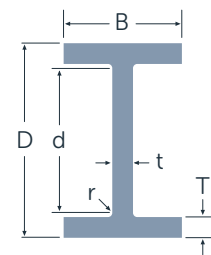
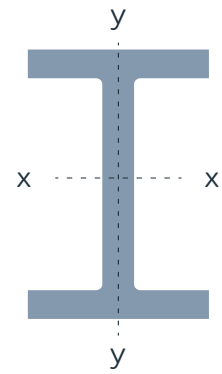


British Steel, the only UK manufacturer of structural sections, is BES 6001 certified, guaranteeing commitment to responsibly sourced materials. Our structural sections are CE and UKCA marked and tested to the highest standards, providing quality and assurance for the UK construction market.



## Universal beams (UB) sizes

| Designation     | Mass per<br>metre | Depth<br>of<br>section | Width<br>of<br>section | Thickness |              | Root<br>radius | Depth<br>between<br>fillets | Ratios for local<br>buckling |      | Second moment<br>of area<br>I |                        | Radius of<br>gyration<br>i |           |
|-----------------|-------------------|------------------------|------------------------|-----------|--------------|----------------|-----------------------------|------------------------------|------|-------------------------------|------------------------|----------------------------|-----------|
|                 |                   |                        |                        | of<br>web | of<br>flange |                |                             | Flange                       | Web  | Axis                          | Axis                   | Axis                       | Axis      |
|                 |                   |                        |                        |           |              |                |                             |                              |      |                               |                        |                            |           |
| Serial size     | kg/m              | D<br>mm                | B<br>mm                | t<br>mm   | T<br>mm      | r<br>mm        | d<br>mm                     | B/2T                         | d/t  | x-x<br>cm <sup>4</sup>        | y-y<br>cm <sup>4</sup> | x-x<br>cm                  | y-y<br>cm |
| 127 x 76 x 13   | 13.0              | 127.0                  | 76.0                   | 4.0       | 7.6          | 7.6            | 96.6                        | 5.00                         | 24.2 | 473                           | 56                     | 5.35                       | 1.84      |
| 152 x 89 x 16   | 16.0              | 152.4                  | 88.7                   | 4.5       | 7.7          | 7.6            | 121.8                       | 5.76                         | 27.1 | 834                           | 90                     | 6.41                       | 2.10      |
| 178 x 102 x 19  | 19.0              | 177.8                  | 101.2                  | 4.8       | 7.9          | 7.6            | 146.8                       | 6.41                         | 30.6 | 1356                          | 137                    | 7.48                       | 2.37      |
| 203 x 102 x 23  | 23.1              | 203.2                  | 101.8                  | 5.4       | 9.3          | 7.6            | 169.4                       | 5.47                         | 31.4 | 2105                          | 164                    | 8.46                       | 2.36      |
| 203 x 133 x 25  | 25.1              | 203.2                  | 133.2                  | 5.7       | 7.8          | 7.6            | 172.4                       | 8.54                         | 30.2 | 2340                          | 308                    | 8.56                       | 3.10      |
| 203 x 133 x 30  | 30.0              | 206.8                  | 133.9                  | 6.4       | 9.6          | 7.6            | 172.4                       | 6.97                         | 26.9 | 2896                          | 385                    | 8.71                       | 3.17      |
| 254 x 102 x 22  | 22.0              | 254.0                  | 101.6                  | 5.7       | 6.8          | 7.6            | 225.2                       | 7.47                         | 39.5 | 2841                          | 119                    | 10.10                      | 2.06      |
| 254 x 102 x 25  | 25.2              | 257.2                  | 101.9                  | 6.0       | 8.4          | 7.6            | 225.2                       | 6.07                         | 37.5 | 3415                          | 149                    | 10.30                      | 2.15      |
| 254 x 102 x 28  | 28.3              | 260.4                  | 102.2                  | 6.3       | 10.0         | 7.6            | 225.2                       | 5.11                         | 35.7 | 4005                          | 179                    | 10.50                      | 2.22      |
| 254 x 146 x 31  | 31.1              | 251.4                  | 146.1                  | 6.0       | 8.6          | 7.6            | 219.0                       | 8.49                         | 36.5 | 4413                          | 448                    | 10.50                      | 3.36      |
| 254 x 146 x 37  | 37.0              | 256.0                  | 146.4                  | 6.3       | 10.9         | 7.6            | 219.0                       | 6.72                         | 34.8 | 5537                          | 571                    | 10.80                      | 3.48      |
| 254 x 146 x 43  | 43.0              | 259.6                  | 147.3                  | 7.2       | 12.7         | 7.6            | 219.0                       | 5.80                         | 30.4 | 6544                          | 677                    | 10.90                      | 3.52      |
| 305 x 102 x 25  | 24.8              | 305.1                  | 101.6                  | 5.8       | 7.0          | 7.6            | 275.9                       | 7.26                         | 47.6 | 4455                          | 123                    | 11.90                      | 1.97      |
| 305 x 102 x 28  | 28.2              | 308.7                  | 101.8                  | 6.0       | 8.8          | 7.6            | 275.9                       | 5.78                         | 46.0 | 5366                          | 155                    | 12.20                      | 2.08      |
| 305 x 102 x 33  | 32.8              | 312.7                  | 102.4                  | 6.6       | 10.8         | 7.6            | 275.9                       | 4.74                         | 41.8 | 6501                          | 194                    | 12.50                      | 2.15      |
| 305 x 127 x 37  | 37.0              | 304.4                  | 123.4                  | 7.1       | 10.7         | 8.9            | 265.2                       | 5.77                         | 37.4 | 7171                          | 336                    | 12.30                      | 2.67      |
| 305 x 127 x 42  | 41.9              | 307.2                  | 124.3                  | 8.0       | 12.1         | 8.9            | 265.2                       | 5.14                         | 33.2 | 8196                          | 389                    | 12.40                      | 2.70      |
| 305 x 127 x 48  | 48.1              | 311.0                  | 125.3                  | 9.0       | 14.0         | 8.9            | 265.2                       | 4.48                         | 29.5 | 9575                          | 461                    | 12.50                      | 2.74      |
| 305 x 165 x 40  | 40.3              | 303.4                  | 165.0                  | 6.0       | 10.2         | 8.9            | 265.2                       | 8.09                         | 44.2 | 8503                          | 764                    | 12.90                      | 3.86      |
| 305 x 165 x 46  | 46.1              | 306.6                  | 165.7                  | 6.7       | 11.8         | 8.9            | 265.2                       | 7.02                         | 39.6 | 9899                          | 896                    | 13.00                      | 3.90      |
| 305 x 165 x 54  | 54.0              | 310.4                  | 166.9                  | 7.9       | 13.7         | 8.9            | 265.2                       | 6.09                         | 33.6 | 11696                         | 1063                   | 13.00                      | 3.93      |
| 356 x 171 x 45  | 45.0              | 351.4                  | 171.1                  | 7.0       | 9.7          | 12.7           | 306.6                       | 8.82                         | 43.8 | 12195                         | 811                    | 14.50                      | 3.75      |
| 356 x 171 x 51  | 51.0              | 355.0                  | 171.5                  | 7.4       | 11.5         | 12.7           | 306.6                       | 7.46                         | 41.4 | 14265                         | 969                    | 14.80                      | 3.85      |
| 356 x 171 x 57  | 57.0              | 358.0                  | 172.2                  | 8.1       | 13.0         | 12.7           | 306.6                       | 6.62                         | 37.9 | 16168                         | 1109                   | 14.90                      | 3.90      |
| 356 x 171 x 67  | 67.1              | 363.4                  | 173.2                  | 9.1       | 15.7         | 12.7           | 306.6                       | 5.52                         | 33.7 | 19592                         | 1362                   | 15.10                      | 3.98      |
| 406 x 140 x 39  | 39.0              | 398.0                  | 141.8                  | 6.4       | 8.6          | 12.7           | 355.4                       | 8.24                         | 55.5 | 12679                         | 410                    | 15.90                      | 2.86      |
| 406 x 140 x 46  | 46.0              | 403.2                  | 142.2                  | 6.8       | 11.2         | 12.7           | 355.4                       | 6.35                         | 52.3 | 15856                         | 538                    | 16.40                      | 3.02      |
| 406 x 140 x 53  | 53.3              | 406.6                  | 143.3                  | 7.9       | 12.9         | 12.7           | 355.4                       | 5.55                         | 45.0 | 18454                         | 635                    | 16.40                      | 3.05      |
| 406 x 178 x 54  | 54.1              | 402.6                  | 177.7                  | 7.7       | 10.9         | 12.7           | 355.4                       | 8.15                         | 46.2 | 18893                         | 1022                   | 16.50                      | 3.84      |
| 406 x 178 x 60  | 60.1              | 406.4                  | 177.9                  | 7.9       | 12.8         | 12.7           | 355.4                       | 6.95                         | 45.0 | 21767                         | 1203                   | 16.80                      | 3.95      |
| 406 x 178 x 67  | 67.1              | 409.4                  | 178.8                  | 8.8       | 14.3         | 12.7           | 355.4                       | 6.25                         | 40.4 | 24502                         | 1365                   | 16.90                      | 3.98      |
| 406 x 178 x 74  | 74.2              | 412.8                  | 179.5                  | 9.5       | 16.0         | 12.7           | 355.4                       | 5.61                         | 37.4 | 27481                         | 1546                   | 17.00                      | 4.03      |
| 406 x 178 x 85  | 85.3              | 417.2                  | 181.9                  | 10.9      | 18.2         | 12.7           | 355.4                       | 5.00                         | 32.6 | 31874                         | 1831                   | 17.10                      | 4.10      |
| 410 x 260 x 100 | 99.99             | 415                    | 260                    | 10.0      | 16.9         | 12.7           | 355.8                       | 7.69                         | 35.6 | 39944                         | 4955                   | 17.7                       | 6.24      |
| 410 x 260 x 114 | 114.9             | 420                    | 261                    | 11.6      | 19.3         | 12.7           | 356.0                       | 6.76                         | 30.7 | 46323                         | 5725                   | 17.8                       | 6.25      |
| 410 x 260 x 132 | 132.52            | 425                    | 263                    | 16.3      | 22.2         | 12.7           | 355.2                       | 5.92                         | 21.8 | 55388                         | 6746                   | 17.5                       | 6.12      |
| 410 x 260 x 149 | 149.62            | 431                    | 265                    | 14.9      | 25.0         | 12.7           | 355.6                       | 5.30                         | 23.9 | 62026                         | 7766                   | 18.0                       | 6.38      |
| 457 x 152 x 52  | 52.3              | 449.8                  | 152.4                  | 7.6       | 10.9         | 12.7           | 402.6                       | 6.99                         | 53.0 | 21586                         | 645                    | 17.90                      | 3.10      |
| 457 x 152 x 60  | 59.8              | 454.6                  | 152.9                  | 8.1       | 13.3         | 12.7           | 402.6                       | 5.75                         | 49.7 | 25717                         | 795                    | 18.30                      | 3.22      |
| 457 x 152 x 67  | 67.2              | 458.0                  | 153.8                  | 9.0       | 15.0         | 12.7           | 402.6                       | 5.13                         | 44.7 | 29144                         | 913                    | 18.40                      | 3.26      |
| 457 x 152 x 74  | 74.2              | 462.0                  | 154.4                  | 9.6       | 17.0         | 12.7           | 402.6                       | 4.54                         | 41.9 | 32891                         | 1047                   | 18.60                      | 3.32      |
| 457 x 152 x 82  | 82.1              | 465.8                  | 155.3                  | 10.5      | 18.9         | 12.7           | 402.6                       | 4.11                         | 38.3 | 36806                         | 1185                   | 18.70                      | 3.36      |

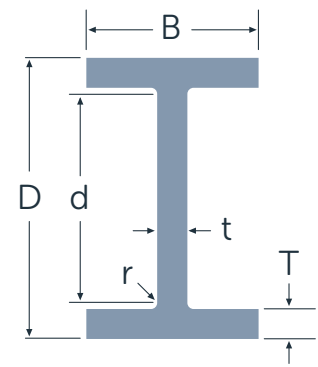


## Universal beams (UB) sizes

| Elastic modulus |                 | Plastic modulus |                 | Buckling<br>parameter | Torsional<br>index | Warping<br>constant  | Torsional<br>constant | Area of<br>section | Designation     |
|-----------------|-----------------|-----------------|-----------------|-----------------------|--------------------|----------------------|-----------------------|--------------------|-----------------|
| Axis            | Axis            | Axis            | Axis            |                       |                    |                      |                       |                    |                 |
| x-x             | y-y             | x-x             | y-y             |                       |                    |                      |                       |                    |                 |
| cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> | u                     | x                  | H<br>dm <sup>6</sup> | J<br>cm <sup>4</sup>  | cm <sup>2</sup>    | Serial size     |
| 75              | 15              | 84              | 23              | 0.895                 | 16.3               | 0.0020               | 2.85                  | 16.5               | 127 x 76 x 13   |
| 109             | 20              | 123             | 31              | 0.890                 | 19.6               | 0.0047               | 3.56                  | 20.3               | 152 x 89 x 16   |
| 153             | 27              | 171             | 42              | 0.888                 | 22.6               | 0.0099               | 4.41                  | 24.3               | 178 x 102 x 19  |
| 207             | 32              | 234             | 50              | 0.888                 | 22.5               | 0.0154               | 7.02                  | 29.4               | 203 x 102 x 23  |
| 230             | 46              | 258             | 71              | 0.877                 | 25.6               | 0.0294               | 5.96                  | 32.0               | 203 x 133 x 25  |
| 280             | 57              | 314             | 88              | 0.881                 | 21.5               | 0.0374               | 10.30                 | 38.2               | 203 x 133 x 30  |
| 224             | 23              | 259             | 37              | 0.856                 | 36.4               | 0.0182               | 4.15                  | 28.0               | 254 x 102 x 22  |
| 266             | 29              | 306             | 46              | 0.866                 | 31.5               | 0.0230               | 6.42                  | 32.0               | 254 x 102 x 25  |
| 308             | 35              | 353             | 55              | 0.874                 | 27.5               | 0.0280               | 9.57                  | 36.1               | 254 x 102 x 28  |
| 351             | 61              | 393             | 94              | 0.880                 | 29.6               | 0.0660               | 8.55                  | 39.7               | 254 x 146 x 31  |
| 433             | 78              | 483             | 119             | 0.890                 | 24.3               | 0.0857               | 15.30                 | 47.2               | 254 x 146 x 37  |
| 504             | 92              | 566             | 141             | 0.891                 | 21.2               | 0.1030               | 23.90                 | 54.8               | 254 x 146 x 43  |
| 292             | 24              | 342             | 39              | 0.846                 | 43.4               | 0.0273               | 4.77                  | 31.6               | 305 x 102 x 25  |
| 348             | 31              | 403             | 48              | 0.859                 | 37.4               | 0.0349               | 7.40                  | 35.9               | 305 x 102 x 28  |
| 416             | 38              | 481             | 60              | 0.866                 | 31.6               | 0.0442               | 12.20                 | 41.8               | 305 x 102 x 33  |
| 471             | 54              | 539             | 85              | 0.872                 | 29.7               | 0.0725               | 14.80                 | 47.2               | 305 x 127 x 37  |
| 534             | 63              | 614             | 98              | 0.872                 | 26.5               | 0.0846               | 21.10                 | 53.4               | 305 x 127 x 42  |
| 616             | 74              | 711             | 116             | 0.873                 | 23.3               | 0.1020               | 31.80                 | 61.2               | 305 x 127 x 48  |
| 560             | 93              | 623             | 142             | 0.889                 | 31.0               | 0.1640               | 14.70                 | 51.3               | 305 x 165 x 40  |
| 646             | 108             | 720             | 166             | 0.891                 | 27.1               | 0.1950               | 22.20                 | 58.7               | 305 x 165 x 46  |
| 754             | 127             | 846             | 196             | 0.889                 | 23.6               | 0.2340               | 34.80                 | 68.8               | 305 x 165 x 54  |
| 694             | 95              | 783             | 147             | 0.875                 | 35.8               | 0.2370               | 16.90                 | 57.8               | 356 x 171 x 45  |
| 804             | 113             | 904             | 174             | 0.882                 | 31.4               | 0.2860               | 25.10                 | 65.4               | 356 x 171 x 51  |
| 903             | 129             | 1018            | 199             | 0.883                 | 28.3               | 0.3300               | 34.90                 | 73.0               | 356 x 171 x 57  |
| 1078            | 157             | 1219            | 243             | 0.887                 | 24.0               | 0.4120               | 57.70                 | 86.0               | 356 x 171 x 67  |
| 637             | 58              | 733             | 91              | 0.859                 | 45.9               | 0.1550               | 11.60                 | 50.1               | 406 x 140 x 39  |
| 787             | 76              | 897             | 118             | 0.872                 | 38.0               | 0.2070               | 20.20                 | 59.1               | 406 x 140 x 46  |
| 908             | 89              | 1040            | 139             | 0.871                 | 33.4               | 0.2460               | 30.40                 | 68.4               | 406 x 140 x 53  |
| 939             | 115             | 1064            | 179             | 0.872                 | 37.4               | 0.3920               | 24.30                 | 69.4               | 406 x 178 x 54  |
| 1071            | 135             | 1209            | 209             | 0.880                 | 33.1               | 0.4660               | 34.80                 | 77.0               | 406 x 178 x 60  |
| 1197            | 153             | 1355            | 237             | 0.880                 | 30.0               | 0.5330               | 47.90                 | 86.0               | 406 x 178 x 67  |
| 1331            | 172             | 1510            | 267             | 0.882                 | 27.2               | 0.6080               | 64.90                 | 95.0               | 406 x 178 x 74  |
| 1528            | 201             | 1742            | 313             | 0.882                 | 24.1               | 0.7290               | 95.70                 | 109.0              | 406 x 178 x 85  |
| 1925            | 381             | 2139            | 582             | 0.888                 | 25.2               | 1.96                 | 102                   | 127                | 410 x 260 x 100 |
| 2206            | 439             | 2466            | 671             | 0.887                 | 22.3               | 2.30                 | 152                   | 146                | 410 x 260 x 114 |
| 2607            | 513             | 2968            | 794             | 0.875                 | 19.0               | 2.74                 | 260                   | 180                | 410 x 260 x 132 |
| 2878            | 586             | 3257            | 900             | 0.887                 | 17.5               | 3.20                 | 327                   | 191                | 410 x 260 x 149 |
| 960             | 85              | 1106            | 134             | 0.860                 | 42.8               | 0.3110               | 22.60                 | 67.1               | 457 x 152 x 52  |
| 1131            | 104             | 1298            | 163             | 0.869                 | 36.8               | 0.3870               | 35.40                 | 76.7               | 457 x 152 x 60  |
| 1273            | 119             | 1463            | 187             | 0.869                 | 33.0               | 0.4480               | 49.60                 | 86.0               | 457 x 152 x 67  |
| 1424            | 136             | 1637            | 213             | 0.873                 | 29.7               | 0.5180               | 68.20                 | 95.0               | 457 x 152 x 74  |
| 1580            | 153             | 1822            | 241             | 0.874                 | 27.0               | 0.5920               | 92.00                 | 105.0              | 457 x 152 x 82  |

