

Pyöreät rakenneputket EN10219

S355 / S235

Circular Hollow Sections EN10219

Ainesstandardi / Material Standard EN10219



Mittastandardi / Size Standard EN10219

Ainestodistus / Material Certificate EN10204 / 3.1

| Ulko-halkaisija  | Paksuus   | Paino | Poikki-pinta-ala | Jäyhyys-momentti  | Jäyhyys-säde       | Taivutus-vastus | Plastinen taivutus-vastus | Vääntöjäyhyys-momentti | Ulko-puolinen pinta-ala | Noin pituus/ tonni  |      |
|------------------|-----------|-------|------------------|-------------------|--------------------|-----------------|---------------------------|------------------------|-------------------------|---------------------|------|
| Outside diameter | Thickness | Mass  | Sectional area   | Moment of inertia | Radius of gyration | Elastic modulus | Plastic modulus           | Torsional constants    | Superficial area/m      | Appr. length/ tonne |      |
| D                | T         | M     | A                | I                 | i                  | W <sub>el</sub> | W <sub>pl</sub>           | I <sub>t</sub>         | C <sub>t</sub>          | A <sub>s</sub>      |      |
| mm               | mm        | kg/m  | cm <sup>2</sup>  | cm <sup>4</sup>   | cm                 | cm <sup>3</sup> | cm <sup>3</sup>           | cm <sup>4</sup>        | cm <sup>3</sup>         | m <sup>2</sup> /m   | m    |
| 26.9             | 2.0       | 1.23  | 1.56             | 1.22              | 0.883              | 0.907           | 1.2                       | 2.44                   | 1.81                    | 0.0845              | 814  |
|                  | 2.5       | 1.50  | 1.92             | 1.44              | 0.867              | 1.07            | 1.5                       | 2.88                   | 2.14                    | 0.0845              | 665  |
|                  | 3.0       | 1.77  | 2.25             | 1.63              | 0.852              | 1.21            | 1.7                       | 3.27                   | 2.43                    | 0.0845              | 566  |
| 33.7             | 2.5       | 1.92  | 2.45             | 3.00              | 1.11               | 1.78            | 2.4                       | 6.00                   | 3.56                    | 0.106               | 520  |
|                  | 3.0       | 2.27  | 2.89             | 3.44              | 1.09               | 2.04            | 2.8                       | 6.88                   | 4.08                    | 0.106               | 440  |
| 42.4             | 2.5       | 2.46  | 3.13             | 6.26              | 1.41               | 2.95            | 4.0                       | 12.5                   | 5.91                    | 0.133               | 407  |
|                  | 3.0       | 2.91  | 3.71             | 7.25              | 1.40               | 3.42            | 4.7                       | 14.5                   | 6.84                    | 0.133               | 343  |
| 48.3             | 2.5       | 2.82  | 3.60             | 9.46              | 1.62               | 3.92            | 5.3                       | 18.9                   | 7.83                    | 0.152               | 354  |
|                  | 3.0       | 3.35  | 4.27             | 11.00             | 1.61               | 4.55            | 6.2                       | 22.0                   | 9.11                    | 0.152               | 298  |
|                  | 3.5       | 3.87  | 4.93             | 12.40             | 1.59               | 5.15            | 7.0                       | 24.9                   | 10.3                    | 0.152               | 259  |
|                  | 4.0       | 4.37  | 5.57             | 13.80             | 1.57               | 5.70            | 7.9                       | 27.5                   | 11.4                    | 0.152               | 229  |
| 60.3             | 3.0       | 4.24  | 5.40             | 22.20             | 2.03               | 7.37            | 9.9                       | 44.4                   | 14.7                    | 0.189               | 236  |
|                  | 3.5       | 4.90  | 6.25             | 25.30             | 2.01               | 8.40            | 11.3                      | 50.6                   | 16.8                    | 0.189               | 204  |
|                  | 4.0       | 5.55  | 7.07             | 28.20             | 2.00               | 9.34            | 12.7                      | 56.3                   | 18.7                    | 0.189               | 180  |
| 76.1             | 2.5       | 4.54  | 5.78             | 39.20             | 2.60               | 10.3            | 13.5                      | 78.4                   | 20.6                    | 0.239               | 220  |
|                  | 3.0       | 5.41  | 6.89             | 46.10             | 2.59               | 12.1            | 16.0                      | 92.2                   | 24.2                    | 0.239               | 185  |
