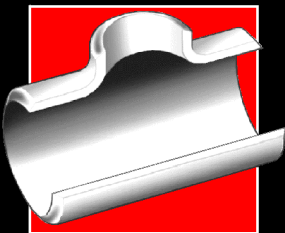


# Section 8

## Flanges

This section contains extracts from American and British specifications applicable to stainless steel flanges.



| Subsections and topics                               | Pages      |
|--|------------|
| Flanges - General Information                        | 8-2        |
| ASME/ANSI Flanges (incl. MSS SP-44 and API 605)      | 8-4        |
| Weld Neck Flanges - Welding Ends (ASME/ANSI)         | 8-5        |
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| Flange Drilling Details - BS 4504                    | 8-64       |
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| Specifications covered in this Section   | Page                             |
|--|----------------------------------|
| ASME B16.5-1996 - Pipe Flanges and Flanged Fittings<br>NPS 1/2 through NP 24   | 8-4<br>(general)<br>8-10 to 8-45 |
| ASME B16.47-1996 - Large Diameter Steel Flanges<br>NPS 26 through NPS 60<br>(Covers MSS SP-44 and API 605 flanges)   | 8-4<br>(general)<br>8-46 to 8-54 |
| MSS SP-44 1996 - Edition, Steel Pipeline Flanges<br>(Covered by ASME B16.47-1996 Series A)   | 8-46 to 8-50                     |
| API Standard 605 - Cancelled<br>(Covered by ASME B16.47-1996 Series B)   | 8-51 to 8-54                     |
| BS 10 : 1962 - Specification for Flanges and Bolting for<br>Pipes, Valves, and Fittings  | 8-71                             |
| BS 3293 : 1960 (incorporating amendment 1972) -<br>Specification for Carbon Steel Pipe Flanges (over 24 inches<br>nominal size) for the Petroleum Industry                   | 8-55                             |
| BS 4504 : Section 3.1 : 1989 (incorporating amendments) -<br>Circular Flanges for Pipes, Valves and Fittings (PN<br>designated), Section 3.1 Specification for Steel Flanges | 8-60                             |
| ISO 7005-1 : 1992 (E), Metallic Flanges - Part 1: Steel<br>Flanges (this is substantially the same as BS 4504)   | 8-60                             |

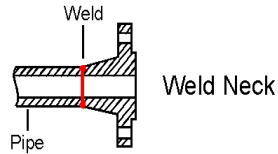
## Flanges - General Information

A Flange is a method of connecting pipes, valves, pumps and other equipment to form a pipework system. It also provides easy access for cleaning, inspection or modification. Flanges are usually welded or screwed into such systems and then joined with bolts.

### Flange Types

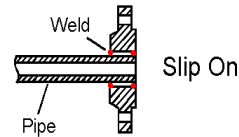
#### Weld Neck

This flange is circumferentially welded into the system at its neck which means that the integrity of the butt welded area can be easily examined by radiography. The bores of both pipe and flange match, which reduces turbulence and erosion inside the pipeline. The weld neck is therefore favoured in critical applications



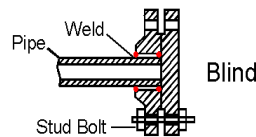
#### Slip-on

This flange is slipped over the pipe and then fillet welded. Slip-on flanges are easy to use in fabricated applications.



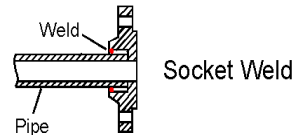
#### Blind

This flange is used to blank off pipelines, valves and pumps, it can also be used as an inspection cover. It is sometimes referred to as a blanking flange.



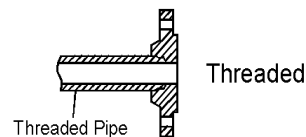
#### Socket Weld

This flange is counter bored to accept the pipe before being fillet welded. The bore of the pipe and flange are both the same therefore giving good flow characteristics.



