

# FICHA TÉCNICA PERFILES SIDERÚRGICOS I-H-W

EDIFICIOS - BODEGAS  
PUENTES - SISTEMAS DE ENTREPOS

CONSORCIO METALÚRGICO NACIONAL SAS



ACERO EN EVOLUCIÓN

## CONSORCIO METALÚRGICO NACIONAL S.A.S.

Tubos COLMENA S.A.S. es una empresa responsable y consciente de las dificultades de nuestro país en la industria del acero, por lo cual ha centrado esfuerzos en promover e impulsar el desarrollo y manipulación de la estructura metálica, con una política centrada en la optimización de los productos y soluciones actuales, fomentando mayor competitividad y eficiencia en obra.

## MATERIALES DE FABRICACIÓN

Los perfiles siderúrgicos COLMENA se fabrican según norma ASTM A572/A992 GRADO 50 de alta resistencia, baja aleación, alta soldabilidad y ductibilidad.

## COMPOSICIÓN QUÍMICA

| ELEMENTO  |                           |
|-----------|---------------------------|
| Carbono   | 0.20 máximo               |
| Manganeso | 0.30 mínimo / 1.65 máximo |
| Fósforo   | 0.40 máximo               |
| Azufre    | 0.50 máximo               |
| Silicio   | 0.60 máximo               |

## PROPIEDADES MECÁNICAS

|                                            |              |
|--------------------------------------------|--------------|
| GRADO                                      | 50           |
| Resistencia mínima a la tracción Mpa (Psi) | 450 (65.000) |
| Límite mínimo de fluencia Mpa (Psi)        | 350 (50.000) |
| Elongación mínima (%) 50 mm (2")           | 17%          |
| Elongación mínima (%) en 200 mm (8")       | 12%          |

## PROCESOS DE FABRICACIÓN

Los perfiles siderúrgicos COLMENA se fabrican con acero al carbón de alta resistencia y de calidad estructural. Estos perfiles se describen según sus dimensiones nominales para columnas (sección H) y vigas sección (I).



