

## DIMENSION OF PIPE FLANGES AS PER TABLE BS- 10

**Table D: For Working Steam Pressure upto 50 lbs per sq. inch**

| Nominal Pipe size | O.D of Pipe | Dia. of Flange | Dia. of Bolt Circle | No. of Bolt | Dia. of Bolt | Thickness |
|-------------------|-------------|----------------|---------------------|-------------|--------------|-----------|
| 1/2"              | 21.3        | 95.3           | 66.7                | 4           | 12.7         | 4.8       |
| 3/4"              | 26.7        | 101.6          | 73.0                | 4           | 12.7         | 4.8       |
| 1"                | 33.4        | 114.3          | 82.6                | 4           | 12.7         | 4.8       |
| 1 1/4"            | 42.2        | 120.7          | 87.6                | 4           | 12.7         | 6.4       |
| 1 1/2"            | 48.3        | 133.4          | 98.4                | 4           | 12.7         | 6.4       |
| 2"                | 60.3        | 152.4          | 114.3               | 4           | 15.9         | 7.9       |
| 2 1/2"            | 73.0        | 165.1          | 127.0               | 4           | 15.9         | 7.9       |
| 3"                | 88.9        | 184.2          | 146.1               | 4           | 15.9         | 9.5       |
| 3 1/2"            | 101.6       | 203.2          | 165.1               | 4           | 15.9         | 9.5       |
| 4"                | 114.3       | 215.9          | 177.8               | 4           | 15.9         | 9.5       |
| 5"                | 141.3       | 254.0          | 209.6               | 8           | 15.9         | 12.7      |
| 6"                | 168.3       | 279.4          | 228.6               | 8           | 15.9         | 12.7      |
| 7"                | 190.5       | 304.8          | 260.4               | 8           | 15.9         | 12.7      |
| 8"                | 219.1       | 336.6          | 292.1               | 8           | 15.9         | 12.7      |
| 9"                | 244.5       | 368.3          | 323.9               | 8           | 15.9         | 15.9      |
| 10"               | 273.0       | 406.4          | 355.6               | 8           | 19.1         | 15.9      |
| 12"               | 323.9       | 457.2          | 406.4               | 12          | 19.1         | 15.9      |
| 14"               | 355.6       | 527.1          | 469.9               | 12          | 22.2         | 19.1      |
| 16"               | 406.4       | 577.9          | 520.7               | 12          | 22.2         | 19.1      |
| 18"               | 457.2       | 641.4          | 584.2               | 12          | 22.2         | 22.2      |
| 20"               | 508.0       | 704.9          | 641.4               | 16          | 22.5         | 25.4      |
| 24"               | 609.6       | 825.5          | 755.7               | 16          | 25.4         | 28.6      |

**Table E: For Working Steam Pressure 50 lbs upto 100 lbs per sq. inch**

| Nominal Pipe Size | Dia. of Flange | Dia. of Bolt Circle | No. of Bolt | Dia. of Bolt | Thickness |
|-------------------|----------------|---------------------|-------------|--------------|-----------|
| 1/2"              | 95.3           | 66.7                | 4           | 12.7         | 6.4       |
| 3/4"              | 101.6          | 73.0                | 4           | 12.7         | 6.4       |
| 1"                | 114.3          | 82.6                | 4           | 12.7         | 7.1       |
| 1 1/4"            | 120.7          | 87.3                | 4           | 12.7         | 7.9       |
| 1 1/2"            | 133.4          | 98.4                | 4           | 12.7         | 8.7       |
| 2"                | 152.4          | 114.3               | 4           | 15.9         | 9.5       |
| 2 1/2"            | 165.1          | 127.0               | 4           | 15.9         | 10.3      |
| 3"                | 184.2          | 146.1               | 4           | 15.9         | 11.1      |
| 3 1/2"            | 203.2          | 165.1               | 8           | 15.9         | 11.9      |
| 4"                | 215.9          | 177.8               | 8           | 15.9         | 12.7      |
| 5"                | 254.0          | 209.6               | 8           | 15.9         | 14.3      |
| 6"                | 279.4          | 228.6               | 8           | 19.1         | 17.5      |
| 7"                | 304.8          | 260.4               | 8           | 19.1         | 19.1      |
| 8"                | 336.6          | 292.1               | 8           | 19.1         | 19.1      |
| 9"                | 368.3          | 323.9               | 12          | 19.1         | 20.6      |
| 10"               | 406.4          | 355.6               | 12          | 19.1         | 22.2      |
| 12"               | 457.2          | 406.4               | 12          | 22.2         | 25.4      |
| 14"               | 527.2          | 469.9               | 12          | 22.2         | 25.4      |
| 16"               | 577.9          | 520.7               | 12          | 22.2         | 25.4      |
| 18"               | 641.4          | 584.2               | 16          | 22.2         | 28.6      |
| 20"               | 704.9          | 647.4               | 16          | 22.2         | 31.8      |
| 24"               | 825.5          | 755.7               | 16          | 25.4         | 38.1      |

