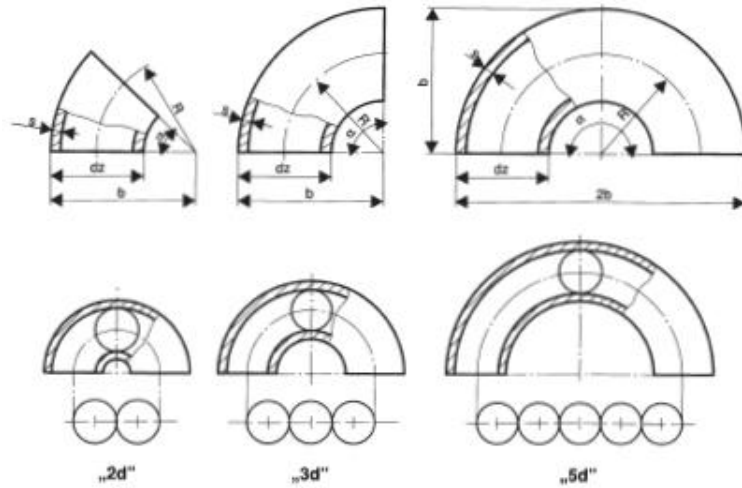


# KOLANA HAMBURSKIE

wg DIN 2605-1

materiał St37.0; St35.8; st45.8; S235; P235



| Średnica nominalna | Średnica zewn. | Grubość ścianki | Rodzaj       |      |        |
|--------------------|----------------|-----------------|--------------|------|--------|
|                    |                |                 | 2d           | 3d   | 5d     |
| DN                 | dz             | s               | Masa dla 90° |      |        |
| mm                 |                |                 | kg           |      |        |
| 15                 | 21.3           | 2.0             | R=17.5       | R=25 | R=42.5 |
|                    |                |                 | b=28         | b=38 | b=53   |
|                    |                |                 | 0.03         | 0.04 | 0.07   |
|                    |                | 2.3             | 0.03         | 0.05 | 0.07   |
|                    |                | 2.6             | 0.04         | 0.05 | 0.08   |
|                    |                | 2.9             | 0.04         | 0.06 | 0.09   |
|                    |                | 3.2             | 0.05         | 0.07 | 0.10   |
| 3.6                | 0.05           | 0.08            | 0.12         |      |        |
| 20                 | 26.9           | 2.3             | R=25         | R=29 | R=57.5 |
|                    |                |                 | b=39         | b=43 | b=71   |
|                    |                | 0.06            | 0.06         | 0.13 |        |
|                    |                | 2.6             | 0.06         | 0.07 | 0.14   |
|                    |                | 2.9             | 0.06         | 0.08 | 0.16   |
|                    |                | 3.2             | 0.07         | 0.09 | 0.17   |
|                    |                | 3.6             | 0.07         | 0.10 | 0.19   |
|                    |                | 4.0             | 0.08         | 0.10 | 0.21   |
| 4.5                | 0.09           | 0.11            | 0.24         |      |        |
| 25                 | 33.7           | 2.6             | R=25         | R=38 | R=72.5 |
|                    |                |                 | b=42         | b=56 | b=90   |
|                    |                |                 | 0.10         | 0.12 | 0.23   |
|                    |                | 2.9             | 0.11         | 0.13 | 0.25   |
|                    |                | 3.2             | 0.12         | 0.15 | 0.28   |
|                    |                | 3.6             | 0.13         | 0.16 | 0.31   |
|                    |                | 4.0             | 0.14         | 0.18 | 0.34   |
|                    |                | 4.5             | 0.14         | 0.20 | 0.37   |
| 5.0                | 0.15           | 0.21            | 0.41         |      |        |