## VIGAS IPE



| REFERENCIA | DIMENSIONES  |         |         |                      |                      |         | DETALLES CONSTRUCTIVOS |                      |         |      |                        |                        | SUPERFICIE                          | PROP. MECÁNICAS EJE FUERTE Y-Y      |                                   |                                   |                                                   |                      |                                    | P. MECÁN. EJE DEBIL Z-Z           |                                   |                                                   |                      | PROP. SELECCIÓN      |                                   |                                                   |
|------------|--------------|---------|---------|----------------------|----------------------|---------|------------------------|----------------------|---------|------|------------------------|------------------------|-------------------------------------|-------------------------------------|-----------------------------------|-----------------------------------|---------------------------------------------------|----------------------|------------------------------------|-----------------------------------|-----------------------------------|---------------------------------------------------|----------------------|----------------------|-----------------------------------|---------------------------------------------------|
|            | PESO<br>Kg/m | h<br>mm | b<br>mm | t <sub>w</sub><br>mm | t <sub>f</sub><br>mm | r<br>mm | A<br>cm <sup>2</sup>   | h <sub>1</sub><br>mm | d<br>mm | ø    | P <sub>min</sub><br>mm | P <sub>max</sub><br>mm | A <sub>L</sub><br>m <sup>2</sup> /m | A <sub>C</sub><br>m <sup>2</sup> /t | I <sub>y</sub><br>cm <sup>4</sup> | W <sub>y</sub><br>cm <sup>3</sup> | W <sub>pl,y</sub> <sup>*</sup><br>cm <sup>3</sup> | I <sub>y</sub><br>cm | A <sub>cz</sub><br>cm <sup>2</sup> | I <sub>z</sub><br>cm <sup>4</sup> | W <sub>z</sub><br>cm <sup>3</sup> | W <sub>pl,z</sub> <sup>*</sup><br>cm <sup>3</sup> | I <sub>z</sub><br>cm | S <sub>5</sub><br>mm | I <sub>t</sub><br>cm <sup>4</sup> | i <sub>w</sub> 10 <sup>3</sup><br>cm <sup>6</sup> |
| IPE 140    | 12,9         | 140     | 73      | 4,7                  | 6,9                  | 7       | 16,4                   | 126,2                | 112,2   | -    | -                      | -                      | 0,55                                | 42,70                               | 541,00                            | 77,30                             | 88,30                                             | 5,74                 | 7,64                               | 44,90                             | 12,30                             | 19,30                                             | 1,65                 | 26,70                | 2,40                              | 1,98                                              |
| IPE 160    | 15,8         | 160     | 82      | 5,0                  | 7,4                  | 9       | 20,1                   | 145,2                | 127,2   | -    | -                      | -                      | 0,62                                | 39,47                               | 869,00                            | 109,00                            | 124,00                                            | 6,58                 | 9,66                               | 68,30                             | 16,70                             | 26,10                                             | 1,84                 | 30,30                | 3,54                              | 3,96                                              |
| IPE 180    | 18,8         | 180     | 91      | 5,3                  | 8,0                  | 9       | 23,9                   | 164,0                | 146,0   | M 10 | 48,0                   | 48,0                   | 0,70                                | 37,13                               | 1.317,00                          | 146,00                            | 166,00                                            | 7,42                 | 11,30                              | 101,00                            | 22,20                             | 34,60                                             | 2,05                 | 31,80                | 4,73                              | 7,43                                              |
| IPE 200    | 22,4         | 200     | 100     | 5,6                  | 8,5                  | 12      | 28,5                   | 183,0                | 159,0   | M 10 | 54,0                   | 58,0                   | 0,77                                | 34,36                               | 1.943,00                          | 194,00                            | 221,00                                            | 8,26                 | 14,00                              | 142,00                            | 28,50                             | 44,60                                             | 2,24                 | 36,70                | 6,92                              | 13,00                                             |
| IPE 220    | 26,2         | 220     | 110     | 5,9                  | 9,2                  | 12      | 33,4                   | 201,6                | 177,6   | M 12 | 60,0                   | 62,0                   | 0,85                                | 32,36                               | 2.772,00                          | 252,00                            | 285,00                                            | 9,11                 | 15,90                              | 205,00                            | 37,30                             | 58,10                                             | 2,48                 | 38,40                | 9,03                              | 22,70                                             |