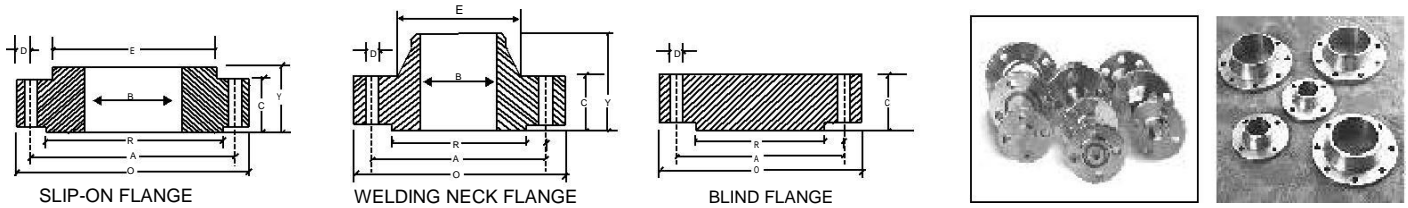
**Table F: For Working Steam Pressure above 100 lbs and upto 150 lbs per sq. inch**

| Nominal Pipe Size | O.D of Pipe | Dia of Flange | Dia of Bolt Circle | No. of Bolt | Dia. of Bolt | Thickness |
|-------------------|-------------|---------------|--------------------|-------------|--------------|-----------|
| 1/2"              | 21.3        | 95.3          | 66.7               | 4           | 12.7         | 9.5       |
| 3/4"              | 26.7        | 101.6         | 73.0               | 4           | 12.7         | 9.5       |
| 1"                | 33.4        | 120.7         | 87.3               | 4           | 15.9         | 9.5       |
| 1 1/4"            | 42.2        | 133.4         | 98.4               | 4           | 15.9         | 12.7      |
| 1 1/2"            | 48.3        | 139.7         | 104.8              | 4           | 15.9         | 12.7      |
| 2"                | 60.3        | 165.1         | 127.0              | 4           | 15.9         | 15.9      |
| 2 1/2"            | 73.0        | 184.2         | 146.1              | 8           | 15.9         | 15.9      |
| 3"                | 88.9        | 203.2         | 165.1              | 8           | 15.9         | 15.9      |
| 3 1/2"            | 101.6       | 215.9         | 177.8              | 8           | 15.9         | 19.1      |
| 4"                | 114.3       | 228.6         | 190.5              | 8           | 15.9         | 19.1      |
| 5"                | 141.3       | 279.4         | 235.0              | 8           | 19.1         | 22.2      |
| 6"                | 168.3       | 304.8         | 260.4              | 12          | 19.1         | 22.2      |
| 7"                | 190.3       | 336.6         | 292.1              | 12          | 19.1         | 22.2      |
| 8"                | 219.1       | 368.3         | 323.9              | 12          | 19.1         | 25.4      |
| 9"                | 244.5       | 406.4         | 355.6              | 12          | 22.2         | 25.4      |
| 10"               | 273.0       | 431.8         | 381.0              | 12          | 22.2         | 25.4      |
| 12"               | 323.0       | 489.0         | 438.2              | 16          | 22.2         | 28.6      |
| 14"               | 355.6       | 552.5         | 495.3              | 16          | 25.4         | 31.8      |
| 16"               | 406.4       | 609.6         | 552.5              | 20          | 25.4         | 31.8      |
| 18"               | 457.2       | 673.1         | 609.6              | 20          | 28.6         | 34.9      |
| 20"               | 508.0       | 736.6         | 673.1              | 24          | 28.6         | 38.1      |
| 24"               | 609.6       | 850.9         | 781.1              | 24          | 31.8         | 41.3      |

