



# FORGED STEEL **FLANGES**



## OUR FLANGES

Wolff is a well-known producer of forged steel flanges. Stainless steel, carbon steel, alloy steel, and special alloys are among the materials used to make our flanges.

Our flanges are manufactured in accordance with international standards for use in high pressure applications and difficult environments such as the oil and gas and petrochemicals industries.

We can achieve the highest levels of product quality, efficiency, and dependability thanks to modern equipment and highly qualified workforce. Integrating it with our unwavering quality management system results in a superior product for our customers.

### STANDARDS

- ANSI/ASME
- DIN
- EN1092-1
- BS4504
- JIS
- GOST
- AWWA

### TYPE

- WELD NECK
- SILP ON
- BLIND
- SOCKET WELD
- LAP JOING
- THREADED
- AS PER DRAWING

### MATERIAL

- STAINLESS STEEL
- CARBON STEEL
- ALLOY STEEL
- DUPLEX/SUPER DUPLEX STEEL
- HIGH NICKEL ALLOYS
- SPECIAL STEEL

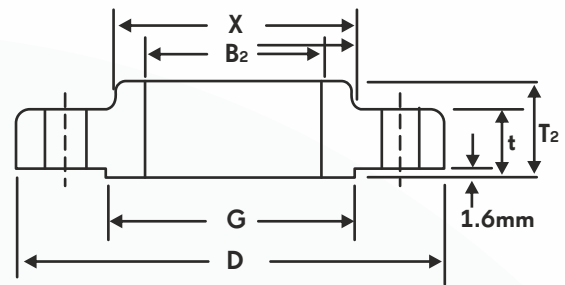
### SIZE

1/2" to 60"

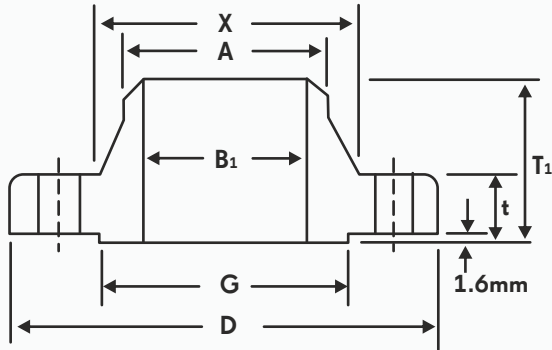
## SECTORS

Oil & Gas, Petrochemical, Chemical, Power, Pharamceuticals, Food Industry, Water, Steel Plants, Ship Building, And General Engineering

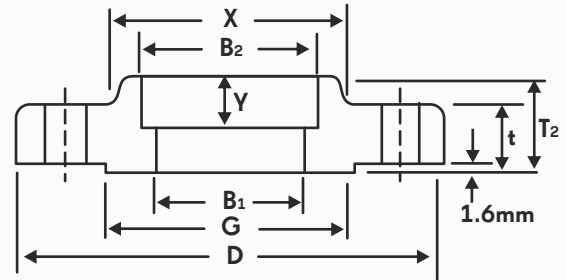
# CLASS 150 FLANGES



SLIP-ON



WELDING NECK

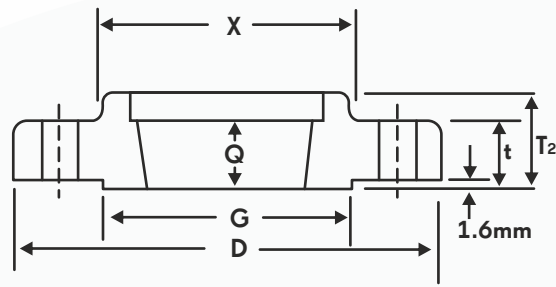


SOCKET WELDING

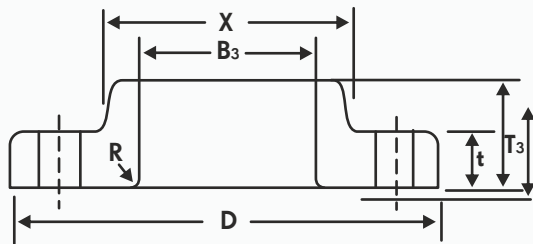
## ANSI B16.5 FORGED FLANGES

Unit: mm

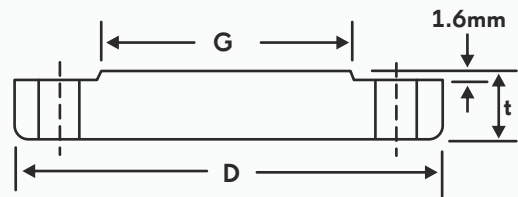
| Nominal<br>Pipe<br>Size<br>(NPS) | Outside<br>Diam | O. D. of<br>Raised<br>Face | At Base<br>of Hub | Thickenss<br>t | BORE                                 |                              |              | LENGTH THRU HUB |                                          |              | Diam of<br>Hub at<br>Bevel | Radius<br>of Fillet | Thread<br>Length |
|----------------------------------|-----------------|----------------------------|-------------------|----------------|--------------------------------------|------------------------------|--------------|-----------------|------------------------------------------|--------------|----------------------------|---------------------|------------------|
|                                  |                 |                            |                   |                | Welding<br>Neck<br>Socket<br>Welding | Slip-on<br>Socket<br>Welding | Lap<br>Joint | Welding<br>Neck | Slip-on<br>Threaded<br>Socket<br>Welding | Lap<br>Joint |                            |                     |                  |
|                                  |                 |                            |                   |                | B1                                   | B2                           | B3           | T1              | T2                                       | T3           | A                          | R                   | Q                |
| 1/2                              | 89              | 35.1                       | 30.2              | 11.2           | 15.7                                 | 22.4                         | 22.9         | 47.8            | 15.7                                     | 15.7         | 21.3                       | 3.0                 | 15.7             |
| 3/4                              | 99              | 42.9                       | 38.1              | 12.7           | 20.8                                 | 27.7                         | 28.2         | 52.3            | 15.7                                     | 15.7         | 26.7                       | 3.0                 | 15.7             |
| 1                                | 108             | 50.8                       | 49.3              | 14.2           | 26.7                                 | 34.5                         | 35.1         | 55.6            | 17.5                                     | 17.5         | 33.5                       | 3.0                 | 17.5             |
| 1 1/4                            | 117             | 63.5                       | 58.7              | 15.7           | 35.1                                 | 43.2                         | 43.7         | 57.2            | 20.6                                     | 20.6         | 42.2                       | 4.8                 | 20.6             |
| 1 1/2                            | 127             | 73.2                       | 65.0              | 17.5           | 40.9                                 | 49.5                         | 50.0         | 62.0            | 22.4                                     | 22.4         | 48.3                       | 6.4                 | 22.4             |
| 2                                | 152             | 91.9                       | 77.7              | 19.1           | 52.6                                 | 62.0                         | 62.5         | 63.5            | 25.4                                     | 25.4         | 60.5                       | 7.9                 | 25.4             |
| 2 1/2                            | 178             | 104.6                      | 90.4              | 22.4           | 62.7                                 | 74.7                         | 75.4         | 69.9            | 28.4                                     | 28.4         | 73.2                       | 7.9                 | 28.4             |
| 3                                | 191             | 127.0                      | 108.0             | 23.9           | 78.0                                 | 90.7                         | 91.4         | 69.9            | 30.2                                     | 30.2         | 88.9                       | 9.7                 | 30.2             |
| 3 1/2                            | 216             | 139.7                      | 122.2             | 23.9           | 90.2                                 | 103.4                        | 104.1        | 71.4            | 31.8                                     | 31.8         | 101.6                      | 9.7                 | 31.8             |
| 4                                | 229             | 157.2                      | 134.9             | 23.9           | 102.4                                | 116.1                        | 116.8        | 76.2            | 33.3                                     | 33.3         | 114.3                      | 11.2                | 33.3             |
| 5                                | 254             | 185.7                      | 163.6             | 23.9           | 128.3                                | 143.8                        | 144.5        | 88.9            | 36.6                                     | 36.6         | 141.2                      | 11.2                | 36.6             |
| 6                                | 279             | 215.9                      | 192.0             | 25.4           | 154.2                                | 170.7                        | 171.5        | 88.9            | 39.6                                     | 39.6         | 168.4                      | 12.7                | 39.6             |
| 8                                | 343             | 269.7                      | 246.1             | 28.4           | 202.7                                | 221.5                        | 222.3        | 101.6           | 44.5                                     | 44.5         | 219.2                      | 12.7                | 44.5             |
| 10                               | 406             | 323.9                      | 304.8             | 30.2           | 254.5                                | 276.4                        | 277.4        | 101.6           | 49.3                                     | 49.3         | 273.1                      | 12.7                | 49.3             |
| 12                               | 483             | 381.0                      | 368.3             | 31.8           | 304.8                                | 327.2                        | 328.2        | 114.3           | 55.6                                     | 55.6         | 323.9                      | 12.7                | 55.6             |
| 14                               | 533             | 412.8                      | 400.1             | 35.1           | 336.6                                | 359.2                        | 360.2        | 127.0           | 57.2                                     | 79.2         | 355.6                      | 12.7                | 57.2             |
| 16                               | 597             | 469.9                      | 457.2             | 36.6           | 387.1                                | 410.5                        | 411.2        | 127.0           | 63.5                                     | 87.4         | 406.4                      | 12.7                | 63.5             |
| 18                               | 635             | 533.4                      | 505.0             | 39.6           | 438.2                                | 461.8                        | 462.3        | 139.7           | 68.3                                     | 96.8         | 457.2                      | 12.7                | 68.3             |
| 20                               | 699             | 584.2                      | 558.8             | 42.9           | 489.0                                | 513.1                        | 514.4        | 144.5           | 73.2                                     | 103.1        | 508.0                      | 12.7                | 73.2             |
| 24                               | 813             | 692.2                      | 663.4             | 47.8           | 590.6                                | 616.0                        | 616.0        | 152.4           | 82.6                                     | 111.3        | 609.6                      | 12.7                | 82.6             |



**THREADED**



**LAP JOINT**



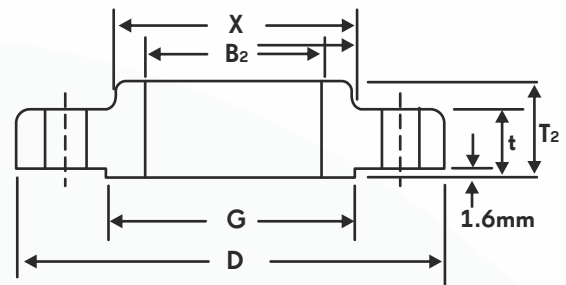
**BLIND**

## ANSI B16.5 FORGED FLANGES

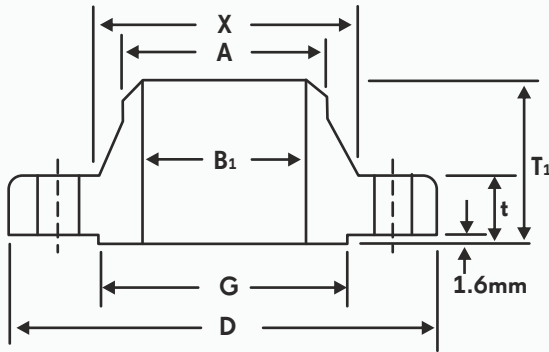
Unit: mm

| Nominal<br>Pipe<br>Size<br>(NPS) | Depth<br>of<br>Socket<br><br>Y | DRILLING               |                       |                     | BOLTING                       |                           |                |                     | APPROXIMATE WEIGHT        |                                      |                        |                 |                             |
|----------------------------------|--------------------------------|------------------------|-----------------------|---------------------|-------------------------------|---------------------------|----------------|---------------------|---------------------------|--------------------------------------|------------------------|-----------------|-----------------------------|
|                                  |                                | Bolt<br>Circle<br>Diam | Number<br>of<br>Holes | Diam<br>of<br>Holes | Diam<br>of<br>Bolts<br>(inch) | Machine<br>Bolt<br>Length |                | Stud Bolt<br>Length | Welding<br>Neck<br><br>Kg | Slip-on<br>and<br>Threaded<br><br>Kg | Lap<br>Joint<br><br>Kg | Blind<br><br>Kg | Socket<br>Welding<br><br>Kg |
|                                  |                                |                        |                       |                     |                               | Raised<br>Face            | Raised<br>Face |                     |                           |                                      |                        |                 |                             |
| 1/2                              | 9.7                            | 60.5                   | 4                     | 15.7                | 1/2                           | 50.8                      | 57.2           | -                   | 0.52                      | 0.47                                 | 0.51                   | 0.47            | 0.47                        |
| 3/4                              | 11.2                           | 69.9                   | 4                     | 15.7                | 1/2                           | 50.8                      | 63.5           | -                   | 0.92                      | 0.75                                 | 0.70                   | 0.63            | 0.76                        |
| 1                                | 12.7                           | 79.2                   | 4                     | 15.7                | 1/2                           | 57.2                      | 63.5           | 76.2                | 1.10                      | 0.86                                 | 0.93                   | 0.95            | 0.87                        |
| 1 1/4                            | 14.2                           | 88.9                   | 4                     | 15.7                | 1/2                           | 57.2                      | 69.9           | 82.6                | 1.40                      | 1.40                                 | 1.40                   | 1.40            | 1.43                        |
| 1 1/2                            | 15.7                           | 98.6                   | 4                     | 15.7                | 1/2                           | 63.5                      | 69.9           | 82.6                | 1.81                      | 1.41                                 | 1.51                   | 1.62            | 1.45                        |
| 2                                | 17.5                           | 120.7                  | 4                     | 19.1                | 5/8                           | 69.9                      | 82.6           | 95.3                | 2.80                      | 2.26                                 | 2.38                   | 2.64            | 2.33                        |
| 2 1/2                            | 19.1                           | 139.7                  | 4                     | 19.1                | 5/8                           | 76.2                      | 88.9           | 101.6               | 4.28                      | 3.43                                 | 3.60                   | 4.06            | 3.55                        |
| 3                                | 20.6                           | 152.4                  | 4                     | 19.1                | 5/8                           | 76.2                      | 88.9           | 101.6               | 5.18                      | 4.00                                 | 4.04                   | 5.00            | 4.15                        |
| 3 1/2                            | 22.4                           | 177.8                  | 8                     | 19.1                | 5/8                           | 76.2                      | 88.9           | 101.6               | 5.50                      | 5.00                                 | 4.99                   | 5.90            | 5.00                        |
| 4                                | 23.9                           | 190.5                  | 8                     | 19.1                | 5/8                           | 76.2                      | 88.9           | 101.6               | 7.32                      | 5.75                                 | 5.96                   | 7.50            | 5.99                        |
| 5                                | 23.9                           | 215.9                  | 8                     | 22.4                | 3/4                           | 82.6                      | 95.3           | 108.8               | 8.91                      | 6.51                                 | 6.44                   | 9.00            | 6.96                        |
| 6                                | 26.9                           | 241.3                  | 8                     | 22.4                | 3/4                           | 82.6                      | 101.6          | 114.3               | 11.26                     | 7.81                                 | 7.70                   | 12.00           | 8.41                        |
| 8                                | 31.8                           | 298.5                  | 8                     | 22.4                | 3/4                           | 88.9                      | 108.0          | 120.7               | 18.00                     | 13.00                                | 12.66                  | 20.00           | 13.93                       |
| 10                               | 33.3                           | 362.0                  | 12                    | 25.4                | 7/8                           | 101.6                     | 114.3          | 127.0               | 25.00                     | 17.10                                | 17.00                  | 30.00           | 19.50                       |
| 12                               | 39.6                           | 431.8                  | 12                    | 25.4                | 7/8                           | 101.6                     | 120.7          | 133.4               | 38.98                     | 27.68                                | 28.30                  | 44.00           | 29.03                       |
| 14                               | 41.4                           | 476.3                  | 12                    | 28.4                | 1                             | 114.3                     | 133.4          | 146.1               | 51.71                     | 35.20                                | 41.50                  | 64.00           | 38.56                       |
| 16                               | 44.5                           | 539.8                  | 16                    | 28.4                | 1                             | 114.3                     | 133.4          | 146.1               | 64.41                     | 45.00                                | 52.98                  | 78.00           | 47.37                       |
| 18                               | 49.3                           | 577.9                  | 16                    | 31.8                | 1 1/8                         | 127.0                     | 146.1          | 158.8               | 74.84                     | 54.00                                | 68.00                  | 95.00           | 58.72                       |
| 20                               | 54.1                           | 635.0                  | 20                    | 31.8                | 1 1/8                         | 139.7                     | 158.8          | 171.5               | 89.36                     | 73.00                                | 85.00                  | 125.00          | 77.81                       |
| 24                               | 63.5                           | 749.0                  | 20                    | 35.1                | 1 1/4                         | 152.4                     | 171.5          | 184.2               | 119.66                    | 96.00                                | 120.00                 | 190.00          | 100.75                      |