| Średnica nominalna | Średnica zewn. | Grubość ścianki | Rodzaj       |      |        |
|--------------------|----------------|-----------------|--------------|------|--------|
|                    |                |                 | 2d           | 3d   | 5d     |
| DN                 | dz             | s               | Masa dla 90° |      |        |
| mm                 |                |                 | kg           |      |        |
| 32                 | 38.0           | 2.6             | R=32.5       | R=45 | R=82.5 |
|                    |                |                 | b=52         | b=64 | b=101  |
|                    |                |                 | 0.12         | 0.16 | 0.30   |
|                    |                | 2.9             | 0.13         | 0.18 | 0.33   |
|                    |                | 3.2             | 0.14         | 0.20 | 0.36   |
|                    |                | 3.6             | 0.16         | 0.22 | 0.40   |
|                    |                | 4.0             | 0.17         | 0.24 | 0.44   |
|                    | 42.4           | 2.6             | R=32         | R=48 | R=92.5 |
|                    |                |                 | b=53         | b=69 | b=114  |
|                    |                | 0.15            | 0.19         | 0.37 |        |
|                    |                | 2.9             | 0.17         | 0.21 | 0.41   |
|                    |                | 3.2             | 0.18         | 0.23 | 0.45   |
|                    |                | 3.6             | 0.21         | 0.26 | 0.50   |
|                    |                | 4.0             | 0.23         | 0.29 | 0.55   |
| 4.5                | 0.25           | 0.32            | 0.60         |      |        |
| 5.0                | 0.27           | 0.35            | 0.70         |      |        |
| 40                 | 44.5           | 2.6             | R=40         | R=51 | R=97.5 |
|                    |                |                 | b=62         | b=73 | b=130  |
|                    |                | 0.17            | 0.22         | 0.41 |        |
|                    | 2.9            | 0.19            | 0.24         | 0.46 |        |
|                    | 3.2            | 0.21            | 0.26         | 0.50 |        |
|                    | 3.6            | 0.23            | 0.29         | 0.56 |        |
|                    | 4.0            | 0.25            | 0.32         | 0.61 |        |

| Średnica nominalna | Średnica zewn. | Grubość ścianki | Rodzaj       |       |         |
|--------------------|----------------|-----------------|--------------|-------|---------|
|                    |                |                 | 2d           | 3d    | 5d      |
| DN                 | dz             | s               | Masa dla 90° |       |         |
| mm                 |                |                 | kg           |       |         |
| 40                 | 48.3           | 2.6             | R=38         | R=57  | R=107,5 |
|                    |                |                 | b=62         | b=81  | b=132   |
|                    |                |                 | 0.20         | 0.26  | 0.50    |
|                    |                | 2.9             | 0.22         | 0.29  | 0.55    |
|                    |                | 3.2             | 0.24         | 0.32  | 0.60    |
|                    |                | 3.6             | 0.27         | 0.36  | 0.67    |
|                    |                | 4.0             | 0.29         | 0.39  | 0.74    |
|                    |                | 4.5             | 0.33         | 0.44  | 0.82    |
| 5.0                | 0.37           | 0.48            | 0.90         |       |         |
| 50                 | 57.0           | 2.9             | R=52.5       | R=72  | R=127,5 |
|                    |                |                 | b=81         | b=100 | b=156   |
|                    |                |                 | 0.32         | 0.44  | 0.78    |
|                    |                | 3.2             | 0.35         | 0.48  | 0.85    |
|                    |                | 3.6             | 0.39         | 0.54  | 0.95    |
|                    |                | 4.0             | 0.43         | 0.59  | 1.05    |
|                    |                | 4.5             | 0.48         | 0.66  | 1.17    |
|                    |                | 5.0             | 0.53         | 0.73  | 1.29    |
|                    |                | 5.6             | 0.59         | 0.81  | 1.42    |
|                    | 6.3            | 0.65            | 0.89         | 1.58  |         |
|                    | 60.3           | 2.9             | R=51         | R=76  | R=135   |
|                    |                |                 | b=81         | b=106 | b=165   |
|                    |                |                 | 0.36         | 0.49  | 0.87    |
|                    |                | 3.2             | 0.39         | 0.54  | 0.96    |
|                    |                | 3.6             | 0.44         | 0.60  | 1.07    |
|                    |                | 4.0             | 0.48         | 0.67  | 1.17    |
|                    |                | 4.5             | 0.54         | 0.74  | 1.32    |
|                    |                | 5.0             | 0.59         | 0.82  | 1.45    |
| 5.6                |                | 0.66            | 0.90         | 1.60  |         |
| 6.3                | 0.73           | 1.00            | 1.78         |       |         |
| 7.1                | 0.78           | 1.11            | 1.90         |       |         |
| 65                 | 76.1           | 2.9             | R=63         | R=95  | R=175   |
|                    |                |                 | b=102        | b=133 | b=213   |
|                    |                |                 | 0.58         | 0.78  | 1.44    |
|                    |                | 3.2             | 0.64         | 0.86  | 1.58    |
|                    |                | 3.6             | 0.71         | 0.96  | 1.77    |
|                    |                | 4.0             | 0.78         | 1.06  | 1.96    |
|                    |                | 4.5             | 0.88         | 1.19  | 2.19    |
|                    |                | 5.0             | 0.97         | 1.31  | 2.41    |
|                    |                | 5.6             | 1.07         | 1.46  | 2.68    |
|                    |                | 6.3             | 1.19         | 1.62  | 2.98    |
| 7.1                | 1.33           | 1.81            | 3.32         |       |         |
| 8.0                | 1.48           | 2.01            | 3.70         |       |         |