| IPE 240    | 30,7         | 240     | 120     | 6,2                  | 9,8                  | 15      | 39,1                   | 220,4                | 190,4   | M 12 | 66,0                   | 68,0                   | 0,92                                | 30,02                               | 3.892,00                          | 324,00                            | 367,00                                            | 9,97                 | 19,10                              | 284,00                            | 47,30                             | 73,90                                             | 2,69                 | 43,40                | 12,95                             | 37,40                                             |
| IPE 270    | 36,1         | 270     | 135     | 6,6                  | 10,2                 | 15      | 45,9                   | 249,6                | 219,6   | M 16 | 72,0                   | 72,0                   | 1,04                                | 28,86                               | 5.790,00                          | 429,00                            | 484,00                                            | 11,20                | 22,10                              | 420,00                            | 62,20                             | 97,00                                             | 3,02                 | 44,60                | 15,90                             | 70,60                                             |
| IPE 300    | 42,2         | 300     | 150     | 7,1                  | 10,7                 | 15      | 53,8                   | 278,6                | 248,6   | M 16 | 72,0                   | 86,0                   | 1,16                                | 27,46                               | 8.356,00                          | 557,00                            | 628,00                                            | 12,50                | 25,70                              | 604,00                            | 80,50                             | 125,00                                            | 3,35                 | 46,10                | 19,92                             | 126,00                                            |
| IPE 330    | 49,1         | 330     | 160     | 7,5                  | 11,5                 | 18      | 62,6                   | 307,0                | 271,0   | M 16 | 78,0                   | 96,0                   | 1,25                                | 25,52                               | 11.770,00                         | 713,00                            | 804,00                                            | 13,70                | 30,80                              | 788,00                            | 98,50                             | 154,00                                            | 3,55                 | 51,60                | 28,06                             | 199,00                                            |
| IPE 360    | 57,1         | 360     | 170     | 8,0                  | 12,7                 | 18      | 72,7                   | 334,6                | 298,6   | M 22 | 88,0                   | 88,0                   | 1,35                                | 23,70                               | 16.270,00                         | 904,00                            | 1.019,00                                          | 15,00                | 35,10                              | 1.043,00                          | 123,00                            | 191,00                                            | 3,79                 | 54,50                | 37,44                             | 314,00                                            |
| IPE 400    | 66,3         | 400     | 180     | 8,6                  | 13,5                 | 21      | 84,5                   | 373,0                | 331,0   | M 22 | 96,0                   | 98,0                   | 1,47                                | 22,12                               | 23.130,00                         | 1.160,00                          | 1.307,00                                          | 16,60                | 42,70                              | 1.318,00                          | 146,00                            | 229,00                                            | 3,95                 | 60,20                | 51,28                             | 490,00                                            |
| IPE 450    | 77,6         | 450     | 190     | 9,4                  | 14,6                 | 21      | 98,8                   | 420,8                | 378,8   | M 24 | 100,0                  | 102,0                  | 1,61                                | 20,69                               | 33.740,00                         | 1.500,00                          | 1.702,00                                          | 18,50                | 50,90                              | 1.676,00                          | 176,00                            | 276,00                                            | 4,12                 | 63,20                | 66,75                             | 791,00                                            |
| IPE 500    | 90,7         | 500     | 200     | 10,2                 | 16,0                 | 21      | 115,5                  | 468,0                | 426,0   | M 24 | 102,0                  | 112,0                  | 1,74                                | 19,23                               | 48.200,00                         | 1.930,00                          | 2.194,00                                          | 20,40                | 59,90                              | 2.142,00                          | 214,00                            | 336,00                                            | 4,31                 | 66,80                | 89,10                             | 1.249,00                                          |
| IPE 600    | 122,0        | 600     | 220     | 12,0                 | 19,0                 | 24      | 156,0                  | 562,0                | 514,0   | M 27 | 116,0                  | 118,0                  | 2,02                                | 16,45                               | 92.080,00                         | 3.070,00                          | 3.512,00                                          | 24,30                | 83,80                              | 3.387,00                          | 308,00                            | 486,00                                            | 4,66                 | 78,10                | 165,20                            | 2.846,00                                          |