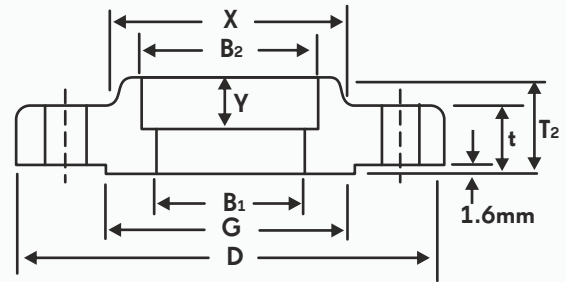
# CLASS 300 FLANGES



**SLIP-ON**



**WELDING NECK**

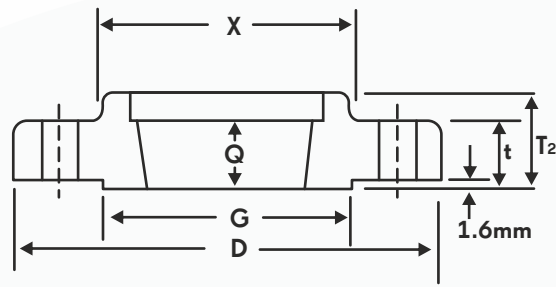


**SOCKET WELDING**

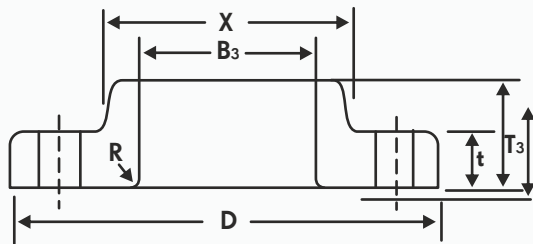
## ANSI B16.5 FORGED FLANGES

Unit: mm

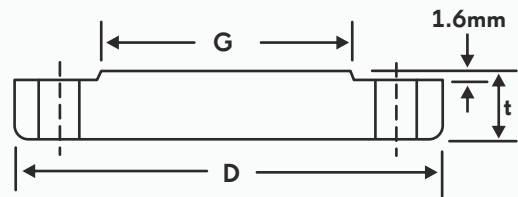
| Nominal<br>Pipe<br>Size<br>(NPS) | Outside<br>Diam | Diam at<br>Base of<br>Hub | O. D. of<br>Raised<br>Face | Thick -<br>ness | BORE                                 |                              |              |                                             | LENGTH THRU HUB |                                          |              | Diam of<br>Hub at<br>Bevel | Radius<br>of<br>Fillet | Threaded<br>Length |
|----------------------------------|-----------------|---------------------------|----------------------------|-----------------|--------------------------------------|------------------------------|--------------|---------------------------------------------|-----------------|------------------------------------------|--------------|----------------------------|------------------------|--------------------|
|                                  |                 |                           |                            |                 | Welding<br>Neck<br>Socket<br>Welding | Slip-on<br>Socket<br>Welding | Lap<br>Joint | Counter<br>Bore<br>Min.<br>Threaded<br>Min. | Welding<br>Neck | Slip-on<br>Threaded<br>Socket<br>Welding | Lap<br>Joint |                            |                        |                    |
| 1/2                              | 95              | 38.1                      | 35.1                       | 14.2            | 15.7                                 | 22.4                         | 22.9         | 23.6                                        | 52.3            | 22.4                                     | 22.4         | 21.3                       | 3.0                    | 15.7               |
| 3/4                              | 117             | 47.8                      | 42.9                       | 15.7            | 20.8                                 | 27.7                         | 28.2         | 29.0                                        | 57.2            | 25.4                                     | 25.4         | 26.7                       | 3.0                    | 15.7               |
| 1                                | 124             | 53.8                      | 50.8                       | 17.5            | 26.7                                 | 34.5                         | 35.1         | 35.8                                        | 62.0            | 26.9                                     | 26.9         | 33.5                       | 3.0                    | 17.5               |
| 1 1/4                            | 133             | 63.5                      | 63.5                       | 19.1            | 35.1                                 | 43.2                         | 43.7         | 44.5                                        | 65.0            | 26.9                                     | 26.9         | 42.2                       | 4.8                    | 20.6               |
| 1 1/2                            | 155             | 69.9                      | 73.2                       | 20.6            | 40.9                                 | 49.5                         | 50.0         | 50.5                                        | 68.3            | 30.2                                     | 30.2         | 48.3                       | 6.4                    | 22.4               |
| 2                                | 165             | 84.1                      | 91.9                       | 22.1            | 52.6                                 | 62.0                         | 62.5         | 63.5                                        | 69.9            | 33.3                                     | 33.3         | 60.5                       | 7.9                    | 28.4               |
| 2 1/2                            | 191             | 100.1                     | 104.6                      | 25.4            | 62.7                                 | 74.7                         | 75.4         | 76.2                                        | 76.2            | 38.1                                     | 38.1         | 73.2                       | 7.9                    | 31.8               |
| 3                                | 210             | 117.3                     | 127.0                      | 28.4            | 78.0                                 | 90.7                         | 91.4         | 92.2                                        | 79.2            | 42.9                                     | 42.9         | 88.9                       | 9.7                    | 31.8               |
| 3 1/2                            | 229             | 133.4                     | 139.7                      | 30.2            | 90.2                                 | 103.4                        | 104.1        | 104.9                                       | 81.0            | 44.5                                     | 44.5         | 101.6                      | 9.7                    | 36.6               |
| 4                                | 254             | 146.1                     | 157.2                      | 31.8            | 102.4                                | 116.1                        | 116.8        | 117.6                                       | 85.9            | 47.8                                     | 47.8         | 114.3                      | 11.2                   | 36.6               |
| 5                                | 279             | 177.8                     | 185.7                      | 35.1            | 123.3                                | 143.8                        | 144.5        | 144.5                                       | 98.6            | 50.8                                     | 50.8         | 141.2                      | 11.2                   | 42.9               |
| 6                                | 318             | 206.2                     | 215.9                      | 36.6            | 154.2                                | 170.7                        | 171.5        | 171.5                                       | 98.6            | 52.6                                     | 52.3         | 168.4                      | 12.7                   | 46.0               |
| 8                                | 381             | 260.4                     | 269.7                      | 41.1            | 202.7                                | 221.5                        | 222.3        | 222.3                                       | 111.3           | 62.0                                     | 62.0         | 219.2                      | 12.7                   | 50.8               |
| 10                               | 445             | 320.5                     | 323.9                      | 47.8            | 254.5                                | 276.4                        | 277.4        | 276.4                                       | 117.3           | 66.5                                     | 95.3         | 273.1                      | 12.7                   | 55.6               |
| 12                               | 521             | 374.7                     | 381.0                      | 50.8            | 304.8                                | 327.2                        | 328.2        | 328.7                                       | 130.0           | 73.2                                     | 101.6        | 323.9                      | 12.7                   | 60.5               |
| 14                               | 584             | 425.5                     | 512.8                      | 53.8            | 336.6                                | 359.2                        | 360.2        | 360.4                                       | 142.7           | 76.2                                     | 111.3        | 355.6                      | 12.7                   | 63.5               |
| 16                               | 648             | 482.6                     | 469.9                      | 57.2            | 387.4                                | 410.5                        | 411.2        | 411.2                                       | 146.1           | 82.6                                     | 120.7        | 406.4                      | 12.7                   | 68.3               |
| 18                               | 711             | 533.4                     | 533.4                      | 60.5            | 438.2                                | 461.8                        | 462.3        | 462.0                                       | 158.8           | 88.9                                     | 130.0        | 457.2                      | 12.7                   | 69.9               |
| 20                               | 775             | 587.2                     | 584.2                      | 63.5            | 489.0                                | 513.1                        | 514.4        | 512.8                                       | 162.1           | 95.3                                     | 139.7        | 508.0                      | 12.7                   | 73.2               |
| 24                               | 914             | 701.5                     | 692.2                      | 69.9            | 590.6                                | 616.0                        | 616.0        | 614.4                                       | 168.1           | 106.4                                    | 152.4        | 609.6                      | 12.7                   | 82.6               |



**THREADED**



**LAP JOINT**



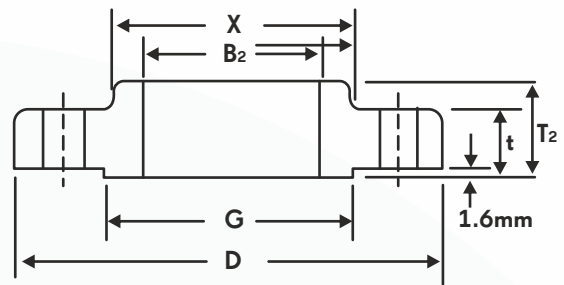
**BLIND**

## ANSI B16.5 FORGED FLANGES

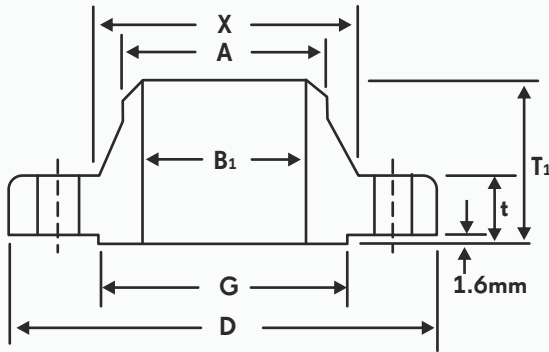
Unit: mm

| Nominal<br><br>Pipe<br>Size<br>(NPS) | Depth<br><br>of<br>Socket<br><br>Y | DRILLING               |                       |                     | BOLTING                       |                                                 |                                                              |        | APPROXIMATE WEIGHT        |                                      |                        |                 |                             |
|--------------------------------------|------------------------------------|------------------------|-----------------------|---------------------|-------------------------------|-------------------------------------------------|--------------------------------------------------------------|--------|---------------------------|--------------------------------------|------------------------|-----------------|-----------------------------|
|                                      |                                    | Bolt<br>Circle<br>Diam | Number<br>of<br>Holes | Diam<br>of<br>Holes | Diam<br>of<br>Bolts<br>(inch) | Machine<br>Bolt<br>Length<br><br>Raised<br>Face | Stud Bolt<br>Length<br><br>Raised<br>Face      Ring<br>Joint |        | Welding<br>Neck<br><br>Kg | Slip-on<br>and<br>Threaded<br><br>Kg | Lap<br>Joint<br><br>Kg | Blind<br><br>Kg | Socket<br>Welding<br><br>Kg |
|                                      |                                    |                        |                       |                     |                               |                                                 |                                                              |        |                           |                                      |                        |                 |                             |
| 1/2                                  | 9.7                                | 66.5                   | 4                     | 15.7                | 1/2                           | 57.2                                            | 63.5                                                         | 76.2   | 0.80                      | 0.62                                 | 0.61                   | 0.65            | 0.62                        |
| 3/4                                  | 11.2                               | 82.6                   | 4                     | 19.1                | 5/8                           | 6.35                                            | 76.2                                                         | 88.9   | 0.40                      | 1.30                                 | 1.30                   | 1.40            | 1.34                        |
| 1                                    | 12.7                               | 88.9                   | 4                     | 19.1                | 5/8                           | 63.5                                            | 76.2                                                         | 88.9   | 1.64                      | 1.50                                 | 1.50                   | 1.50            | 1.55                        |
| 1 <sup>1/4</sup>                     | 14.2                               | 98.6                   | 4                     | 19.1                | 5/8                           | 69.9                                            | 82.6                                                         | 95.3   | 2.10                      | 1.70                                 | 1.70                   | 2.8             | 1.76                        |
| 1 <sup>1/2</sup>                     | 15.7                               | 114.3                  | 4                     | 22.4                | 3/4                           | 76.2                                            | 88.9                                                         | 101.6  | 3.06                      | 2.60                                 | 2.60                   | 2.8             | 2.69                        |
| 2                                    | 17.5                               | 127.0                  | 4                     | 19.1                | 5/8                           | 76.2                                            | 88.9                                                         | 101.6  | 3.50                      | 3.00                                 | 3.00                   | 3.30            | 3.14                        |
| 2 <sup>1/2</sup>                     | 19.1                               | 149.4                  | 4                     | 22.4                | 3/4                           | 82.6                                            | 101.6                                                        | 114.3  | 5.31                      | 4.50                                 | 4.50                   | 5.40            | 4.75                        |
| 3                                    | 20.6                               | 168.1                  | 4                     | 22.4                | 3/4                           | 88.9                                            | 108.0                                                        | 120.7  | 7.32                      | 5.90                                 | 5.80                   | 7.00            | 6.29                        |
| 3 <sup>1/2</sup>                     | 22.4                               | 184.2                  | 8                     | 22.4                | 3/4                           | 95.3                                            | 108.0                                                        | 127.06 | 8.20                      | 7.72                                 | 7.72                   | 9.53            |                             |
| 4                                    | 23.9                               | 200.2                  | 8                     | 22.4                | 3/4                           | 95.3                                            | 114.3                                                        | 127.0  | 11.30                     | 10.13                                | 10.07                  | 12.00           |                             |
| 5                                    | 23.9                               | 235.0                  | 8                     | 22.4                | 3/4                           | 108.0                                           | 120.7                                                        | 133.4  | 15.12                     | 13.00                                | 13.00                  | 16.00           |                             |
| 6                                    | 26.9                               | 269.7                  | 12                    | 22.4                | 3/4                           | 108.0                                           | 120.7                                                        | 139.7  | 20.00                     | 17.00                                | 16.00                  | 22.00           |                             |
| 8                                    | 31.8                               | 330.2                  | 12                    | 25.4                | 7/8                           | 120.7                                           | 139.7                                                        | 152.4  | 30.48                     | 26.00                                | 25.00                  | 36.00           |                             |
| 10                                   | 33.3                               | 387.4                  | 16                    | 28.4                | 1                             | 139.7                                           | 158.8                                                        | 171.5  | 43.74                     | 34.16                                | 39.92                  | 55.34           |                             |
| 12                                   | 39.6                               | 450.9                  | 16                    | 31.8                | 1 <sup>1/8</sup>              | 146.1                                           | 171.5                                                        | 184.2  | 64.41                     | 51.26                                | 60.00                  | 80.00           |                             |
| 14                                   | 41.4                               | 514.4                  | 20                    | 31.8                | 1 <sup>1/8</sup>              | 158.8                                           | 177.8                                                        | 190.5  | 88.30                     | 75.20                                | 85.00                  | 110.00          |                             |
| 16                                   | 44.5                               | 571.5                  | 20                    | 35.1                | 1 <sup>1/4</sup>              | 165.1                                           | 190.5                                                        | 203.2  | 115.00                    | 95.00                                | 112.00                 | 139.25          |                             |
| 18                                   | 49.3                               | 628.7                  | 24                    | 35.1                | 1 <sup>1/4</sup>              | 171.5                                           | 196.9                                                        | 209.6  | 143.00                    | 109.00                               | 135.00                 | 178.00          |                             |
| 20                                   | 54.1                               | 685.8                  | 24                    | 35.8                | 1 <sup>1/4</sup>              | 184.2                                           | 203.2                                                        | 222.3  | 175.00                    | 136.00                               | 165.00                 | 223.17          |                             |
| 24                                   | 63.5                               | 812.8                  | 24                    | 41.1                | 1 <sup>1/2</sup>              | 203.2                                           | 228.6                                                        | 254.0  | 260.00                    | 245.00                               | 250.00                 | 355.00          |                             |