|                  | 4.0       | 7.11  | 9.06             | 59.10             | 2.55               | 15.5            | 20.8                      | 118                    | 31.0                    | 0.239               | 141  |
| 88.9             | 3.0       | 6.36  | 8.10             | 74.80             | 3.04               | 16.8            | 22.1                      | 150                    | 33.6                    | 0.279               | 157  |
|                  | 3.5       | 7.37  | 9.39             | 85.70             | 3.02               | 19.3            | 25.5                      | 171                    | 38.6                    | 0.279               | 136  |
|                  | 4.0       | 8.38  | 10.7             | 96.30             | 3.00               | 21.7            | 28.9                      | 193                    | 43.3                    | 0.279               | 119  |
|                  | 5.0       | 10.3  | 13.2             | 116.0             | 2.97               | 26.2            | 35.2                      | 233                    | 52.4                    | 0.279               | 96.7 |
| 114.3            | 3.0       | 8.23  | 10.5             | 163.0             | 3.94               | 28.4            | 37.2                      | 325                    | 56.9                    | 0.359               | 121  |
|                  | 3.5       | 9.56  | 12.2             | 187.0             | 3.92               | 32.7            | 43.0                      | 374                    | 65.5                    | 0.359               | 105  |
|                  | 4.0       | 10.9  | 13.9             | 211.0             | 3.90               | 36.9            | 48.7                      | 422                    | 73.9                    | 0.359               | 91.9 |
|                  | 5.0       | 13.5  | 17.2             | 257.0             | 3.87               | 45.0            | 59.8                      | 514                    | 89.9                    | 0.359               | 74.2 |
|                  | 6.0       | 16.0  | 20.4             | 300.0             | 3.83               | 52.5            | 70.4                      | 600                    | 105                     | 0.359               | 62.4 |
| 139.7            | 4.0       | 13.4  | 17.1             | 393.0             | 4.80               | 56.2            | 73.7                      | 786                    | 112                     | 0.439               | 74.7 |
|                  | 5.0       | 16.6  | 21.2             | 481.0             | 4.77               | 68.8            | 90.8                      | 961                    | 138                     | 0.439               | 60.2 |
|                  | 6.0       | 19.8  | 25.2             | 564.0             | 4.73               | 80.8            | 107                       | 1129                   | 162                     | 0.439               | 50.5 |
|                  | 8.0       | 26.0  | 33.1             | 720.0             | 4.66               | 103             | 139                       | 1441                   | 206                     | 0.439               | 38.5 |
|                  | 10.0      | 32.0  | 40.7             | 862.0             | 4.60               | 123             | 169                       | 1724                   | 247                     | 0.439               | 31.3 |
| 168.3            | 4.0       | 16.2  | 20.6             | 697.0             | 5.81               | 82.8            | 108                       | 1394                   | 166                     | 0.529               | 61.7 |
|                  | 5.0       | 20.1  | 25.7             | 856.0             | 5.78               | 102             | 133                       | 1712                   | 203                     | 0.529               | 49.7 |
|                  | 6.0       | 24.0  | 30.6             | 1009              | 5.74               | 120             | 158                       | 2017                   | 240                     | 0.529               | 41.6 |
|                  | 8.0       | 31.6  | 40.3             | 1297              | 5.67               | 154             | 206                       | 2595                   | 308                     | 0.529               | 31.6 |
|                  | 10.0      | 39.0  | 49.7             | 1564              | 5.61               | 186             | 251                       | 3128                   | 372                     | 0.529               | 25.6 |
|                  | 12.5      | 48.0  | 61.2             | 1868              | 5.53               | 222             | 304                       | 3737                   | 444                     | 0.529               | 20.8 |
| 193.7            | 4.0       | 18.7  | 23.8             | 1073              | 6.71               | 111             | 144                       | 2146                   | 222                     | 0.609               | 53.4 |