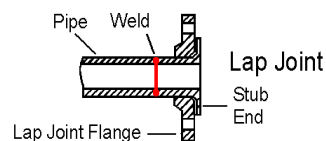
#### Threaded

This flange is referred to as either threaded or screwed. It is used to connect other threaded components in low pressure, non-critical applications. No welding is required.



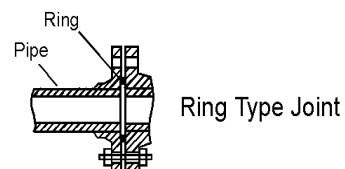
#### Lap Joint

These flanges are always used with either a stub end or taft which is butt welded to the pipe with the flange loose behind it. This means the stub end or taft always makes the face. The lap joint is favoured in low pressure applications because it is easily assembled and aligned. To reduce cost these flanges can be supplied without a hub and/or in treated, coated carbon steel.



#### Ring Type Joint

This is a method of ensuring leak proof flange connection at high pressures. A metal ring is compressed into a hexagonal groove on the face of the flange to make the seal. This jointing method can be employed on Weld Neck, Slip-on and Blind Flanges.



# Flanges - General Information

## Specifications

Refer to page 8-1 for a list of flange specifications (with page references) covered in this Section.

## Manufacture

### Summary of materials used for flanges

|                                 | ASME/<br>ANSI<br>B16.5 | ASME B16.47<br>Series A<br>(or MSS SP-44 <sup>1</sup> ) | ASME B16.47<br>Series B<br>(or API 605 <sup>2</sup> ) | BS<br>4504 | BS<br>3293 | BS 10 <sup>3</sup> |
|---------------------------------|------------------------|---|---|------------|------------|--------------------|
| Forging (ASTM A 182)            | ✓                      | ✓   | ✓   | ✓          | ✓          | ✓                  |
| Plate (ASTM A 240) <sup>4</sup> | ✓                      |   |   | ✓          |            | ✓                  |
| Bar <sup>5</sup>                |                        |   |   |            |            | ✓                  |
| Casting <sup>6</sup>            | ✓                      |   |   | ✓          |            | ✓                  |

#### Notes

- MSS SP-44 flanges are designated Series A flanges in ASME B16.47.
- API 605 has been cancelled. API 605 flanges are designated Series B flanges in ASME B16.47.
- BS 10, although obsolete, remains in use for light weight economy stainless steel flanges.
- Within specification ANSI B16.5, plate can only be used to provide blind flanges.
- Most small BS 10 flanges are made from bar.
- Castings are not included in this manual.

- **Materials.** Most standards specify the material from which the flange is produced. The purchaser should specify the exact requirements.
- **Flange Sizes.** All sizes and grades compatible to standard pipe ranges and wall thicknesses (pressure ratings) are available. The table below provides a summary.
- **Flange Face.** There are various face configurations for flanges. Typically: flat face, raised face, tongue and groove, ring joint.
- **Face Finish.** The finish on the face of a flange is measured as an Arithmetical Average Roughness Height (AARH). The finish is determined by the standard used. For example, ANSI B16.5 specifies face finishes within a range 125AARH - 500AARH (3.2 Ra to 12.5 Ra). Other finishes are available on request, for example 1.6 Ra max, 1.6/3.2 Ra, 3.2/6.3 Ra or 6.3/12.5 Ra. The range 3.2/6.3 Ra is most common.