Dimensions and properties to BS EN 10365:2017

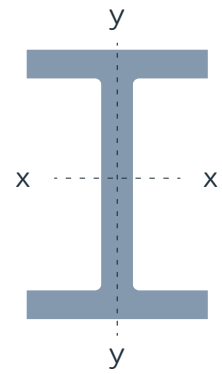




## Universal beams (UB) sizes

| Designation<br><br>Serial size | Mass per<br>metre<br><br>kg/m | Depth<br>of<br>section<br><br>D<br>mm | Width<br>of<br>section<br><br>B<br>mm | Thickness                |                             | Root<br>radius<br><br>r<br>mm | Depth<br>between<br>fillets<br><br>d<br>mm | Ratios for local<br>buckling |                | Second moment<br>of area<br>I      |                                    | Radius of<br>gyration<br>i |                       |
|--------------------------------|-------------------------------|---------------------------------------|---------------------------------------|--------------------------|-----------------------------|-------------------------------|--------------------------------------------|------------------------------|----------------|------------------------------------|------------------------------------|----------------------------|-----------------------|
|                                |                               |                                       |                                       | of<br>web<br><br>t<br>mm | of<br>flange<br><br>T<br>mm |                               |                                            | Flange<br><br>B/2T           | Web<br><br>d/t | Axis<br><br>x-x<br>cm <sup>4</sup> | Axis<br><br>y-y<br>cm <sup>4</sup> | Axis<br><br>x-x<br>cm      | Axis<br><br>y-y<br>cm |
|                                |                               |                                       |                                       |                          |                             |                               |                                            |                              |                |                                    |                                    |                            |                       |
|                                |                               |                                       |                                       |                          |                             |                               |                                            |                              |                |                                    |                                    |                            |                       |
| 457 x 191 x 67                 | 67.1                          | 453.4                                 | 189.9                                 | 8.5                      | 12.7                        | 12.7                          | 402.6                                      | 7.48                         | 47.4           | 29597                              | 1452                               | 18.60                      | 4.11                  |
| 457 x 191 x 74                 | 74.3                          | 457.0                                 | 190.4                                 | 9.0                      | 14.5                        | 12.7                          | 402.6                                      | 6.57                         | 44.7           | 33536                              | 1672                               | 18.80                      | 4.19                  |
| 457 x 191 x 82                 | 82.0                          | 460.0                                 | 191.3                                 | 9.9                      | 16.0                        | 12.7                          | 402.6                                      | 5.98                         | 40.7           | 37268                              | 1871                               | 18.80                      | 4.22                  |
| 457 x 191 x 89                 | 89.3                          | 463.4                                 | 191.9                                 | 10.5                     | 17.7                        | 12.7                          | 402.6                                      | 5.42                         | 38.3           | 41232                              | 2090                               | 19.00                      | 4.28                  |
| 457 x 191 x 98                 | 98.3                          | 467.2                                 | 192.8                                 | 11.4                     | 19.6                        | 12.7                          | 402.6                                      | 4.92                         | 35.3           | 45944                              | 2348                               | 19.1                       | 4.32                  |
| 457 x 191 x 106                | 105.8                         | 469.2                                 | 194.0                                 | 12.6                     | 20.6                        | 12.7                          | 402.6                                      | 4.71                         | 32.0           | 49090                              | 2515                               | 19.1                       | 4.31                  |
| 457 x 191 x 133                | 133.3                         | 480.6                                 | 196.7                                 | 15.3                     | 26.3                        | 12.7                          | 402.6                                      | 3.74                         | 26.3           | 64058                              | 3350                               | 19.4                       | 4.43                  |
| 457 x 191 x 161                | 161.4                         | 492.0                                 | 199.4                                 | 18.0                     | 32.0                        | 12.7                          | 402.6                                      | 3.12                         | 22.4           | 79996                              | 4251                               | 19.7                       | 4.54                  |
| 457 x 280 x 113                | 113.0                         | 463.0                                 | 280.0                                 | 10.8                     | 17.3                        | 20.0                          | 388.4                                      | 8.09                         | 36.0           | 56724                              | 6338                               | 19.7                       | 6.58                  |
| 457 x 280 x 128                | 128.0                         | 467.0                                 | 282.0                                 | 12.2                     | 19.6                        | 20.0                          | 387.8                                      | 7.19                         | 31.8           | 64820                              | 7337                               | 19.8                       | 6.64                  |
| 457 x 280 x 144                | 144.0                         | 472.0                                 | 283.0                                 | 13.6                     | 22.1                        | 20.0                          | 387.8                                      | 6.40                         | 28.5           | 73727                              | 8362                               | 19.9                       | 6.69                  |
| 457 x 280 x 158                | 158.0                         | 476.0                                 | 284.0                                 | 15.0                     | 23.9                        | 20.0                          | 388.2                                      | 5.94                         | 25.9           | 80756                              | 9142                               | 19.9                       | 6.70                  |
| 457 x 280 x 177                | 177.0                         | 482.0                                 | 286.0                                 | 16.6                     | 26.9                        | 20.0                          | 388.2                                      | 5.32                         | 23.4           | 92134                              | 10511                              | 20.1                       | 6.78                  |
| 457 x 280 x 193                | 193.0                         | 489.0                                 | 283.0                                 | 17.0                     | 30.5                        | 20.0                          | 388.0                                      | 4.64                         | 22.8           | 103476                             | 11545                              | 20.4                       | 6.81                  |
| 457 x 280 x 213                | 213.0                         | 495.0                                 | 285.0                                 | 18.5                     | 33.5                        | 20.0                          | 388.0                                      | 4.25                         | 21.0           | 115446                             | 12954                              | 20.5                       | 6.88                  |
| 457 x 280 x 235                | 235.0                         | 501.0                                 | 287.0                                 | 20.6                     | 36.6                        | 20.0                          | 387.8                                      | 3.92                         | 18.8           | 128452                             | 14459                              | 20.6                       | 6.92                  |
| 457 x 280 x 260                | 260.0                         | 509.0                                 | 289.0                                 | 22.6                     | 40.4                        | 20.0                          | 388.2                                      | 3.58                         | 17.2           | 144803                             | 16303                              | 20.8                       | 6.99                  |
| 457 x 280 x 286                | 286.0                         | 517.0                                 | 291.0                                 | 24.4                     | 44.4                        | 20.0                          | 388.2                                      | 3.28                         | 15.9           | 162187                             | 18297                              | 21.0                       | 7.07                  |
| 457 x 280 x 315                | 315.0                         | 525.0                                 | 293.0                                 | 26.9                     | 48.5                        | 20.0                          | 388.0                                      | 3.02                         | 14.4           | 180967                             | 20414                              | 21.2                       | 7.12                  |
| 533 x 165 x 66                 | 65.7                          | 524.7                                 | 165.1                                 | 8.9                      | 11.4                        | 12.7                          | 476.5                                      | 7.24                         | 53.5           | 35028                              | 859                                | 20.5                       | 3.20                  |
| 533 x 165 x 74                 | 74.7                          | 529.1                                 | 165.9                                 | 9.7                      | 13.6                        | 12.7                          | 476.5                                      | 6.10                         | 49.1           | 41058                              | 1040                               | 20.8                       | 3.30                  |
| 533 x 165 x 85                 | 84.8                          | 534.9                                 | 166.5                                 | 10.3                     | 16.5                        | 12.7                          | 476.5                                      | 5.05                         | 46.3           | 48631                              | 1275                               | 21.2                       | 3.44                  |
| 533 x 210 x 82                 | 82.2                          | 528.3                                 | 208.8                                 | 9.6                      | 13.2                        | 12.7                          | 476.5                                      | 7.91                         | 49.6           | 47539                              | 2007                               | 21.3                       | 4.38                  |
| 533 x 210 x 92                 | 92.1                          | 533.1                                 | 209.3                                 | 10.1                     | 15.6                        | 12.7                          | 476.5                                      | 6.71                         | 47.2           | 55227                              | 2389                               | 21.7                       | 4.51                  |
| 533 x 210 x 101                | 101.0                         | 536.7                                 | 210.0                                 | 10.8                     | 17.4                        | 12.7                          | 476.5                                      | 6.03                         | 44.1           | 61519                              | 2692                               | 21.9                       | 4.57                  |
| 533 x 210 x 109                | 109.0                         | 539.5                                 | 210.8                                 | 11.6                     | 18.8                        | 12.7                          | 476.5                                      | 5.61                         | 41.1           | 66822                              | 2943                               | 21.9                       | 4.60                  |
| 533 x 210 x 122                | 122.0                         | 544.5                                 | 211.9                                 | 12.7                     | 21.3                        | 12.7                          | 476.5                                      | 4.97                         | 37.5           | 76043                              | 3388                               | 22.1                       | 4.67                  |
| 533 x 210 x 138                | 138.3                         | 549.1                                 | 213.9                                 | 14.7                     | 23.6                        | 12.7                          | 476.5                                      | 4.53                         | 32.4           | 86088                              | 3864                               | 22.1                       | 4.68                  |
| 533 x 312 x 150                | 150.6                         | 542.5                                 | 312.0                                 | 12.7                     | 20.3                        | 12.7                          | 476.5                                      | 7.68                         | 37.5           | 100633                             | 10285                              | 22.9                       | 7.32                  |
| 533 x 312 x 165                | 165.0                         | 546.0                                 | 313.0                                 | 14.0                     | 22.2                        | 12.7                          | 476.2                                      | 7.05                         | 34.0           | 110955                             | 11359                              | 23.0                       | 7.34                  |
| 533 x 312 x 182                | 181.5                         | 550.7                                 | 314.5                                 | 15.2                     | 24.4                        | 12.7                          | 476.5                                      | 6.44                         | 31.3           | 123222                             | 12667                              | 23.1                       | 7.40                  |
| 533 x 312 x 196                | 196.0                         | 554.0                                 | 316.0                                 | 16.5                     | 26.3                        | 12.7                          | 476.0                                      | 6.01                         | 28.8           | 133993                             | 13852                              | 23.1                       | 7.44                  |
| 533 x 312 x 219                | 218.7                         | 560.3                                 | 317.4                                 | 18.3                     | 29.2                        | 12.7                          | 476.5                                      | 5.43                         | 26.0           | 150976                             | 15589                              | 23.3                       | 7.48                  |
| 533 x 312 x 248                | 248.0                         | 571.0                                 | 315.0                                 | 19.0                     | 34.5                        | 12.7                          | 476.6                                      | 4.57                         | 25.1           | 177499                             | 18003                              | 23.8                       | 7.57                  |
| 533 x 312 x 272                | 273.2                         | 577.1                                 | 320.2                                 | 21.1                     | 37.6                        | 12.7                          | 476.5                                      | 4.26                         | 22.6           | 198578                             | 20615                              | 23.9                       | 7.70                  |
| 610 x 178 x 82                 | 81.8                          | 598.6                                 | 177.9                                 | 10.0                     | 12.8                        | 20.0                          | 533.0                                      | 6.95                         | 53.3           | 57487                              | 1209                               | 23.3                       | 3.37                  |
| 610 x 178 x 92                 | 92.2                          | 603.0                                 | 178.8                                 | 10.9                     | 15.0                        | 20.0                          | 533.0                                      | 5.96                         | 48.9           | 66195                              | 1439                               | 23.5                       | 3.47                  |
| 610 x 178 x 100                | 100.3                         | 607.4                                 | 179.2                                 | 11.3                     | 17.2                        | 20.0                          | 533.0                                      | 5.21                         | 47.2           | 74145                              | 1661                               | 23.9                       | 3.58                  |
| 610 x 229 x 101                | 101.2                         | 602.6                                 | 227.6                                 | 10.5                     | 14.8                        | 20.0                          | 533.0                                      | 7.69                         | 50.8           | 77398                              | 2917                               | 24.3                       | 4.72                  |
| 610 x 229 x 113                | 113.0                         | 607.6                                 | 228.2                                 | 11.1                     | 17.3                        | 20.0                          | 533.0                                      | 6.60                         | 48.0           | 88936                              | 3437                               | 24.7                       | 4.85                  |
| 610 x 229 x 125                | 125.1                         | 612.2                                 | 229.0                                 | 11.9                     | 19.6                        | 20.0                          | 533.0                                      | 5.84                         | 44.8           | 100228                             | 3935                               | 24.9                       | 4.94                  |
| 610 x 229 x 140                | 139.9                         | 617.2                                 | 230.2                                 | 13.1                     | 22.1                        | 20.0                          | 533.0                                      | 5.21                         | 40.7           | 113395                             | 4509                               | 25.1                       | 5.00                  |
| 610 x 305 x 149                | 149.2                         | 612.4                                 | 304.8                                 | 11.8                     | 19.7                        | 20.0                          | 533.0                                      | 7.74                         | 45.2           | 126738                             | 9309                               | 25.8                       | 6.98                  |
| 610 x 305 x 179                | 179.0                         | 620.2                                 | 307.1                                 | 14.1                     | 23.6                        | 20.0                          | 533.0                                      | 6.51                         | 37.8           | 153886                             | 11410                              | 25.9                       | 7.06                  |
| 610 x 305 x 238                | 238.1                         | 635.8                                 | 311.4                                 | 18.4                     | 31.4                        | 20.0                          | 533.0                                      | 4.96                         | 29.0           | 210333                             | 15839                              | 26.3                       | 7.21                  |
| 610 x 324 x 155                | 155.0                         | 611.0                                 | 324.0                                 | 12.7                     | 19.0                        | 20.0                          | 533.0                                      | 8.53                         | 42.0           | 130552                             | 10785                              | 25.6                       | 7.36                  |