| Średnica nominalna | Średnica zewn. | Grubość ścianki | Rodzaj       |       |       |
|--------------------|----------------|-----------------|--------------|-------|-------|
|                    |                |                 | 2d           | 3d    | 5d    |
| DN                 | dz             | s               | Masa dla 90° |       |       |
| mm                 |                |                 | kg           |       |       |
| 80                 | 88.9           | 3.2             | R=76         | R=114 | R=205 |
|                    |                |                 | b=121        | b=159 | b=250 |
|                    |                |                 | 0.88         | 1.22  | 2.18  |
|                    |                | 3.6             | 0.96         | 1.36  | 2.44  |
|                    |                | 4.0             | 1.09         | 1.51  | 2.70  |
|                    |                | 4.5             | 1.22         | 1.69  | 3.02  |
|                    |                | 5.0             | 1.34         | 1.86  | 3.33  |
|                    |                | 5.6             | 1.49         | 2.07  | 3.71  |
|                    |                | 6.3             | 1.67         | 2.31  | 4.13  |
|                    |                | 7.1             | 1.86         | 2.58  | 4.61  |
|                    |                | 8.0             | 2.07         | 2.87  | 5.14  |
|                    |                | 10.0            | 2.52         | 3.50  | 6.27  |
|                    |                | 100             | 108.0        | 3.6   | RM00  |
| b=154              | b=196          |                 |              |       | b=306 |
| 1.46               | 2.08           |                 |              |       | 3.68  |
| 4.0                | 1.61           |                 |              | 2.30  | 4.07  |
| 4.5                | 1.81           |                 |              | 2.57  | 4.56  |
| 5.0                | 2.00           |                 |              | 2.85  | 5.04  |
| 5.6                | 2.22           |                 |              | 3.17  | 5.61  |
| 6.3                | 2.48           |                 |              | 3.54  | 6.27  |
| 7.1                | 2.78           |                 |              | 3.96  | 7.01  |
| 8.0                | 3.10           |                 |              | 4.42  | 7.83  |
| 10.0               | 3.40           |                 | 3.50         | 9.59  |       |
| 114.3              | 3.6            |                 | R=102        | R=152 | R=270 |
|                    |                |                 | b=159        | b=210 | b=327 |
|                    |                |                 | 1.62         | 2.36  | 4.17  |
|                    | 4.0            |                 | 1.80         | 2.61  | 4.62  |
|                    | 4.5            |                 | 2.01         | 2.92  | 5.17  |
|                    | 5.0            |                 | 2.23         | 3.23  | 5.72  |
|                    | 5.6            |                 | 2.48         | 3.60  | 6.37  |
|                    | 6.3            |                 | 2.77         | 4.02  | 7.12  |
|                    | 7.1            |                 | 3.10         | 4.50  | 7.96  |
|                    | 8.0            | 3.40            | 5.03         | 8.90  |       |
| 10.0               | 4.24           | 6.16            | 10.90        |       |       |