# FICHA TÉCNICA PERFILES SIDERÚRGICOS I-H-W

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## VIGAS HEA



| REFERENCIA | DIMENSIONES  |         |         |                      |                      |         | DETALLES CONSTRUCTIVOS |                                   |         |      |                        | SUPERFICIE             |                                     | PROP. MECÁNICAS EJE FUERTE Y-Y   |                                   |                                   |                                      | P. MECÁN. EJE DEBIL Z-Z |                                   |                                   |                                   | PROP. SELECCIÓN                      |                      |                      |                                   |                                                   |
|------------|--------------|---------|---------|----------------------|----------------------|---------|------------------------|-----------------------------------|---------|------|------------------------|------------------------|-------------------------------------|----------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|-------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|----------------------|----------------------|-----------------------------------|---------------------------------------------------|
|            | PESO<br>Kg/m | h<br>mm | b<br>mm | t <sub>w</sub><br>mm | t <sub>f</sub><br>mm | r<br>mm | A<br>cm <sup>2</sup>   | I <sub>y</sub><br>mm <sup>4</sup> | d<br>mm | Ø    | P <sub>min</sub><br>mm | P <sub>max</sub><br>mm | A <sub>L</sub><br>m <sup>2</sup> /m | A <sub>G</sub><br>m <sup>2</sup> | I <sub>y</sub><br>cm <sup>4</sup> | W <sub>y</sub><br>cm <sup>3</sup> | W <sub>pl,y</sub><br>cm <sup>3</sup> | I <sub>y</sub><br>cm    | A <sub>α</sub><br>cm <sup>2</sup> | I <sub>z</sub><br>cm <sup>4</sup> | W <sub>z</sub><br>cm <sup>3</sup> | W <sub>pl,z</sub><br>cm <sup>3</sup> | I <sub>z</sub><br>cm | S <sub>s</sub><br>mm | I <sub>T</sub><br>cm <sup>4</sup> | I <sub>x</sub> 10 <sub>3</sub><br>cm <sup>6</sup> |
| HEA 200    | 42,3         | 190     | 200     | 6,5                  | 10,0                 | 18      | 53,8                   | 170,0                             | 134,0   | M 27 | 98,0                   | 100,0                  | 1,14                                | 26,89                            | 3.692,00                          | 388,60                            | 429,50                               | 8,28                    | 18,08                             | 1.336,00                          | 133,60                            | 203,80                               | 4,98                 | 47,59                | 21,05                             | 108,00                                            |
| HEA 240    | 60,3         | 230     | 240     | 7,5                  | 12,0                 | 21      | 76,8                   | 206,0                             | 164,0   | M 27 | 104,0                  | 138,0                  | 1,26                                | 24,85                            | 5.410,00                          | 515,20                            | 568,50                               | 9,17                    | 20,67                             | 1.955,00                          | 177,70                            | 270,60                               | 5,51                 | 50,09                | 28,61                             | 193,30                                            |
| HEA 300    | 88,3         | 290     | 300     | 8,5                  | 14,0                 | 27      | 112,5                  | 262,0                             | 208,0   | M 27 | 118,0                  | 198,0                  | 1,72                                | 19,43                            | 18.260,00                         | 1.260,00                          | 1.383,00                             | 12,74                   | 37,28                             | 6.310,00                          | 420,60                            | 641,20                               | 7,49                 | 68,13                | 87,76                             | 1.200,00                                          |
| HEA 320    | 97,6         | 310     | 300     | 9,0                  | 15,5                 | 27      | 124,4                  | 279,0                             | 225,0   | M 27 | 118,0                  | 198,0                  | 1,76                                | 17,98                            | 22.930,00                         | 1.479,00                          | 1.628,00                             | 13,58                   | 41,13                             | 6.985,00                          | 465,70                            | 709,70                               | 7,49                 | 71,63                | 111,86                            | 1.512,00                                          |
| HEA 360    | 112,0        | 350     | 300     | 10,0                 | 17,5                 | 27      | 142,8                  | 315,0                             | 261,0   | M 27 | 120,0                  | 198,0                  | 1,83                                | 16,36                            | 33.090,00                         | 1.891,00                          | 2.088,00                             | 15,22                   | 48,96                             | 7.887,00                          | 525,80                            | 802,30                               | 7,43                 | 76,63                | 153,34                            | 2.177,00                                          |
| HEA 400    | 125,0        | 390     | 300     | 11,0                 | 19,0                 | 27      | 159,0                  | 352,0                             | 298,0   | M 27 | 120,0                  | 198,0                  | 1,91                                | 15,32                            | 45.070,00                         | 2.311,00                          | 2.562,00                             | 16,84                   | 57,33                             | 8.564,00                          | 570,90                            | 872,90                               | 7,34                 | 80,63                | 193,17                            | 2.942,00                                          |