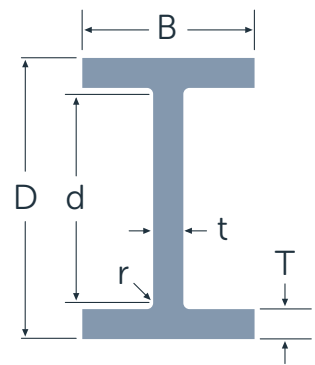


## Universal beams (UB) sizes

| Elastic modulus |                 | Plastic modulus |                 | Buckling<br>parameter | Torsional<br>index | Warping<br>constant  | Torsional<br>constant | Area of<br>section | Designation     |
|-----------------|-----------------|-----------------|-----------------|-----------------------|--------------------|----------------------|-----------------------|--------------------|-----------------|
| Axis            | Axis            | Axis            | Axis            |                       |                    |                      |                       |                    |                 |
| x-x             | y-y             | x-x             | y-y             |                       |                    |                      |                       |                    |                 |
| cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> | u                     | x                  | H<br>dm <sup>6</sup> | J<br>cm <sup>4</sup>  | cm <sup>2</sup>    | Serial size     |
| 1306            | 153             | 1481            | 238             | 0.873                 | 37.2               | 0.7050               | 38.70                 | 86.0               | 457 x 191 x 67  |
| 1468            | 176             | 1663            | 272             | 0.878                 | 33.4               | 0.8180               | 53.60                 | 95.1               | 457 x 191 x 74  |
| 1620            | 196             | 1842            | 304             | 0.878                 | 30.5               | 0.9220               | 71.40                 | 105.0              | 457 x 191 x 82  |
| 1780            | 218             | 2024            | 339             | 0.880                 | 27.9               | 1.0400               | 93.30                 | 114.0              | 457 x 191 x 89  |
| 1967            | 244             | 2243            | 379             | 0.881                 | 25.5               | 1.180                | 124.0                 | 126.0              | 457 x 191 x 98  |
| 2093            | 259             | 2399            | 406             | 0.878                 | 24.2               | 1.270                | 149.0                 | 135.0              | 457 x 191 x 106 |
| 2666            | 341             | 3080            | 535             | 0.880                 | 19.4               | 1.730                | 298.0                 | 170.0              | 457 x 191 x 133 |
| 3252            | 426             | 3789            | 672             | 0.882                 | 16.3               | 2.250                | 524.0                 | 206.0              | 457 x 191 x 161 |
| 2450            | 453             | 2727            | 694             | 0.887                 | 26.5               | 3.15                 | 132                   | 147                | 457 x 280 x 113 |
| 2776            | 520             | 3103            | 799             | 0.887                 | 23.7               | 3.67                 | 189                   | 166                | 457 x 280 x 128 |
| 3124            | 591             | 3508            | 908             | 0.887                 | 21.3               | 4.23                 | 266                   | 187                | 457 x 280 x 144 |
| 3393            | 644             | 3829            | 992             | 0.885                 | 19.9               | 4.67                 | 337                   | 203                | 457 x 280 x 158 |
| 3823            | 735             | 4335            | 1134            | 0.886                 | 17.9               | 5.44                 | 473                   | 228                | 457 x 280 x 177 |
| 4232            | 816             | 4808            | 1256            | 0.891                 | 16.2               | 6.07                 | 641                   | 249                | 457 x 280 x 193 |
| 4664            | 909             | 5326            | 1402            | 0.892                 | 14.9               | 6.90                 | 843                   | 274                | 457 x 280 x 213 |
| 5128            | 1008            | 5893            | 1557            | 0.890                 | 13.7               | 7.80                 | 1106                  | 302                | 457 x 280 x 235 |
| 5690            | 1128            | 6579            | 1747            | 0.890                 | 12.6               | 8.95                 | 1479                  | 334                | 457 x 280 x 260 |
| 6274            | 1258            | 7297            | 1949            | 0.891                 | 11.6               | 10.2                 | 1942                  | 366                | 457 x 280 x 286 |
| 6894            | 1393            | 8076            | 2165            | 0.890                 | 10.7               | 11.6                 | 2537                  | 403                | 457 x 280 x 315 |
| 1335            | 104             | 1561            | 166             | 0.847                 | 47.0               | 0.566                | 32.0                  | 83.7               | 533 x 165 x 66  |
| 1552            | 125             | 1808            | 200             | 0.853                 | 41.1               | 0.691                | 47.9                  | 95.2               | 533 x 165 x 74  |
| 1818            | 153             | 2107            | 243             | 0.862                 | 35.5               | 0.857                | 73.8                  | 108.0              | 533 x 165 x 85  |
| 1800            | 192             | 2059            | 300             | 0.864                 | 41.6               | 1.330                | 51.5                  | 105.0              | 533 x 210 x 82  |
| 2072            | 228             | 2360            | 355             | 0.872                 | 36.5               | 1.600                | 75.7                  | 117.0              | 533 x 210 x 92  |
| 2292            | 256             | 2612            | 399             | 0.874                 | 33.2               | 1.810                | 101.0                 | 129.0              | 533 x 210 x 101 |
| 2477            | 279             | 2829            | 436             | 0.875                 | 30.9               | 1.990                | 126.0                 | 139.0              | 533 x 210 x 109 |
| 2793            | 320             | 3196            | 500             | 0.877                 | 27.6               | 2.320                | 178.0                 | 155.0              | 533 x 210 x 122 |
| 3136            | 361             | 3613            | 568             | 0.873                 | 25.0               | 2.670                | 250.0                 | 176.0              | 533 x 210 x 138 |
| 3710            | 659             | 4142            | 1009            | 0.885                 | 27.8               | 7.010                | 216.0                 | 192.0              | 533 x 312 x 150 |
| 4064            | 726             | 4555            | 1113            | 0.885                 | 25.6               | 7.79                 | 283                   | 211                | 533 x 312 x 165 |
| 4475            | 806             | 5030            | 1237            | 0.885                 | 23.4               | 8.770                | 373.0                 | 231.0              | 533 x 312 x 182 |
| 4837            | 877             | 5457            | 1349            | 0.884                 | 21.8               | 9.64                 | 470                   | 250                | 533 x 312 x 196 |
| 5389            | 982             | 6109            | 1514            | 0.884                 | 19.8               | 11.000               | 642.0                 | 279.0              | 533 x 312 x 219 |
| 6217            | 1143            | 7062            | 1759            | 0.891                 | 17.2               | 13.0                 | 977                   | 314                | 533 x 312 x 248 |
| 6882            | 1288            | 7859            | 1985            | 0.890                 | 15.9               | 15.000               | 1288.0                | 348.0              | 533 x 312 x 272 |
| 1921            | 136             | 2252            | 220             | 0.846                 | 45.3               | 1.040                | 57.0                  | 106.0              | 610 x 178 x 82  |
| 2196            | 161             | 2569            | 260             | 0.850                 | 40.4               | 1.240                | 81.0                  | 120.0              | 610 x 178 x 92  |
| 2441            | 185             | 2844            | 298             | 0.857                 | 36.8               | 1.450                | 107.0                 | 130.0              | 610 x 178 x 100 |
| 2569            | 256             | 2939            | 402             | 0.865                 | 40.9               | 2.520                | 86.7                  | 131.0              | 610 x 229 x 101 |
| 2927            | 301             | 3339            | 471             | 0.872                 | 36.4               | 2.990                | 123.0                 | 146.0              | 610 x 229 x 113 |
| 3274            | 344             | 3734            | 537             | 0.875                 | 32.9               | 3.450                | 168.0                 | 161.0              | 610 x 229 x 125 |
| 3674            | 392             | 4200            | 614             | 0.876                 | 29.6               | 3.990                | 233.0                 | 180.0              | 610 x 229 x 140 |
| 4139            | 611             | 4625            | 938             | 0.887                 | 32.2               | 8.180                | 208.0                 | 191.0              | 610 x 305 x 149 |
| 4962            | 743             | 5578            | 1145            | 0.886                 | 27.3               | 10.200               | 351.0                 | 229.0              | 610 x 305 x 179 |
| 6616            | 1017            | 7517            | 1575            | 0.886                 | 21.1               | 14.500               | 803.0                 | 304.0              | 610 x 305 x 238 |
| 4273            | 666             | 4784            | 1024            | 0.881                 | 32.7               | 9.45                 | 210                   | 199                | 610 x 324 x 155 |

Dimensions and properties to BS EN 10365:2017

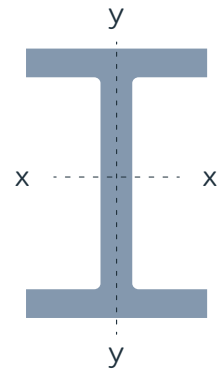




## Universal beams (UB) sizes

| Designation<br><br>Serial size | Mass per<br>metre<br><br>kg/m | Depth<br>of<br>section | Width<br>of<br>section | Thickness |              | Root<br>radius | Depth<br>between<br>fillets | Ratios for local<br>buckling |      | Second moment<br>of area<br>I |                        | Radius of<br>gyration<br>i |           |
|--------------------------------|-------------------------------|------------------------|------------------------|-----------|--------------|----------------|-----------------------------|------------------------------|------|-------------------------------|------------------------|----------------------------|-----------|
|                                |                               |                        |                        | of<br>web | of<br>flange |                |                             | Flange                       | Web  | Axis                          | Axis                   | Axis                       | Axis      |
|                                |                               | D<br>mm                | B<br>mm                | t<br>mm   | T<br>mm      | r<br>mm        | d<br>mm                     | B/2T                         | d/t  | x-x<br>cm <sup>4</sup>        | y-y<br>cm <sup>4</sup> | x-x<br>cm                  | y-y<br>cm |
| 610 x 324 x 174                | 174.0                         | 616.0                  | 325.0                  | 14.0      | 21.6         | 20.0           | 532.8                       | 7.52                         | 38.1 | 148722                        | 12376                  | 25.8                       | 7.43      |
| 610 x 324 x 195                | 195.0                         | 622.0                  | 327.0                  | 15.4      | 24.4         | 20.0           | 533.2                       | 6.70                         | 34.6 | 169453                        | 14242                  | 26.0                       | 7.53      |
| 610 x 324 x 217                | 217.0                         | 628.0                  | 328.0                  | 16.5      | 27.7         | 20.0           | 532.6                       | 5.92                         | 32.3 | 192362                        | 16319                  | 26.2                       | 7.64      |
| 610 x 324 x 241                | 241.0                         | 635.0                  | 329.0                  | 17.9      | 31.0         | 20.0           | 533.0                       | 5.31                         | 29.8 | 216996                        | 18433                  | 26.5                       | 7.71      |
| 610 x 324 x 262                | 262.0                         | 641.0                  | 327.0                  | 19.0      | 34.0         | 20.0           | 533.0                       | 4.81                         | 28.1 | 237554                        | 19854                  | 26.6                       | 7.70      |
| 610 x 324 x 285                | 285.0                         | 647.0                  | 329.0                  | 20.6      | 37.1         | 20.0           | 532.8                       | 4.43                         | 25.9 | 262288                        | 22069                  | 26.8                       | 7.77      |
| 610 x 324 x 307                | 307.0                         | 653.0                  | 330.0                  | 22.1      | 39.9         | 20.0           | 533.2                       | 4.14                         | 24.1 | 285235                        | 23958                  | 26.9                       | 7.80      |
| 610 x 324 x 341                | 341.0                         | 661.0                  | 333.0                  | 24.4      | 43.9         | 20.0           | 533.2                       | 3.79                         | 21.9 | 319846                        | 27097                  | 27.1                       | 7.89      |
| 610 x 324 x 372                | 372.0                         | 669.0                  | 335.0                  | 26.4      | 48.0         | 20.0           | 533.0                       | 3.49                         | 20.2 | 354794                        | 30175                  | 27.3                       | 7.96      |
| 686 x 254 x 125                | 125.2                         | 677.9                  | 253.0                  | 11.7      | 16.2         | 20.0           | 605.5                       | 7.81                         | 51.8 | 119448                        | 4385                   | 27.2                       | 5.22      |
| 686 x 254 x 140                | 140.1                         | 683.5                  | 253.7                  | 12.4      | 19.0         | 20.0           | 605.5                       | 6.68                         | 48.8 | 137723                        | 5186                   | 27.7                       | 5.37      |
| 686 x 254 x 152                | 152.4                         | 687.5                  | 254.5                  | 13.2      | 21.0         | 20.0           | 605.5                       | 6.06                         | 45.9 | 151811                        | 5786                   | 27.9                       | 5.44      |
| 686 x 254 x 170                | 170.2                         | 692.9                  | 255.8                  | 14.5      | 23.7         | 20.0           | 605.5                       | 5.40                         | 41.8 | 171782                        | 6633                   | 28.1                       | 5.51      |
| 686 x 254 x 192                | 192.6                         | 702.0                  | 254.0                  | 15.5      | 27.9         | 20.0           | 606.2                       | 4.55                         | 39.1 | 199444                        | 7646                   | 28.5                       | 5.58      |
| 762 x 267 x 134                | 133.9                         | 750.0                  | 264.4                  | 12.0      | 15.5         | 20.0           | 679.0                       | 8.53                         | 56.6 | 152061                        | 4790                   | 29.8                       | 5.28      |
| 762 x 267 x 147                | 146.9                         | 754.0                  | 265.2                  | 12.8      | 17.5         | 20.0           | 679.0                       | 7.58                         | 53.0 | 169871                        | 5457                   | 30.0                       | 5.38      |
| 762 x 267 x 161                | 161.0                         | 758.0                  | 266.0                  | 13.8      | 19.3         | 20.0           | 679.4                       | 6.89                         | 49.2 | 187252                        | 6075                   | 30.2                       | 5.44      |
| 762 x 267 x 173                | 173.0                         | 762.2                  | 266.7                  | 14.3      | 21.6         | 20.0           | 679.0                       | 6.17                         | 47.5 | 206651                        | 6852                   | 30.5                       | 5.56      |
| 762 x 267 x 185                | 185.0                         | 766.0                  | 267.0                  | 14.9      | 23.6         | 20.0           | 678.8                       | 5.66                         | 45.6 | 224146                        | 7512                   | 30.8                       | 5.64      |
| 762 x 267 x 197                | 196.8                         | 769.8                  | 268.0                  | 15.6      | 25.4         | 20.0           | 679.0                       | 5.28                         | 43.5 | 241326                        | 8177                   | 31.0                       | 5.70      |
| 838 x 292 x 176                | 175.9                         | 834.9                  | 291.7                  | 14.0      | 18.8         | 20.0           | 757.3                       | 7.76                         | 54.1 | 247120                        | 7800                   | 33.2                       | 5.89      |
| 838 x 292 x 194                | 193.8                         | 840.7                  | 292.4                  | 14.7      | 21.7         | 20.0           | 757.3                       | 6.74                         | 51.5 | 280274                        | 9068                   | 33.6                       | 6.05      |
| 838 x 292 x 210                | 210.0                         | 846.0                  | 293.0                  | 15.4      | 24.4         | 20.0           | 757.2                       | 6.00                         | 49.2 | 311719                        | 10259                  | 34.0                       | 6.17      |
| 838 x 292 x 226                | 226.5                         | 850.9                  | 293.8                  | 16.1      | 26.8         | 20.0           | 757.3                       | 5.48                         | 47.0 | 340802                        | 11361                  | 34.3                       | 6.27      |
| 838 x 292 x 252                | 250.7                         | 859.0                  | 292.1                  | 17.0      | 31.0         | 20.0           | 757.0                       | 4.71                         | 44.5 | 387599                        | 12916                  | 34.8                       | 6.35      |
| 914 x 305 x 201                | 200.9                         | 903.0                  | 303.3                  | 15.1      | 20.2         | 19.1           | 824.4                       | 7.51                         | 54.6 | 325254                        | 9423                   | 35.7                       | 6.07      |
| 914 x 305 x 224                | 224.2                         | 910.4                  | 304.1                  | 15.9      | 23.9         | 19.1           | 824.4                       | 6.36                         | 51.8 | 376414                        | 11236                  | 36.3                       | 6.27      |
| 914 x 305 x 239                | 238.3                         | 915.0                  | 305.0                  | 16.5      | 25.9         | 19.1           | 825.0                       | 5.89                         | 50.0 | 406472                        | 12285                  | 36.6                       | 6.36      |
| 914 x 305 x 253                | 253.4                         | 918.4                  | 305.5                  | 17.3      | 27.9         | 19.1           | 824.4                       | 5.47                         | 47.7 | 436305                        | 13301                  | 36.8                       | 6.42      |
| 914 x 305 x 271                | 271.0                         | 923.0                  | 307.0                  | 18.4      | 30.0         | 19.1           | 824.8                       | 5.12                         | 44.8 | 471633                        | 14518                  | 36.9                       | 6.48      |
| 914 x 305 x 289                | 289.1                         | 926.6                  | 307.7                  | 19.5      | 32.0         | 19.1           | 824.4                       | 4.81                         | 42.3 | 504187                        | 15597                  | 37.0                       | 6.51      |
| 914 x 305 x 313                | 313.0                         | 932.0                  | 309.0                  | 21.1      | 34.5         | 19.1           | 824.8                       | 4.48                         | 39.1 | 548297                        | 17039                  | 37.1                       | 6.54      |
| 914 x 305 x 345                | 345.1                         | 943                    | 308                    | 22.1      | 39.9         | 19.1           | 825                         | 3.86                         | 37.3 | 625645                        | 19515                  | 37.7                       | 6.66      |
| 914 x 305 x 381                | 381.5                         | 950.7                  | 310.3                  | 24.4      | 43.9         | 20.0           | 822.9                       | 3.53                         | 33.7 | 697408                        | 21975                  | 37.9                       | 6.72      |
| 914 x 419 x 343                | 343.3                         | 911.8                  | 418.5                  | 19.4      | 32.0         | 24.1           | 799.6                       | 6.54                         | 41.2 | 625780                        | 39156                  | 37.8                       | 9.46      |
| 914 x 419 x 388                | 388.0                         | 921.0                  | 420.5                  | 21.4      | 36.6         | 24.1           | 799.6                       | 5.74                         | 37.4 | 719635                        | 45438                  | 38.2                       | 9.59      |
| 1016 x 305 x 222               | 222.0                         | 970.3                  | 300.0                  | 16.0      | 21.1         | 30.0           | 868.1                       | 7.11                         | 54.3 | 407961                        | 9546                   | 38.0                       | 5.81      |
| 1016 x 305 x 249               | 248.7                         | 980.1                  | 300.0                  | 16.5      | 26.0         | 30.0           | 868.1                       | 5.77                         | 52.6 | 481192                        | 11754                  | 39.0                       | 6.09      |
| 1016 x 305 x 272               | 272.3                         | 990.1                  | 300.0                  | 16.5      | 31.0         | 30.0           | 868.1                       | 4.84                         | 52.6 | 553974                        | 14004                  | 40.0                       | 6.35      |