| Średnica nominalna | Średnica zewn. | Grubość ścianki | Rodzaj       |       |         |
|--------------------|----------------|-----------------|--------------|-------|---------|
|                    |                |                 | 2d           | 3d    | 5d      |
| DN                 | dz             | s               | Masa dla 90° |       |         |
| mm                 |                |                 | kg           |       |         |
| 125                | 133.0          | 4.0             | R=125        | R=181 | R=321,5 |
|                    |                |                 | b=192        | b=247 | b=379   |
|                    |                |                 | 2.50         | 3.62  | 6.25    |
|                    |                | 4.5             | 2.80         | 4.06  | 7.00    |
|                    |                | 5.0             | 3.10         | 4.49  | 7.75    |
|                    |                | 5.6             | 3.46         | 5.00  | 8.64    |
|                    |                | 6.3             | 3.87         | 5.60  | 9.66    |
|                    |                | 7.1             | 4.33         | 6.27  | 10.8    |
|                    | 8.0            | 4.84            | 7.01         | 12.1  |         |
|                    | 139.7          | 4.0             | R=127        | R=190 | R=330   |
|                    |                |                 | b=197        | b=260 | b=400   |
|                    |                |                 | 2.79         | 4.01  | 6.94    |
|                    |                | 4.5             | 3.13         | 4.49  | 7.78    |
|                    |                | 5.0             | 3.46         | 4.97  | 8.61    |
| 5.6                |                | 3.86            | 5.54         | 9.60  |         |
| 6.3                |                | 4.32            | 6.20         | 10.8  |         |
| 7.1                |                | 4.63            | 6.95         | 12.0  |         |
| 8.0                | 5.41           | 7.78            | 13.5         |       |         |
| 150                | 159.0          | 4.5             | R=150        | R=216 | R=375   |
|                    |                |                 | b=230        | b=294 | b=454   |
|                    |                |                 | 4.04         | 5.82  | 10.1    |
|                    |                | 5.0             | 4.48         | 6.45  | 11.2    |
|                    |                | 5.6             | 4.99         | 7.19  | 12.5    |
|                    |                | 6.3             | 5.59         | 8.05  | 14.0    |
|                    |                | 7.1             | 6.27         | 9.03  | 15.7    |
|                    |                | 8.0             | 7.02         | 10.1  | 17.6    |
|                    |                | 8.8             | 7.68         | 11.1  | 19.2    |
|                    |                | 10.0            | 8.66         | 12.5  | 21.7    |
|                    | 14.0           | -               | 18.0         | -     |         |
|                    | 168.3          | 4.5             | R=152        | R=229 | R=390   |
|                    |                |                 | b=237        | b=313 | b=474   |
|                    |                |                 | 4.43         | 6.53  | 11.1    |
|                    |                | 5.0             | 4.90         | 7.23  | 12.3    |
|                    |                | 5.6             | 5.47         | 8.07  | 13.8    |
|                    |                | 6.3             | 6.13         | 9.04  | 15.4    |
|                    |                | 7.1             | 6.87         | 10.10 | 17.3    |
|                    |                | 8.0             | 7.70         | 11.40 | 19.4    |
|                    |                | 8.8             | 8.43         | 12.40 | 21.2    |
| 10.0               |                | 9.51            | 14.00        | 23.9  |         |

| Średnica nominalna | Średnica zewn. | Grubość ścianki | Rodzaj       |       |        |
|--------------------|----------------|-----------------|--------------|-------|--------|
|                    |                |                 | 2d           | 3d    | 5d     |
| DN                 | dz             | s               | Masa dla 90° |       |        |
| mm                 |                |                 | kg           |       |        |
| 200                | 219.1          | 6.3             | R=203        | R=305 | R=510  |
|                    |                |                 | b=313        | b=415 | b=620  |
|                    |                |                 | 10.9         | 15.8  | 26.5   |
|                    |                | 7.1             | 12.3         | 17.8  | 29.7   |
|                    |                | 8.0             | 13.7         | 20.0  | 33.4   |
|                    |                | 8.8             | 15.1         | 21.9  | 36.6   |
|                    |                | 10.0            | 17.0         | 24.7  | 41.3   |
|                    |                | 11.0            | 18.6         | 27.0  | 45.2   |
|                    |                | 12.5            | 21.0         | 30.5  | 51.0   |
|                    |                | 16.0            | 26.4         | 38.4  | 66.0   |
| 250                | 273.0          | 6.3             | R=254        | R=381 | R=650  |
|                    |                |                 | b=391        | b=518 | b=787  |
|                    |                |                 | 16.5         | 24.8  | 42.3   |
|                    |                | 7.1             | 18.6         | 27.9  | 47.5   |
|                    |                | 8.0             | 20.9         | 31.3  | 53.4   |
|                    |                | 8.8             | 22.9         | 34.3  | 58.5   |
|                    |                | 10.0            | 25.9         | 38.8  | 66.2   |
|                    |                | 11.0            | 28.4         | 42.5  | 72.6   |
| 12.5               | 32.0           | 48.1            | 82.0         |       |        |
| 300                | 323.9          | 7.1             | R=305        | R=457 | R=775  |
|                    |                |                 | b=467        | b=619 | b=937  |
|                    |                |                 | 26.6         | 39.8  | 67.5   |
|                    |                | 8.0             | 29.9         | 44.7  | 75.9   |
|                    |                | 8.8             | 32.8         | 49.1  | 83.3   |
|                    |                | 10.0            | 37.1         | 55.6  | 94.2   |
|                    |                | 11.0            | 40.7         | 60.9  | 103    |
| 12.5               | 46.0           | 68.9            | 117          |       |        |
| 350                | 355.6          | 8.0             | R=356        | R=533 | R=850  |
|                    |                |                 | b=533        | b=711 | b=1028 |
|                    |                |                 | 38.2         | 57.5  | 91.6   |
|                    |                | 8.8             | 42.0         | 63.1  | 101    |
|                    |                | 10.0            | 47.5         | 71.4  | 114    |
|                    |                | 11.0            | 52.1         | 76.3  | 125    |
| 12.5               | 59.0           | 88.6            | 141          |       |        |
| 14.2               | 66.7           | 100             | 160          |       |        |
| 400                | 406.4          | 8.0             | R=406        | R=610 | R=970  |
|                    |                |                 | b=610        | b=813 | b=1173 |
|                    |                |                 | 50.1         | 75.3  | 120    |
|                    |                | 8.8             | 55.1         | 82.6  | 132    |
|                    |                | 10.0            | 62.4         | 93.6  | 149    |
|                    |                | 11.0            | 68.5         | 103   | 163    |
|                    |                | 12.5            | 77.5         | 116   | 185    |
| 14.2               | 87.7           | 131             | 209          |       |        |