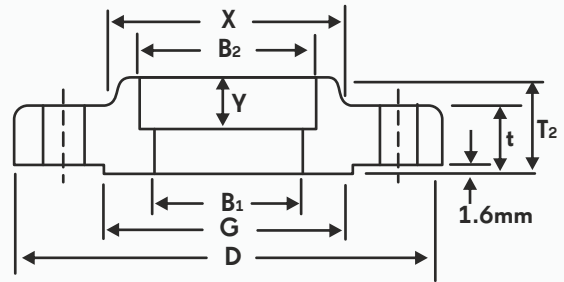
# CLASS 600 FLANGES



**SLIP-ON**



**WELDING NECK**

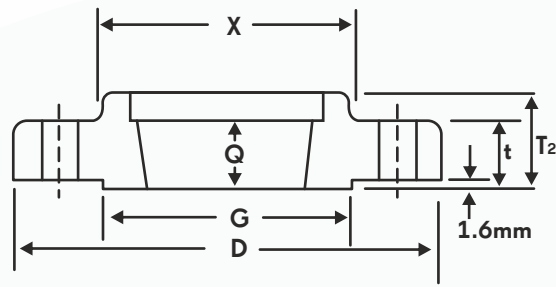


**SOCKET WELDING**

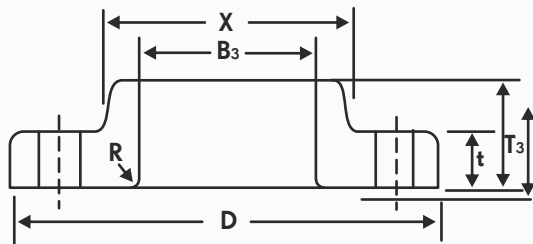
## ANSI B16.5 FORGED FLANGES

Unit: mm

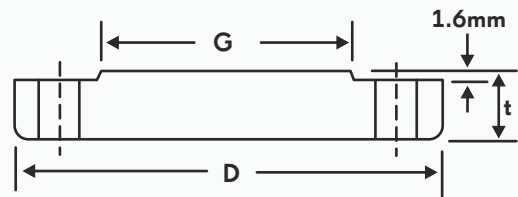
| Nominal<br>Pipe<br>Size<br>(NPS) | Outside<br>Diam | Diam at<br>Base of<br>Hub | O. D. of<br>Raised<br>Face | Thick -<br>ness | BORE                                      |                              |              |                                             | LENGTH THRU HUB |                                          |              | Diam of<br>Hub at<br>Bevel | Radius<br>of<br>Fillet | Threaded<br>Length |
|----------------------------------|-----------------|---------------------------|----------------------------|-----------------|-------------------------------------------|------------------------------|--------------|---------------------------------------------|-----------------|------------------------------------------|--------------|----------------------------|------------------------|--------------------|
|                                  |                 |                           |                            |                 | Welding<br>Neck<br>Socket<br>Welding      | Slip-on<br>Socket<br>Welding | Lap<br>Joint | Counter<br>Bore<br>Min.<br>Threaded<br>Min. | Welding<br>Neck | Slip-on<br>Threaded<br>Socket<br>Welding | Lap<br>Joint |                            |                        |                    |
|                                  |                 |                           |                            |                 | B1                                        | B2                           | B3           | B                                           | T1              | T2                                       | T3           | A                          | R                      | Q                  |
| 1/2                              | 95              | 38.1                      | 35.1                       | 14.2            |                                           | 22.4                         | 22.9         | 23.6                                        | 52.3            | 22.4                                     | 22.4         | 21.3                       | 3.0                    | 15.7               |
| 3/4                              | 117             | 47.8                      | 42.9                       | 15.7            |                                           | 27.7                         | 28.2         | 29.0                                        | 57.2            | 25.4                                     | 25.4         | 26.7                       | 3.0                    | 15.7               |
| 1                                | 124             | 53.8                      | 50.8                       | 17.5            |                                           | 34.5                         | 35.1         | 35.8                                        | 62.0            | 26.9                                     | 26.9         | 33.5                       | 3.0                    | 17.5               |
| 1 1/4                            | 133             | 63.5                      | 63.5                       | 20.6            |                                           | 43.2                         | 43.7         | 44.5                                        | 66.5            | 28.4                                     | 28.4         | 42.2                       | 4.8                    | 20.6               |
| 1 1/2                            | 155             | 69.9                      | 73.2                       | 22.4            |                                           | 49.5                         | 50.0         | 50.5                                        | 69.3            | 31.8                                     | 31.8         | 48.3                       | 6.4                    | 22.4               |
| 2                                | 165             | 84.1                      | 91.9                       | 25.4            |                                           | 62.0                         | 62.5         | 63.5                                        | 73.2            | 36.6                                     | 36.6         | 60.5                       | 7.9                    | 28.4               |
| 2 1/2                            | 191             | 100.1                     | 104.6                      | 28.4            | See Note (1) To be specified by purchaser | 74.7                         | 75.4         | 76.2                                        | 79.2            | 41.1                                     | 41.1         | 73.2                       | 7.9                    | 31.8               |
| 3                                | 210             | 117.3                     | 127.0                      | 31.8            |                                           | 90.7                         | 91.4         | 92.2                                        | 82.6            | 46.0                                     | 46.0         | 88.9                       | 9.7                    | 35.8               |
| 3 1/2                            | 229             | 133.4                     | 139.7                      | 35.1            |                                           | 103.4                        | 104.1        | 104.9                                       | 85.9            | 49.3                                     | 49.3         | 101.6                      | 9.7                    | 39.6               |
| 4                                | 273             | 152.4                     | 157.2                      | 38.1            |                                           | 116.1                        | 116.8        | 117.6                                       | 101.6           | 53.8                                     | 53.8         | 114.3                      | 11.2                   | 41.1               |
| 5                                | 330             | 189.0                     | 185.7                      | 44.5            |                                           | 143.8                        | 144.5        | 144.5                                       | 114.3           | 60.5                                     | 60.5         | 141.2                      | 11.2                   | 47.8               |
| 6                                | 356             | 222.3                     | 215.9                      | 47.8            |                                           | 170.7                        | 171.5        | 171.5                                       | 117.3           | 66.5                                     | 66.5         | 168.4                      | 12.7                   | 50.8               |
| 8                                | 419             | 273.1                     | 269.7                      | 55.6            |                                           | 221.5                        | 222.3        | 222.3                                       | 133.4           | 76.2                                     | 76.2         | 219.2                      | 12.7                   | 57.2               |
| 10                               | 508             | 342.9                     | 323.9                      | 63.5            |                                           | 276.4                        | 277.4        | 276.4                                       | 152.4           | 85.9                                     | 111.3        | 273.1                      | 12.7                   | 65.0               |
| 12                               | 559             | 400.1                     | 381.0                      | 66.45           |                                           | 327.2                        | 328.2        | 328.7                                       | 155.4           | 91.9                                     | 117.3        | 323.9                      | 12.7                   | 69.9               |
| 14                               | 603             | 431.8                     | 412.8                      | 69.9            |                                           | 359.2                        | 360.2        | 360.4                                       | 165.1           | 93.7                                     | 127.0        | 355.6                      | 12.7                   | 73.2               |
| 16                               | 686             | 495.3                     | 469.9                      | 76.2            |                                           | 510.5                        | 411.2        | 411.2                                       | 177.8           | 106.4                                    | 139.7        | 406.4                      | 12.7                   | 77.7               |
| 18                               | 743             | 546.1                     | 533.4                      | 82.6            |                                           | 461.8                        | 462.3        | 462.0                                       | 184.2           | 117.3                                    | 152.4        | 457.2                      | 12.7                   | 79.2               |
| 20                               | 813             | 609.6                     | 584.2                      | 88.9            |                                           | 513.1                        | 514.4        | 512.8                                       | 190.5           | 127.0                                    | 165.1        | 508.0                      | 12.7                   | 82.6               |
| 24                               | 940             | 717.6                     | 692.2                      | 101.6           |                                           | 616.0                        | 616.0        | 614.4                                       | 203.2           | 139.7                                    | 184.2        | 609.6                      | 12.7                   | 91.9               |



**THREADED**



**LAP JOINT**



**BLIND**

## ANSI B16.5 FORGED FLANGES

Unit: mm

| Nominal<br>Pipe<br>Size<br>(NPS) | Depth<br>of<br>Socket<br>Y | DRILLING               |                       |                     | BOLTING                       |                         |                                |               | APPROXIMATE WEIGHT    |                                  |                    |             |                         |
|----------------------------------|----------------------------|------------------------|-----------------------|---------------------|-------------------------------|-------------------------|--------------------------------|---------------|-----------------------|----------------------------------|--------------------|-------------|-------------------------|
|                                  |                            | Bolt<br>Circle<br>Diam | Number<br>of<br>Holes | Diam<br>of<br>Holes | Diam<br>of<br>Bolts<br>(inch) | Stud Bolt Length        |                                |               | Welding<br>Neck<br>Kg | Slip-on<br>and<br>Threaded<br>Kg | Lap<br>Joint<br>Kg | Blind<br>Kg | Socket<br>Welding<br>Kg |
|                                  |                            |                        |                       |                     |                               | 0.25"<br>Raised<br>Face | Malefemale<br>Tongue<br>Groove | Ring<br>Joint |                       |                                  |                    |             |                         |
| 1/2                              | 9.7                        | 66.5                   | 4                     | 15.7                | 1/2                           | 76.2                    | 69.9                           | 76.2          | 0.98                  | 0.98                             | 0.98               | 0.98        | 0.98                    |
| 3/4                              | 11.2                       | 82.6                   | 4                     | 19.1                | 5/8                           | 88.9                    | 82.6                           | 88.9          | 1.60                  | 1.40                             | 1.40               | 1.40        | 1.36                    |
| 1                                | 12.7                       | 88.9                   | 4                     | 15.7                | 5/8                           | 88.9                    | 82.6                           | 88.9          | 2.00                  | 2.00                             | 2.00               | 2.00        | 2.11                    |
| 1 1/4                            | 14.2                       | 98.6                   | 4                     | 19.1                | 5/8                           | 95.3                    | 88.9                           | 95.3          | 2.80                  | 2.70                             | 2.70               | 2.70        | 3.03                    |
| 1 1/2                            | 15.7                       | 114.3                  | 4                     | 22.4                | 3/4                           | 108.0                   | 101.6                          | 108.0         | 3.80                  | 3.80                             | 3.80               | 3.80        | 3.88                    |
| 2                                | 17.5                       | 127.0                  | 8                     | 19.1                | 5/8                           | 108.0                   | 101.6                          | 108.0         | 4.54                  | 4.10                             | 4.00               | 4.60        | 4.37                    |
| 2 1/2                            | 19.1                       | 149.4                  | 8                     | 22.4                | 3/4                           | 120.7                   | 114.3                          | 120.7         | 8.20                  | 5.90                             | 5.90               | 6.80        | 6.36                    |
| 3                                | 20.6                       | 168.1                  | 8                     | 22.4                | 3/4                           | 127.0                   | 120.7                          | 127.0         | 8.80                  | 7.30                             | 7.30               | 8.90        |                         |
| 3 1/2                            | 22.4                       | 184.2                  | 8                     | 25.4                | 7/8                           | 139.7                   | 133.4                          | 139.7         | 12.00                 | 9.53                             | 9.40               | 13.17       |                         |
| 4                                | 23.9                       | 215.9                  | 8                     | 25.4                | 7/8                           | 146.1                   | 139.7                          | 146.1         | 17.00                 | 17.00                            | 17.00              | 18.60       |                         |
| 5                                | 23.9                       | 266.7                  | 8                     | 28.4                | 1                             | 165.1                   | 158.8                          | 165.1         | 31.00                 | 29.00                            | 29.00              | 30.84       |                         |
| 6                                | 26.9                       | 292.1                  | 12                    | 28.4                | 1                             | 171.5                   | 165.1                          | 171.5         | 36.77                 | 36.32                            | 36.00              | 39.00       |                         |
| 8                                | 31.8                       | 349.3                  | 12                    | 31.8                | 1 1/8                         | 190.5                   | 184.2                          | 196.9         | 55.00                 | 52.00                            | 52.00              | 64.00       |                         |
| 10                               | 33.3                       | 431.8                  | 16                    | 35.1                | 1 1/4                         | 215.9                   | 209.6                          | 215.9         | 90.00                 | 77.00                            | 77.00              | 102.00      |                         |
| 12                               | 39.6                       | 489.0                  | 20                    | 35.1                | 1 1/4                         | 222.3                   | 215.9                          | 222.3         | 110.00                | 97.52                            | 108.86             | 132.00      |                         |
| 14                               | 41.4                       | 527.1                  | 20                    | 38.1                | 1 3/8                         | 235.0                   | 228.6                          | 235.0         | 127.00                | 102.00                           | 113.00             | 159.00      |                         |
| 16                               | 44.5                       | 603.3                  | 20                    | 41.1                | 1 1/2                         | 254.0                   | 247.7                          | 254.0         | 177.06                | 149.82                           | 165.71             | 224.73      |                         |
| 18                               | 49.3                       | 654.1                  | 20                    | 45.5                | 1 5/8                         | 273.1                   | 266.7                          | 273.1         | 215.65                | 182.00                           | 197.00             | 285.00      |                         |
| 20                               | 54.1                       | 723.9                  | 24                    | 44.5                | 1 5/8                         | 285.8                   | 279.4                          | 292.1         | 267.86                | 231.54                           | 260.00             | 365.00      |                         |
| 24                               | 63.5                       | 838.2                  | 24                    | 50.8                | 1 7/8                         | 330.2                   | 323.9                          | 339.6         | 372.00                | 330.00                           | 370.00             | 565.00      |                         |

## STANDARD FINISHES for Face of Flange (ANSI B16.5)

**STOCK FINISH:** The most widely used of any gasket finish, because, practically, is suitable for all ordinary service conditions. this is a continuous spiral groove. Flanges sizes 12" (304.8mm) and smaller , are produced with a 1/16 round- nosed tool at a feed of 1/32" per revolution. For sizes 14:" (355.6mm) and arger. The finish is made with 1/8" round- nosed tool at a feed of 3/64" per revolution.

**SPIRAL; SERRATED OR PHONOGRAPHIC :** This finish is produced by using a 90° round- nosed tool.

**CONCENTRIC SERRATED :** This finish is produced by using a 90° round-nosed tool.

**SMOOTH FINISH :** The cutting tool employed shall have an approximate 0.60" radius. The resultant surface finish. shall have a 125μ inch to 250μ inch (ANSI B16.5 para 6.4:4.1).

### 1. RAISED FACE , AND LARGE MALE AND FEMALE

Either a serrated-concentric or serrated-spiral finish having from 34 to 64 grooves per inch is used The cutting tool employed has an approximate 0.06 inch radius. The resultant surface finish shall have a 125m inch (3.2μm) to 500, inch (12.5μm) approximate roughness.