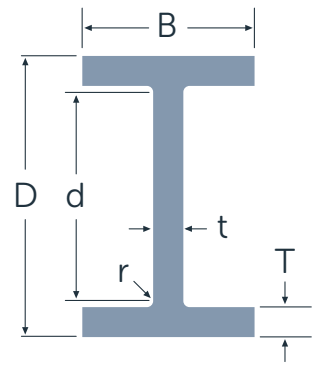


## Universal beams (UB) sizes

| Elastic modulus |                 | Plastic modulus |                 | Buckling<br>parameter | Torsional<br>index | Warping<br>constant  | Torsional<br>constant | Area of<br>section | Designation      |
|-----------------|-----------------|-----------------|-----------------|-----------------------|--------------------|----------------------|-----------------------|--------------------|------------------|
| Axis            | Axis            | Axis            | Axis            |                       |                    |                      |                       |                    |                  |
| x-x             | y-y             | x-x             | y-y             |                       |                    |                      |                       |                    |                  |
| cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> | u                     | x                  | H<br>dm <sup>6</sup> | J<br>cm <sup>4</sup>  | cm <sup>2</sup>    | Serial size      |
| 4829            | 762             | 5418            | 1172            | 0.883                 | 29.2               | 10.9                 | 298                   | 224                | 610 x 324 x 174  |
| 5449            | 871             | 6130            | 1342            | 0.884                 | 26.2               | 12.7                 | 418                   | 251                | 610 x 324 x 195  |
| 6126            | 995             | 6904            | 1533            | 0.887                 | 23.5               | 14.7                 | 586                   | 280                | 610 x 324 x 217  |
| 6835            | 1121            | 7727            | 1728            | 0.889                 | 21.3               | 16.8                 | 802                   | 310                | 610 x 324 x 241  |
| 7412            | 1214            | 8405            | 1874            | 0.890                 | 19.6               | 18.3                 | 1028                  | 335                | 610 x 324 x 262  |
| 8108            | 1342            | 9231            | 2073            | 0.890                 | 18.1               | 20.5                 | 1329                  | 366                | 610 x 324 x 285  |
| 8736            | 1452            | 9985            | 2248            | 0.890                 | 17.0               | 22.5                 | 1646                  | 393                | 610 x 324 x 307  |
| 9678            | 1627            | 11123           | 2525            | 0.890                 | 15.6               | 25.8                 | 2196                  | 436                | 610 x 324 x 341  |
| 10607           | 1802            | 12250           | 2799            | 0.890                 | 14.4               | 29.1                 | 2850                  | 476                | 610 x 324 x 372  |
| 3524            | 347             | 4040            | 544             | 0.863                 | 42.6               | 4.800                | 124.0                 | 161.0              | 686 x 254 x 125  |
| 4030            | 409             | 4604            | 640             | 0.869                 | 37.7               | 5.720                | 179.0                 | 180.0              | 686 x 254 x 140  |
| 4416            | 455             | 5047            | 712             | 0.872                 | 34.7               | 6.430                | 231.0                 | 196.0              | 686 x 254 x 152  |
| 4958            | 519             | 5677            | 813             | 0.873                 | 31.2               | 7.430                | 322.0                 | 218.0              | 686 x 254 x 170  |
| 5682            | 602             | 6505            | 943             | 0.878                 | 27.3               | 8.69                 | 480                   | 245                | 686 x 254 x 192  |
| 4055            | 362             | 4683            | 571             | 0.855                 | 48.7               | 6.460                | 125.0                 | 172.0              | 762 x 267 x 134  |
| 4506            | 412             | 5195            | 648             | 0.859                 | 44.4               | 7.400                | 166.0                 | 188.0              | 762 x 267 x 147  |
| 4941            | 457             | 5700            | 721             | 0.860                 | 40.8               | 8.29                 | 215                   | 205                | 762 x 267 x 161  |
| 5422            | 514             | 6237            | 809             | 0.865                 | 37.5               | 9.400                | 277.0                 | 221.0              | 762 x 267 x 173  |
| 5852            | 563             | 6725            | 885             | 0.868                 | 34.9               | 10.4                 | 343                   | 237                | 762 x 267 x 185  |
| 6270            | 610             | 7206            | 960             | 0.869                 | 32.8               | 11.300               | 417.0                 | 252.0              | 762 x 267 x 197  |
| 5920            | 535             | 6836            | 843             | 0.857                 | 46.0               | 13.000               | 227.0                 | 225.0              | 838 x 292 x 176  |
| 6668            | 620             | 7668            | 974             | 0.863                 | 41.3               | 15.200               | 312.0                 | 248.0              | 838 x 292 x 194  |
| 7369            | 700             | 8456            | 1098            | 0.867                 | 37.6               | 17.3                 | 413                   | 269                | 838 x 292 x 210  |
| 8010            | 773             | 9183            | 1212            | 0.870                 | 34.7               | 19.300               | 522.0                 | 289.0              | 838 x 292 x 226  |
| 9024            | 884             | 10333           | 1384            | 0.876                 | 30.7               | 22.1                 | 746                   | 320                | 838 x 292 x 252  |
| 7204            | 621             | 8352            | 982             | 0.854                 | 46.8               | 18.400               | 291.0                 | 256.0              | 914 x 305 x 201  |
| 8269            | 739             | 9535            | 1163            | 0.861                 | 41.3               | 22.100               | 422.0                 | 286.0              | 914 x 305 x 224  |
| 8885            | 806             | 10231           | 1267            | 0.864                 | 38.6               | 24.3                 | 515                   | 304                | 914 x 305 x 239  |
| 9501            | 871             | 10942           | 1370            | 0.866                 | 36.2               | 26.400               | 626.0                 | 323.0              | 914 x 305 x 253  |
| 10220           | 946             | 11785           | 1491            | 0.866                 | 33.9               | 28.9                 | 770                   | 346                | 914 x 305 x 271  |
| 10883           | 1014            | 12570           | 1601            | 0.867                 | 31.9               | 31.200               | 926.0                 | 368.0              | 914 x 305 x 289  |
| 11766           | 1103            | 13631           | 1747            | 0.866                 | 29.8               | 34.3                 | 1162                  | 398                | 914 x 305 x 313  |
| 13269           | 1267            | 15349           | 2002            | 0.872                 | 26.4               | 39.8                 | 1649                  | 440                | 914 x 305 x 345  |
| 14671           | 1416            | 17042           | 2247            | 0.872                 | 24.1               | 45.2                 | 2208                  | 486                | 914 x 305 x 381  |
| 13726           | 1871            | 15478           | 2889            | 0.883                 | 30.1               | 75.8                 | 1193                  | 437                | 914 x 419 x 343  |
| 15627           | 2161            | 17666           | 3340            | 0.885                 | 26.7               | 88.9                 | 1734                  | 494                | 914 x 419 x 388  |
| 8409            | 636             | 9808            | 1019            | 0.850                 | 45.7               | 21.5                 | 390                   | 283                | 1016 x 305 x 222 |
| 9819            | 784             | 11350           | 1244            | 0.861                 | 39.8               | 26.8                 | 582                   | 317                | 1016 x 305 x 249 |
| 11190           | 934             | 12827           | 1469            | 0.873                 | 35.0               | 32.2                 | 835                   | 347                | 1016 x 305 x 272 |

Dimensions and properties to BS EN 10365:2017

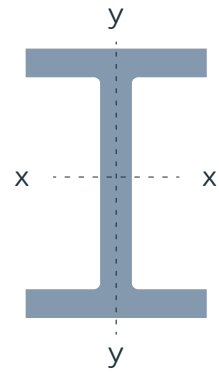




## Universal beams (UB) sizes

| Designation      | Mass per<br>metre | Depth<br>of<br>section | Width<br>of<br>section | Thickness |              | Root<br>radius | Depth<br>between<br>fillets | Ratios for local<br>buckling |      | Second moment<br>of area<br>I |                 | Radius of<br>gyration<br>i |      |
|------------------|-------------------|------------------------|------------------------|-----------|--------------|----------------|-----------------------------|------------------------------|------|-------------------------------|-----------------|----------------------------|------|
|                  |                   |                        |                        | of<br>web | of<br>flange |                |                             | Flange                       | Web  | Axis                          | Axis            | Axis                       | Axis |
|                  |                   |                        |                        | D         | B            |                |                             | t                            | T    | r                             | d               | B/2T                       | d/t  |
| Serial size      | kg/m              | mm                     | mm                     | mm        | mm           | mm             | mm                          |                              |      | cm <sup>4</sup>               | cm <sup>4</sup> | cm                         | cm   |
| 1016 x 305 x 314 | 314.3             | 999.9                  | 300.0                  | 19.1      | 35.9         | 30.0           | 868.1                       | 4.18                         | 45.5 | 644063                        | 16232           | 40.1                       | 6.37 |
| 1016 x 305 x 350 | 349.4             | 1008.0                 | 302.0                  | 21.1      | 40.0         | 30.0           | 868.0                       | 3.78                         | 41.1 | 722965                        | 18460           | 40.30                      | 6.44 |
| 1016 x 305 x 393 | 392.7             | 1015.9                 | 303.0                  | 24.4      | 43.9         | 30.0           | 868.1                       | 3.45                         | 35.6 | 807503                        | 20496           | 40.2                       | 6.40 |
| 1016 x 305 x 415 | 415.0             | 1020.0                 | 304.0                  | 26.0      | 46.0         | 30.0           | 868.0                       | 3.30                         | 33.4 | 853121                        | 21707           | 40.2                       | 6.41 |
| 1016 x 305 x 437 | 437.0             | 1026.1                 | 305.4                  | 26.9      | 49.0         | 30.0           | 868.1                       | 3.12                         | 32.3 | 910322                        | 23447           | 40.4                       | 6.49 |
| 1016 x 305 x 487 | 486.7             | 1036.3                 | 308.5                  | 30.0      | 54.1         | 30.0           | 868.1                       | 2.85                         | 28.9 | 1021884                       | 26721           | 40.6                       | 6.57 |
| 1016 x 305 x 494 | 493.9             | 1036.0                 | 309.0                  | 31.0      | 54.0         | 30.0           | 868.0                       | 2.86                         | 28.0 | 1027960                       | 26824           | 40.4                       | 6.53 |
| 1016 x 305 x 584 | 583.8             | 1056.0                 | 314.0                  | 36.0      | 64.0         | 30.0           | 868.0                       | 2.45                         | 24.1 | 1246072                       | 33433           | 40.9                       | 6.70 |





## Universal beams (UB) sizes

| Elastic modulus |                 | Plastic modulus |                 | Buckling<br>parameter | Torsional<br>index | Warping<br>constant | Torsional<br>constant | Area of<br>section | Designation      |
|-----------------|-----------------|-----------------|-----------------|-----------------------|--------------------|---------------------|-----------------------|--------------------|------------------|
| Axis            | Axis            | Axis            | Axis            |                       |                    |                     |                       |                    |                  |
| x-x             | y-y             | x-x             | y-y             |                       |                    |                     |                       |                    |                  |
| cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> | u                     | x                  | dm <sup>6</sup>     | cm <sup>4</sup>       | cm <sup>2</sup>    | Serial size      |
| 12883           | 1082            | 14850           | 1712            | 0.872                 | 30.7               | 37.7                | 1264                  | 400                | 1016 x 305 x 314 |
| 14345           | 1223            | 16591           | 1940            | 0.872                 | 27.9               | 43.2                | 1718                  | 445                | 1016 x 305 x 350 |
| 15897           | 1353            | 18538           | 2167            | 0.868                 | 25.5               | 48.4                | 2330                  | 500                | 1016 x 305 x 393 |
| 16728           | 1428            | 19573           | 2296            | 0.866                 | 24.4               | 51.5                | 2704                  | 529                | 1016 x 305 x 415 |
| 17743           | 1535            | 20769           | 2467            | 0.868                 | 23.1               | 56.0                | 3185                  | 557                | 1016 x 305 x 437 |
| 19722           | 1732            | 23208           | 2799            | 0.867                 | 21.1               | 64.4                | 4299                  | 620                | 1016 x 305 x 487 |
| 19845           | 1736            | 23414           | 2817            | 0.865                 | 21.0               | 64.7                | 4396                  | 629                | 1016 x 305 x 494 |
| 23600           | 2130            | 28040           | 3474            | 0.866                 | 18.1               | 82.3                | 7154                  | 744                | 1016 x 305 x 584 |

Dimensions and properties to BS EN 10365:2017

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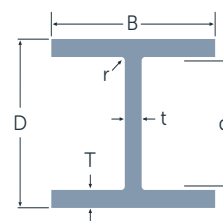
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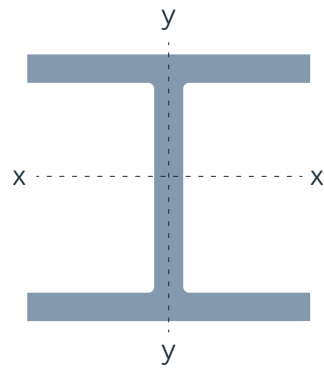


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## Universal columns (UC) sizes