### Summary of flange sizes specified by common standards

| Flange Type         | Specifications           |   |   |                         |            |
|---------------------|--------------------------|---|---|-------------------------|------------|
|                     | ASME/ANSI<br>B16.5       | ASME B16.47<br>Series A<br>(or MSS SP-44 <sup>1</sup> ) | ASME B16.47<br>Series B<br>(or API 605 <sup>2</sup> ) | BS 4504<br>(ISO 7005-1) | BS 3293    |
|                     | Nominal Pipe Sizes       |   |   |                         |            |
|                     | < NPS 26                 | ≥NPS 26   | ≥NPS 26   | DN 10 to<br>DN 4000     | ≥ NPS 26   |
|                     | Nominal Pressure (Class) |   |   |                         |            |
|                     | Class (lb)               | Class (lb)  | Class (lb)  | PN (bar)                | Class (lb) |
| Weld Neck           | 150-2500                 | 150-900   | 75-900  | 2.5-40                  | 150-600    |
| Slip-on             | 150-1500                 | -   | -   | 2.5-40                  | 150-600    |
| Blind               | 150-2500                 | 300-900   | 300-900   | 2.5-40                  | -          |
| Lap Joint           | 150-2500                 | -   | -   | 6-40 <sup>3</sup>       | -          |
| Socket Weld         | 150-1500                 | -   | -   | N/A                     | -          |
| Threaded            | 150-2500                 | -   | -   | 6-40                    | -          |
| Flat/Raised Facings | As above                 | As above  | As above  | As above                | As above   |
| Ring Joint Facings  | 150-2500                 | 300-900   | 300-900   | 2.5-40                  | 300-600    |
| Other Facings       | 150-2500 <sup>3</sup>    | -   | -   | 2.5-40                  | -          |

#### Notes

- MSS SP-44 flanges are designated Series A flanges in ASME B16.47. It also covers flanges in the range NPS 12 to 24, these being equivalent to ASME/ANSI B16.5 flanges in the same range (except for the addition of NPS 22 in MSS SP-44).
- API 605 has been cancelled. API 605 flanges are designated Series B flanges in ASME B16.47. Ranges quoted are based on ASME B16.47 Series B.
- Dimensions not covered in this summary.

## ASME/ANSI B16.5-1996 and B16.47-1996

American national standards ASME/ANSI B16.5 and B16.47 together cover pipe flanges up to NPS 60 (NPS 48 is the largest detailed in this summary). ASME/ANSI B16.47 covers two series of flanges, Series A which is equivalent to MSS SP-44 (the 1996 Edition of MSS SP-44 complies with B16.47 tolerances), and Series B which is equivalent to API 605 (API 605 is now cancelled).