| Średnica nominalna | Średnica zewn. | Grubość ścianki | Rodzaj       |        |        |     |
|--------------------|----------------|-----------------|--------------|--------|--------|-----|
|                    |                |                 | 2d           | 3d     | 5d     |     |
| DN                 | dz             | s               | Masa dla 90° |        |        |     |
| mm                 |                |                 | kg           |        |        |     |
| 450                | 457.0          | 8.0             | R=457        | R=686  | R=1122 |     |
|                    |                |                 | b=686        | b=914  | b=1351 |     |
|                    |                |                 | 63.3         | 95.5   | 156    |     |
|                    |                |                 | 8.8          | 69.5   | 105    | 171 |
|                    |                |                 | 10.0         | 78.8   | 119    | 194 |
|                    |                |                 | 11.0         | 86.5   | 130    | 213 |
|                    |                |                 | 12.5         | 98     | 148    | 242 |
|                    | 14.2           | 111             | 167          | 274    |        |     |
| 500                | 508.0          | 8.0             | R=508        | R=762  | R=1245 |     |
|                    |                |                 | b=762        | b=1016 | b=1499 |     |
|                    |                |                 | 78.2         | 118    | 193    |     |
|                    |                |                 | 8.8          | 85.9   | 130    | 212 |
|                    |                |                 | 10.0         | 97.4   | 147    | 240 |
|                    |                |                 | 11.0         | 107    | 161    | 264 |
|                    |                |                 | 12.5         | 121    | 183    | 299 |
|                    | 14.2           | 137             | 207          | 338    |        |     |
| 600                | 610.0          | 10.0            | R=610        | R=914  | R=1525 |     |
|                    |                |                 | b=915        | b=1219 | b=1830 |     |
|                    |                |                 | 142          | 209    | 348    |     |
|                    |                |                 | 11.0         | 156    | 230    | 383 |
|                    |                |                 | 12.5         | 176    | 260    | 434 |
|                    |                |                 | 14.2         | 200    | 295    | 491 |
|                    |                |                 | 16.0         | 224    | 331    | 552 |
|                    | 17.5           | 245             | 361          | 602    |        |     |
| 700                | 711.0          | 10.0            | R=711        | R=1067 | R=1778 |     |
|                    |                |                 | b=1067       | b=1422 | b=2133 |     |
|                    |                |                 | 190          | 285    | 475    |     |
|                    |                |                 | 11.0         | 209    | 313    | 521 |
|                    |                |                 | 12.5         | 237    | 355    | 592 |
|                    |                |                 | 14.2         | 268    | 403    | 671 |
|                    | 16.0           | 302             | 452          | 754    |        |     |