 261            | 300            | 12.5           | 22.5           | 27   | 181                     | 43190              | 2399               | 15.45          | 2680               | 10140              | 676                | 7.48           | 248.32                | 2887523            | 17.17       | 24637          | 1.75E-05            |
| 400    | 155.43 | 400         | 298            | 300            | 13.5           | 24             | 27   | 198                     | 57680              | 2884               | 17.07          | 3240               | 10820              | 721                | 7.39           | 305.35                | 3824221            | 18.60       | 23773          | 2.07E-05            |
| 450    | 171.13 | 450         | 344            | 300            | 14             | 26             | 27   | 218                     | 79890              | 3551               | 19.14          | 3980               | 11720              | 781                | 7.33           | 387.92                | 5267437            | 20.50       | 22838          | 2.48E-05            |
| 500    | 187.62 | 500         | 390            | 300            | 14.5           | 28             | 27   | 239                     | 107200             | 4288               | 21.18          | 4820               | 12620              | 841                | 7.27           | 484.16                | 7028835            | 22.39       | 22121          | 2.87E-05            |
| 550    | 199.39 | 550         | 438            | 300            | 15             | 29             | 27   | 254                     | 136700             | 4971               | 23.20          | 5600               | 13080              | 872                | 7.18           | 543.13                | 8876121            | 24.28       | 20835          | 3.74E-05            |
| 600    | 211.95 | 600         | 486            | 300            | 15.5           | 30             | 27   | 270                     | 171000             | 5700               | 25.17          | 6420               | 13530              | 902                | 7.08           | 607.03                | 10989743           | 26.14       | 19805          | 4.71E-05            |
| 650    | 224.51 | 650         | 534            | 300            | 16             | 31             | 27   | 286                     | 210600             | 6480               | 27.14          | 7320               | 13980              | 932                | 6.99           | 676.10                | 13391477           | 28.02       | 18922          | 5.79E-05            |
| 700    | 240.21 | 700         | 582            | 300            | 17             | 32             | 27   | 306                     | 256900             | 7340               | 28.97          | 8320               | 14440              | 963                | 6.87           | 759.52                | 16108686           | 29.78       | 18314          | 6.85E-05            |
| 800    | 262.19 | 800         | 674            | 300            | 17.5           | 33             | 30   | 334                     | 359100             | 8978               | 32.79          | 10220              | 14900              | 993                | 6.68           | 849.87                | 21913765           | 33.46       | 16548          | 1.08E-04            |
| 900    | 291.24 | 900         | 770            | 300            | 18.5           | 35             | 30   | 371                     | 494100             | 10980              | 36.49          | 12580              | 15820              | 1055               | 6.53           | 1032.67               | 29592299           | 37.07       | 15719          | 1.39E-04            |
| 1000   | 314.00 | 1000        | 868            | 300            | 19             | 36             | 30   | 400                     | 644700             | 12894              | 40.15          | 14860              | 16280              | 1085               | 6.38           | 1145.29               | 37822347           | 40.65       | 14637          | 1.94E-04            |