### Dimensions and Tolerances

#### Tolerances on flange dimensions (ASME/ANSI B16.5 and B16.47, and MSS SP-44)

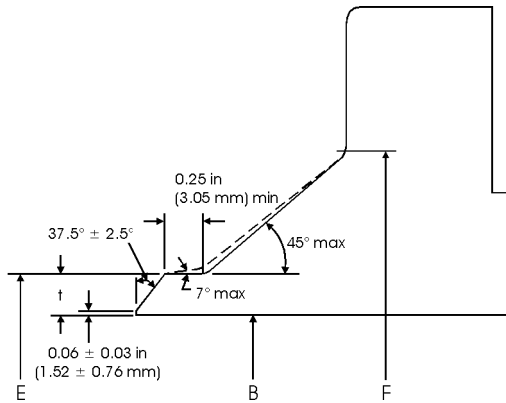
| Dimension   | Range                                 | Tolerance                              |              |
|---|---------------------------------------|--|--------------|
|   |                                       | in                                     | mm           |
| General and Blind Flanges (For blind flange dimensions see page 8-23 for B16.5, page 8-46 for B16.47 Series A / MSS SP-44 and page 8-51 for B16.47 Series B / API 605): |                                       |  |              |
| G (raised face diameter)  | ≤ NPS 24                              | ±0.03                                  | ±0.76        |
|   | ≥ NPS 26, with<br>0.06 in raised face | ±0.08                                  | ±2.03        |
|   | ≥ NPS 26, with<br>0.25 in raised face | ±0.04                                  | ±1.02        |
| I (bolt hole diameter)  | All                                   | No tolerance in B16.5 or B16.47        |              |
| J (bolt circle diameter)  | All                                   | ±0.06                                  | ±1.52        |
| Centre to centre of adjacent bolt holes   | All                                   | ±0.03                                  | ±0.76        |
| Eccentricity of bolt circle and machined facing diameters   | ≤ NPS 2½                              | ±0.03                                  | ±0.76        |
|   | ≥ NPS 3                               | ±0.06                                  | ±1.52        |
| Weld Neck Flanges <sup>1</sup> (For dimensions see page 8-10 for B16.5, page 8-46 for B16.47 Series A / MSS SP-44 and page 8-51 for B16.47 Series B / API 605):         |                                       |  |              |
| D (overall length)  | ≤ NPS 4                               | +0.06                                  | +1.52        |
|   | NPS 5 to 10                           | +0.06, -0.12                           | +1.52, -3.05 |
|   | NPS 12 to 24                          | +0.12, -0.18                           | +3.05, -4.57 |
|   | ≥ NPS 26                              | ±0.19                                  | ±4.83        |
| Thickness of hub  | All                                   | > 87.5% of pipe nominal wall thickness |              |
| Slip on (see page 8-17), Lap Joint (see page 8-32 for dimensions) and Socket Welding (see page 8-30 for dimensions) Flanges:  |                                       |  |              |
| B (inside diameter, or bore)  | ≤ NPS 10                              | +0.03, -0.0                            | +0.76, -0.0  |
|   | ≥ NPS 12                              | +0.06, -0.0                            | +1.52, -0.0  |
| Threaded Flanges (see page 8-40 for dimensions):  |                                       |  |              |
| B (counterbore)<br>(Not applicable for Class 150 lb)  | ≤ NPS 10                              | +0.03, -0.0                            | +0.76, -0.0  |
|   | ≥ NPS 12                              | +0.06, -0.0                            | +1.52, -0.0  |
| Ring Joint Facing (See page 8-6 for dimensions; see page 8-9 for tolerances)  |                                       |  |              |

Note

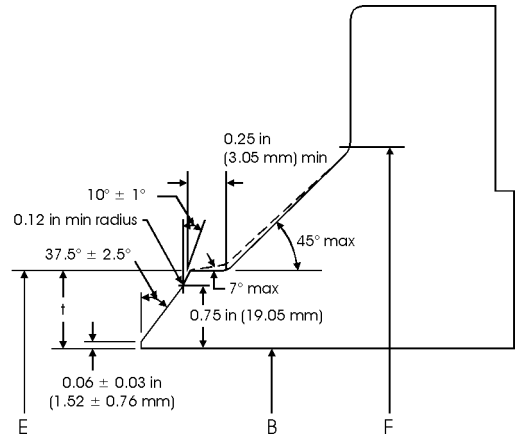
<sup>1</sup> See page 8-5 for weld neck welding end dimension and tolerance data.