### 2. TONGUE AND GROOVE , AND SMALL MALE AND FEMALE

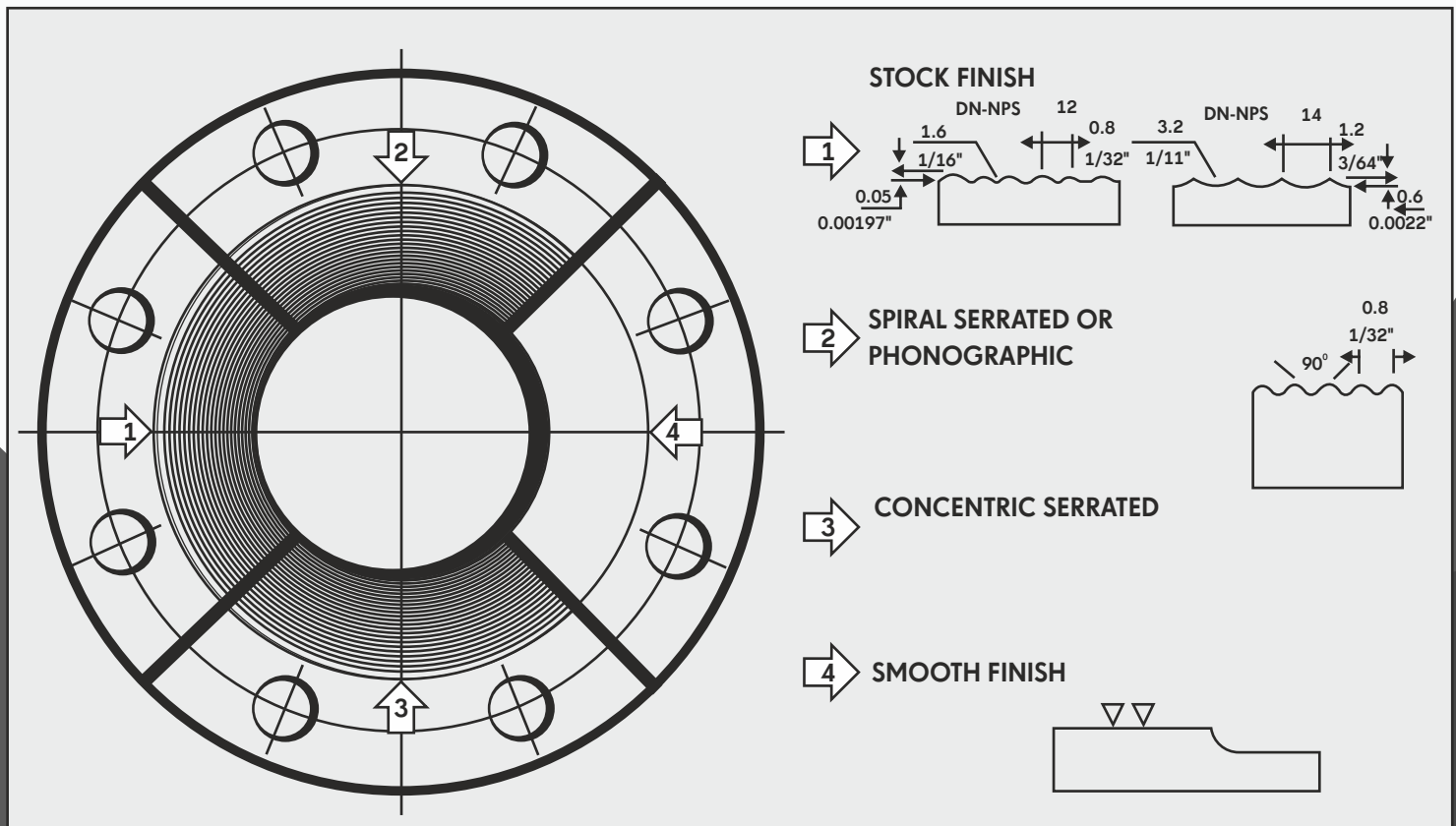
The gasket contact surface does not exceed 125μ inch (3.2μm) roughness..

### 3. RING JOINT

The inside wall surface of gasket groove does not exceed 63μ inch (1.6μm) roughness

### 4. BLIND

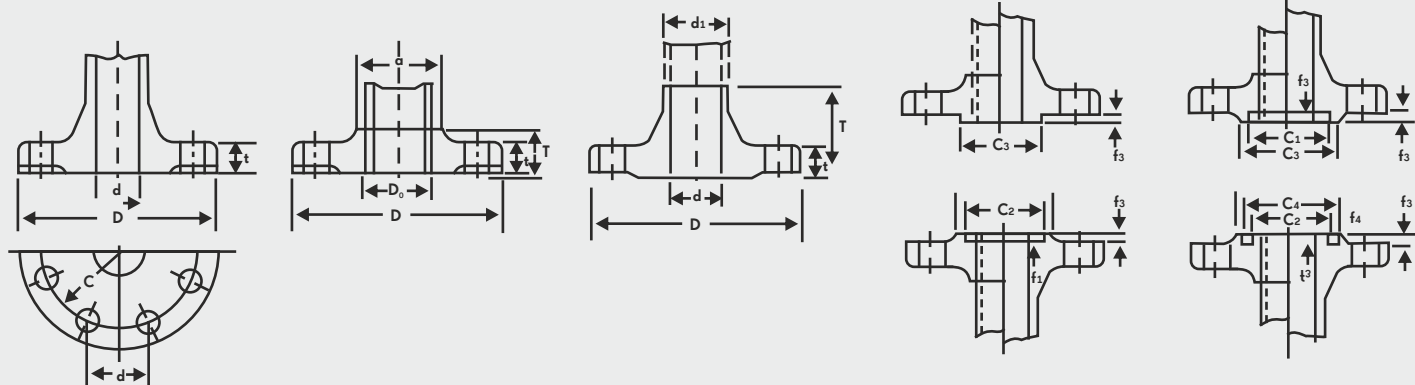
Blind flanges need not be faced in the center if when this center part is raised its diameter is at least 1 inch small than the inside diameter of fittings of the corresponding pressure class. When the centre part is depressed its diameter is greater than the inside diameter of the corresponding pressure class fittings. Machining of the depressed center is mpt required



# TOLERANCE

## ANSI B16.5 FORGED FLANGES

### SOLID FLANGE SLIP-ON FLANGE WELDING NECK FLANGE TYPE OF GASKET SURFACE



## THREAD SOCKET--WELDING SLIP--ON LAP JOINT AND BLIND

|                          |                                                    |                                                                               |
|--------------------------|----------------------------------------------------|-------------------------------------------------------------------------------|
| Outside Diameter         | When O.D. is 24" or less                           | $\pm 1/16"$ (1.6mm)*                                                          |
|                          | When O.D. is Over 24"                              | $\pm 1/8"$ (3.2mm)*                                                           |
| Inside Diameter          | Threaded                                           | Within Limits on boring guage                                                 |
|                          | Socket-Welding Slip-on                             | 10" & Smaller<br>$\pm 1/32"$ (0.8mm) -0"                                      |
|                          | and Lap joint                                      | 12" & Larger<br>$+ 1/16"$ (1.6mm) -0"                                         |
| Outside Diameter of Hub  | 5" and Smaller                                     | $+ 3/32"$ (2.4mm)*<br>$-1/32"$ (0.8mm)                                        |
|                          | 6" and Larger                                      | $+5/32"$ (4.0mm)<br>$-1/32"$ (0.8mm)                                          |
| Diameter of Contact Face | 1/16" Raised Face                                  | $\pm 1/32"$ (0.8mm)                                                           |
|                          | 1/4" Raised Face Tongue & Groove Male:Female       | $\pm 1/64"$ (0.4mm)                                                           |
| Diameter of Counterbore  | Same as for Inside Diameter                        |                                                                               |
| Drilling                 | Bolt Circle                                        | $\pm 1/16"$ (1.6mm)                                                           |
|                          | Bolt Hole Spacing                                  | $\pm 1/32"$ (0.8mm)                                                           |
|                          | Eccentricity of Bolt Circle with Respect to Facing | 2 1/2: Smaller<br>$1/32"$ (0.8mm) Max.<br>2" & Larger<br>$1/16"$ (1.6mm) Max. |
|                          | Eccentricity of Bolt Circle with Respect to Bore   | $1/32"$ (0.8mm) Max.                                                          |
|                          | Eccentricity of Facing with Respect to Bore        |                                                                               |
| Thickness                | 18" and Smaller                                    | $+1/8"$ (3.2mm) -0"                                                           |
|                          | 20" and Larger                                     | $+3/16"$ (4.8mm) -0"                                                          |
| Length Thru Hub          | 10" and Smaller                                    | $\pm 1/16"$ (1.6mm)                                                           |
|                          | 12" and Larger                                     | $\pm 1/8"$ (3.2mm)                                                            |

## WELDING NECK

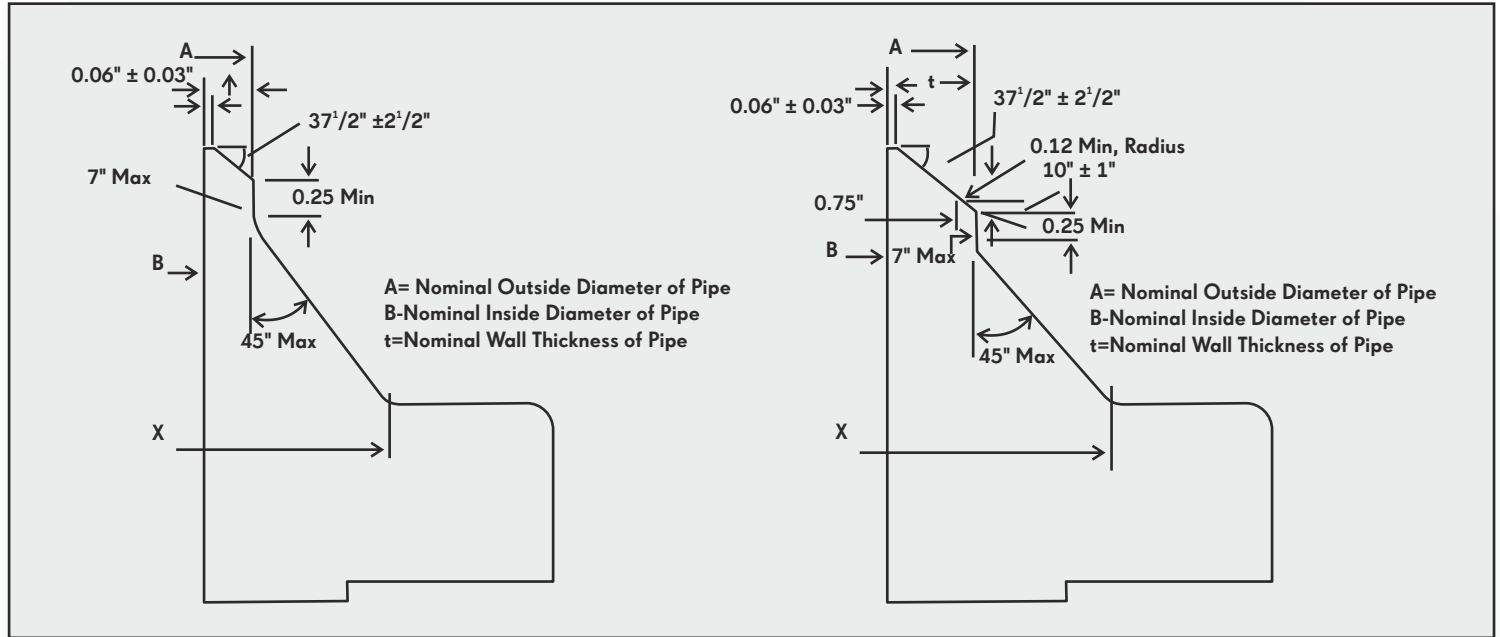
|                                     |                                                    |                                                                                 |
|-------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------|
| Outside Diameter                    | When O.D. is 24 or less                            | $\pm 1/16"$ (1.6mm)                                                             |
|                                     | When O.D. is Over 24                               | $\pm 1/8"$ (3.2mm)*                                                             |
| Inside Diameter                     | 10" and Smaller                                    | $\pm 1/32"$ (0.8mm)                                                             |
|                                     | 12" thru 18"                                       | $\pm 1/16"$ (1.6mm)                                                             |
|                                     | 20" and Larger                                     | $+1/8"$ (3.2mm)<br>$-1/16"$ (1.6mm)                                             |
| Diameter of Contact Face            | 1/16" Raised Face                                  | $\pm 1/32"$ (0.8mm)                                                             |
|                                     | 1/4" Raised Face Tongue & Groove Male:Female       | $\pm 1/64"$ (0.4mm)                                                             |
| Diameter of Hub at Base             | When Hub Base is 24" or Smaller                    | $\pm 1/16"$ (1.6mm)                                                             |
|                                     | When Hub Base is Over 24"                          | $\pm 1/8"$ (3.2mm)                                                              |
| Diameter of Hub at Point of Welding | 5" and Smaller                                     | $+ 3/32"$ (2.4mm)<br>$- 1/32"$ (0.8mm)                                          |
|                                     | 6" and Smaller                                     | $+ 5/32"$ (4.0mm)<br>$- 1/32"$ (0.8mm)                                          |
| Drilling                            | Bolt Circle                                        | $\pm 1/16"$ (1.6mm)                                                             |
|                                     | Bolt Hole Spacing                                  | $\pm 1/32"$ (0.8mm)                                                             |
|                                     | Eccentricity of Bolt Circle with Respect to Facing | 2 1/2" & Smaller<br>$1/32"$ (0.8mm) Max.<br>3" & Larger<br>$1/16"$ (1.6mm) Max. |
|                                     | Eccentricity of Bolt Circle with Respect           | $1/32"$ (0.8mm) Max*                                                            |
|                                     | Eccentricity of Bolt Circle with Respect to Bore   | $1/32"$ (0.8mm) Max*                                                            |
| Thickness                           | 18" and Smaller                                    | $+ 1/8"$ (3.2mm) -0"                                                            |
|                                     | 20" and Larger                                     | $+ 3/16"$ (4.8mm) -0"                                                           |
| Length Thru Hub                     | 10" and Smaller                                    | $\pm 1/16"$ (1.6mm)                                                             |
|                                     | 20" and Larger                                     | $\pm 1/8"$ (3.2mm)                                                              |

Note: \* This tolerance is not covered in ANSI B16.5, but maker's option.

# WELDING ENDS

## ANSI B16.5 FORGED FLANGES

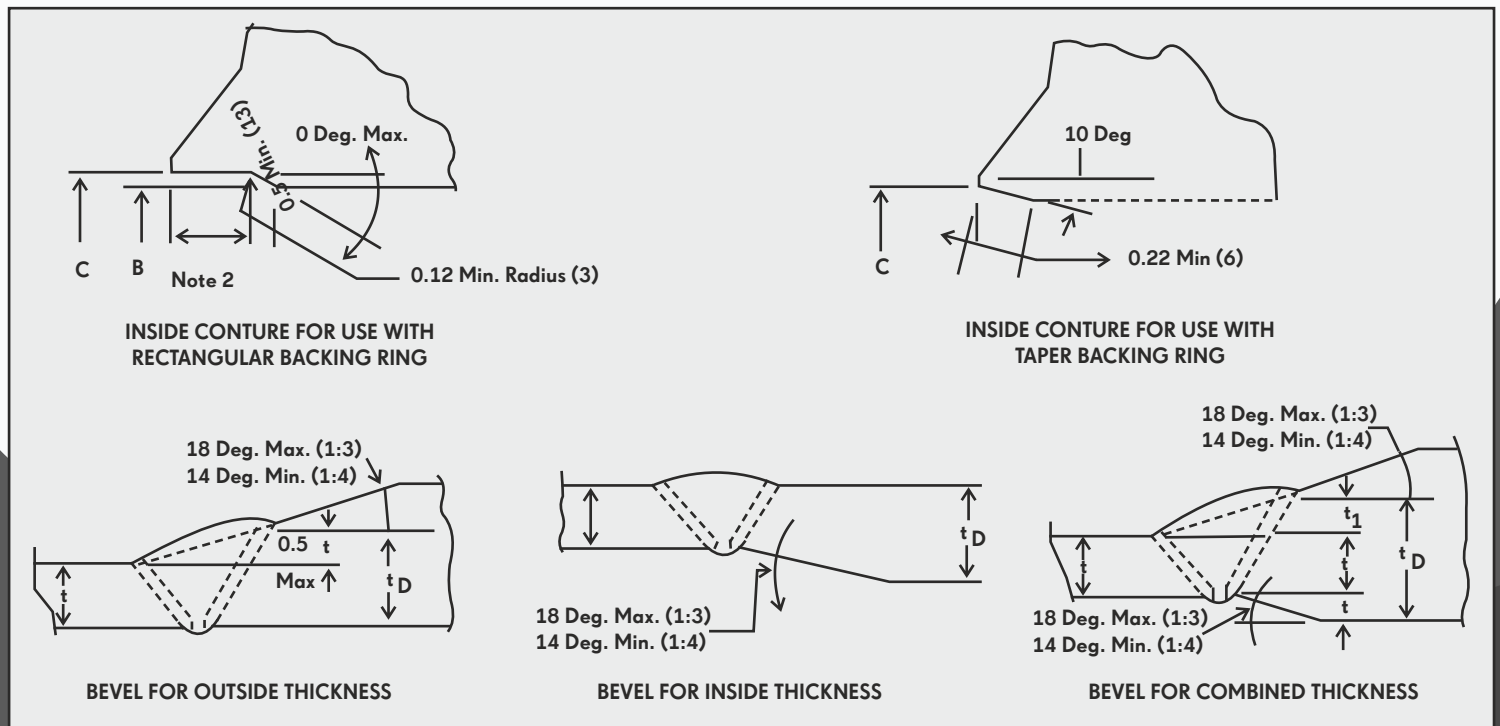
### BEVEL FOR WALL THICKNESS(t) 0.19 INCH RTO 0.88 INCH INCLUSIVE



**NOTE:** When the thickness of the hub at the bevel is greater than that of the pipe to which the flange is joined and the additional thickness is providing on the outside diameter. A taper weld having a slop not exceeding 1 to 3 may be employed or alternatively, the greater outside diameter may be tapered at the same maximum slope or less. from a point on the welding bevel equal to the OD at the mating pipe. Similarly, when then the greater thickness is provide on the inside of the flange, it shall be taper- bored from the welding end at a slope not exceeding 1 to 3.

when flanges covered by this standard are intended for sserbices with light wall. higher strength pipe. the thickness of the hub at the bevel may be greater than that of the pipe to which the flange is joined under these conditions a single taper hub may be provided and the outside diameter of the outside diameter of the hub at the base (Dimensions X) may also be modified.