**Table H: For Working Steam Pressure above 150 lbs and upto 250 lbs per sq. inch**

| Nominal Pipe size | Dia of Flange | Dia. of Bolt Circle | No. of Bolt | Dia. of Bolt | Thickness |
|-------------------|---------------|---------------------|-------------|--------------|-----------|
| 1/2"              | 114.3         | 82.6                | 4           | 15.9         | 12.7      |
| 3/4"              | 114.3         | 82.6                | 4           | 15.9         | 12.7      |
| 1"                | 120.78        | 87.3                | 4           | 15.9         | 14.3      |
| 1 1/4"            | 133.4         | 98.4                | 4           | 15.9         | 17.5      |
| 1 1/2"            | 139.7         | 104.8               | 4           | 15.9         | 17.5      |
| 2"                | 165.1         | 127.0               | 4           | 15.9         | 19.1      |
| 2 1/2"            | 184.2         | 146.1               | 8           | 15.9         | 19.1      |
| 3"                | 203.2         | 165.1               | 8           | 15.9         | 22.2      |
| 3 1/2"            | 215.9         | 177.8               | 8           | 15.9         | 22.2      |
| 4"                | 228.6         | 190.5               | 8           | 15.9         | 25.4      |
| 5"                | 279.4         | 235.0               | 8           | 19.1         | 28.6      |
| 6"                | 304.8         | 260.4               | 12          | 19.1         | 28.6      |
| 7"                | 336.6         | 292.1               | 12          | 19.1         | 31.8      |
| 8"                | 368.3         | 323.9               | 12          | 19.1         | 31.8      |
| 9"                | 406.4         | 355.6               | 12          | 22.2         | 34.9      |
| 10"               | 431.8         | 381.0               | 12          | 22.2         | 34.9      |
| 12"               | 489.0         | 438.2               | 16          | 22.2         | 38.1      |
| 14"               | 552.5         | 495.3               | 16          | 25.4         | 41.3      |
| 16"               | 609.6         | 552.5               | 20          | 25.4         | 44.5      |
| 18"               | 673.1         | 609.6               | 20          | 28.6         | 47.6      |
| 20"               | 736.6         | 673.1               | 24          | 28.6         | 50.8      |
| 24"               | 850.9         | 781.1               | 24          | 31.8         | 57.2      |