# General - ASME/ANSI B16.5 & B16.47

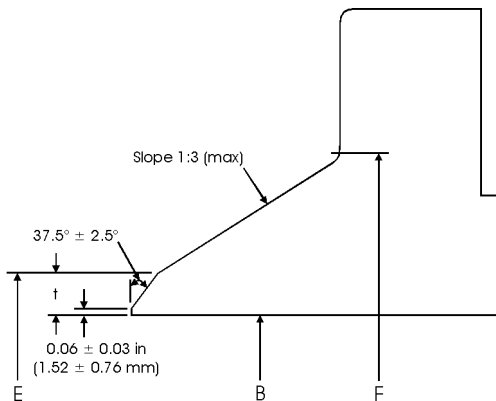
## Weld Neck Flanges - Welding Ends



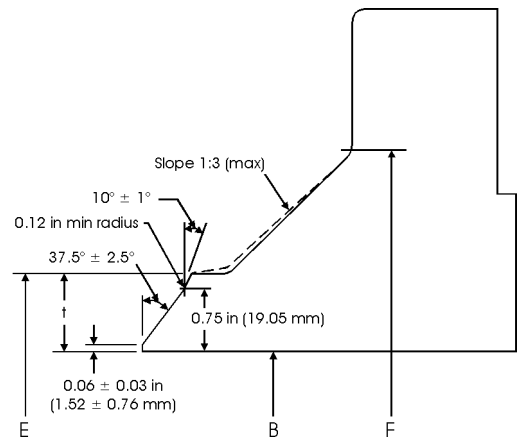
ASME/ANSI B16.5 (NPS  $1/2$  to 24) Weld Neck Flange Bevel (with no backing ring) for Wall Thicknesses ( $t$ ) from 0.19 to 0.88 in (4.83 to 22.35 mm).



ASME/ANSI B16.5 (NPS  $1/2$  to 24) Weld Neck Flange Bevel (with no backing ring) for Wall Thicknesses ( $t$ )  $> 0.88$  in (22.35 mm).



ASME B16.47 and MSS SP-44 ( $>NPS$  24) Weld Neck Flange Bevel (with no backing ring) for Wall Thickness ( $t$ ) = 0.19 to 0.88 in (4.83 to 22.35 mm).



ASME B16.47 and MSS SP-44 ( $>NPS$  24) Weld Neck Flange Bevel (with no backing ring) for Wall Thicknesses ( $t$ )  $> 0.88$  in (22.35 mm).

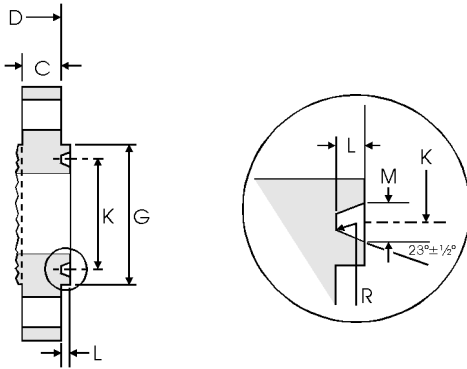
### Tolerances on welding end dimensions (ASME/ANSI B16.5 and B16.47, and MSS SP-44)

| Dimension                           | Range                 | Tolerance    |              |
|-------------------------------------|-----------------------|--------------|--------------|
|                                     |                       | in           | mm           |
| E (outside diameter at welding end) | $\leq NPS$ 5          | +0.09, -0.03 | +2.29, -0.76 |
|                                     | NPS 6 to 24           | +0.16, -0.03 | +4.06, -0.76 |
|                                     | $\geq NPS$ 26         | +0.21, -0.06 | +5.33, -1.52 |
| B (inside diameter of flange)       | $B \leq NPS$ 10       | $\pm 0.03$   | $\pm 0.76$   |
|                                     | $B \geq NPS$ 12 to 18 | $\pm 0.03$   | $\pm 0.76$   |
|                                     | $B \geq NPS$ 20       | +0.12, -0.06 | +3.05, -1.52 |
| t (thickness at weld bevel)         | All                   | $> 87.5\%$   |              |

**Note**

-  $t$  = Nominal wall thickness of the pipe. Additional thickness at the weld bevel (up to 0.5 x  $t$ ) may be provided on the inside or outside diameter (or partially on both) of the hub if it is used with light walled higher strength pipe. Hub diameter, F, may also be increased.

# Ring Joint Facings - ASME/ANSI B16.5 & B16.47



**Note**

- Values for minimum flange thickness, C, and overall length, D, are detailed in the flange tables.
- For ring joint tolerances see page 8-9.