The additional thickness may be provided on either inside or outside partially on each side. but total additional thickness shall not exceed one half times the nominal wall thickness of intend mating pipe.

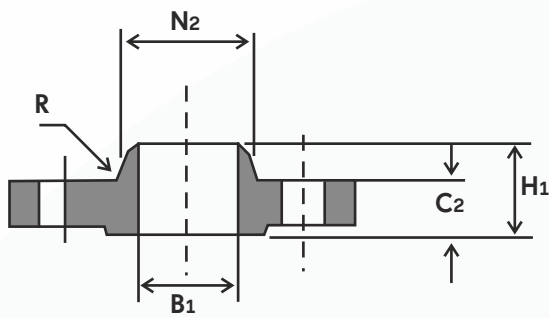


**NOTE:** (1) when the materials jointed have equal minimum specified yield strength, there shall be no restriction on the minimum slop.

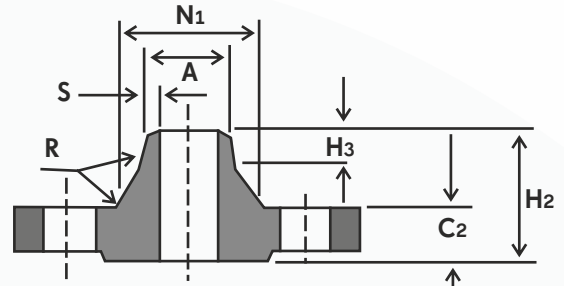
(2) Neither  $t_1$ ,  $t_2$  nor theor sum ( $t_1+t_2$ ) shall exceed  $0.5t$

(3) When the minimum specified yield strengths of the sections to be jointed are unequal, the value of  $t$  shall at least equal  $t$  times the ratio of minimum specified yield strength of the pipe to minimum specified yield strength of the flange.

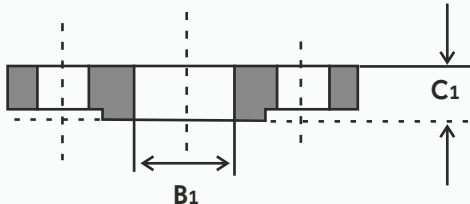
# BS4504



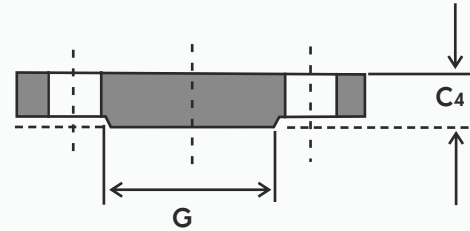
Code 112



Code 111



Code 101



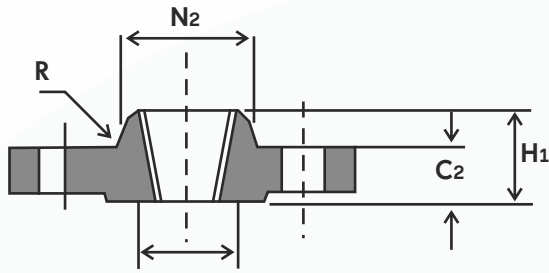
Code 105

## Dimensions of PN 10 flanges

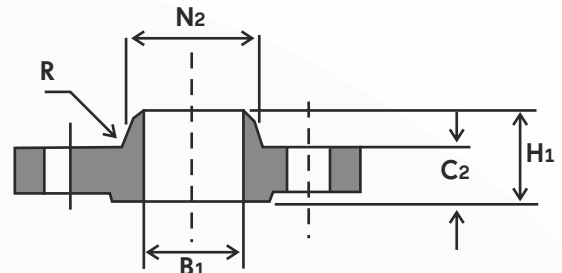
Unit: mm

| Nominal size<br><br>DN | Mating dimensions    |                           |                         |         |      | Outside dia.<br>of neck |            | Flange thickness |            |     | Dia. of<br>shoulder | Lengths |     |     | Neck diameters |     | Radius     | Neck<br>Thickness |
|------------------------|----------------------|---------------------------|-------------------------|---------|------|-------------------------|------------|------------------|------------|-----|---------------------|---------|-----|-----|----------------|-----|------------|-------------------|
|                        | Outside<br>dia.      | Dia. of<br>bolt<br>circle | Dia. of<br>bolt<br>hole | Bolting |      |                         |            |                  |            |     |                     |         |     |     |                |     |            |                   |
|                        |                      |                           |                         | No.     | Size |                         |            |                  |            |     |                     |         |     |     |                |     |            |                   |
| Codess<br>affected     | 101, 105, 111, 112,  |                           |                         |         |      | 111                     | 101<br>112 | 101<br>104       | 111<br>112 | 105 | 105                 | 112     | 111 | 111 | 111            | 112 | 111<br>112 | 111               |
| 10                     | Use PN 16 dimentions |                           |                         |         |      |                         |            |                  |            |     |                     |         |     |     |                |     |            |                   |
| 15                     |                      |                           |                         |         |      |                         |            |                  |            |     |                     |         |     |     |                |     |            |                   |
| 20                     |                      |                           |                         |         |      |                         |            |                  |            |     |                     |         |     |     |                |     |            |                   |
| 25                     |                      |                           |                         |         |      |                         |            |                  |            |     |                     |         |     |     |                |     |            |                   |
| 32                     |                      |                           |                         |         |      |                         |            |                  |            |     |                     |         |     |     |                |     |            |                   |
| 40                     |                      |                           |                         |         |      |                         |            |                  |            |     |                     |         |     |     |                |     |            |                   |
| 50                     |                      |                           |                         |         |      |                         |            |                  |            |     |                     |         |     |     |                |     |            |                   |
| 65                     |                      |                           |                         |         |      |                         |            |                  |            |     |                     |         |     |     |                |     |            |                   |
| 80                     |                      |                           |                         |         |      |                         |            |                  |            |     |                     |         |     |     |                |     |            |                   |
| 100                    |                      |                           |                         |         |      |                         |            |                  |            |     |                     |         |     |     |                |     |            |                   |
| 125                    |                      |                           |                         |         |      |                         |            |                  |            |     |                     |         |     |     |                |     |            |                   |
| 150                    |                      |                           |                         |         |      |                         |            |                  |            |     |                     |         |     |     |                |     |            |                   |
| 200                    | 340                  | 295                       | 22                      | 8       | M20  | 219.1                   | 221.5      | 24               | 24         | 24  | 190                 | 44      | 62  | 16  | 234            | 246 | 8          | 5.6               |
| 250                    | 395                  | 350                       | 22                      | 12      | M20  | 273.0                   | 276.5      | 26               | 26         | 26  | 235                 | 46      | 68  | 16  | 288            | 298 | 10         | 6.3               |
| 300                    | 445                  | 400                       | 22                      | 12      | M20  | 323.0                   | 327.5      | 26               | 26         | 26  | 285                 | 46      | 68  | 16  | 342            | 350 | 10         | 7.1               |
| 350                    | 505                  | 460                       | 22                      | 16      | M20  | 355.6                   | 359.5      | 28               | 26         | 26  | 325                 | 53      | 68  | 16  | 390            | 400 | 10         | 7.1               |
| 400                    | 565                  | 515                       | 26                      | 16      | M24  | 406.4                   | 411.0      | 32               | 26         | 26  | 375                 | 57      | 72  | 16  | 440            | 456 | 10         | 7.1               |
| 450                    | 615                  | 565                       | 26                      | 20      | M24  | 457.0                   | 467.0      | 36               | 28         | 28  | 425                 | 63      | 72  | 16  | 488            | 502 | 12         | 7.1               |
| 500                    | 670                  | 620                       | 26                      | 20      | M24  | 508.0                   | 513.0      | 38               | 28         | 28  | 475                 | 67      | 75  | 16  | 540            | 559 | 12         | 7.1               |
| 600                    | 780                  | 725                       | 30                      | 20      | M27  | 610.0                   | 616.5      | 42               | 28         | 34  | 575                 | 75      | 80  | 18  | 640            | 658 | 12         | 7.1               |
| 700                    | 895                  | 840                       | 30                      | 24      | M27  | 711.0                   | -          | -                | 30         | 38  | 670                 | -       | 80  | 18  | 746            | -   | 12         | 8.0               |
| 800                    | 1015                 | 950                       | 33                      | 24      | M30  | 813.0                   | -          | -                | 32         | 42  | 770                 | -       | 90  | 18  | 848            | -   | 12         | 8.0               |
| 900                    | 1115                 | 1050                      | 33                      | 28      | M30  | 814.0                   | -          | -                | 34         | 46  | 860                 | -       | 95  | 20  | 948            | -   | 12         | 10.0              |
| 1000                   | 1230                 | 1160                      | 36                      | 28      | M33  | 1016.0                  | -          | -                | 34         | 52  | 960                 | -       | 95  | 20  | 1050           | -   | 12         | 10.0              |
| 1200                   | 1455                 | 1380                      | 39                      | 32      | M36  | 1220.0                  | -          | -                | 38         | 60  | 1160                | -       | 115 | 25  | 1256           | -   | 12         | 11.0              |
| 1400                   | 1675                 | 1590                      | 42                      | 36      | M39  | 1420.0                  | -          | -                | 42         | -   | -                   | -       | 120 | 25  | 1460           | -   | 12         | 12.0              |
| 1600                   | 1915                 | 1820                      | 48                      | 40      | M45  | 1620.0                  | -          | -                | 46         | -   | -                   | -       | 130 | 25  | 1666           | -   | 12         | 14.0              |
| 1800                   | 2115                 | 2020                      | 48                      | 44      | M45  | 1820.0                  | -          | -                | 50         | -   | -                   | -       | 140 | 30  | 1866           | -   | 15         | 15.0              |
| 200                    | 2325                 | 2230                      | 48                      | 48      | M45  | 2020.0                  | -          | -                | 54         | -   | -                   | -       | 150 | 30  | 2070           | -   | 15         | 16.0              |
| 2200                   | 2550                 | 2440                      | 56                      | 52      | M52  | 2220.0                  | -          | -                | 58         | -   | -                   | -       | 160 | 35  | 2275           | -   | 18         | 18.0              |
| 2400                   | 2760                 | 2650                      | 56                      | 56      | M52  | 2420.0                  | -          | -                | 62         | -   | -                   | -       | 170 | 35  | 2478           | -   | 18         | 20.0              |
| 2600                   | 2960                 | 2850                      | 56                      | 60      | M52  | 2620.0                  | -          | -                | 66         | -   | -                   | -       | 180 | 40  | 2680           | -   | 18         | 22.0              |
| 2800                   | 3180                 | 3070                      | 56                      | 64      | M52  | 2820.0                  | -          | -                | 70         | -   | -                   | -       | 190 | 40  | 2882           | -   | 18         | 22.0              |
| 3000                   | 3405                 | 3290                      | 62                      | 68      | M56  | 3020.0                  | -          | -                | 75         | -   | -                   | -       | 200 | 45  | 3085           | -   | 18         | 24.0              |

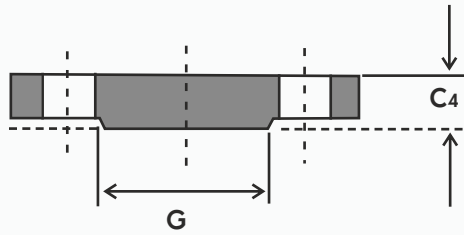
# BS4504



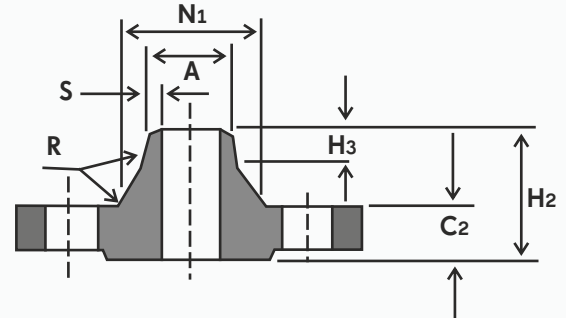
Code 113



Code 112



Code 105

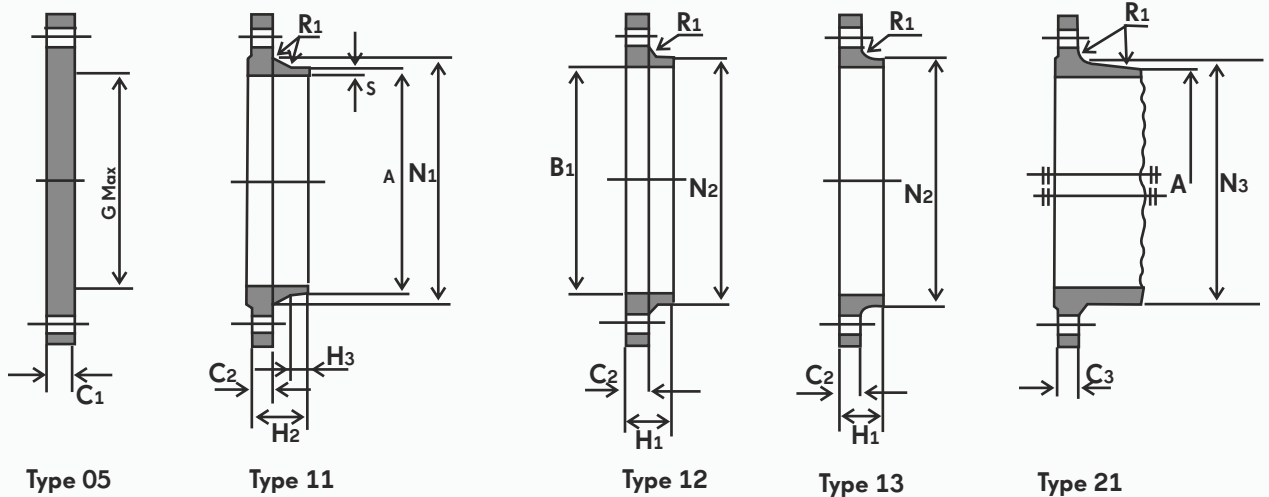
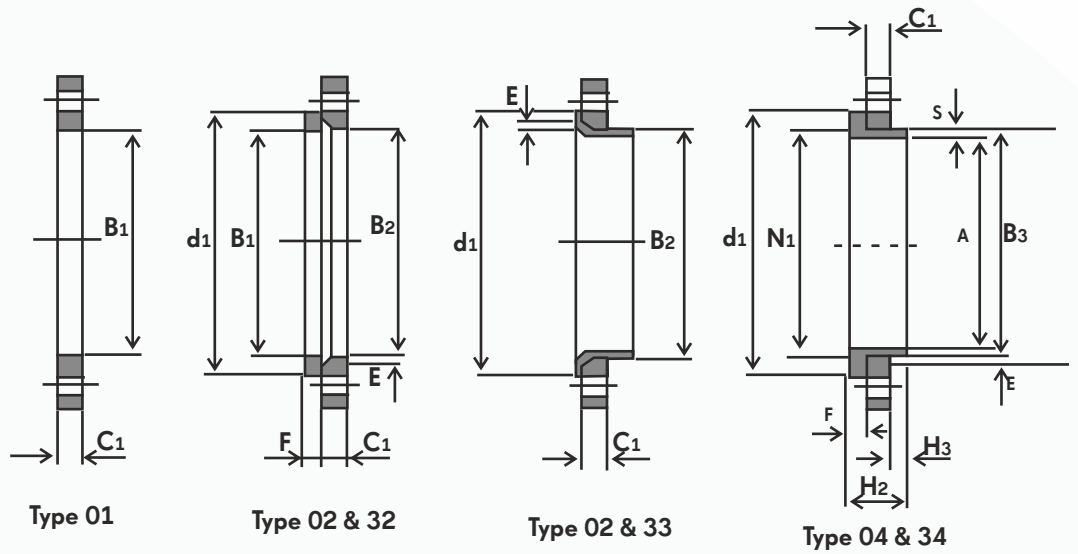
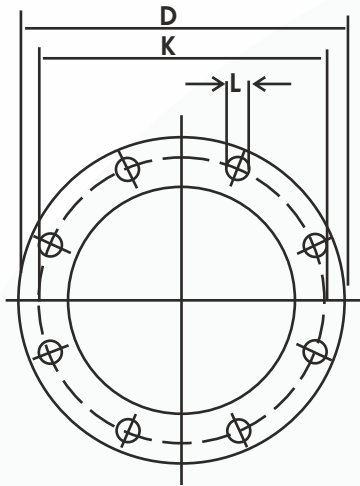