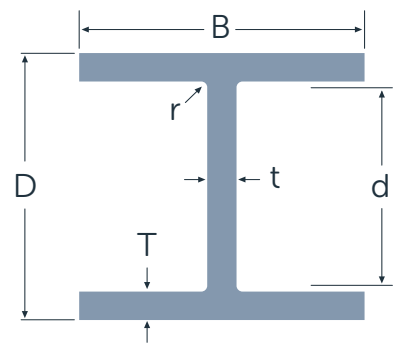
| Designation     | Mass per<br>metre | Depth<br>of<br>section | Width<br>of<br>section | Thickness |              | Root<br>radius | Depth<br>between<br>fillets | Ratios for local<br>buckling |       | Second moment<br>of area<br>I |                        | Radius of<br>gyration<br>i |           |
|-----------------|-------------------|------------------------|------------------------|-----------|--------------|----------------|-----------------------------|------------------------------|-------|-------------------------------|------------------------|----------------------------|-----------|
|                 |                   |                        |                        | of<br>web | of<br>flange |                |                             | Flange                       | Web   | Axis                          | Axis                   | Axis                       | Axis      |
|                 |                   |                        |                        |           |              |                |                             |                              |       |                               |                        |                            |           |
| Serial size     | kg/m              | D<br>mm                | B<br>mm                | t<br>mm   | T<br>mm      | r<br>mm        | d<br>mm                     | B/2T                         | d/t   | x-x<br>cm <sup>4</sup>        | y-y<br>cm <sup>4</sup> | x-x<br>cm                  | y-y<br>cm |
| 152 x 152 x 23  | 23.0              | 152.4                  | 152.2                  | 5.8       | 6.8          | 7.6            | 123.6                       | 11.20                        | 21.30 | 1250                          | 400                    | 6.54                       | 3.70      |
| 152 x 152 x 30  | 30.0              | 157.6                  | 152.9                  | 6.5       | 9.4          | 7.6            | 123.6                       | 8.13                         | 19.00 | 1748                          | 560                    | 6.76                       | 3.83      |
| 152 x 152 x 37  | 37.0              | 161.8                  | 154.4                  | 8.0       | 11.5         | 7.6            | 123.6                       | 6.71                         | 15.50 | 2210                          | 706                    | 6.85                       | 3.87      |
| 152 x 152 x 44  | 44.0              | 166.0                  | 155.9                  | 9.5       | 13.6         | 7.6            | 123.6                       | 5.73                         | 13.00 | 2703                          | 860                    | 6.94                       | 3.92      |
| 152 x 152 x 51  | 51.2              | 170.2                  | 157.4                  | 11.0      | 15.7         | 7.6            | 123.6                       | 5.01                         | 11.20 | 3227                          | 1022                   | 7.04                       | 3.96      |
| 203 x 203 x 46  | 46.1              | 203.2                  | 203.6                  | 7.2       | 11.0         | 12.7           | 155.8                       | 9.25                         | 21.60 | 4605                          | 1549                   | 8.82                       | 5.11      |
| 203 x 203 x 52  | 52.0              | 206.2                  | 204.3                  | 7.9       | 12.5         | 12.7           | 155.8                       | 8.17                         | 19.70 | 5296                          | 1778                   | 8.91                       | 5.16      |
| 203 x 203 x 60  | 60.0              | 209.6                  | 205.8                  | 9.4       | 14.2         | 12.7           | 155.8                       | 7.25                         | 16.60 | 6162                          | 2065                   | 8.95                       | 5.18      |
| 203 x 203 x 71  | 71.0              | 215.8                  | 206.4                  | 10.0      | 17.3         | 12.7           | 155.8                       | 5.97                         | 15.60 | 7655                          | 2538                   | 9.18                       | 5.28      |
| 203 x 203 x 86  | 86.1              | 222.2                  | 209.1                  | 12.7      | 20.5         | 12.7           | 155.8                       | 5.10                         | 12.30 | 9486                          | 3128                   | 9.28                       | 5.33      |
| 203 x 203 x 100 | 99.6              | 228.6                  | 210.3                  | 14.5      | 23.7         | 12.7           | 155.8                       | 4.44                         | 10.70 | 11335                         | 3680                   | 9.43                       | 5.38      |
| 203 x 203 x 113 | 113.5             | 235.0                  | 212.1                  | 16.3      | 26.9         | 12.7           | 155.8                       | 3.94                         | 9.56  | 13338                         | 4286                   | 9.59                       | 5.44      |
| 203 x 203 x 127 | 127.5             | 241.4                  | 213.9                  | 18.1      | 30.1         | 12.7           | 155.8                       | 3.55                         | 8.61  | 15474                         | 4921                   | 9.74                       | 5.50      |
| 254 x 254 x 73  | 73.1              | 254.1                  | 254.6                  | 8.6       | 14.2         | 20.0           | 185.7                       | 8.96                         | 21.60 | 11643                         | 3910                   | 11.10                      | 6.41      |
| 254 x 254 x 81  | 81.0              | 256.0                  | 255.0                  | 9.4       | 15.6         | 20.0           | 184.8                       | 8.17                         | 19.7  | 12801                         | 4316                   | 11.1                       | 6.44      |
| 254 x 254 x 89  | 88.9              | 260.3                  | 256.3                  | 10.3      | 17.3         | 20.0           | 185.7                       | 7.41                         | 18.00 | 14504                         | 4860                   | 11.20                      | 6.49      |
| 254 x 254 x 101 | 101.0             | 264.0                  | 257.0                  | 11.9      | 19.6         | 20.0           | 184.8                       | 6.56                         | 15.5  | 16603                         | 5552                   | 11.3                       | 6.51      |
| 254 x 254 x 107 | 107.1             | 266.7                  | 258.8                  | 12.8      | 20.5         | 20.0           | 185.7                       | 6.31                         | 14.50 | 17747                         | 5931                   | 11.30                      | 6.55      |
| 254 x 254 x 115 | 115.0             | 269.0                  | 259.0                  | 13.5      | 22.1         | 20.0           | 184.8                       | 5.86                         | 13.7  | 19171                         | 6409                   | 11.4                       | 6.57      |
| 254 x 254 x 132 | 132.0             | 276.3                  | 261.3                  | 15.3      | 25.3         | 20.0           | 185.7                       | 5.16                         | 12.10 | 22765                         | 7535                   | 11.60                      | 6.65      |
| 254 x 254 x 149 | 149.0             | 282.0                  | 263.0                  | 17.3      | 28.4         | 20.0           | 185.2                       | 4.63                         | 10.7  | 26167                         | 8627                   | 11.7                       | 6.71      |
| 254 x 254 x 167 | 167.1             | 289.1                  | 265.2                  | 19.2      | 31.7         | 20.0           | 185.7                       | 4.18                         | 9.67  | 30234                         | 9875                   | 11.90                      | 6.78      |
| 305 x 305 x 97  | 96.9              | 307.9                  | 305.3                  | 9.9       | 15.4         | 20.0           | 237.1                       | 9.91                         | 23.90 | 22504                         | 7310                   | 13.40                      | 7.65      |
| 305 x 305 x 107 | 107.0             | 311.0                  | 306.0                  | 10.9      | 17.0         | 20.0           | 237.0                       | 9.00                         | 21.7  | 25055                         | 8125                   | 13.5                       | 7.68      |
| 305 x 305 x 118 | 117.9             | 314.5                  | 307.4                  | 12.0      | 18.7         | 20.0           | 237.1                       | 8.22                         | 19.80 | 27927                         | 9061                   | 13.60                      | 7.73      |
| 305 x 305 x 129 | 129.0             | 318.0                  | 308.0                  | 13.1      | 20.6         | 20.0           | 236.8                       | 7.48                         | 18.1  | 31035                         | 10041                  | 13.6                       | 7.76      |
| 305 x 305 x 137 | 136.9             | 320.5                  | 309.2                  | 13.8      | 21.7         | 20.0           | 237.1                       | 7.12                         | 17.20 | 33070                         | 10702                  | 13.70                      | 7.80      |
| 305 x 305 x 143 | 143.0             | 323.0                  | 309.0                  | 14.0      | 22.9         | 20.0           | 237.2                       | 6.75                         | 16.9  | 35029                         | 11272                  | 13.8                       | 7.83      |
| 305 x 305 x 158 | 158.1             | 327.1                  | 311.2                  | 15.8      | 25.0         | 20.0           | 237.1                       | 6.22                         | 15.00 | 39002                         | 12572                  | 13.90                      | 7.87      |
| 305 x 305 x 179 | 179.0             | 333.0                  | 313.0                  | 18.0      | 28.1         | 20.0           | 236.8                       | 5.57                         | 13.2  | 44796                         | 14381                  | 14.0                       | 7.92      |
| 305 x 305 x 198 | 198.1             | 339.9                  | 314.5                  | 19.1      | 31.4         | 20.0           | 237.1                       | 5.01                         | 12.40 | 51159                         | 16303                  | 14.20                      | 8.01      |
| 305 x 305 x 202 | 202.0             | 341.0                  | 315.0                  | 20.1      | 31.8         | 20.0           | 237.4                       | 4.95                         | 11.8  | 52247                         | 16592                  | 14.2                       | 8.00      |
| 305 x 305 x 226 | 226.0             | 348.0                  | 317.0                  | 22.1      | 35.6         | 20.0           | 236.8                       | 4.45                         | 10.7  | 59829                         | 18934                  | 14.4                       | 8.08      |
| 305 x 305 x 240 | 240.0             | 352.5                  | 318.4                  | 23.0      | 37.7         | 20.0           | 237.1                       | 4.22                         | 10.30 | 64458                         | 20319                  | 14.50                      | 8.13      |
| 305 x 305 x 253 | 253.0             | 356.0                  | 319.0                  | 24.4      | 39.6         | 20.0           | 236.8                       | 4.03                         | 9.70  | 68490                         | 21468                  | 14.5                       | 8.14      |
| 305 x 305 x 283 | 282.9             | 365.3                  | 322.2                  | 26.8      | 44.1         | 20.0           | 237.1                       | 3.65                         | 8.85  | 79127                         | 24641                  | 14.80                      | 8.25      |
| 356 x 368 x 129 | 129.0             | 355.6                  | 368.6                  | 10.4      | 17.5         | 20.0           | 280.6                       | 10.50                        | 27.00 | 40591                         | 14613                  | 15.60                      | 9.39      |
| 356 x 368 x 134 | 134.0             | 356.0                  | 369.0                  | 11.2      | 18.0         | 20.0           | 280.0                       | 10.3                         | 25.0  | 41866                         | 15081                  | 15.6                       | 9.36      |
| 356 x 368 x 147 | 147.0             | 360.0                  | 370.0                  | 12.3      | 19.8         | 20.0           | 280.4                       | 9.34                         | 22.8  | 46647                         | 16725                  | 15.7                       | 9.40      |
| 356 x 368 x 153 | 152.9             | 362.0                  | 370.5                  | 12.3      | 20.7         | 20.0           | 280.6                       | 8.95                         | 22.80 | 48935                         | 17556                  | 15.80                      | 9.46      |
| 356 x 368 x 162 | 162.0             | 364.0                  | 371.0                  | 13.3      | 21.8         | 20.0           | 280.4                       | 8.51                         | 21.1  | 51897                         | 18565                  | 15.8                       | 9.45      |
| 356 x 368 x 177 | 177.0             | 368.2                  | 372.6                  | 14.4      | 23.8         | 20.0           | 280.6                       | 7.83                         | 19.50 | 57464                         | 20532                  | 15.90                      | 9.51      |



## Universal columns (UC) sizes

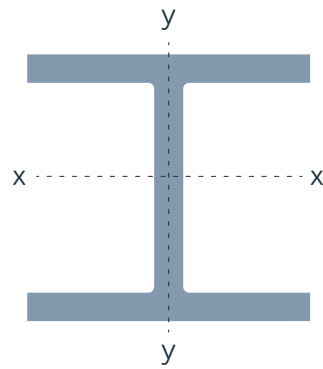
| Elastic modulus |                 | Plastic modulus |                 | Buckling<br>parameter | Torsional<br>index | Warping<br>constant  | Torsional<br>constant | Area of<br>section | Designation     |
|-----------------|-----------------|-----------------|-----------------|-----------------------|--------------------|----------------------|-----------------------|--------------------|-----------------|
| Axis            | Axis            | Axis            | Axis            |                       |                    |                      |                       |                    |                 |
| x-x             | y-y             | x-x             | y-y             |                       |                    |                      |                       |                    |                 |
| cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> | u                     | x                  | H<br>dm <sup>6</sup> | J<br>cm <sup>4</sup>  | cm <sup>2</sup>    | Serial size     |
| 164             | 53              | 182             | 80              | 0.840                 | 20.70              | 0.0212               | 4.63                  | 29.2               | 152 x 152 x 23  |
| 222             | 73              | 248             | 112             | 0.849                 | 16.00              | 0.0308               | 10.50                 | 38.3               | 152 x 152 x 30  |
| 273             | 91              | 309             | 140             | 0.848                 | 13.30              | 0.0399               | 19.20                 | 47.1               | 152 x 152 x 37  |
| 326             | 110             | 372             | 169             | 0.848                 | 11.50              | 0.0499               | 31.70                 | 56.1               | 152 x 152 x 44  |
| 379             | 130             | 438             | 199             | 0.848                 | 10.10              | 0.0610               | 48.80                 | 65.2               | 152 x 152 x 51  |
| 453             | 152             | 502             | 231             | 0.848                 | 17.30              | 0.1430               | 23.30                 | 59.2               | 203 x 203 x 46  |
| 514             | 174             | 572             | 265             | 0.849                 | 15.50              | 0.1670               | 33.20                 | 66.8               | 203 x 203 x 52  |
| 588             | 201             | 660             | 306             | 0.847                 | 13.80              | 0.1970               | 49.10                 | 76.9               | 203 x 203 x 60  |
| 709             | 246             | 803             | 374             | 0.853                 | 11.80              | 0.2500               | 82.70                 | 90.9               | 203 x 203 x 71  |
| 854             | 299             | 981             | 457             | 0.850                 | 10.10              | 0.3180               | 140.00                | 110.0              | 203 x 203 x 86  |
| 992             | 350             | 1153            | 535             | 0.852                 | 8.94               | 0.3860               | 214.00                | 127.0              | 203 x 203 x 100 |
| 1135            | 404             | 1333            | 619             | 0.853                 | 8.04               | 0.4640               | 311.00                | 145.0              | 203 x 203 x 113 |
| 1282            | 460             | 1521            | 705             | 0.854                 | 7.32               | 0.5490               | 435.00                | 163.0              | 203 x 203 x 127 |
| 916             | 307             | 1014            | 467             | 0.851                 | 16.30              | 0.5630               | 66.10                 | 95.2               | 254 x 254 x 73  |
| 1000            | 339             | 1112            | 515             | 0.851                 | 15.0               | 0.624                | 85.4                  | 104                | 254 x 254 x 81  |
| 1114            | 379             | 1246            | 577             | 0.851                 | 13.90              | 0.7170               | 114.00                | 115.0              | 254 x 254 x 89  |
| 1258            | 432             | 1419            | 658             | 0.851                 | 12.4               | 0.829                | 163                   | 131                | 254 x 254 x 101 |
| 1331            | 458             | 1507            | 699             | 0.849                 | 12.00              | 0.8990               | 188.00                | 138.0              | 254 x 254 x 107 |
| 1425            | 495             | 1621            | 755             | 0.850                 | 11.2               | 0.977                | 231                   | 148                | 254 x 254 x 115 |
| 1648            | 577             | 1892            | 881             | 0.851                 | 10.00              | 1.1900               | 341.00                | 170.0              | 254 x 254 x 132 |
| 1856            | 656             | 2151            | 1003            | 0.851                 | 9.08               | 1.39                 | 479                   | 192                | 254 x 254 x 149 |
| 2092            | 745             | 2446            | 1140            | 0.852                 | 8.30               | 1.6400               | 661.00                | 215.0              | 254 x 254 x 167 |
| 1462            | 479             | 1612            | 727             | 0.851                 | 18.70              | 1.5600               | 98.40                 | 125.0              | 305 x 305 x 97  |
| 1611            | 531             | 1785            | 807             | 0.851                 | 17.1               | 1.76                 | 130                   | 138                | 305 x 305 x 107 |
| 1776            | 590             | 1977            | 897             | 0.851                 | 15.80              | 1.9800               | 171.00                | 152.0              | 305 x 305 x 118 |
| 1952            | 652             | 2184            | 992             | 0.852                 | 14.5               | 2.22                 | 224                   | 167                | 305 x 305 x 129 |
| 2064            | 692             | 2316            | 1054            | 0.851                 | 13.90              | 2.3900               | 261.00                | 176.0              | 305 x 305 x 137 |
| 2169            | 730             | 2439            | 1110            | 0.853                 | 13.3               | 2.54                 | 300                   | 184                | 305 x 305 x 143 |
| 2385            | 808             | 2700            | 1232            | 0.852                 | 12.30              | 2.8700               | 394.00                | 203.0              | 305 x 305 x 158 |
| 2690            | 919             | 3073            | 1403            | 0.851                 | 11.1               | 3.34                 | 558                   | 229                | 305 x 305 x 179 |
| 3010            | 1037            | 3460            | 1583            | 0.854                 | 10.10              | 3.8800               | 758.00                | 254.0              | 305 x 305 x 198 |
| 3064            | 1053            | 3530            | 1610            | 0.853                 | 9.97               | 3.97                 | 800                   | 260                | 305 x 305 x 202 |
| 3438            | 1195            | 3995            | 1827            | 0.853                 | 9.05               | 4.62                 | 1109                  | 290                | 305 x 305 x 226 |
| 3657            | 1276            | 4267            | 1953            | 0.854                 | 8.64               | 5.0300               | 1307.00               | 307.0              | 305 x 305 x 240 |
| 3848            | 1346            | 4511            | 2061            | 0.854                 | 8.27               | 5.37                 | 1517                  | 324                | 305 x 305 x 253 |
| 4332            | 1530            | 5125            | 2345            | 0.855                 | 7.58               | 6.3600               | 2084.00               | 362.0              | 305 x 305 x 283 |
| 2283            | 793             | 2502            | 1200            | 0.845                 | 19.40              | 4.1800               | 161.00                | 166.0              | 356 x 368 x 129 |
| 2352            | 817             | 2585            | 1239            | 0.843                 | 18.8               | 4.31                 | 177                   | 172                | 356 x 368 x 134 |
| 2591            | 904             | 2862            | 1371            | 0.844                 | 17.3               | 4.84                 | 233                   | 189                | 356 x 368 x 147 |
| 2704            | 948             | 2987            | 1436            | 0.845                 | 16.70              | 5.1100               | 261.00                | 196.0              | 356 x 368 x 153 |
| 2851            | 1001            | 3163            | 1518            | 0.844                 | 15.9               | 5.43                 | 307                   | 208                | 356 x 368 x 162 |
| 3121            | 1102            | 3478            | 1672            | 0.845                 | 14.80              | 6.0900               | 396.00                | 227.0              | 356 x 368 x 177 |

