

| section | $A_{lw}(mm^2)$ | ST37-Fy240 |          |           |                        |                      | ST52-Fy360 |          |           |                        |                      |
|---------|----------------|------------|----------|-----------|------------------------|----------------------|------------|----------|-----------|------------------------|----------------------|
|         |                | Vp(KN)     | Mp(KN.M) | Mpr(KN.M) | Mu(KN.M)<br>قاب معمولی | P <sub>bu</sub> (KN) | Vp(KN)     | Mp(KN.M) | Mpr(KN.M) | Mu(KN.M)<br>قاب معمولی | P <sub>bu</sub> (KN) |
| IPE 100 | 363.26         | 52.309     | 9.456    | 13.617    | 12.482                 | 7.22                 | 78.464     | 14.184   | 20.425    | 18.723                 | 10.83                |
| IPE 120 | 472.56         | 68.049     | 14.568   | 20.978    | 19.230                 | 9.23                 | 102.073    | 21.852   | 31.467    | 28.845                 | 13.84                |
| IPE 140 | 593.14         | 85.412     | 21.192   | 30.516    | 27.973                 | 11.46                | 128.118    | 31.788   | 45.775    | 41.960                 | 17.20                |
| IPE 160 | 726            | 104.544    | 29.76    | 42.854    | 39.283                 | 14.04                | 156.816    | 44.64    | 64.282    | 58.925                 | 21.06                |
| IPE 180 | 869.2          | 125.165    | 39.84    | 57.370    | 52.589                 | 16.68                | 187.747    | 59.76    | 86.054    | 78.883                 | 25.02                |
| IPE 200 | 1024.8         | 147.571    | 53.04    | 76.378    | 70.013                 | 19.94                | 221.357    | 79.56    | 114.566   | 105.019                | 29.91                |
| IPE 220 | 1189.44        | 171.279    | 68.4     | 98.496    | 90.288                 | 23.36                | 256.919    | 102.6    | 147.744   | 135.432                | 35.04                |
| IPE 240 | 1366.48        | 196.773    | 88.08    | 126.835   | 116.266                | 27.55                | 295.160    | 132.12   | 190.253   | 174.398                | 41.32                |
| IPE 270 | 1647.36        | 237.220    | 116.16   | 167.270   | 153.331                | 32.19                | 355.830    | 174.24   | 250.906   | 229.997                | 48.29                |
| IPE 300 | 1978.06        | 284.841    | 150.72   | 217.037   | 198.950                | 37.51                | 427.261    | 226.08   | 325.555   | 298.426                | 56.27                |
| IPE 330 | 2302.5         | 331.560    | 192.96   | 277.862   | 254.707                | 43.62                | 497.340    | 289.44   | 416.794   | 382.061                | 65.43                |
| IPE 360 | 2676.8         | 385.459    | 244.56   | 352.166   | 322.819                | 50.70                | 578.189    | 366.84   | 528.250   | 484.229                | 76.05                |
| IPE 400 | 3207.8         | 461.923    | 313.68   | 451.699   | 414.058                | 58.43                | 692.885    | 470.52   | 677.549   | 621.086                | 87.65                |
| IPE 450 | 3955.52        | 569.595    | 408.48   | 588.211   | 539.194                | 67.55                | 854.392    | 612.72   | 882.317   | 808.790                | 101.32               |
| IPE 500 | 4773.6         | 687.398    | 526.56   | 758.246   | 695.059                | 78.33                | 1031.098   | 789.84   | 1137.370  | 1042.589               | 117.50               |
| IPE 550 | 5723.16        | 824.135    | 668.88   | 963.187   | 882.922                | 90.39                | 1236.203   | 1003.32  | 1444.781  | 1324.382               | 135.58               |
| IPE 600 | 6744           | 971.136    | 842.88   | 1213.747  | 1112.602               | 104.45               | 1456.704   | 1264.32  | 1820.621  | 1668.902               | 156.68               |