Code 111

## Dimensions of PN 16 flanges

Unit: mm

| Nominal size<br><br>DN | Mating dimensions |                     |                   |         |      | Outside dia.<br>of neck | Bore dia.  | Flange thickness |                   |     | Dia. of shoulder | Lengths    |     |     | Neck diameters |            | Radius            | Neck Thickness |
|------------------------|-------------------|---------------------|-------------------|---------|------|-------------------------|------------|------------------|-------------------|-----|------------------|------------|-----|-----|----------------|------------|-------------------|----------------|
|                        | Outside dia.      | Dia. of bolt circle | Dia. of bolt hole | Bolting |      |                         |            | C1               | C2                | C4  |                  | H1         | H2  | H3  | N1             | N2         |                   |                |
|                        |                   |                     |                   | No.     | Size |                         |            |                  |                   |     |                  |            |     |     |                |            |                   |                |
| Codess affected        | 101,              | 105,                | 111,              | 112,    | 113, | 111                     | 111<br>112 | 101              | 111<br>112<br>113 | 105 | 105              | 112<br>113 | 111 | 111 | 111            | 112<br>113 | 111<br>112<br>113 | 111            |
| 10                     | 90                | 60                  | 14                | 4       | M12  | 17.2                    | 18.0       | 14               | 14                | 14  | -                | 20         | 35  | 6   | 28             | 30         | 3                 | 1.8            |
| 15                     | 95                | 65                  | 14                | 4       | M12  | 21.3                    | 22.0       | 14               | 14                | 14  | -                | 20         | 35  | 6   | 32             | 35         | 3                 | 2.0            |
| 20                     | 105               | 75                  | 14                | 4       | M12  | 26.9                    | 27.5       | 16               | 16                | 16  | -                | 24         | 38  | 6   | 39             | 45         | 4                 | 2.3            |
| 25                     | 115               | 85                  | 14                | 4       | M12  | 33.7                    | 34.5       | 16               | 16                | 16  | -                | 24         | 38  | 6   | 46             | 52         | 4                 | 2.6            |
| 32                     | 140               | 100                 | 18                | 4       | M16  | 42.4                    | 43.5       | 18               | 16                | 16  | -                | 26         | 40  | 6   | 56             | 60         | 5                 | 2.6            |
| 40                     | 150               | 110                 | 18                | 4       | M16  | 48.3                    | 49.5       | 18               | 16                | 16  | -                | 26         | 42  | 7   | 64             | 70         | 5                 | 2.6            |
| 50                     | 165               | 125                 | 18                | 4       | M16  | 60.3                    | 61.5       | 20               | 18                | 18  | -                | 28         | 45  | 8   | 74             | 84         | 5                 | 2.9            |
| 65                     | 185               | 145                 | 18                | 4       | M16  | 76.1                    | 77.5       | 20               | 18                | 18  | 55               | 32         | 45  | 10  | 92             | 104        | 6                 | 2.9            |
| 80                     | 200               | 160                 | 18                | 8       | M16  | 88.9                    | 90.5       | 20               | 20                | 20  | 70               | 34         | 50  | 10  | 110            | 118        | 6                 | 3.2            |
| 100                    | 220               | 180                 | 18                | 8       | M16  | 114.3                   | 116.0      | 22               | 20                | 20  | 90               | 40         | 52  | 12  | 130            | 140        | 6                 | 3.6            |
| 125                    | 250               | 210                 | 18                | 8       | M16  | 139.7                   | 141.5      | 22               | 22                | 22  | 115              | 44         | 55  | 12  | 158            | 168        | 6                 | 4.0            |
| 150                    | 285               | 240                 | 22                | 8       | M20  | 168.3                   | 170.5      | 24               | 22                | 22  | 140              | 44         | 55  | 12  | 184            | 195        | 8                 | 4.5            |
| 200                    | 340               | 295                 | 22                | 12      | M20  | 219.1                   | 221.5      | 26               | 24                | 24  | 190              | 44         | 62  | 16  | 234            | 246        | 8                 | 5.6            |
| 250                    | 405               | 355                 | 26                | 12      | M24  | 273.0                   | 276.5      | 29               | 26                | 26  | 235              | 46         | 70  | 16  | 288            | 298        | 10                | 6.3            |
| 300                    | 460               | 410                 | 26                | 12      | M24  | 323.9                   | 327.5      | 32               | 28                | 28  | 285              | 46         | 78  | 16  | 342            | 350        | 10                | 7.1            |
| 350                    | 520               | 470                 | 26                | 16      | M24  | 355.6                   | 359.5      | 35               | 30                | 30  | 325              | 57         | 82  | 16  | 390            | 400        | 10                | 8.0            |
| 400                    | 580               | 525                 | 30                | 16      | M27  | 406.4                   | 411.0      | 38               | 32                | 32  | 375              | 63         | 85  | 16  | 444            | 456        | 10                | 8.0            |
| 450                    | 640               | 585                 | 30                | 20      | M27  | 457.0                   | 462.0      | 42               | 34                | 36  | 425              | 68         | 87  | 16  | 490            | 502        | 12                | 8.0            |
| 500                    | 715               | 650                 | 33                | 20      | M30  | 508.0                   | 513.0      | 46               | 34                | 36  | 475              | 73         | 90  | 16  | 546            | 559        | 12                | 8.0            |
| 600                    | 840               | 770                 | 36                | 20      | M33  | 610.0                   | 616.5      | 52               | 36                | 44  | 575              | 83         | 95  | 18  | 650            | 658        | 12                | 8.8            |
| 700                    | 910               | 840                 | 36                | 24      | M33  | 711.0                   | -          | 60               | 36                | 48  | 670              | 83         | 100 | 18  | 750            | 760        | 12                | 8.8            |
| 800                    | 1025              | 950                 | 39                | 24      | M36  | 813.0                   | -          | 68               | 38                | 52  | 770              | 90         | 105 | 20  | 848            | 864        | 12                | 10.0           |
| 900                    | 1125              | 1050                | 39                | 28      | M36  | 914.0                   | -          | 76               | 40                | 58  | 860              | 94         | 110 | 20  | 948            | 968        | 12                | 10.0           |
| 1000                   | 1255              | 1170                | 42                | 28      | M39  | 1016.0                  | -          | 84               | 42                | 64  | 960              | 100        | 120 | 22  | 1056           | 1072       | 12                | 10.0           |
| 1200                   | 1485              | 1390                | 48                | 32      | M45  | 1220.0                  | -          | 98               | 48                | 76  | 1160             | -          | 130 | 30  | 1260           | -          | 12                | 12.5           |
| 1400                   | 1685              | 1590                | 48                | 36      | M45  | 1420.0                  | -          | -                | 52                | -   | -                | -          | 145 | 30  | 1465           | -          | 12                | 14.2           |
| 1600                   | 1930              | 1820                | 56                | 40      | M52  | 1620.0                  | -          | -                | 58                | -   | -                | -          | 160 | 35  | 1668           | -          | 12                | 16.0           |
| 1800                   | 2130              | 2020                | 56                | 44      | M52  | 1820.0                  | -          | -                | 62                | -   | -                | -          | 170 | 35  | 1870           | -          | 15                | 17.5           |
| 2000                   | 2345              | 2230                | 62                | 48      | M56  | 2020.0                  | -          | -                | 66                | -   | -                | -          | 190 | 40  | 2072           | -          | 15                | 20.0           |



This diagram illustrates the arrangement but not necessarily the correct number of bolt holes.

**NOTE 1.** Dimensions  $N_1$ ,  $N_2$  and  $N_3$  are measured at the intersection of the hub draft angle and the back face of the flange.

**NOTE 2.** Type 33, lapped pipe and without determination of thickness.

Dimensions of PN 10 flanges

| DN                             | Mating dimensions |                         |                       |         |      | Outside diameter of neck | Bore diameters |                |                | Flange thickness |                |                |                | Chamfer | Collar thickness | Diameter of shoulder | Length |     |                  | Neck diameters |                |                | Corner radii | Neck thickness |                |                |                |
|--------------------------------|-------------------|-------------------------|-----------------------|---------|------|--------------------------|----------------|----------------|----------------|------------------|----------------|----------------|----------------|---------|------------------|----------------------|--------|-----|------------------|----------------|----------------|----------------|--------------|----------------|----------------|----------------|----------------|
|                                | Outside diameter  | Diameter of bolt circle | Diameter of bolt hole | Bolting |      |                          | B <sub>1</sub> | B <sub>2</sub> | B <sub>3</sub> | C <sub>1</sub>   | C <sub>2</sub> | C <sub>3</sub> | C <sub>4</sub> |         |                  |                      | E      | F   | G <sub>max</sub> | H <sub>1</sub> | H <sub>2</sub> | H <sub>3</sub> |              |                | N <sub>1</sub> | N <sub>2</sub> | N <sub>3</sub> |
|                                |                   |                         |                       | Number  | Size |                          |                |                |                |                  |                |                |                |         |                  |                      |        |     |                  |                |                |                |              |                |                |                |                |
|                                | Flange Type       |                         |                       |         |      |                          |                |                |                |                  |                |                |                |         |                  |                      |        |     |                  |                |                |                |              |                |                |                |                |
| 01, 02, 04, 05, 11, 12, 13, 21 |                   |                         |                       |         | 11   | 01                       | 02             | 04             | 01             | 11               | 21             | 05             | 02             | 32      | 05               | 12                   | 11     | 11  | 11               | 12             | 21             | 11             | 11           |                |                |                |                |
|                                |                   |                         |                       |         | 21°  | 12                       |                |                | 02             | 12               |                |                | 04             |         | 34               |                      | 34     |     | 13               | 34             | 34             | 13             |              | 12             | 13             | 13             |                |
|                                |                   |                         |                       |         | 34   | 32                       |                |                | 04             | 13               |                |                |                |         |                  |                      |        |     |                  |                |                |                |              |                |                | 21             |                |
|                                |                   |                         |                       |         |      |                          |                |                |                |                  |                |                |                |         |                  |                      |        |     |                  |                |                |                |              |                |                |                |                |
| Use PN40 dimensions            |                   |                         |                       |         |      |                          |                |                |                |                  |                |                |                |         |                  |                      |        |     |                  |                |                |                |              |                |                |                |                |
| Use PN16 dimensions            |                   |                         |                       |         |      |                          |                |                |                |                  |                |                |                |         |                  |                      |        |     |                  |                |                |                |              |                |                |                |                |
| 10 to 40                       | 200               | 340                     | 295                   | 22      | 8    | M20                      | 219.1          | 221.5          | 226            | 240              | 24             | 24             | 24             | 24      | 6                | 20                   | 190    | 44  | 62               | 16             | 234            | 246            | 246          | 10             | 6.3            |                |                |
| 40 to 50                       | 250               | 395                     | 350                   | 22      | 12   | M20                      | 273.0          | 276.5          | 281            | 294              | 26             | 26             | 26             | 26      | 8                | 22                   | 235    | 46  | 68               | 16             | 292            | 298            | 298          | 12             | 6.3            |                |                |
| 50 to 100                      | 300               | 445                     | 400                   | 22      | 12   | M20                      | 323.9          | 327.5          | 333            | 348              | 26             | 26             | 26             | 26      | 8                | 22                   | 285    | 46  | 68               | 16             | 342            | 350            | 348          | 12             | 7.1            |                |                |
|                                | 350               | 505                     | 460                   | 22      | 16   | M20                      | 335.6          | 359.5          | 365            | 400              | 28             | 26             | 26             | 26      | 8                | 22                   | 330    | 53  | 68               | 16             | 385            | 400            | 408          | 12             | 7.1            |                |                |
|                                | 400               | 565                     | 515                   | 26      | 16   | M24                      | 406.8          | 411.0          | 416            | 450              | 32             | 26             | 26             | 26      | 8                | 24                   | 380    | 57  | 72               | 16             | 440            | 456            | 456          | 12             | 7.1            |                |                |
|                                | 450               | 615                     | 565                   | 26      | 20   | M24                      | 457.0          | 462.0          | 467            | 498              | 36             | 28             | 26             | 28      | 8                | 24                   | 425    | 63  | 72               | 16             | 488            | 502            | 502          | 12             | 7.1            |                |                |
|                                | 500               | 670                     | 620                   | 26      | 20   | M24                      | 508.0          | 513.5          | 519            | 550              | 38             | 28             | 28             | 28      | 8                | 26                   | 475    | 67  | 75               | 16             | 542            | 559            | 559          | 12             | 7.1            |                |                |
|                                | 600               | 780                     | 725                   | 30      | 20   | M27                      | 610.0          | 616.5          | 622            | 650              | 42             | 28             | 34             | 34      | 8                | 26                   | 575    | 75  | 80               | 18             | 642            | 658            | 658          | 12             | 7.1            |                |                |
|                                | 700               | 895                     | 840                   | 30      | 24   | M27                      | 711.0          | -              | -              | -                | -              | 30             | 34             | 38      | -                | -                    | 670    | -   | 80               | 18             | 746            | -              | 772          | 12             | 8.0            |                |                |
|                                | 800               | 1015                    | 950                   | 33      | 24   | M30                      | 813.0          | -              | -              | -                | -              | 32             | 36             | 42      | -                | -                    | 770    | -   | 90               | 18             | 850            | -              | 876          | 12             | 8.0            |                |                |
|                                | 900               | 1115                    | 1050                  | 33      | 28   | M30                      | 914.0          | -              | -              | -                | -              | 34             | 38             | 46      | -                | -                    | 860    | -   | 95               | 20             | 950            | -              | 976          | 12             | 10.0           |                |                |
|                                | 1000              | 1230                    | 1160                  | 36      | 28   | M33                      | 1016.0         | -              | -              | -                | -              | 34             | 38             | 52      | -                | -                    | 960    | -   | 95               | 20             | 1052           | -              | 1080         | 16             | 10.0           |                |                |
|                                | 1200              | 1455                    | 1380                  | 39      | 32   | M36                      | 1219.0         | -              | -              | -                | -              | 38             | 44             | 60      | -                | -                    | 1160   | -   | 115              | 25             | 1256           | -              | 1292         | 16             | 11.0           |                |                |
|                                | 1400              | 1675                    | 1590                  | 42      | 36   | M39                      | 1422.0         | -              | -              | -                | -              | 42             | 48             | -       | -                | -                    | -      | 120 | 25               | 1460           | -              | 1496           | 16           | 12.0           |                |                |                |
|                                | 1600              | 1915                    | 1820                  | 48      | 40   | M45                      | 1626.0         | -              | -              | -                | -              | 46             | 52             | -       | -                | -                    | -      | 130 | 25               | 1666           | -              | 1712           | 16           | 14.0           |                |                |                |
|                                | 1800              | 2115                    | 2020                  | 48      | 44   | M45                      | 1829.0         | -              | -              | -                | -              | 50             | 56             | -       | -                | -                    | -      | 140 | 30               | 1868           | -              | 1910           | 16           | 15.0           |                |                |                |
|                                | 2000              | 2325                    | 2230                  | 48      | 48   | M45                      | 2032.0         | -              | -              | -                | -              | 54             | 60             | -       | -                | -                    | -      | 150 | 30               | 2072           | -              | 2120           | 16           | 16.0           |                |                |                |
|                                | 2200              | 2550                    | 2440                  | 56      | 52   | M52                      | 2235.0         | -              | -              | -                | -              | 58             | -              | -       | -                | -                    | -      | 160 | 35               | 2275           | -              | -              | 18           | 18.0           |                |                |                |
|                                | 2400              | 2760                    | 2650                  | 56      | 56   | M52                      | 2438.0         | -              | -              | -                | -              | 62             | -              | -       | -                | -                    | -      | 170 | 35               | 2478           | -              | -              | 18           | 20.0           |                |                |                |
|                                | 2600              | 2960                    | 2850                  | 56      | 60   | M52                      | 2620.0         | -              | -              | -                | -              | 66             | -              | -       | -                | -                    | -      | 180 | 40               | 2680           | -              | -              | 18           | 22.0           |                |                |                |
|                                | 2800              | 3180                    | 3070                  | 56      | 64   | M52                      | 2820.0         | -              | -              | -                | -              | 70             | -              | -       | -                | -                    | -      | 190 | 40               | 2882           | -              | -              | 18           | 22.0           |                |                |                |
|                                | 300               | 3405                    | 3290                  | 62      | 68   | M56                      | 3020.0         | -              | -              | -                | -              | 75             | -              | -       | -                | -                    | -      | 200 | 45               | 3085           | -              | -              | 18           | 24.0           |                |                |                |

<sup>a</sup> For flanges type 21 the outside hub diameter approximately corresponds to the outside pipe diameter.