## FORGED FLANGES TO ANSI B 16.5 (ASA 150 / 300 LBS)



### 150 LBS

| Nominal Pipe Size<br>(MM) (INCH.) | Flange Dia<br>O | Dia of Bolt Circle<br>A | Dia of Bolt Holes<br>D | No. of Holes | Thk. of Flange<br>C | Dia of Hub<br>E | Length through Hub |          |          | Dia of Bore    |          | Dia of R/F<br>R | Depth of Socket<br>F |      |
|-----------------------------------|-----------------|-------------------------|------------------------|--------------|---------------------|-----------------|--------------------|----------|----------|----------------|----------|-----------------|----------------------|------|
|                                   |                 |                         |                        |              |                     |                 | S/O & S/W<br>Y     | W/N<br>Y | L/J<br>Y | S/O & S/W<br>B | L/J<br>B |                 |                      |      |
| 15                                | 1/2             | 88.9                    | 60.3                   | 15.9         | 4                   | 11.1            | 30.2               | 15.9     | 47.6     | 15.9           | 22.3     | 22.9            | 34.9                 | 9.5  |
| 20                                | 3/4             | 98.4                    | 69.8                   | 15.9         | 4                   | 12.7            | 38.1               | 15.9     | 52.4     | 15.9           | 27.7     | 28.2            | 42.9                 | 11.1 |
| 25                                | 1               | 107.9                   | 79.4                   | 15.9         | 4                   | 14.3            | 49.2               | 17.5     | 55.6     | 17.5           | 34.5     | 35.0            | 50.8                 | 12.7 |
| 32                                | 1 1/4           | 117.5                   | 88.9                   | 15.9         | 4                   | 15.9            | 58.7               | 20.6     | 57.1     | 20.6           | 43.2     | 43.7            | 63.5                 | 14.3 |
| 40                                | 1 1/2           | 127.0                   | 98.4                   | 15.9         | 4                   | 17.5            | 65.1               | 22.2     | 61.9     | 22.2           | 49.5     | 50.0            | 73.0                 | 15.9 |
| 50                                | 2               | 152.4                   | 120.6                  | 19.0         | 4                   | 19.0            | 77.8               | 25.4     | 63.5     | 25.4           | 62.0     | 62.5            | 92.1                 | 17.5 |
| 65                                | 2 1/2           | 177.8                   | 139.7                  | 19.0         | 4                   | 22.2            | 90.5               | 28.6     | 69.8     | 28.6           | 74.7     | 75.4            | 104.8                | 19.0 |
| 80                                | 3               | 190.5                   | 152.4                  | 19.0         | 4                   | 23.8            | 107.9              | 30.2     | 69.8     | 30.2           | 90.7     | 91.4            | 127.0                | 20.6 |
| 100                               | 4               | 228.6                   | 190.5                  | 19.0         | 8                   | 23.8            | 134.9              | 33.3     | 76.2     | 33.3           | 116.1    | 116.8           | 157.2                | 23.8 |
| 125                               | 5               | 254.0                   | 215.9                  | 22.2         | 8                   | 23.8            | 163.5              | 36.5     | 88.9     | 36.5           | 143.8    | 144.5           | 185.7                | 23.8 |
| 150                               | 6               | 279.4                   | 241.3                  | 22.2         | 8                   | 25.4            | 192.1              | 39.7     | 88.9     | 39.7           | 170.7    | 171.4           | 215.9                | 27.0 |
| 200                               | 8               | 342.9                   | 298.4                  | 22.2         | 8                   | 28.6            | 246.1              | 44.4     | 101.6    | 44.4           | 221.5    | 222.2           | 269.9                | 31.7 |
| 250                               | 10              | 406.4                   | 361.9                  | 25.4         | 12                  | 30.2            | 304.8              | 49.2     | 101.6    | 49.2           | 276.3    | 277.4           | 323.8                | 33.3 |
| 300                               | 12              | 482.6                   | 431.8                  | 25.4         | 12                  | 31.8            | 365.1              | 55.6     | 114.3    | 55.6           | 327.1    | 328.2           | 381.0                | 39.7 |
| 350                               | 14              | 533.4                   | 476.2                  | 28.6         | 12                  | 34.9            | 400.0              | 57.1     | 127.0    | 79.4           | 359.1    | 360.2           | 412.7                | 41.3 |
| 400                               | 16              | 596.9                   | 539.7                  | 28.6         | 16                  | 36.5            | 457.2              | 63.5     | 127.0    | 87.3           | 410.5    | 411.2           | 469.9                | 44.4 |
| 450                               | 18              | 635.0                   | 577.8                  | 31.7         | 16                  | 39.7            | 504.8              | 68.3     | 139.7    | 96.8           | 461.8    | 462.3           | 533.4                | 49.2 |
| 500                               | 20              | 698.5                   | 635.0                  | 31.7         | 20                  | 42.9            | 558.8              | 73.0     | 144.5    | 103.2          | 513.1    | 514.3           | 584.2                | 54.0 |
| 600                               | 24              | 812.8                   | 749.3                  | 34.9         | 20                  | 47.6            | 663.6              | 82.5     | 152.4    | 111.1          | 615.9    | 615.9           | 692.1                | 63.5 |