|                  | 4.5       | 21.0  | 26.7             | 1198              | 6.69               | 124             | 161                       | 2395                   | 247                     | 0.609               | 47.6 |
|                  | 5.0       | 23.3  | 29.6             | 1320              | 6.67               | 136             | 178                       | 2640                   | 273                     | 0.609               | 43.0 |
|                  | 6.0       | 27.8  | 35.4             | 1560              | 6.64               | 161             | 211                       | 3119                   | 322                     | 0.609               | 36.0 |
|                  | 8.0       | 36.6  | 46.7             | 2016              | 6.57               | 208             | 276                       | 4031                   | 416                     | 0.609               | 27.3 |
|                  | 10.0      | 45.3  | 57.7             | 2442              | 6.50               | 252             | 338                       | 4883                   | 504                     | 0.609               | 22.1 |
|                  | 12.5      | 55.9  | 71.2             | 2934              | 6.42               | 303             | 411                       | 5869                   | 606                     | 0.609               | 17.9 |
| 219.1            | 4.5       | 23.8  | 30.3             | 1747              | 7.59               | 159             | 207                       | 3494                   | 319                     | 0.688               | 42.0 |
|                  | 5.0       | 26.4  | 33.6             | 1928              | 7.57               | 176             | 229                       | 3856                   | 352                     | 0.688               | 37.9 |
|                  | 6.0       | 31.5  | 40.2             | 2282              | 7.54               | 208             | 273                       | 4564                   | 417                     | 0.688               | 31.7 |
|                  | 8.0       | 41.6  | 53.1             | 2960              | 7.47               | 270             | 357                       | 5919                   | 540                     | 0.688               | 24.0 |
|                  | 10.0      | 51.6  | 65.7             | 3598              | 7.40               | 328             | 438                       | 7197                   | 657                     | 0.688               | 19.4 |
|                  | 12.0      | 61.3  | 78.1             | 4200              | 7.33               | 383             | 515                       | 8400                   | 767                     | 0.688               | 16.3 |
|                  | 12.5      | 63.7  | 81.1             | 4345              | 7.32               | 397             | 534                       | 8689                   | 793                     | 0.688               | 15.7 |
|                  | 16.0      | 80.1  | 102.0            | 5297              | 7.20               | 483             | 661                       | 10590                  | 967                     | 0.688               | 12.5 |
| 244.5            | 5.0       | 29.5  | 37.6             | 2699              | 8.47               | 221             | 287                       | 5397                   | 441                     | 0.768               | 33.9 |
|                  | 6.0       | 35.3  | 45.0             | 3199              | 8.43               | 262             | 341                       | 6397                   | 523                     | 0.768               | 28.3 |
|                  | 8.0       | 46.7  | 59.4             | 4160              | 8.37               | 340             | 448                       | 8321                   | 681                     | 0.768               | 21.4 |
|                  | 10.0      | 57.8  | 73.7             | 5073              | 8.30               | 415             | 550                       | 10150                  | 830                     | 0.768               | 17.3 |
|                  | 12.0      | 68.8  | 87.7             | 8938              | 8.23               | 486             | 649                       | 11880                  | 972                     | 0.768               | 14.5 |
|                  | 12.5      | 71.5  | 91.1             | 6147              | 8.21               | 503             | 673                       | 12290                  | 1006                    | 0.768               | 14.0 |
|                  | 16.0      | 90.2  | 115.0            | 7533              | 8.10               | 616             | 837                       | 15070                  | 1232                    | 0.768               | 11.1 |
| 273              | 5.0       | 33.0  | 42.1             | 3781              | 9.48               | 277             | 359                       | 7562                   | 554                     | 0.858               | 30.3 |