Dimensions of PN 16 flanges

Unit:mm

| DN                             | Mating dimensions |                         |                       |                |      | Outside diameter of neck | Bore diameters |                |                | Flange thickness |                |                |                | Chamfer |    | Collar thickness | Diameter of shoulder | Length           |                |                | Neck diameters |                |                | Corner radii | Neck thickness |                |                |   |
|--------------------------------|-------------------|-------------------------|-----------------------|----------------|------|--------------------------|----------------|----------------|----------------|------------------|----------------|----------------|----------------|---------|----|------------------|----------------------|------------------|----------------|----------------|----------------|----------------|----------------|--------------|----------------|----------------|----------------|---|
|                                | Outside diameter  | Diameter of bolt circle | Diameter of bolt hole | Bolting        |      |                          | B <sub>1</sub> | B <sub>2</sub> | B <sub>3</sub> | C <sub>1</sub>   | C <sub>2</sub> | C <sub>3</sub> | C <sub>4</sub> | E       | F  |                  |                      | G <sub>max</sub> | H <sub>1</sub> | H <sub>2</sub> | H <sub>3</sub> | N <sub>1</sub> | N <sub>2</sub> |              |                | N <sub>3</sub> | R <sub>1</sub> | S |
|                                |                   |                         |                       | Number         | Size |                          |                |                |                |                  |                |                |                |         |    |                  |                      |                  |                |                |                |                |                |              |                |                |                |   |
|                                | Flange Type       |                         |                       |                |      |                          |                |                |                |                  |                |                |                |         |    |                  |                      |                  |                |                |                |                |                |              |                |                |                |   |
| 01, 02, 04, 05, 11, 12, 13, 21 |                   |                         |                       |                | 11   | 01                       | 02             | 04             | 01             | 11               | 12             | 13             | 05             | 02      | 32 | 05               | 12                   | 11               | 11             | 11             | 12             | 12             | 21             | 11           | 11             |                |                |   |
|                                |                   |                         |                       |                | 21°  | 12                       |                |                | 02             | 12               | 13             |                |                | 04      | 34 |                  | 13                   | 34               | 34             | 34             | 13             |                | 12             | 13           | 34             |                |                |   |
|                                |                   |                         |                       |                | 34   | 32                       |                |                | 04             | 13               |                |                |                |         |    |                  |                      |                  |                |                |                |                | 21             |              |                |                |                |   |
| Use PN40 dimensions            |                   |                         |                       |                |      |                          |                |                |                |                  |                |                |                |         |    |                  |                      |                  |                |                |                |                |                |              |                |                |                |   |
| 10 to 40                       |                   |                         |                       |                |      |                          |                |                |                |                  |                |                |                |         |    |                  |                      |                  |                |                |                |                |                |              |                |                |                |   |
| 50                             | 165               | 125                     | 18                    | 4              | M16  | 60.3                     | 61.5           | 65             | 77             | 19               | 18             | 18             | 18             | 5       | 16 | -                | 28                   | 45               | 8              | 74             | 84             | 84             | 5              | 2.9          |                |                |                |   |
| 65                             | 185               | 145                     | 18                    | 8 <sup>b</sup> | M16  | 76.1                     | 77.5           | 81             | 96             | 20               | 18             | 18             | 18             | 6       | 16 | 55               | 32                   | 45               | 10             | 92             | 104            | 104            | 6              | 2.9          |                |                |                |   |
| 80                             | 200               | 160                     | 18                    | 8              | M16  | 88.9                     | 90.5           | 94             | 108            | 20               | 20             | 20             | 20             | 6       | 16 | 70               | 34                   | 50               | 10             | 105            | 118            | 120            | 6              | 3.2          |                |                |                |   |
| 100                            | 220               | 180                     | 18                    | 8              | M16  | 114.3                    | 116.0          | 120            | 134            | 22               | 20             | 20             | 20             | 6       | 18 | 90               | 40                   | 52               | 12             | 131            | 140            | 140            | 8              | 3.6          |                |                |                |   |
| 125                            | 250               | 210                     | 18                    | 8              | M16  | 139.7                    | 141.5          | 145            | 162            | 22               | 22             | 22             | 22             | 6       | 18 | 115              | 44                   | 55               | 12             | 156            | 168            | 170            | 8              | 4.0          |                |                |                |   |
| 150                            | 285               | 240                     | 22                    | 8              | M20  | 168.3                    | 170.5          | 174            | 188            | 24               | 22             | 22             | 22             | 6       | 20 | 140              | 44                   | 55               | 12             | 184            | 195            | 190            | 10             | 4.5          |                |                |                |   |
| 200                            | 340               | 295                     | 22                    | 12             | M20  | 219.1                    | 221.5          | 226            | 240            | 26               | 24             | 24             | 24             | 6       | 20 | 190              | 44                   | 62               | 16             | 235            | 246            | 246            | 10             | 6.3          |                |                |                |   |
| 250                            | 405               | 355                     | 26                    | 12             | M24  | 273.0                    | 276.5          | 281            | 294            | 29               | 26             | 26             | 26             | 8       | 22 | 235              | 46                   | 70               | 16             | 292            | 298            | 296            | 12             | 6.3          |                |                |                |   |
| 300                            | 460               | 410                     | 26                    | 12             | M24  | 32.9                     | 327.5          | 333            | 348            | 32               | 28             | 28             | 28             | 8       | 24 | 285              | 46                   | 78               | 16             | 344            | 350            | 350            | 12             | 7.1          |                |                |                |   |
| 350                            | 520               | 470                     | 26                    | 16             | M24  | 356.6                    | 359.5          | 365            | 400            | 35               | 30             | 30             | 30             | 8       | 26 | 330              | 57                   | 82               | 16             | 390            | 400            | 410            | 12             | 8.0          |                |                |                |   |
| 400                            | 580               | 525                     | 30                    | 16             | M24  | 406.4                    | 411.0          | 416            | 454            | 38               | 32             | 32             | 32             | 8       | 28 | 380              | 63                   | 85               | 16             | 445            | 456            | 458            | 12             | 8.0          |                |                |                |   |
| 450                            | 640               | 585                     | 30                    | 20             | M24  | 457.0                    | 462.0          | 467            | 500            | 42               | 40             | 40             | 40             | 8       | 30 | 425              | 68                   | 87               | 16             | 490            | 502            | 516            | 12             | 8.0          |                |                |                |   |
| 500                            | 715               | 650                     | 33                    | 20             | M30  | 508.0                    | 513.5          | 510            | 556            | 46               | 44             | 44             | 44             | 8       | 32 | 475              | 73                   | 90               | 16             | 548            | 559            | 576            | 12             | 8.0          |                |                |                |   |
| 600                            | 840               | 770                     | 36                    | 20             | M33  | 610.0                    | 616.5          | 622            | 660            | 52               | 54             | 54             | 54             | 8       | 32 | 575              | 83                   | 95               | 18             | 652            | 658            | 690            | 12             | 8.8          |                |                |                |   |
| 700                            | 910               | 840                     | 36                    | 24             | M33  | 711.0                    | -              | -              | -              | -                | 36             | 42             | 48             | -       | -  | 670              | 83                   | 100              | 18             | 755            | 760            | 760            | 12             | 8.8          |                |                |                |   |
| 800                            | 1025              | 950                     | 39                    | 24             | M36  | 813.0                    | -              | -              | -              | -                | 38             | 42             | 52             | -       | -  | 770              | 90                   | 105              | 20             | 855            | 864            | 865            | 12             | 10.0         |                |                |                |   |
| 900                            | 1125              | 1050                    | 39                    | 28             | M36  | 814.0                    | -              | -              | -              | -                | 40             | 44             | 58             | -       | -  | 860              | 94                   | 110              | 20             | 955            | 968            | 962            | 12             | 10.0         |                |                |                |   |
| 1000                           | 1255              | 1170                    | 42                    | 28             | M39  | 1016.0                   | -              | -              | -              | -                | 42             | 46             | 64             | -       | -  | 960              | 100                  | 120              | 22             | 1058           | 1072           | 1076           | 16             | 10.0         |                |                |                |   |
| 1200                           | 1485              | 1390                    | 48                    | 32             | M45  | 1219.0                   | -              | -              | -              | -                | 48             | 52             | 76             | -       | -  | 1160             | -                    | 130              | 30             | 1262           | -              | 1282           | 16             | 12.5         |                |                |                |   |
| 1400                           | 1685              | 1590                    | 48                    | 36             | M45  | 1422.0                   | -              | -              | -              | -                | 52             | 58             | -              | -       | -  | 1346             | -                    | 145              | 30             | 1465           | -              | 1482           | 16             | 14.2         |                |                |                |   |
| 1600                           | 1930              | 1820                    | 56                    | 40             | M52  | 1626.0                   | -              | -              | -              | -                | 58             | 64             | -              | -       | -  | 1546             | -                    | 160              | 35             | 1668           | -              | 1696           | 16             | 16.0         |                |                |                |   |
| 1800                           | 2130              | 2020                    | 56                    | 44             | M52  | 1829.0                   | -              | -              | -              | -                | 62             | 68             | -              | -       | -  | 1746             | -                    | 170              | 35             | 1870           | -              | 1896           | 16             | 17.5         |                |                |                |   |
| 2000                           | 2345              | 2230                    | 62                    | 48             | M56  | 2032.0                   | -              | -              | -              | -                | 66             | 70             | -              | -       | -  | 1950             | -                    | 180              | 40             | 2072           | -              | 2100           | 16             | 20.0         |                |                |                |   |

<sup>a</sup> For flanges type 21 the outside hub diameter approximately corresponds to the outside pipe diameter.

<sup>b</sup> According to EN092-2 (cast iron flanges) and pr EN 1092-3(copper jolly flanges) the flanges in this DN and PN may be supplied with 4 holes where steel flanges are required with 4 holes, these may be supplied by agreement between manufacturer and purchaser.

Dimensions of PN 25 flanges

| DN                             | Mating dimensions |                         |                       |         |      | Outside diameter of neck | Bore diameters |                |                | Flange thickness |                |                |                | Chamfer | Collar thickness | Diameter of shoulder | Length |     |                  | Neck diameters |                |                | Corner radii | Neck thickness |                |                |                |                |   |
|--------------------------------|-------------------|-------------------------|-----------------------|---------|------|--------------------------|----------------|----------------|----------------|------------------|----------------|----------------|----------------|---------|------------------|----------------------|--------|-----|------------------|----------------|----------------|----------------|--------------|----------------|----------------|----------------|----------------|----------------|---|
|                                | Outside diameter  | Diameter of bolt circle | Diameter of bolt hole | Bolting |      |                          | B <sub>1</sub> | B <sub>2</sub> | B <sub>3</sub> | C <sub>1</sub>   | C <sub>2</sub> | C <sub>3</sub> | C <sub>4</sub> |         |                  |                      | E      | F   | G <sub>max</sub> | H <sub>1</sub> | H <sub>2</sub> | H <sub>3</sub> |              |                | N <sub>1</sub> | N <sub>2</sub> | N <sub>3</sub> | R <sub>1</sub> | S |
|                                |                   |                         |                       | Number  | Size |                          |                |                |                |                  |                |                |                |         |                  |                      |        |     |                  |                |                |                |              |                |                |                |                |                |   |
|                                | Flange Type       |                         |                       |         |      |                          |                |                |                |                  |                |                |                |         |                  |                      |        |     |                  |                |                |                |              |                |                |                |                |                |   |
| 01, 02, 04, 05, 11, 12, 13, 21 |                   |                         |                       |         | 11   | 01                       | 02             | 04             | 01             | 11               | 21             | 05             | 02             | 32      | 05               | 12                   | 11     | 11  | 11               | 12             | 12             | 21             | 11           | 11             |                |                |                |                |   |
|                                |                   |                         |                       |         | 21°  | 12                       |                |                | 02             | 12               |                |                | 04             | 34      |                  | 13                   | 34     | 34  | 34               | 13             |                | 12             | 12           | 34             |                |                |                |                |   |
|                                |                   |                         |                       |         | 34   | 32                       |                |                | 04             | 13               |                |                |                |         |                  |                      |        |     |                  |                |                | 21             | 13           | 34             |                |                |                |                |   |
| Use PN40 dimensions            |                   |                         |                       |         |      |                          |                |                |                |                  |                |                |                |         |                  |                      |        |     |                  |                |                |                |              |                |                |                |                |                |   |
| 200                            | 360               | 310                     | 26                    | 12      | M24  | 219.1                    | 221.5          | 226            | 250            | 32               | 30             | 30             | 30             | 6       | 26               | 190                  | 52     | 80  | 16               | 244            | 256            | 252            | 10           | 6.3            |                |                |                |                |   |
| 250                            | 425               | 370                     | 30                    | 12      | M27  | 273.0                    | 276.5          | 281            | 302            | 35               | 32             | 32             | 32             | 8       | 26               | 235                  | 60     | 88  | 18               | 298            | 310            | 304            | 12           | 7.1            |                |                |                |                |   |
| 200                            | 485               | 430                     | 30                    | 16      | M27  | 323.9                    | 327.5          | 333            | 356            | 38               | 34             | 34             | 34             | 8       | 28               | 285                  | 67     | 92  | 18               | 352            | 364            | 364            | 12           | 8.0            |                |                |                |                |   |
| 350                            | 55                | 490                     | 33                    | 16      | M30  | 355.6                    | 359.5          | 365            | 408            | 42               | 38             | 38             | 38             | 8       | 32               | 332                  | 72     | 100 | 20               | 398            | 418            | 418            | 12           | 8.0            |                |                |                |                |   |
| 400                            | 620               | 550                     | 36                    | 16      | M33  | 406.4                    | 411.0          | 416            | 462            | 46               | 40             | 40             | 40             | 8       | 34               | 380                  | 78     | 110 | 20               | 452            | 472            | 472            | 12           | 8.8            |                |                |                |                |   |
| 450                            | 670               | 600                     | 36                    | 20      | M33  | 457.0                    | 462.0          | 467            | 510            | 50               | 46             | 46             | 46             | 8       | 36               | 425                  | 84     | 110 | 20               | 500            | 520            | 520            | 12           | 8.8            |                |                |                |                |   |
| 500                            | 730               | 660                     | 36                    | 20      | M33  | 508.0                    | 613.5          | 519            | 568            | 56               | 48             | 48             | 48             | 8       | 38               | 475                  | 90     | 125 | 20               | 558            | 580            | 580            | 12           | 10.0           |                |                |                |                |   |
| 600                            | 845               | 770                     | 39                    | 20      | M36  | 610.0                    | 616.5          | 622            | 670            | 68               | 58             | 58             | 58             | 8       | 40               | 575                  | 100    | 125 | 20               | 660            | 684            | 684            | 12           | 11.0           |                |                |                |                |   |
| 700                            | 960               | 875                     | 42                    | 24      | M39  | 711.0                    | -              | -              | -              | -                | 46             | 50             | -              | -       | -                | -                    | -      | 125 | 20               | 760            | -              | 780            | 12           | 12.5           |                |                |                |                |   |
| 800                            | 1085              | 990                     | 48                    | 24      | M45  | 813.0                    | -              | -              | -              | -                | 50             | 54             | -              | -       | -                | -                    | -      | 135 | 22               | 864            | -              | 882            | 12           | 14.2           |                |                |                |                |   |
| 900                            | 1185              | 1090                    | 48                    | 28      | M45  | 914.0                    | -              | -              | -              | -                | 54             | 58             | -              | -       | -                | -                    | -      | 145 | 24               | 968            | -              | 982            | 12           | 16.0           |                |                |                |                |   |
| 1000                           | 1320              | 1210                    | 56                    | 28      | M52  | 1016.0                   | -              | -              | -              | -                | 58             | 62             | -              | -       | -                | -                    | -      | 155 | 24               | 1070           | -              | 1086           | 16           | 17.5           |                |                |                |                |   |
| 1200                           | 1530              | 1420                    | 56                    | 32      | M52  | 1219.0                   | -              | -              | -              | -                | -              | 70             | -              | -       | -                | -                    | -      | -   | -                | -              | -              | 1296           | 18           | -              |                |                |                |                |   |
| 1400                           | 1755              | 1640                    | 62                    | 36      | M56  | 1422.0                   | -              | -              | -              | -                | -              | 76             | -              | -       | -                | -                    | -      | -   | -                | -              | -              | 1508           | 18           | -              |                |                |                |                |   |
| 1600                           | 1975              | 1860                    | 62                    | 40      | M56  | 1626.0                   | -              | -              | -              | -                | -              | 84             | -              | -       | -                | -                    | -      | -   | -                | -              | -              | 1726           | 20           | -              |                |                |                |                |   |
| 1800                           | 2195              | 2070                    | 70                    | 44      | M64  | 1829.0                   | -              | -              | -              | -                | -              | 90             | -              | -       | -                | -                    | -      | -   | -                | -              | -              | 1920           | 20           | -              |                |                |                |                |   |
| 2000                           | 2425              | 2300                    | 70                    | 48      | M64  | 2032.0                   | -              | -              | -              | -                | -              | 96             | -              | -       | -                | -                    | -      | -   | -                | -              | -              | 2150           | 20           | -              |                |                |                |                |   |

<sup>a</sup> For flanges type 21 the outside hub diameter approximately corresponds to the outside pipe diameter.