### 300 LBS

| Nominal Pipe Size<br>(MM) (INCH.) | Flange Dia<br>O | Dia of Bolt Circle<br>A | Dia of Bolt Holes<br>D | No. of Holes | Thk. of Flange<br>C | Dia of Hub<br>E | Length through Hub |          |          | Dia of Bore    |          | Dia of R/F<br>R | Depth of Socket<br>F |      |
|-----------------------------------|-----------------|-------------------------|------------------------|--------------|---------------------|-----------------|--------------------|----------|----------|----------------|----------|-----------------|----------------------|------|
|                                   |                 |                         |                        |              |                     |                 | S/O & S/W<br>Y     | W/N<br>Y | L/J<br>Y | S/O & S/W<br>B | L/J<br>B |                 |                      |      |
| 15                                | 1/2             | 95.2                    | 66.7                   | 15.9         | 4                   | 14.3            | 38.1               | 22.2     | 52.4     | 22.2           | 22.3     | 22.9            | 34.9                 | 9.5  |
| 20                                | 3/4             | 117.5                   | 82.5                   | 19.0         | 4                   | 15.9            | 47.6               | 25.4     | 57.1     | 25.4           | 27.7     | 28.2            | 42.9                 | 11.1 |
| 25                                | 1               | 123.8                   | 88.9                   | 19.0         | 4                   | 17.5            | 54.0               | 27.0     | 61.9     | 27.0           | 34.5     | 35.0            | 50.8                 | 12.7 |
| 32                                | 1 1/4           | 133.3                   | 98.4                   | 19.0         | 4                   | 19.0            | 63.5               | 27.0     | 65.1     | 27.0           | 43.2     | 43.7            | 63.5                 | 14.3 |
| 40                                | 1 1/2           | 155.6                   | 114.3                  | 22.2         | 4                   | 20.6            | 69.8               | 30.2     | 68.3     | 30.2           | 49.5     | 50.0            | 73.0                 | 15.9 |
| 50                                | 2               | 165.1                   | 127.0                  | 19.0         | 8                   | 22.2            | 84.1               | 33.3     | 69.8     | 33.3           | 62.0     | 62.5            | 92.1                 | 17.5 |
| 65                                | 2 1/2           | 190.5                   | 149.2                  | 22.2         | 8                   | 25.4            | 100.0              | 38.1     | 76.2     | 38.1           | 74.7     | 75.4            | 104.8                | 19.0 |
| 80                                | 3               | 209.5                   | 168.3                  | 22.2         | 8                   | 28.6            | 117.5              | 42.9     | 79.4     | 42.9           | 90.7     | 91.4            | 127.0                | 20.6 |
| 100                               | 4               | 254.0                   | 200.0                  | 22.2         | 8                   | 31.8            | 146.0              | 47.6     | 85.7     | 47.6           | 116.1    | 116.8           | 157.2                | 23.8 |
| 125                               | 5               | 279.4                   | 234.9                  | 22.2         | 8                   | 34.9            | 177.8              | 50.8     | 98.4     | 50.8           | 143.8    | 144.5           | 185.7                | -    |
| 150                               | 6               | 317.5                   | 269.9                  | 22.2         | 12                  | 36.5            | 206.4              | 52.4     | 98.4     | 52.4           | 170.7    | 171.4           | 215.9                | -    |
| 200                               | 8               | 381.0                   | 330.2                  | 25.4         | 12                  | 41.3            | 260.3              | 61.9     | 111.1    | 61.9           | 221.5    | 222.2           | 269.9                | -    |
| 250                               | 10              | 444.5                   | 387.3                  | 28.6         | 16                  | 47.6            | 320.7              | 66.7     | 117.5    | 95.2           | 276.3    | 277.4           | 323.8                | -    |
| 300                               | 12              | 520.7                   | 450.8                  | 31.7         | 16                  | 50.8            | 374.6              | 73.0     | 130.2    | 101.6          | 327.1    | 328.2           | 381.0                | -    |
| 350                               | 14              | 584.2                   | 514.3                  | 31.7         | 20                  | 54.0            | 425.4              | 76.2     | 142.9    | 111.1          | 359.1    | 360.2           | 412.7                | -    |
| 400                               | 16              | 647.7                   | 571.5                  | 34.9         | 20                  | 57.2            | 482.6              | 82.5     | 146.0    | 120.6          | 410.5    | 411.2           | 469.9                | -    |
| 450                               | 18              | 711.2                   | 628.5                  | 34.9         | 24                  | 60.3            | 533.4              | 88.9     | 158.7    | 130.2          | 461.8    | 462.3           | 533.4                | -    |
| 500                               | 20              | 774.7                   | 685.8                  | 34.9         | 24                  | 63.5            | 587.4              | 95.2     | 161.9    | 139.7          | 513.1    | 514.3           | 584.2                | -    |
| 600                               | 24              | 914.4                   | 812.8                  | 41.3         | 24                  | 69.8            | 701.7              | 106.4    | 168.3    | 152.4          | 615.9    | 615.9           | 692.1                | -    |