|                  | 6.0       | 39.5  | 50.3             | 4487              | 9.44               | 329             | 428                       | 8974                   | 657                     | 0.858               | 25.3 |
|                  | 8.0       | 52.3  | 66.6             | 5852              | 9.37               | 429             | 562                       | 11703                  | 857                     | 0.858               | 19.1 |
|                  | 10.0      | 64.9  | 82.6             | 7154              | 9.31               | 524             | 692                       | 14308                  | 1048                    | 0.858               | 15.4 |
|                  | 12.0      | 77.2  | 98.4             | 8396              | 9.24               | 615             | 818                       | 16792                  | 1230                    | 0.858               | 12.9 |

| Ulko-halkaisija  | Paksuus   | Paino | Poikki-pinta-ala | Jäyhyys-momentti  | Jäyhyys-säde       | Taivutus-vastus | Plastinen taivutus-vastus | Vääntöjäyhyys-momentti |                 | Ulko-puolinen pinta-ala | Noin pituus/tonni  |
|------------------|-----------|-------|------------------|-------------------|--------------------|-----------------|---------------------------|------------------------|-----------------|-------------------------|--------------------|
| Outside diameter | Thickness | Mass  | Sectional area   | Moment of inertia | Radius of gyration | Elastic modulus | Plastic modulus           | Torsional constants    |                 | Superficial area/m      | Appr. length/tonne |
| D                | T         | M     | A                | I                 | i                  | W <sub>el</sub> | W <sub>pl</sub>           | I <sub>t</sub>         | C <sub>t</sub>  | A <sub>s</sub>          |                    |
| mm               | mm        | kg/m  | cm <sup>2</sup>  | cm <sup>4</sup>   | cm                 | cm <sup>3</sup> | cm <sup>3</sup>           | cm <sup>4</sup>        | cm <sup>3</sup> | m <sup>2</sup> /m       | m                  |
| 323.9            | 12.5      | 80.3  | 102.0            | 8697              | 9.22               | 637             | 849                       | 17395                  | 1274            | 0.858                   | 12.5               |
|                  | 16.0      | 101.0 | 129.0            | 10707             | 9.10               | 784             | 1058                      | 21414                  | 1569            | 0.858                   | 9.9                |
|                  | 5.0       | 39.3  | 50.1             | 6369              | 11.3               | 393             | 509                       | 12739                  | 787             | 1.020                   | 25.4               |
| 323.9            | 6.0       | 47.0  | 59.9             | 7572              | 11.2               | 468             | 606                       | 15145                  | 935             | 1.020                   | 21.3               |
|                  | 8.0       | 62.3  | 79.4             | 9910              | 11.2               | 612             | 799                       | 19820                  | 1224            | 1.020                   | 16.0               |
|                  | 10.0      | 77.4  | 98.6             | 12158             | 11.1               | 751             | 986                       | 24317                  | 1501            | 1.020                   | 12.9               |
|                  | 12.0      | 92.3  | 118.0            | 14320             | 11.0               | 884             | 1168                      | 28639                  | 1768            | 1.020                   | 10.8               |
|                  | 12.5      | 96.0  | 122.0            | 14847             | 11.0               | 917             | 1213                      | 29693                  | 1833            | 1.020                   | 10.4               |
|                  | 16.0      | 121.0 | 155.0            | 18390             | 10.9               | 1136            | 1518                      | 36780                  | 2271            | 1.020                   | 8.2                |
|                  | 5.0       | 43.2  | 55.1             | 8464              | 12.4               | 476             | 615                       | 16927                  | 952             | 1.120                   | 23.1               |
| 355.6            | 6.0       | 51.7  | 65.9             | 10071             | 12.4               | 566             | 733                       | 20141                  | 1133            | 1.120                   | 19.3               |
|                  | 8.0       | 68.6  | 87.4             | 13201             | 12.3               | 742             | 967                       | 26403                  | 1485            | 1.120                   | 14.6               |
|                  | 10.0      | 85.2  | 109.0            | 16223             | 12.2               | 912             | 1195                      | 32447                  | 1825            | 1.120                   | 11.7               |