Dimensions and properties to BS EN 10365:2017



## Universal columns (UC) sizes

| Designation<br><br>Serial size | Mass per<br>metre<br><br>kg/m | Depth<br>of<br>section<br><br>D<br>mm | Width<br>of<br>section<br><br>B<br>mm | Thickness                |                             | Root<br>radius<br><br>r<br>mm | Depth<br>between<br>fillets<br><br>d<br>mm | Ratios for local<br>buckling |                | Second moment<br>of area<br>I      |                                    | Radius of<br>gyration<br>i |                       |
|--------------------------------|-------------------------------|---------------------------------------|---------------------------------------|--------------------------|-----------------------------|-------------------------------|--------------------------------------------|------------------------------|----------------|------------------------------------|------------------------------------|----------------------------|-----------------------|
|                                |                               |                                       |                                       | of<br>web<br><br>t<br>mm | of<br>flange<br><br>T<br>mm |                               |                                            | Flange<br><br>B/2T           | Web<br><br>d/t | Axis<br><br>x-x<br>cm <sup>4</sup> | Axis<br><br>y-y<br>cm <sup>4</sup> | Axis<br><br>x-x<br>cm      | Axis<br><br>y-y<br>cm |
|                                |                               |                                       |                                       |                          |                             |                               |                                            |                              |                |                                    |                                    |                            |                       |
|                                |                               |                                       |                                       |                          |                             |                               |                                            |                              |                |                                    |                                    |                            |                       |
| 356 x 368 x 179                | 179.0                         | 368.0                                 | 374.0                                 | 15.0                     | 23.9                        | 20.0                          | 280.2                                      | 7.82                         | 18.7           | 57940                              | 20853                              | 15.9                       | 9.52                  |
| 356 x 368 x 196                | 196.0                         | 372.0                                 | 374.0                                 | 16.4                     | 26.2                        | 20.0                          | 279.6                                      | 7.14                         | 17.0           | 63988                              | 22861                              | 15.9                       | 9.53                  |
| 356 x 368 x 202                | 201.9                         | 374.6                                 | 374.7                                 | 16.5                     | 27.0                        | 20.0                          | 280.6                                      | 6.94                         | 17.00          | 66607                              | 23692                              | 16.00                      | 9.57                  |
| 356 x 406 x 216                | 216.0                         | 375.0                                 | 394.0                                 | 17.3                     | 27.7                        | 20.0                          | 279.6                                      | 7.11                         | 16.2           | 71495                              | 28257                              | 16.1                       | 10.1                  |
| 356 x 406 x 235                | 235.1                         | 381.0                                 | 394.8                                 | 18.4                     | 30.2                        | 20.0                          | 280.6                                      | 6.54                         | 15.30          | 79431                              | 30997                              | 16.20                      | 10.10                 |
| 356 x 406 x 237                | 237.0                         | 380.0                                 | 395.0                                 | 18.9                     | 30.2                        | 20.0                          | 279.6                                      | 6.54                         | 14.80          | 79134                              | 31045                              | 16.2                       | 10.10                 |
| 356 x 406 x 262                | 262.0                         | 387.0                                 | 398.0                                 | 21.1                     | 33.3                        | 20.0                          | 280.4                                      | 5.98                         | 13.3           | 89764                              | 35023                              | 16.3                       | 10.2                  |
| 356 x 406 x 287                | 287.1                         | 393.6                                 | 399.0                                 | 22.6                     | 36.5                        | 20.0                          | 280.6                                      | 5.47                         | 12.40          | 100221                             | 38682                              | 16.50                      | 10.30                 |
| 356 x 406 x 314                | 314.0                         | 399.0                                 | 401.0                                 | 24.9                     | 39.6                        | 20.0                          | 279.8                                      | 5.06                         | 11.2           | 110589                             | 42609                              | 16.6                       | 10.3                  |
| 356 x 406 x 340                | 339.9                         | 406.4                                 | 403.0                                 | 26.6                     | 42.9                        | 20.0                          | 280.6                                      | 4.70                         | 10.50          | 122889                             | 46859                              | 16.80                      | 10.40                 |
| 356 x 406 x 347                | 347.0                         | 407.0                                 | 404.0                                 | 27.2                     | 43.7                        | 20.0                          | 279.6                                      | 4.62                         | 10.3           | 125301                             | 48091                              | 16.8                       | 10.4                  |
| 356 x 406 x 382                | 382.0                         | 416.0                                 | 406.0                                 | 29.8                     | 48.0                        | 20.0                          | 280.0                                      | 4.23                         | 9.40           | 141674                             | 53623                              | 17.0                       | 10.5                  |
| 356 x 406 x 393                | 393.0                         | 419.0                                 | 407.0                                 | 30.6                     | 49.2                        | 20.0                          | 280.6                                      | 4.14                         | 9.17           | 146964                             | 55374                              | 17.10                      | 10.50                 |
| 356 x 406 x 421                | 421.0                         | 425.0                                 | 409.0                                 | 32.8                     | 52.6                        | 20.0                          | 279.8                                      | 3.89                         | 8.53           | 159938                             | 60089                              | 17.2                       | 10.6                  |
| 356 x 406 x 463                | 463.0                         | 435.0                                 | 412.0                                 | 35.8                     | 57.4                        | 20.0                          | 280.2                                      | 3.59                         | 7.83           | 180519                             | 67044                              | 17.5                       | 10.70                 |
| 356 x 406 x 467                | 467.0                         | 436.6                                 | 412.2                                 | 35.8                     | 58.0                        | 20.0                          | 280.6                                      | 3.55                         | 7.84           | 183349                             | 67842                              | 17.50                      | 10.70                 |
| 356 x 406 x 509                | 509.0                         | 446.0                                 | 416.0                                 | 39.1                     | 62.7                        | 20.0                          | 280.6                                      | 3.32                         | 7.18           | 204886                             | 75411                              | 17.7                       | 10.8                  |
| 356 x 406 x 551                | 551.0                         | 455.6                                 | 418.5                                 | 42.1                     | 67.5                        | 20.0                          | 280.6                                      | 3.10                         | 6.67           | 227284                             | 82681                              | 18.00                      | 10.80                 |
| 356 x 406 x 592                | 592.0                         | 465.0                                 | 421.0                                 | 45.0                     | 72.3                        | 20.0                          | 280.4                                      | 2.91                         | 6.23           | 250519                             | 90184                              | 18.2                       | 10.9                  |
| 356 x 406 x 634                | 633.9                         | 474.6                                 | 424.0                                 | 47.6                     | 77.0                        | 20.0                          | 280.6                                      | 2.75                         | 5.89           | 275191                             | 98138                              | 18.40                      | 11.00                 |



## Universal columns (UC) sizes

| Elastic modulus |                 | Plastic modulus |                 | Buckling<br>parameter | Torsional<br>index | Warping<br>constant  | Torsional<br>constant | Area of<br>section | Designation     |
|-----------------|-----------------|-----------------|-----------------|-----------------------|--------------------|----------------------|-----------------------|--------------------|-----------------|
| Axis            | Axis            | Axis            | Axis            |                       |                    |                      |                       |                    |                 |
| x-x             | y-y             | x-x             | y-y             |                       |                    |                      |                       |                    |                 |
| cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> | u                     | x                  | H<br>dm <sup>6</sup> | J<br>cm <sup>4</sup>  | cm <sup>2</sup>    | Serial size     |
| 3149            | 1115            | 3514            | 1693            | 0.842                 | 14.6               | 6.17                 | 407                   | 230                | 356 x 368 x 179 |
| 3440            | 1223            | 3861            | 1858            | 0.843                 | 13.5               | 6.83                 | 531                   | 252                | 356 x 368 x 196 |
| 3556            | 1265            | 3994            | 1921            | 0.845                 | 13.20              | 7.1600               | 576.00                | 259.0              | 356 x 368 x 202 |
| 3813            | 1434            | 4286            | 2178            | 0.832                 | 12.8               | 8.52                 | 652                   | 277                | 356 x 406 x 216 |
| 4170            | 1570            | 4709            | 2385            | 0.835                 | 11.90              | 9.5400               | 834.00                | 301.0              | 356 x 406 x 235 |
| 4165            | 1572            | 4709            | 2389            | 0.833                 | 11.90              | 9.50                 | 842                   | 302                | 356 x 406 x 237 |
| 4639            | 1760            | 5283            | 2678            | 0.833                 | 10.9               | 11.0                 | 1134                  | 336                | 356 x 406 x 262 |
| 5093            | 1939            | 5835            | 2951            | 0.835                 | 10.10              | 12.3000              | 1474.00               | 367.0              | 356 x 406 x 287 |
| 5543            | 2125            | 6397            | 3239            | 0.835                 | 9.36               | 13.8                 | 1891                  | 401                | 356 x 406 x 314 |
| 6048            | 2326            | 7022            | 3546            | 0.836                 | 8.77               | 15.5000              | 2391.00               | 434.0              | 356 x 406 x 340 |
| 6157            | 2381            | 7162            | 3631            | 0.835                 | 8.60               | 15.9                 | 2532                  | 443                | 356 x 406 x 347 |
| 6811            | 2642            | 7988            | 4033            | 0.837                 | 7.96               | 18.2                 | 3348                  | 489                | 356 x 406 x 382 |
| 7015            | 2721            | 8245            | 4156            | 0.837                 | 7.80               | 18.9000              | 3611.00               | 502.0              | 356 x 406 x 393 |
| 7526            | 2938            | 8904            | 4492            | 0.838                 | 7.36               | 20.8                 | 4417                  | 539                | 356 x 406 x 421 |
| 8300            | 3255            | 9901            | 4982            | 0.839                 | 6.85               | 23.9                 | 5747                  | 591                | 356 x 406 x 463 |
| 8399            | 3292            | 10025           | 5037            | 0.840                 | 6.81               | 24.3000              | 5905.00               | 596.0              | 356 x 406 x 467 |
| 9188            | 3626            | 11056           | 5556            | 0.840                 | 6.38               | 27.7                 | 7514                  | 650                | 356 x 406 x 509 |
| 9977            | 3951            | 12099           | 6062            | 0.841                 | 6.01               | 31.1000              | 9381.00               | 703.0              | 356 x 406 x 551 |
| 10775           | 4284            | 13162           | 6578            | 0.842                 | 5.69               | 34.8                 | 11530                 | 756                | 356 x 406 x 592 |
| 11597           | 4629            | 14258           | 7112            | 0.843                 | 5.43               | 38.8000              | 13920.00              | 809.0              | 356 x 406 x 634 |

Dimensions and properties to BS EN 10365:2017

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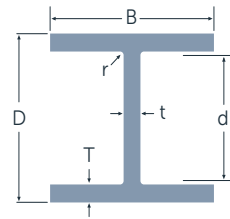
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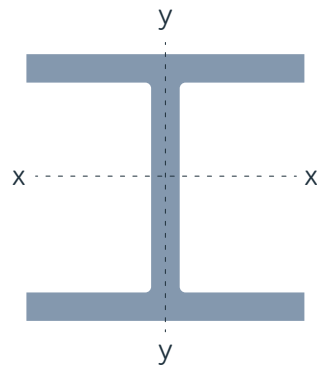


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## Universal bearing piles (UBP) sizes