## VIGAS W



| REFERENCIA | DIMENSIONES  |         |         |                      |                      |         | DETALLES CONSTRUCTIVOS |                      |         |      |                        | SUPERFICIE             |                        | PROP. MECÁ. EJE FUERTE Y-Y |                       |                       |                          |                      |                       | PROP. MECÁ. EJE DEBIL Z-Z |                       |                          |                      | PROP. DE LA SECCIÓN  |                       |                                        |
|------------|--------------|---------|---------|----------------------|----------------------|---------|------------------------|----------------------|---------|------|------------------------|------------------------|------------------------|----------------------------|-----------------------|-----------------------|--------------------------|----------------------|-----------------------|---------------------------|-----------------------|--------------------------|----------------------|----------------------|-----------------------|----------------------------------------|
|            | PESO<br>Kg/m | h<br>mm | b<br>mm | t <sub>w</sub><br>mm | t <sub>f</sub><br>mm | r<br>mm | A<br>cm²               | I <sub>y</sub><br>mm | d<br>mm | Ø    | P <sub>min</sub><br>mm | P <sub>max</sub><br>mm | A <sub>s</sub><br>m²/m | A <sub>g</sub><br>m²/t     | I <sub>y</sub><br>cm⁴ | W <sub>y</sub><br>cm³ | W <sub>pl,y</sub><br>cm³ | I <sub>y</sub><br>cm | A <sub>α</sub><br>cm² | I <sub>z</sub><br>cm⁴     | W <sub>z</sub><br>cm³ | W <sub>pl,z</sub><br>cm³ | I <sub>z</sub><br>cm | S <sub>x</sub><br>mm | I <sub>t</sub><br>cm⁴ | I <sub>x</sub> X10 <sub>3</sub><br>cm⁶ |
| W8X10      | 14,9         | 200     | 100     | 4,3                  | 5,2                  | 8       | 19,1                   | 190,0                | 174,0   | -    | -                      | -                      | 0,78                   | 51,86                      | 1.280,00              | 128,00                | 145,20                   | 8,18                 | 9,80                  | 86,89                     | 17,38                 | 27,10                    | 2,13                 | 24,09                | 1,80                  | 8,22                                   |
| W8X15      | 22,3         | 206     | 102     | 6,2                  | 8,0                  | 8       | 28,7                   | 190,0                | 174,0   | -    | -                      | -                      | 0,79                   | 35,30                      | 2.004,00              | 194,50                | 222,80                   | 8,36                 | 14,14                 | 142,00                    | 27,85                 | 43,72                    | 2,22                 | 31,59                | 5,73                  | 13,87                                  |
| W10X12     | 17,9         | 251     | 101     | 4,8                  | 5,3                  | 8       | 22,8                   | 240,0                | 224,0   | -    | -                      | -                      | 0,88                   | 49,33                      | 2.252,00              | 179,50                | 207,80                   | 9,92                 | 13,26                 | 91,34                     | 18,09                 | 28,67                    | 2,00                 | 24,80                | 2,28                  | 13,74                                  |
| W10X49     | 72,9         | 253     | 254     | 8,6                  | 14,2                 | 13      | 92,9                   | 225,0                | 199,0   | M 27 | 102,0                  | 148,0                  | 1,48                   | 20,33                      | 11.290,00             | 892,10                | 986,10                   | 11,02                | 25,78                 | 3.880,00                  | 305,50                | 463,30                   | 6,46                 | 52,27                | 57,73                 | 552,90                                 |
| W12X14     | 20,8         | 303     | 101     | 5,1                  | 5,7                  | 8       | 26,9                   | 291,1                | 275,1   | -    | -                      | -                      | 0,99                   | 46,64                      | 3.708,00              | 244,80                | 287,10                   | 11,75                | 16,56                 | 98,31                     | 19,47                 | 31,19                    | 1,91                 | 25,85                | 2,98                  | 21,63                                  |
| W12X16     | 23,8         | 305     | 101     | 5,6                  | 6,7                  | 8       | 30,4                   | 291,1                | 275,1   | -    | -                      | -                      | 0,99                   | 41,43                      | 4.280,00              | 280,70                | 328,60                   | 11,87                | 18,30                 | 115,60                    | 22,89                 | 36,70                    | 1,95                 | 28,36                | 4,30                  | 25,59                                  |
| W14X22     | 32,7         | 349     | 127     | 5,8                  | 8,5                  | 10      | 41,7                   | 332,0                | 312,0   | M 12 | 62,0                   | 70,0                   | 1,01                   | 30,68                      | 6.507,00              | 415,80                | 480,90                   | 12,47                | 22,22                 | 191,90                    | 37,62                 | 59,63                    | 2,14                 | 37,57                | 12,28                 | 43,61                                  |
| W14X34     | 50,6         | 355     | 171     | 7,2                  | 11,6                 | 10      | 64,4                   | 332,0                | 312,0   | M 22 | 84,0                   | 84,0                   | 1,36                   | 26,94                      | 14.130,00             | 796,30                | 894,50                   | 14,80                | 28,04                 | 968,10                    | 113,20                | 174,40                   | 3,87                 | 42,16                | 23,71                 | 285,00                                 |
| W16X26     | 38,7         | 399     | 140     | 6,4                  | 8,8                  | 10      | 49,9                   | 381,0                | 361,0   | M 12 | 68,0                   | 82,0                   | 1,33                   | 33,90                      | 12.620,00             | 632,60                | 727,80                   | 15,93                | 27,40                 | 403,50                    | 57,65                 | 90,55                    | 2,85                 | 35,67                | 11,02                 | 153,20                                 |
| W18X35     | 52,1         | 450     | 152     | 7,6                  | 10,8                 | 10      | 66,3                   | 428,0                | 408,0   | M 16 | 76,0                   | 82,0                   | 1,48                   | 28,37                      | 21.200,00             | 942,00                | 1.088,00                 | 17,89                | 36,40                 | 634,00                    | 83,43                 | 131,50                   | 3,09                 | 40,92                | 20,90                 | 304,80                                 |
| W21X68     | 101,2        | 537     | 210     | 10,9                 | 17,4                 | 13      | 129,3                  | 501,9                | 475,9   | M 27 | 94,0                   | 104,0                  | 1,87                   | 18,43                      | 61.760,00             | 2.300,00              | 2.623,00                 | 21,85                | 62,72                 | 2.692,00                  | 256,40                | 399,90                   | 4,56                 | 60,95                | 102,01                | 1.813,00                               |
| W24X68     | 101,2        | 603     | 228     | 10,5                 | 14,9                 | 13      | 129,6                  | 573,0                | 547,0   | M 27 | 94,0                   | 122,0                  | 2,08                   | 20,40                      | 76.470,00             | 2.536,00              | 2.905,00                 | 24,27                | 67,31                 | 2.950,00                  | 258,80                | 404,40                   | 4,77                 | 55,57                | 78,36                 | 2.545,00                               |
| W24X76     | 113,1        | 608     | 228     | 11,2                 | 17,3                 | 13      | 144,6                  | 573,0                | 547,0   | M 27 | 94,0                   | 122,0                  | 2,08                   | 18,36                      | 87.570,00             | 2.881,00              | 3.290,00                 | 24,62                | 71,99                 | 3.425,00                  | 300,50                | 468,80                   | 4,87                 | 61,01                | 112,43                | 2.981,00                               |