|                  | 12.0      | 102.0 | 130.0            | 19139             | 12.2               | 1076            | 1417                      | 38279                  | 2153            | 1.120                   | 9.8                |
|                  | 12.5      | 106.0 | 135.0            | 19852             | 12.1               | 1117            | 1472                      | 39704                  | 2233            | 1.120                   | 9.5                |
|                  | 16.0      | 134.0 | 171.0            | 24663             | 12.0               | 1387            | 1847                      | 49326                  | 2774            | 1.120                   | 7.5                |
| 406.4            | 6.0       | 59.2  | 75.5             | 15128             | 14.2               | 745             | 962                       | 30257                  | 1489            | 1.280                   | 16.9               |
|                  | 8.0       | 78.6  | 100.0            | 19874             | 14.1               | 978             | 1270                      | 39748                  | 1956            | 1.280                   | 12.7               |
|                  | 10.0      | 97.8  | 125.0            | 24476             | 14.0               | 1205            | 1572                      | 48952                  | 2409            | 1.280                   | 10.2               |
|                  | 12.0      | 117.0 | 149.0            | 28937             | 14.0               | 1424            | 1867                      | 57874                  | 2848            | 1.280                   | 8.6                |
|                  | 12.5      | 121.0 | 155.0            | 30031             | 13.9               | 1478            | 1940                      | 60061                  | 2956            | 1.280                   | 8.2                |
|                  | 16.0      | 154.0 | 196.0            | 37449             | 13.8               | 1843            | 2440                      | 74898                  | 3686            | 1.280                   | 6.5                |
| 457              | 6.0       | 66.7  | 85.0             | 21618             | 15.9               | 946             | 1220                      | 43236                  | 1892            | 1.440                   | 15.0               |
|                  | 8.0       | 88.6  | 113.0            | 28446             | 15.9               | 1245            | 1613                      | 56893                  | 2490            | 1.440                   | 11.3               |
|                  | 10.0      | 110.0 | 140.0            | 35091             | 15.8               | 1536            | 1998                      | 70183                  | 3071            | 1.440                   | 9.07               |
|                  | 12.0      | 132.0 | 168.0            | 41556             | 15.7               | 1819            | 2377                      | 83113                  | 3637            | 1.440                   | 7.59               |
|                  | 12.5      | 137.0 | 175.0            | 43145             | 15.7               | 1888            | 2470                      | 86290                  | 3776            | 1.440                   | 7.30               |
|                  | 16.0      | 174.0 | 222.0            | 53959             | 15.6               | 2361            | 3113                      | 107919                 | 4723            | 1.440                   | 5.75               |
| 508              | 6.0       | 74.3  | 95.0             | 29812             | 17.7               | 1174            | 1512                      | 59623                  | 2347            | 1.600                   | 13.5               |
|                  | 8.0       | 98.6  | 126.0            | 39280             | 17.7               | 1546            | 2000                      | 78560                  | 3093            | 1.600                   | 10.1               |
|                  | 10.0      | 123.0 | 156.0            | 48520             | 17.6               | 1910            | 2480                      | 97040                  | 3820            | 1.600                   | 8.14               |
|                  | 12.0      | 147.0 | 187.0            | 57536             | 17.5               | 2265            | 2953                      | 115072                 | 4530            | 1.600                   | 6.81               |
|                  | 12.5      | 153.0 | 195.0            | 59755             | 17.5               | 2353            | 3070                      | 119511                 | 4705            | 1.600                   | 6.55               |
|                  | 16.0      | 194.0 | 247.0            | 74909             | 17.4               | 2949            | 3874                      | 149818                 | 5898            | 1.600                   | 5.15               |