All Dimensions are in Millimeters ● Flanges except Lap Joint will be furnished with (1.6) Raised Face, which is included in "Thickness(C)" and "Length through Hub(Y)"

## DIMENSIONAL TOLERANCES

| Threaded, Socket-Welding, Slip-on, Lap Joint and Blind |   |  | Welding Neck                        |  |   |
|--|---|--|-------------------------------------|--|---|
| Outside Diameter                                       | When O.D is 24" or less                       | + 1/16" (1.6mm)  | Outside Diameter                    | When O.D. is 24" or less                           | ± 1/6" (1.6mm)  |
|  | When O.D is Over 24"                          | + 1/8" (3.2mm)   |                                     | When O.D is over 24"                               | ± 1/16" (3.2mm)   |
| Inside Diameter  | Threaded                                      | Within limits on boring guage  | Inside Diameter                     | 10" and Smaller                                    | + 1/32" (0.8mm)   |
|  | Socket-Welding, Slip-on and Lap joint         | <b>10" 7 Smaller</b><br>+ 1/32" (0.8mm) - 0"<br>12" & Larger<br>+ 1/16" (1.6mm) - 0" |                                     | 12" thru 18"                                       | + 1/16" (1.6mm)   |
| Outside Diameter of Hub                                | 12" and Smaller                               | + 1/32" (0.8mm)<br>- 1/16" (1.6mm)   | Diameter of Contact Face            | 20" and Larger                                     | + 1/8" (3.2mm)<br>- 1/16" (1.6mm)   |
|  | 14" and Larger                                | ± 1/8" (3.2mm)   |                                     | 1/16" Raised Face                                  | +1/32" (0.8mm)  |
| Diameter of Contact Face                               | 1/16" Raised Face                             | ±1/32" (0.8mm)   | Diameter of Hub at Base             | 1/4" Raised Face Tongue & Groove Male, Female      | + 1/64" (0.4mm)   |
|  | 1/4" Raised Face Tongue & Groove Male, Female | ± 1/64" (0.4mm)  |                                     | When Hub Base is 24" or Smaller                    | = 1/16" (1.6mm)   |
| Diameter of Counterbore                                | <b>Same as for Inside Diameter</b>            |  | Diameter of Hub at Point of Welding | When Hub Base is Over 24"                          | - 1/8" (3.2mm)  |
|  | Drilling                                      | Bolt Circle  |                                     | ± 1/16" (1.6mm)                                    | 5" and Smaller  |
| Bolt hole Spacing                                      |   | ± 1/32" (0.8mm)  | 6" and Larger                       | + 5/32" (4.0mm)<br>- 1/32" (0.8mm)                 |   |
| Eccentricity of Both Circle with Respect to Facing     |   | 2 1/2" & Smaller<br>1/32" (0.8mm) max<br>3" & Larger<br>1/16" (1.6mm) max            | Drilling                            | Bolt Circle  | + 1/16" (1.6mm)   |
| Eccentricity of Both Circle with Respect to Bore       |   | 1/32" (0.8mm) max  |                                     | Bolt hole spacing                                  | + 1/32" (0.8mm)   |
| Eccentricity of Facing with Respect to Bore            |   | 1/32" (0.8mm) max  |                                     | 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 to Bore                                     |                                     | 1/32" (0.8mm) max                                  |   |
| Thickness  | 18" and Smaller                               | + 1/8" (3.2mm) - 0"  | Thickness                           | 18" and Smaller                                    | + 1/8" (3.2mm)-0"   |
|  | 20" and Larger                                | + 3/16" (4.8mm) - 0"   |                                     | 20" and Larger                                     | + 3/16" (4.8mm)-0"  |
| Length Thru Hub  | 10" and Smaller                               | ± 1/16" (1.6mm)  | Length Thru Hub                     | 10" and Smaller                                    | + 1/16" (1.6mm)   |
|  | 12" and Larger                                | ± 1/8" (3.2mm)   |                                     | 12" and Larger                                     | + 1/8" (3.2mm)  |