| Designation<br><br>Serial size | Mass per<br>metre<br><br>kg/m | Depth<br>of<br>section<br><br>D<br>mm | Width<br>of<br>section<br><br>B<br>mm | Thickness                |                             | Root<br>radius<br><br>r<br>mm | Depth<br>between<br>fillets<br><br>d<br>mm | Ratios for local<br>buckling |                | Second moment<br>of area<br>I      |                                    | Radius of<br>gyration<br>i |                       |
|--------------------------------|-------------------------------|---------------------------------------|---------------------------------------|--------------------------|-----------------------------|-------------------------------|--------------------------------------------|------------------------------|----------------|------------------------------------|------------------------------------|----------------------------|-----------------------|
|                                |                               |                                       |                                       | of<br>web<br><br>t<br>mm | of<br>flange<br><br>T<br>mm |                               |                                            | Flange<br><br>B/2T           | Web<br><br>d/t | Axis<br><br>x-x<br>cm <sup>4</sup> | Axis<br><br>y-y<br>cm <sup>4</sup> | Axis<br><br>x-x<br>cm      | Axis<br><br>y-y<br>cm |
|                                |                               |                                       |                                       |                          |                             |                               |                                            |                              |                |                                    |                                    |                            |                       |
|                                |                               |                                       |                                       |                          |                             |                               |                                            |                              |                |                                    |                                    |                            |                       |
| 203 x 203 x 45                 | 44.9                          | 200.2                                 | 205.9                                 | 9.5                      | 9.5                         | 10.2                          | 160.8                                      | 10.80                        | 16.9           | 4100                               | 1384                               | 8.46                       | 4.92                  |
| 203 x 203 x 54                 | 53.9                          | 204.0                                 | 207.7                                 | 11.3                     | 11.4                        | 10.2                          | 160.8                                      | 9.11                         | 14.2           | 5027                               | 1705                               | 8.55                       | 4.98                  |
| 254 x 254 x 63                 | 63.0                          | 247.1                                 | 256.6                                 | 10.6                     | 10.7                        | 20.0                          | 185.7                                      | 12.00                        | 17.5           | 9097                               | 3019                               | 10.50                      | 6.06                  |
| 254 x 254 x 71                 | 71.0                          | 249.7                                 | 258.0                                 | 12.0                     | 12.0                        | 20.0                          | 185.7                                      | 10.80                        | 15.5           | 10307                              | 3442                               | 10.60                      | 6.10                  |
| 254 x 254 x 85                 | 85.1                          | 254.3                                 | 260.4                                 | 14.4                     | 14.3                        | 20.0                          | 185.7                                      | 9.10                         | 12.9           | 12521                              | 4219                               | 10.60                      | 6.18                  |
| 305 x 305 x 79                 | 78.9                          | 299.3                                 | 306.4                                 | 11.0                     | 11.1                        | 20.0                          | 237.1                                      | 13.80                        | 21.6           | 16700                              | 5329                               | 12.80                      | 7.23                  |
| 305 x 305 x 88                 | 88.0                          | 301.7                                 | 307.8                                 | 12.4                     | 12.3                        | 20.0                          | 237.1                                      | 12.50                        | 19.1           | 18680                              | 5987                               | 12.80                      | 7.26                  |
| 305 x 305 x 95                 | 94.9                          | 303.7                                 | 308.7                                 | 13.3                     | 13.3                        | 20.0                          | 237.1                                      | 11.60                        | 17.8           | 20300                              | 6531                               | 12.90                      | 7.30                  |
| 305 x 305 x 110                | 110.0                         | 307.9                                 | 310.7                                 | 15.3                     | 15.4                        | 20.0                          | 237.1                                      | 10.10                        | 15.5           | 23818                              | 7712                               | 13.00                      | 7.38                  |
| 305 x 305 x 126                | 126.1                         | 312.3                                 | 312.9                                 | 17.5                     | 17.6                        | 20.0                          | 237.1                                      | 8.89                         | 13.5           | 27663                              | 9005                               | 13.10                      | 7.45                  |
| 305 x 305 x 149                | 149.1                         | 318.5                                 | 316.0                                 | 20.6                     | 20.7                        | 20.0                          | 237.1                                      | 7.63                         | 11.5           | 33322                              | 10914                              | 13.20                      | 7.55                  |
| 305 x 305 x 186                | 186.0                         | 328.3                                 | 320.9                                 | 25.5                     | 25.6                        | 2.0                           | 273.1                                      | 6.27                         | 10.7           | 42254                              | 14138                              | 13.40                      | 7.76                  |
| 305 x 305 x 223                | 222.9                         | 337.9                                 | 325.7                                 | 30.3                     | 30.4                        | 20.0                          | 237.1                                      | 5.36                         | 7.8            | 52954                              | 17583                              | 13.60                      | 7.85                  |
| 356 x 368 x 109                | 108.9                         | 346.4                                 | 371.0                                 | 12.8                     | 12.9                        | 20.0                          | 280.6                                      | 14.40                        | 21.9           | 30977                              | 10989                              | 14.90                      | 8.85                  |
| 356 x 368 x 133                | 133.0                         | 352.0                                 | 373.8                                 | 15.6                     | 15.7                        | 20.0                          | 280.6                                      | 11.90                        | 18.0           | 38329                              | 13683                              | 15.00                      | 8.95                  |
| 356 x 368 x 152                | 152.0                         | 356.4                                 | 376.0                                 | 17.8                     | 17.9                        | 20.0                          | 280.6                                      | 10.50                        | 15.8           | 44317                              | 15880                              | 15.10                      | 9.02                  |
| 356 x 368 x 174                | 173.9                         | 361.4                                 | 378.5                                 | 20.3                     | 20.4                        | 20.0                          | 280.6                                      | 9.28                         | 13.8           | 51355                              | 18467                              | 15.20                      | 9.10                  |



## Universal bearing piles (UBP) sizes

| Elastic modulus |                 | Plastic modulus |                 | Buckling<br>parameter | Torsional<br>index | Warping<br>constant | Torsional<br>constant | Area of<br>section | Designation     |
|-----------------|-----------------|-----------------|-----------------|-----------------------|--------------------|---------------------|-----------------------|--------------------|-----------------|
| Axis            | Axis            | Axis            | Axis            |                       |                    |                     |                       |                    |                 |
| x-x             | y-y             | x-x             | y-y             |                       |                    |                     |                       |                    |                 |
| cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> | u                     | x                  | dm <sup>6</sup>     | cm <sup>4</sup>       | cm <sup>2</sup>    | Serial size     |
| 410             | 134             | 459             | 206             | 0.827                 | 18.6               | 0.126               | 19.2                  | 57.2               | 203 x 203 x 45  |
| 493             | 164             | 557             | 252             | 0.827                 | 15.8               | 0.158               | 32.7                  | 68.7               | 203 x 203 x 54  |
| 736             | 235             | 822             | 362             | 0.831                 | 18.9               | 0.422               | 41.1                  | 82.3               | 254 x 254 x 63  |
| 826             | 267             | 926             | 411             | 0.830                 | 17.2               | 0.486               | 56.5                  | 92.4               | 254 x 254 x 71  |
| 985             | 324             | 1115            | 500             | 0.828                 | 14.8               | 0.608               | 92.6                  | 110.0              | 254 x 254 x 85  |
| 1116            | 348             | 1238            | 533             | 0.834                 | 22.8               | 1.110               | 52.2                  | 102.0              | 305 x 305 x 79  |
| 1238            | 389             | 1380            | 597             | 0.832                 | 20.8               | 1.250               | 70.3                  | 114.0              | 305 x 305 x 88  |
| 1337            | 423             | 1494            | 649             | 0.832                 | 19.5               | 1.380               | 86.9                  | 122.0              | 305 x 305 x 95  |
| 1547            | 496             | 1740            | 763             | 0.831                 | 17.2               | 1.650               | 131.0                 | 142.0              | 305 x 305 x 110 |
| 1772            | 576             | 2005            | 887             | 0.830                 | 15.3               | 1.960               | 193.0                 | 162.0              | 305 x 305 x 126 |
| 2092            | 691             | 2390            | 1068            | 0.829                 | 13.2               | 2.420               | 310.0                 | 191.0              | 305 x 305 x 149 |
| 2574            | 881             | 2977            | 1363            | 0.826                 | 11.5               | 3.240               | 520.0                 | 235.0              | 305 x 305 x 186 |
| 3134            | 1080            | 3673            | 1682            | 0.827                 | 9.41               | 4.160               | 977.0                 | 285.0              | 305 x 305 x 223 |
| 1789            | 592             | 1979            | 904             | 0.825                 | 23.4               | 3.060               | 91.2                  | 140.0              | 356 x 368 x 109 |
| 2178            | 732             | 2428            | 1120            | 0.823                 | 19.7               | 3.870               | 160.0                 | 171.0              | 356 x 368 x 133 |
| 2487            | 845             | 2789            | 1295            | 0.823                 | 17.5               | 4.550               | 235.0                 | 195.0              | 356 x 368 x 152 |
| 2842            | 976             | 3208            | 1499            | 0.822                 | 15.5               | 5.370               | 345.0                 | 223.0              | 356 x 368 x 174 |

Dimensions and properties to BS EN 10365:2017

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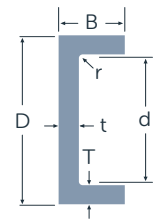
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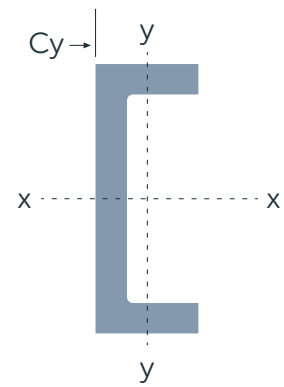


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#### Parallel flange channels (PFC) sizes

| Designation    | Mass<br>per<br>metre | Depth<br>of<br>section | Width<br>of<br>section | Thickness |              | Distance<br>of<br>Cy | Root<br>radius | Depth<br>between<br>fillets | Ratios for local<br>buckling |      | Second moment<br>of area |                 | Radius<br>of<br>gyration |
|----------------|----------------------|------------------------|------------------------|-----------|--------------|----------------------|----------------|-----------------------------|------------------------------|------|--------------------------|-----------------|--------------------------|
|                |                      |                        |                        | of<br>web | of<br>flange |                      |                |                             | Flange                       | Web  | Axis                     | Axis            |                          |
|                |                      |                        |                        | t         | T            |                      |                |                             | B/2T                         | d/t  | x-x                      | y-y             |                          |
| Serial size    | kg/m                 | mm                     | mm                     | mm        | mm           | cm                   | mm             | mm                          |                              |      | cm <sup>4</sup>          | cm <sup>4</sup> | cm                       |
| 150 x 75 x 18  | 17.9                 | 150                    | 75                     | 5.5       | 10.0         | 2.58                 | 12             | 106                         | 7.50                         | 19.3 | 861                      | 131             | 6.15                     |
| 150 x 90 x 24  | 23.9                 | 150                    | 90                     | 6.5       | 12.0         | 3.30                 | 12             | 102                         | 7.50                         | 15.7 | 1162                     | 253             | 6.18                     |
| 180 x 75 x 20  | 20.3                 | 180                    | 75                     | 6.0       | 10.5         | 2.41                 | 12             | 135                         | 7.14                         | 22.5 | 1370                     | 146             | 7.27                     |
| 180 x 90 x 26  | 26.1                 | 180                    | 90                     | 6.5       | 12.5         | 3.17                 | 12             | 131                         | 7.20                         | 20.2 | 1817                     | 277             | 7.40                     |
| 200 x 75 x 23  | 23.4                 | 200                    | 75                     | 6.0       | 12.5         | 2.48                 | 12             | 151                         | 6.00                         | 25.2 | 1963                     | 170             | 8.11                     |
| 200 x 90 x 30  | 29.7                 | 200                    | 90                     | 7.0       | 14.0         | 3.12                 | 12             | 148                         | 6.43                         | 21.1 | 2523                     | 314             | 8.16                     |
| 230 x 75 x 26  | 25.7                 | 230                    | 75                     | 6.5       | 12.5         | 2.30                 | 12             | 181                         | 6.00                         | 27.8 | 2748                     | 181             | 9.17                     |
| 230 x 90 x 32  | 32.2                 | 230                    | 90                     | 7.5       | 14.0         | 2.92                 | 12             | 178                         | 6.43                         | 23.7 | 3518                     | 334             | 9.27                     |
| 260 x 75 x 28  | 27.6                 | 260                    | 75                     | 7.0       | 12.0         | 2.10                 | 12             | 212                         | 6.25                         | 30.3 | 3619                     | 185             | 10.10                    |
| 260 x 90 x 35  | 34.8                 | 260                    | 90                     | 8.0       | 14.0         | 2.74                 | 12             | 208                         | 6.43                         | 26.0 | 4728                     | 353             | 10.30                    |
| 300 x 90 x 41  | 41.4                 | 300                    | 90                     | 9.0       | 15.5         | 2.60                 | 12             | 245                         | 5.81                         | 27.2 | 7218                     | 404             | 11.70                    |
| 300 x 100 x 46 | 45.5                 | 300                    | 100                    | 9.0       | 16.5         | 3.05                 | 15             | 237                         | 6.06                         | 26.3 | 8229                     | 568             | 11.90                    |



## Parallel flange channels (PFC) sizes

| Radius of gyration | Elastic modulus |                 | Plastic modulus |                 | Buckling parameter | Torsional index | Warping constant | Torsional constant | Area of section | Designation    |
|--------------------|-----------------|-----------------|-----------------|-----------------|--------------------|-----------------|------------------|--------------------|-----------------|----------------|
| Axis               | Axis            | Axis            | Axis            | Axis            |                    |                 |                  |                    |                 |                |
| y-y                | x-x             | y-y             | x-x             | y-y             | u                  | x               | H                | J                  | cm <sup>2</sup> | Serial size    |
| cm                 | cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> |                    |                 | dm <sup>6</sup>  | cm <sup>4</sup>    |                 |                |
| 2.40               | 115.00          | 26.6            | 132.0           | 47.3            | 0.946              | 13.1            | 0.0047           | 6.10               | 22.8            | 150 x 75 x 18  |
| 2.89               | 155.00          | 44.4            | 179.0           | 77.0            | 0.936              | 10.8            | 0.0089           | 11.80              | 30.4            | 150 x 90 x 24  |
| 2.38               | 152.00          | 28.8            | 176.0           | 52.0            | 0.946              | 15.3            | 0.0075           | 7.34               | 25.9            | 180 x 75 x 20  |
| 2.89               | 202.00          | 47.4            | 232.0           | 83.5            | 0.949              | 12.8            | 0.0141           | 13.30              | 33.2            | 180 x 90 x 26  |
| 2.39               | 196.00          | 33.8            | 227.0           | 60.8            | 0.956              | 14.8            | 0.0107           | 11.10              | 29.9            | 200 x 75 x 23  |
| 2.88               | 252.00          | 53.4            | 291.0           | 94.6            | 0.954              | 12.9            | 0.0197           | 18.30              | 37.9            | 200 x 90 x 30  |
| 2.35               | 239.00          | 34.8            | 278.0           | 63.2            | 0.947              | 17.3            | 0.0153           | 11.80              | 32.7            | 230 x 75 x 26  |
| 2.86               | 306.00          | 55.0            | 355.0           | 99.2            | 0.950              | 15.1            | 0.0279           | 19.30              | 41.0            | 230 x 90 x 32  |
| 2.30               | 278.00          | 34.4            | 328.0           | 62.0            | 0.932              | 20.5            | 0.0203           | 11.70              | 35.1            | 260 x 75 x 28  |
| 2.82               | 364.00          | 56.3            | 425.0           | 102.1           | 0.942              | 17.2            | 0.0379           | 20.60              | 44.4            | 260 x 90 x 35  |
| 2.77               | 481.00          | 63.1            | 568.0           | 114.0           | 0.934              | 18.4            | 0.0581           | 28.80              | 52.7            | 300 x 90 x 41  |
| 3.13               | 549.00          | 81.7            | 641.0           | 148.3           | 0.944              | 17.0            | 0.0813           | 36.80              | 58.0            | 300 x 100 x 46 |

Dimensions and properties to BS EN 10365:2017

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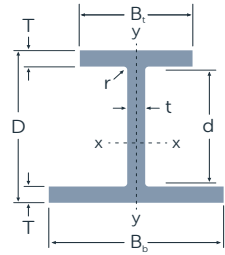
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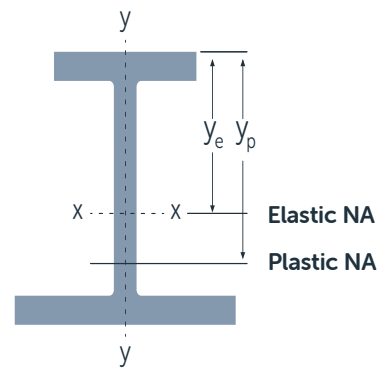


## Asymmetric beams (ASB) sizes

| Designation  | Mass<br>per<br>metre | Depth<br>of<br>section | Width<br>of<br>top<br>flange | Width<br>of<br>bottom<br>flange | Thickness |              | Root<br>radius | Depth<br>between<br>fillets | Ratios for local buckling |                  |       | Elastic<br>neutral<br>axis<br>position | Second<br>moment of area |                 |
|--------------|----------------------|------------------------|------------------------------|---------------------------------|-----------|--------------|----------------|-----------------------------|---------------------------|------------------|-------|----------------------------------------|--------------------------|-----------------|
|              |                      |                        |                              |                                 | of<br>web | of<br>flange |                |                             | Top<br>flange             | Bottom<br>flange | Web   |                                        | Axis                     | Axis            |
|              |                      |                        |                              |                                 | t         | T            |                |                             | r                         | d                | Bt/2T |                                        | Bb/2T                    | d/t             |
| Serial size  | kg/m                 | mm                     | mm                           | mm                              | mm        | mm           | mm             | mm                          |                           |                  |       | cm                                     | cm <sup>4</sup>          | cm <sup>4</sup> |
| 280 ASB 74   | 73.6                 | 272                    | 175                          | 285                             | 10        | 14           | 27             | 190                         | 6.25                      | 10.18            | 19.00 | 15.7                                   | 12366                    | 3337            |
| 280 ASB 100* | 100.3                | 276                    | 184                          | 294                             | 19        | 16           | 27             | 190                         | 5.75                      | 9.19             | 10.00 | 15.6                                   | 15679                    | 4250            |
| 280 ASB 105  | 104.7                | 288                    | 176                          | 286                             | 11        | 22           | 27             | 190                         | 4.00                      | 6.50             | 17.27 | 16.8                                   | 19426                    | 5301            |
| 280 ASB 124  | 123.9                | 296                    | 178                          | 288                             | 13        | 26           | 27             | 190                         | 3.42                      | 5.54             | 14.62 | 17.2                                   | 23630                    | 6414            |
| 280 ASB 136* | 136.4                | 288                    | 190                          | 300                             | 25        | 22           | 27             | 190                         | 4.32                      | 6.82             | 7.60  | 16.2                                   | 22390                    | 6262            |
| 300 ASB 153* | 152.8                | 310                    | 190                          | 300                             | 27        | 24           | 27             | 208                         | 3.96                      | 6.25             | 7.70  | 17.4                                   | 28398                    | 6840            |
| 300 ASB 155  | 155.4                | 326                    | 179                          | 289                             | 16        | 32           | 27             | 208                         | 2.80                      | 4.52             | 13.00 | 18.9                                   | 34514                    | 7989            |
| 300 ASB 185* | 184.6                | 320                    | 195                          | 305                             | 32        | 29           | 27             | 208                         | 3.36                      | 5.26             | 6.50  | 18.0                                   | 35657                    | 8752            |
| 300 ASB 196  | 195.5                | 342                    | 183                          | 293                             | 20        | 40           | 27             | 208                         | 2.29                      | 3.66             | 10.40 | 19.8                                   | 45871                    | 10463           |
| 300 ASB 249* | 249.2                | 342                    | 203                          | 313                             | 40        | 40           | 27             | 208                         | 2.54                      | 3.91             | 5.20  | 19.2                                   | 52920                    | 13194           |