$$1.1 \leq C_{pr} = \frac{F_y + F_u}{2F_y} \leq 1.2$$

$$P_{bu} = \frac{0.06 \times R_y \cdot F_y \cdot Z_b}{h_0}$$

$$M_u = 1.1R_y \cdot M_p$$

$$V_p = 0.6F_y \cdot A_{lw}$$

$$M_{pr} = C_{pr} \cdot R_y \cdot F_y \cdot Z$$

$$M_p = F_y \cdot Z_x$$

| section | $A_{lw}(mm^2)$ | ST37-Fy240 |          |           |                        |                      | ST52-Fy360 |          |           |                        |                      |
|---------|----------------|------------|----------|-----------|------------------------|----------------------|------------|----------|-----------|------------------------|----------------------|
|         |                | Vp(KN)     | Mp(KN.M) | Mpr(KN.M) | Mu(KN.M)<br>قاب معمولی | P <sub>bu</sub> (KN) | Vp(KN)     | Mp(KN.M) | Mpr(KN.M) | Mu(KN.M)<br>قاب معمولی | P <sub>bu</sub> (KN) |
| IPB 100 | 480.00         | 69.12      | 24.96    | 35.94     | 32.95                  | 19.97                | 103.68     | 37.44    | 53.9136   | 49.4208                | 29.95                |
| IPB 120 | 637.00         | 91.73      | 39.60    | 57.02     | 52.27                  | 26.16                | 137.592    | 59.4     | 85.536    | 78.408                 | 39.24                |
| IPB 140 | 812.00         | 116.93     | 58.90    | 84.81     | 77.74                  | 33.13                | 175.392    | 88.344   | 127.21536 | 116.61408              | 49.69                |
| IPB 160 | 1072.00        | 154.37     | 84.96    | 122.34    | 112.15                 | 41.61                | 231.552    | 127.44   | 183.5136  | 168.2208               | 62.42                |
| IPB 180 | 1292.00        | 186.05     | 115.44   | 166.23    | 152.38                 | 50.07                | 279.072    | 173.16   | 249.3504  | 228.5712               | 75.11                |
| IPB 200 | 1530.00        | 220.32     | 154.20   | 222.05    | 203.54                 | 60.01                | 330.48     | 231.3    | 333.072   | 305.316                | 90.02                |
| IPB 220 | 1786.00        | 257.18     | 198.48   | 285.81    | 261.99                 | 70.05                | 385.776    | 297.72   | 428.7168  | 392.9904               | 105.08               |
| IPB 240 | 2060.00        | 296.64     | 252.72   | 363.92    | 333.59                 | 81.60                | 444.96     | 379.08   | 545.8752  | 500.3856               | 122.39               |
| IPB 260 | 2250.00        | 324.00     | 307.92   | 443.40    | 406.45                 | 91.42                | 486        | 461.88   | 665.1072  | 609.6816               | 137.14               |
| IPB 280 | 2562.00        | 368.93     | 368.16   | 530.15    | 485.97                 | 101.17               | 553.392    | 552.24   | 795.2256  | 728.9568               | 151.76               |
| IPB 300 | 2882.00        | 415.01     | 448.56   | 645.93    | 592.10                 | 114.93               | 622.512    | 672.84   | 968.8896  | 888.1488               | 172.40               |
| IPB 320 | 3208.50        | 462.02     | 515.76   | 742.69    | 680.80                 | 123.99               | 693.036    | 773.64   | 1114.0416 | 1021.2048              | 185.98               |
| IPB 340 | 3564.00        | 513.22     | 577.92   | 832.20    | 762.85                 | 130.64               | 769.824    | 866.88   | 1248.3072 | 1144.2816              | 195.97               |
| IPB 360 | 3937.50        | 567.00     | 643.92   | 927.24    | 849.97                 | 137.37               | 850.5      | 965.88   | 1390.8672 | 1274.9616              | 206.05               |
| IPB 400 | 4752.00        | 684.29     | 775.68   | 1116.98   | 1023.90                | 148.53               | 1026.432   | 1163.52  | 1675.4688 | 1535.8464              | 222.80               |
| IPB 450 | 5572.00        | 802.37     | 955.68   | 1376.18   | 1261.50                | 162.29               | 1203.552   | 1433.52  | 2064.2688 | 1892.2464              | 243.43               |
| IPB 500 | 6438.00        | 927.07     | 1155.60  | 1664.06   | 1525.39                | 176.28               | 1390.608   | 1733.4   | 2496.096  | 2288.088               | 264.42               |

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$$M_u = 1.1R_y \cdot M_p$$

$$M_{pr} = C_{pr} \cdot R_y \cdot F_y \cdot Z$$

$$V_p = 0.6F_y \cdot A_{lw}$$

$$M_p = F_y \cdot Z_x$$