Dimensions of PN 40 flanges

| DN                             | Mating dimensions |                         |    |    |         | Outside diameter of neck | Bore diameters |                |                | Flange thickness |                |                |                | Chamfer |    | Collar thickness | Diameter of shoulder | Length           |                |                | Neck diameters |                |                | Corner radii | Neck thickness |                |                |   |      |
|--------------------------------|-------------------|-------------------------|----|----|---------|--------------------------|----------------|----------------|----------------|------------------|----------------|----------------|----------------|---------|----|------------------|----------------------|------------------|----------------|----------------|----------------|----------------|----------------|--------------|----------------|----------------|----------------|---|------|
|                                | Outside diameter  | Diameter of bolt circle | K  | L  | Bolting |                          | B <sub>1</sub> | B <sub>2</sub> | B <sub>3</sub> | C <sub>1</sub>   | C <sub>2</sub> | C <sub>3</sub> | C <sub>4</sub> | E       | F  |                  |                      | G <sub>max</sub> | H <sub>1</sub> | H <sub>2</sub> | H <sub>3</sub> | N <sub>1</sub> | N <sub>2</sub> |              |                | N <sub>3</sub> | R <sub>1</sub> | S |      |
|                                |                   |                         |    |    | Number  |                          |                |                |                |                  |                |                |                |         |    |                  |                      |                  |                |                |                |                |                |              |                |                |                |   | Size |
|                                | Flange Type       |                         |    |    |         |                          |                |                |                |                  |                |                |                |         |    |                  |                      |                  |                |                |                |                |                |              |                |                |                |   |      |
| 01, 02, 04, 05, 11, 12, 13, 21 |                   |                         |    |    |         | 11                       | 01             | 02             | 04             | 01               | 11             | 12             | 13             | 05      | 02 | 32               | 05                   | 12               | 11             | 11             | 11             | 12             | 13             | 21           | 11             | 11             | 34             |   |      |
| 10                             | 90                | 60                      | 14 | 4  | M12     | 17.2                     | 18.0           | 21             | 31             | 14               | 16             | 16             | 16             | 16      | 3  | 12               | -                    | 22               | 35             | 6              | 28             | 30             | 28             | 4            | 1.8            |                |                |   |      |
| 15                             | 95                | 65                      | 14 | 4  | M12     | 21.3                     | 22.0           | 25             | 35             | 14               | 16             | 16             | 16             | 16      | 3  | 12               | -                    | 22               | 38             | 6              | 32             | 35             | 32             | 4            | 2.0            |                |                |   |      |
| 20                             | 105               | 75                      | 14 | 4  | M12     | 26.9                     | 27.5           | 31             | 42             | 16               | 18             | 18             | 18             | 18      | 4  | 14               | -                    | 26               | 40             | 6              | 40             | 45             | 40             | 4            | 2.3            |                |                |   |      |
| 25                             | 115               | 85                      | 14 | 4  | M12     | 33.7                     | 34.5           | 38             | 49             | 16               | 18             | 18             | 18             | 18      | 4  | 14               | -                    | 28               | 40             | 6              | 46             | 52             | 50             | 4            | 2.6            |                |                |   |      |
| 32                             | 140               | 100                     | 18 | 4  | M16     | 42.4                     | 43.5           | 47             | 59             | 18               | 18             | 18             | 18             | 18      | 5  | 14               | -                    | 30               | 42             | 6              | 56             | 60             | 60             | 6            | 2.6            |                |                |   |      |
| 40                             | 150               | 110                     | 18 | 4  | M16     | 48.3                     | 49.5           | 53             | 67             | 18               | 18             | 18             | 18             | 18      | 5  | 14               | -                    | 32               | 45             | 7              | 64             | 70             | 70             | 6            | 2.6            |                |                |   |      |
| 50                             | 165               | 125                     | 18 | 4  | M16     | 60.3                     | 61.5           | 65             | 77             | 20               | 20             | 20             | 20             | 20      | 5  | 16               | -                    | 34               | 48             | 8              | 75             | 84             | 84             | 6            | 2.9            |                |                |   |      |
| 65                             | 185               | 145                     | 18 | 8  | M16     | 76.1                     | 77.5           | 81             | 96             | 22               | 22             | 22             | 22             | 22      | 6  | 16               | 55                   | 38               | 52             | 10             | 90             | 104            | 104            | 6            | 2.9            |                |                |   |      |
| 80                             | 200               | 160                     | 18 | 8  | M16     | 88.9                     | 90.5           | 94             | 114            | 24               | 24             | 24             | 24             | 24      | 6  | 18               | 70                   | 40               | 58             | 12             | 105            | 118            | 120            | 8            | 3.2            |                |                |   |      |
| 100                            | 235               | 190                     | 22 | 8  | M20     | 114.3                    | 116.5          | 120            | 138            | 26               | 24             | 24             | 24             | 24      | 6  | 20               | 90                   | 44               | 65             | 12             | 134            | 145            | 142            | 8            | 3.6            |                |                |   |      |
| 125                            | 270               | 220                     | 26 | 8  | M24     | 139.7                    | 141.5          | 145            | 166            | 28               | 26             | 26             | 26             | 26      | 6  | 22               | 115                  | 48               | 68             | 12             | 162            | 170            | 162            | 8            | 4.0            |                |                |   |      |
| 150                            | 300               | 250                     | 26 | 8  | M24     | 168.3                    | 170.5          | 174            | 194            | 30               | 28             | 28             | 28             | 28      | 6  | 24               | 140                  | 52               | 75             | 12             | 192            | 200            | 192            | 10           | 4.5            |                |                |   |      |
| 200                            | 375               | 320                     | 30 | 12 | M27     | 219.1                    | 221.5          | 226            | 250            | 36               | 34             | 34             | 36             | 36      | 6  | 28               | 190                  | 52               | 88             | 16             | 244            | 260            | 254            | 10           | 6.3            |                |                |   |      |
| 250                            | 450               | 385                     | 33 | 12 | M30     | 279.0                    | 276.5          | 281            | 312            | 42               | 38             | 38             | 38             | 38      | 8  | 30               | 235                  | 60               | 105            | 18             | 306            | 312            | 312            | 12           | 7.1            |                |                |   |      |
| 300                            | 515               | 450                     | 33 | 16 | M30     | 323.9                    | 327.5          | 333            | 368            | 48               | 42             | 42             | 42             | 42      | 8  | 34               | 285                  | 67               | 115            | 18             | 362            | 380            | 378            | 12           | 8.0            |                |                |   |      |
| 350                            | 580               | 510                     | 36 | 16 | M33     | 355.6                    | 359.5          | 365            | 418            | 54               | 46             | 46             | 46             | 46      | 8  | 36               | 330                  | 72               | 125            | 20             | 408            | 424            | 432            | 12           | 8.8            |                |                |   |      |
| 400                            | 660               | 585                     | 39 | 16 | M36     | 406.4                    | 411.0          | 416            | 472            | 60               | 50             | 50             | 50             | 50      | 8  | 42               | 380                  | 78               | 135            | 20             | 462            | 478            | 498            | 12           | 11.0           |                |                |   |      |
| 450                            | 685               | 610                     | 39 | 20 | M36     | 457.0                    | 462.0          | 467            | 510            | 66               | 57             | 57             | 57             | 57      | 8  | 46               | 425                  | 84               | 135            | 20             | 500            | 522            | 522            | 12           | 12.5           |                |                |   |      |
| 500                            | 755               | 670                     | 42 | 20 | M39     | 508.0                    | 513.5          | 519            | 572            | 72               | 57             | 57             | 57             | 57      | 8  | 50               | 475                  | 90               | 140            | 20             | 562            | 576            | 576            | 12           | 14.2           |                |                |   |      |
| 600                            | 890               | 795                     | 48 | 20 | M45     | 610.0                    | 616.5          | 622            | 676            | 84               | 72             | 72             | 72             | 72      | 8  | 54               | 575                  | 100              | 150            | 20             | 666            | 686            | 686            | 12           | 16.0           |                |                |   |      |

α For flanges type 21 the outside hub diameter approximately corresponds to the outside pipe diameter.

# MATERIAL SPECIFICATIONS

| ASTM  | Grade | Classifica-<br>tion | CHEMICAL COMPOSITION |             |               |               |             |               |               |             | MECHANICAL PROPERTIES |              |             |                  |         |
|-------|-------|---------------------|----------------------|-------------|---------------|---------------|-------------|---------------|---------------|-------------|-----------------------|--------------|-------------|------------------|---------|
|       |       |                     | C<br>%               | Mn<br>%     | P<br>Max<br>% | S<br>Max<br>% | Si<br>%     | Ni<br>%       | Cr<br>%       | Mo<br>%     | T. S.<br>Mpa          | Y. S.<br>Mpa | ELMin.<br>% | Red<br>Min.<br>% | HB      |
| A-105 |       | Carbon              | ≤0.35                | 0.60-1.05   | 0.040         | 0.050         | ≤0.35       | ≤0.40         | 0.30          | ≤0.12       | ≥485                  | ≥250         | 22          | 30               | ≤187    |
| A-181 | 60    | Carbon              | ≤0.35                | ≤0.90       | 0.050         | 0.050         | ≤0.35       |               |               |             | ≥415                  | ≥205         | 22          | 35               |         |
| A-181 | 70    | Carbon              | ≤0.35                | ≤0.90       | 0.050         | 0.050         | ≤0.35       |               |               |             | ≥485                  | ≥250         | 18          | 24               |         |
| A-182 | F1    | Low Alloy           | ≤0.28                | 0.60-0.90   | 0.045         | 0.045         | 0.15-0.35   |               |               | 0.44 - 0.65 | ≥485                  | ≥275         | 20          | 30               | 143-192 |
| A-182 | F5    | Low Alloy           | ≤0.15                | 0.30-0.60   | 0.30          | 0.030         | ≤0.50       | ≤0.50         | 4.0 - 6.00    | 0.44 - 0.65 | ≥485                  | ≥275         | 20          | 35               | 143-217 |
| A-182 | F5a   | Low Alloy           | ≤0.25                | ≤0.60       | 0.040         | 0.030         | ≤0.50       | ≤0.50         | 4.0 - 6.00    | 0.44 - 0.65 | ≥620                  | ≥450         | 22          | 50               | 187-248 |
| A-182 | F11-1 | Low Alloy           | 0.05-0.15            | 0.30-0.60   | 0.030         | 0.030         | 0.5-1.00    |               | 1.00 - 1.50   | 0.44 - 0.65 | ≥415                  | ≥205         | 20          | 45               | 121-174 |
| A-182 | F11-2 | Low Alloy           | 0.10-0.20            | 0.30-0.80   | 0.404         | 0.40          | 0.5-1.00    |               | 1.00 - 1.50   | 0.44 - 0.65 | ≥485                  | ≥275         | 20          | 30               | 143-207 |
| A-182 | F12-2 | Low Alloy           | 1.10-0.20            | 0.30-0.80   | 0.040         | 0.040         | 0.5-1.00    |               | 1.00 - 1.50   | 0.44 - 0.65 | ≥515                  | ≥310         | 20          | 30               | 156-207 |
| A-182 | F12-1 | Low Alloy           | 0.05-0.15            | 0.30-0.60   | 0.045         | 0.045         | ≤0.50       |               | 0.80 - 1.25   | 0.44 - 0.65 | ≥415                  | ≥220         | 20          | 45               | 121-174 |
| A-182 | F12-2 | Low Alloy           | 1.10-0.20            | 0.30-0.80   | 0.040         | 0.040         | 0.10-0.60   |               | 0.80 - 1.25   | 0.44 - 0.65 | ≥485                  | ≥275         | 20          | 30               | 143-207 |
| A-182 | F22   | Low Alloy           | ≤0.15                | 0.30-0.60   | 0.040         | 0.040         | ≤0.50       |               |               | 0.87 - 1.13 | ≥515                  | ≥310         | 20          | 30               | 156-207 |
| A-182 | F304  | Stainless           | ≤0.08                | ≤2.00       | 0.040         | 0.030         | ≤1.00       | 8.00 - 11.00  | 2.00 - 2.50   |             | ≥515                  | ≥205         | 30          | 50               |         |
| A-182 | F304L | Stainless           | ≤0.035               | ≤2.00       | 0.040         | 0.030         | ≤1.00       | 8.00 - 13.00  | 18.00 - 20.00 |             | ≥485                  | ≥170         | 30          | 50               |         |
| A-182 | F316  | Stainless           | ≤0.08                | ≤2.00       | 0.040         | 0.030         | ≤1.00       | 8.00 - 14.00  | 18.00 - 20.00 | 2.00 - 3.00 | ≥515                  | ≥205         | 30          | 50               |         |
| A-182 | F316l | Stainless           | ≤0.035               | ≤2.00       | 0.040         | 0.030         | ≤1.00       | 10.00 - 15.00 | 16.00 - 18.00 | 2.00 - 3.00 | ≥485                  | ≥170         | 30          | 50               |         |
| A-182 | F321  | Stainless           | ≤0.08                | ≤2.00       | 0.030         | 0.030         | ≤1.00       | 9.00 - 12.00  | 16.00 - 18.00 |             | ≥515                  | ≥205         | 30          | 50               |         |
| A-182 | F347  | Stainless           | ≤0.08                | ≤2.00       | 0.030         | 0.030         | ≤1.00       | 8.00 - 13.00  | 17.00 - 19.00 |             | ≥515                  | ≥205         | 30          | 50               |         |
| A-350 | Lf1   | CS Low temp         | ≤0.30                | 0.75 - 1.05 | 0.035         | 0.040         | 0.15 - 0.30 | ≤0.40         | ≤0.30         | ≤0.12       | 415<br>585            | ≥205         | 25          | 38               |         |
| A-350 | Lf2   | CS Low temp         | ≤0.30                | ≤1.35       | 0.035         | 0.040         | 0.15 - 0.30 | ≤0.40         | ≤0.30         | ≤0.12       | 485<br>655            | ≥250         | 22          | 30               |         |
| A-350 | Lf3   | CS Low temp         | ≤0.20                | ≤0.90       | 0.035         | 0.040         | 0.20 - 0.35 | 3.25 - 3.75   | ≤0.30         | ≤0.12       | 485<br>655            | ≥250         | 22          | 38               |         |



37 Hillmorton Road, Sutton Coldfield, West Midlands,  
B74 4SQ, United Kingdom

**Tel/Fax:** +44 121 308 1872

**Email:** [sales@wolffpipelines.com](mailto:sales@wolffpipelines.com)