The elastic and plastic neutral axis position is measured from the upper surface of the beam

\* These sections have been specifically developed with thicker webs for improved performance in fire



## Asymmetric beams (ASB) sizes

| Elastic modulus |                 |                 | Radius of gyration |          | Plastic neutral axis position | Plastic modulus |                 | Buckling parameter | Torsional index | Warping constant | Torsional constant | Area of section | Designation  |
|-----------------|-----------------|-----------------|--------------------|----------|-------------------------------|-----------------|-----------------|--------------------|-----------------|------------------|--------------------|-----------------|--------------|
| Axis x-x        | Axis x-x        | Axis y-y        | Axis x-x           | Axis y-y |                               | Axis x-x        | Axis y-y        |                    |                 |                  |                    |                 |              |
| Top             | Bottom          | Bottom          | x-x                | y-y      | y <sub>p</sub>                | x-x             | y-y             | u                  | x               | H                | J                  | cm <sup>2</sup> | Serial size  |
| cm <sup>3</sup> | cm <sup>3</sup> | cm <sup>3</sup> | cm                 | cm       | cm                            | cm <sup>3</sup> | cm <sup>3</sup> |                    |                 | dm <sup>6</sup>  | cm <sup>4</sup>    |                 |              |
| 788             | 1075            | 234             | 11.4               | 5.93     | 21.3                          | 994             | 404             | 0.832              | 15.90           | 0.338            | 80.1               | 95.1            | 280 ASB 74   |
| 1007            | 1307            | 289             | 11.0               | 5.74     | 18.4                          | 1310            | 512             | 0.816              | 12.80           | 0.451            | 170.0              | 129.0           | 280 ASB 100* |
| 1157            | 1619            | 371             | 12.0               | 6.27     | 25.2                          | 1456            | 634             | 0.832              | 11.80           | 0.574            | 219.0              | 135.0           | 280 ASB 105  |
| 1372            | 1906            | 445             | 12.2               | 6.35     | 25.6                          | 1745            | 762             | 0.833              | 10.40           | 0.721            | 347.0              | 159.0           | 280 ASB 124  |
| 1379            | 1777            | 417             | 11.3               | 5.98     | 19.2                          | 1821            | 742             | 0.815              | 10.00           | 0.710            | 396.0              | 175.0           | 280 ASB 136* |
| 1628            | 2088            | 456             | 12.1               | 5.93     | 20.4                          | 2160            | 816             | 0.822              | 9.97            | 0.895            | 513.0              | 195.0           | 300 ASB 153* |
| 1825            | 2519            | 553             | 13.2               | 6.35     | 27.3                          | 2361            | 949             | 0.843              | 9.40            | 1.070            | 620.0              | 198.0           | 300 ASB 155  |
| 1984            | 2547            | 574             | 12.3               | 6.10     | 21.0                          | 2658            | 1030            | 0.822              | 8.56            | 1.200            | 871.0              | 235.0           | 300 ASB 185* |
| 2321            | 3185            | 714             | 13.6               | 6.48     | 28.1                          | 3055            | 1229            | 0.845              | 7.86            | 1.500            | 1177.0             | 249.0           | 300 ASB 196  |
| 2757            | 3528            | 843             | 12.9               | 6.45     | 22.6                          | 3761            | 1512            | 0.825              | 6.80            | 2.000            | 2004.0             | 317.0           | 300 ASB 249* |

The elastic and plastic neutral axis position is measured from the upper surface of the beam

\* These sections have been specifically developed with thicker webs for improved performance in fire

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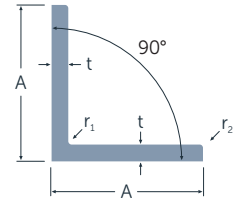
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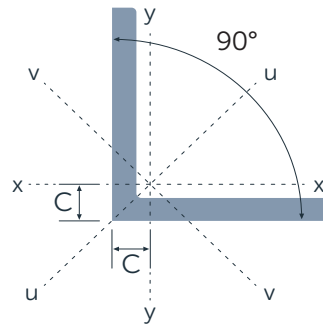


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## Equal angles (EA) sizes

| Designation    | Mass per metre | Depth of section | Width of section | Thickness | Root radius    | Toe radius     | Area of section | Distance to centre of gravity | Second moment of area |      |      |
|----------------|----------------|------------------|------------------|-----------|----------------|----------------|-----------------|-------------------------------|-----------------------|------|------|
| Serial size    |                |                  |                  |           |                |                |                 |                               | I                     |      |      |
| A x A x t      |                | h                | b                | s         | r <sub>1</sub> | r <sub>2</sub> |                 | C                             | Axis                  | Axis | Axis |
| mm x mm x mm   | kg/m           | mm               | mm               | mm        | mm             | mm             | cm <sub>2</sub> | cm                            | x-x, y-y              | u-u  | v-v  |
| 120 x 120 x 8  | 14.7           | 120              | 120              | 8         | 13             | 6.5            | 18.7            | 3.23                          | 256                   | 411  | 107  |
| 120 x 120 x 10 | 18.2           | 120              | 120              | 10        | 13             | 6.5            | 23.2            | 3.31                          | 313                   | 497  | 129  |
| 120 x 120 x 12 | 21.6           | 120              | 120              | 12        | 13             | 6.5            | 27.5            | 3.40                          | 368                   | 584  | 152  |
| 120 x 120 x 15 | 26.6           | 120              | 120              | 15        | 13             | 6.5            | 33.9            | 3.51                          | 445                   | 710  | 186  |
| 150 x 150 x 10 | 23.0           | 150              | 150              | 10        | 16             | 8.0            | 29.3            | 4.03                          | 624                   | 990  | 258  |
| 150 x 150 x 12 | 27.3           | 150              | 150              | 12        | 16             | 8.0            | 34.8            | 4.12                          | 737                   | 1170 | 303  |
| 150 x 150 x 15 | 33.8           | 150              | 150              | 15        | 16             | 8.0            | 43.0            | 4.25                          | 898                   | 1430 | 370  |
| 150 x 150 x 18 | 40.1           | 150              | 150              | 18        | 16             | 8.0            | 51.0            | 4.37                          | 1050                  | 1680 | 440  |
| 200 x 200 x 16 | 48.5           | 200              | 200              | 16        | 18             | 9.0            | 61.8            | 5.52                          | 2342                  | 3720 | 960  |
| 200 x 200 x 18 | 54.2           | 200              | 200              | 18        | 18             | 9.0            | 69.1            | 5.60                          | 2600                  | 4150 | 1050 |
| 200 x 200 x 20 | 59.9           | 200              | 200              | 20        | 18             | 9.0            | 76.3            | 5.68                          | 2851                  | 4530 | 1170 |
| 200 x 200 x 24 | 71.1           | 200              | 200              | 24        | 18             | 9.0            | 90.6            | 5.84                          | 3331                  | 5280 | 1380 |



## Equal angles (EA) sizes

| Radius of gyration<br>i |      |      | Elastic<br>modulus | Torsional<br>constant | Equivalent<br>slenderness<br>coefficient | Surface area   |                | Designation               |
|-------------------------|------|------|--------------------|-----------------------|------------------------------------------|----------------|----------------|---------------------------|
| Axis                    | Axis | Axis |                    |                       |                                          | Per metre      | Per tonne      |                           |
| x-x, y-y                | u-u  | v-v  | x-x, y-y           | J                     | Fa                                       |                |                | Serial size               |
| cm                      | cm   | cm   | cm <sup>3</sup>    | cm <sup>4</sup>       |                                          | m <sup>2</sup> | m <sup>2</sup> | A x A x t<br>mm x mm x mm |
| 3.69                    | 4.69 | 2.39 | 29.1               | 4.44                  | 4.56                                     | 0.47           | 31.87          | 120 x 120 x 8             |
| 3.67                    | 4.63 | 2.36 | 36.0               | 8.41                  | 3.61                                     | 0.47           | 25.76          | 120 x 120 x 10            |
| 3.65                    | 4.61 | 2.35 | 42.7               | 14.21                 | 2.99                                     | 0.47           | 21.69          | 120 x 120 x 12            |
| 3.62                    | 4.58 | 2.34 | 52.4               | 27.04                 | 2.37                                     | 0.47           | 17.60          | 120 x 120 x 15            |
| 4.62                    | 5.81 | 2.97 | 56.9               | 10.80                 | 4.51                                     | 0.59           | 25.51          | 150 x 150 x 10            |
| 4.60                    | 5.80 | 2.95 | 67.8               | 18.21                 | 3.77                                     | 0.59           | 21.44          | 150 x 150 x 12            |
| 4.57                    | 5.77 | 2.93 | 83.5               | 34.62                 | 3.01                                     | 0.59           | 17.36          | 150 x 150 x 15            |
| 4.54                    | 5.74 | 2.94 | 98.8               | 58.57                 | 2.48                                     | 0.59           | 14.63          | 150 x 150 x 18            |
| 6.16                    | 7.76 | 3.94 | 162.0              | 56.09                 | 3.85                                     | 0.78           | 16.18          | 200 x 200 x 16            |
| 6.13                    | 7.75 | 3.90 | 181.0              | 78.95                 | 3.43                                     | 0.78           | 14.46          | 200 x 200 x 18            |
| 6.11                    | 7.71 | 3.92 | 199.0              | 107.19                | 3.05                                     | 0.78           | 13.09          | 200 x 200 x 20            |
| 6.06                    | 7.63 | 3.90 | 235.0              | 181.89                | 2.50                                     | 0.78           | 11.03          | 200 x 200 x 24            |

Dimensions and properties to BS EN 10056-1

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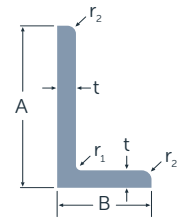
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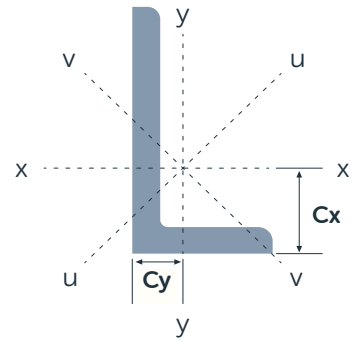


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### Unequal angles (UA) sizes

| Designation    | Mass<br>per<br>metre | Depth<br>of<br>section | Width<br>of<br>section | Thickness<br>of<br>web | Root<br>radius | Toe<br>radius  | Area of<br>section | Distance to<br>centre of gravity |      | Second moment of area |                 |                 |                 |
|----------------|----------------------|------------------------|------------------------|------------------------|----------------|----------------|--------------------|----------------------------------|------|-----------------------|-----------------|-----------------|-----------------|
|                |                      |                        |                        |                        |                |                |                    |                                  |      | I                     |                 |                 |                 |
| Serial size    |                      |                        |                        |                        |                |                |                    |                                  |      | Axis                  | Axis            | Axis            | Axis            |
| A x B x t      |                      | h                      | b                      | s                      | r <sub>1</sub> | r <sub>2</sub> |                    | Cx                               | Cy   | x-x                   | y-y             | u-u             | v-v             |
| mm x mm x mm   | kg/m                 | mm                     | mm                     | mm                     | mm             | mm             | cm <sup>2</sup>    | cm                               | cm   | cm <sup>4</sup>       | cm <sup>4</sup> | cm <sup>4</sup> | cm <sup>4</sup> |
| 200 x 100 x 10 | 23.0                 | 200                    | 100                    | 10                     | 15             | 7.5            | 29.2               | 6.93                             | 2.01 | 1219                  | 210             | 1290            | 135             |
| 200 x 100 x 12 | 27.3                 | 200                    | 100                    | 12                     | 15             | 7.5            | 34.8               | 7.03                             | 2.10 | 1441                  | 247             | 1530            | 159             |
| 200 x 100 x 15 | 33.7                 | 200                    | 100                    | 15                     | 15             | 7.5            | 43.0               | 7.16                             | 2.22 | 1759                  | 299             | 1860            | 193             |
| 200 x 150 x 12 | 32.0                 | 200                    | 150                    | 12                     | 15             | 7.5            | 40.8               | 6.08                             | 3.61 | 1653                  | 803             | 2030            | 430             |
| 200 x 150 x 15 | 39.6                 | 200                    | 150                    | 15                     | 15             | 7.5            | 50.5               | 6.21                             | 3.73 | 2023                  | 979             | 2480            | 526             |
| 200 x 150 x 18 | 47.1                 | 200                    | 150                    | 18                     | 15             | 7.5            | 60.0               | 6.33                             | 3.85 | 2376                  | 1146            | 2920            | 623             |



## Unequal angles (UA) sizes

| Radius of gyration<br>i |      |      |      | Elastic modulus |                 | Angle<br>axis x-x<br>to<br>axis y-y<br>tan a | Torsional<br>constant<br><br>J | Equivalent slenderness<br>coefficient |      | Mono-<br>symmetry<br>index<br><br>Ya | Designation<br><br><br>Serial size<br>A x B x t<br>mm x mm x mm |
|-------------------------|------|------|------|-----------------|-----------------|----------------------------------------------|--------------------------------|---------------------------------------|------|--------------------------------------|-----------------------------------------------------------------|
| Axis                    | Axis | Axis | Axis | Axis            | Axis            |                                              |                                | Min                                   | Max  |                                      |                                                                 |
| x-x                     | y-y  | u-u  | v-v  | x-x             | y-y             |                                              |                                | Fa                                    | Fa   |                                      |                                                                 |
| cm                      | cm   | cm   | cm   | cm <sup>3</sup> | cm <sup>3</sup> |                                              | cm <sup>4</sup>                | Fa                                    | Fa   |                                      |                                                                 |
| 6.46                    | 2.68 | 6.65 | 2.15 | 93.3            | 26.3            | 0.263                                        | 10.7                           | 5.26                                  | 7.92 | 13.90                                | 200 x 100 x 10                                                  |
| 6.43                    | 2.67 | 6.63 | 2.14 | 111.0           | 31.3            | 0.262                                        | 18.0                           | 4.42                                  | 6.57 | 11.50                                | 200 x 100 x 12                                                  |
| 6.40                    | 2.64 | 6.58 | 2.12 | 137.0           | 38.4            | 0.260                                        | 34.3                           | 3.54                                  | 5.17 | 9.19                                 | 200 x 100 x 15                                                  |
| 6.36                    | 4.44 | 7.05 | 3.25 | 119.0           | 70.5            | 0.552                                        | 20.9                           | 4.43                                  | 5.70 | 6.97                                 | 200 x 150 x 12                                                  |
| 6.33                    | 4.40 | 7.01 | 3.23 | 147.0           | 86.9            | 0.551                                        | 39.9                           | 3.53                                  | 4.50 | 5.55                                 | 200 x 150 x 15                                                  |
| 6.29                    | 4.37 | 6.98 | 3.22 | 174.0           | 103.0           | 0.549                                        | 67.9                           | 2.93                                  | 3.72 | 4.60                                 | 200 x 150 x 18                                                  |

Dimensions and properties to BS EN 10056-1

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