**Ring joint facing dimensions - ASME/ANSI B16.5 and B16.47 Series A (MSS SP-44) and Series B (API 605)**

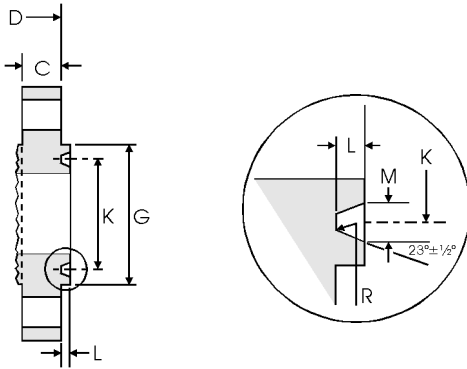
| Class (lb)                            |       |     |       |       |       | Groove/Ring Number | Raised Face       | Groove          |                    |                |                  |   |
|---------------------------------------|-------|-----|-------|-------|-------|--------------------|-------------------|-----------------|--------------------|----------------|------------------|---|
| 150                                   | 300   | 400 | 600   | 900   | 1500  |                    | 2500              | G               | K                  | L              | M                | R |
| Nominal Pipe Size (NPS)               |       |     |       |       |       |                    | Face Diameter min | Pitch Diameter  | Depth <sup>1</sup> | Width          | Radius at Bottom |   |
|                                       |       |     |       |       |       |                    | in mm             | in mm           | in mm              | in mm          | in mm            |   |
| ASME/ANSI B16.5 covers NPS 1/2 to 24: |       |     |       |       |       |                    |                   |                 |                    |                |                  |   |
|                                       | 1/2   |     | 1/2   |       |       | R11                | 2.000<br>50.80    | 1.344<br>34.14  | 0.219<br>5.56      | 0.281<br>7.14  | 0.03<br>0.76     |   |
|                                       |       |     |       | 1/2   |       | R12                | 2.380<br>60.45    | 1.562<br>39.67  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |   |
|                                       | 3/4   |     | 3/4   |       |       | R13                | 2.500<br>63.50    | 1.688<br>42.88  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |   |
|                                       |       |     |       | 1/2   |       | R13                | 2.560<br>65.02    | 1.688<br>42.88  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |   |
|                                       |       |     |       | 3/4   |       | R14                | 2.620<br>66.55    | 1.750<br>44.45  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |   |
| 1                                     |       |     |       |       |       | R15                | 2.500<br>63.50    | 1.875<br>47.63  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |   |
|                                       | 1     |     | 1     |       |       | R16                | 2.750<br>69.85    | 2.000<br>50.80  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |   |
|                                       |       |     |       | 1     |       | R16                | 2.810<br>71.37    | 2.000<br>50.80  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |   |
|                                       |       |     |       |       | 3/4   | R16                | 2.880<br>73.15    | 2.000<br>50.80  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |   |
|                                       | 1 1/4 |     | 1 1/4 |       |       | R17                | 2.880<br>73.15    | 2.250<br>57.15  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |   |
|                                       |       |     |       |       |       | R18                | 3.120<br>79.25    | 2.375<br>60.33  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |   |
|                                       |       |     |       | 1 1/4 |       | R18                | 3.190<br>81.03    | 2.375<br>60.33  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |   |
|                                       |       |     |       |       | 1     | R18                | 3.250<br>82.55    | 2.375<br>60.33  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |   |
|                                       | 1 1/2 |     | 1 1/2 |       |       | R19                | 3.250<br>82.55    | 2.562<br>65.07  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |   |
|                                       |       |     |       | 1 1/2 |       | R20                | 3.560<br>90.42    | 2.688<br>68.28  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |   |
|                                       |       |     |       |       | 1 1/2 | R20                | 3.620<br>91.95    | 2.688<br>68.28  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |   |
|                                       |       |     |       |       | 1 1/4 | R21                | 4.000<br>101.60   | 2.844<br>72.24  | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |   |
|                                       |       |     |       |       |       | R22                | 4.000<br>101.60   | 3.250<br>82.55  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |   |
|                                       |       |     |       |       |       | R23                | 4.250<br>107.95   | 3.250<br>82.55  | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |   |
|                                       |       |     |       |       | 1 1/2 | R23                | 4.500<br>114.30   | 3.250<br>82.55  | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |   |
|                                       |       |     |       | 2     |       | R24                | 4.880<br>123.95   | 3.750<br>95.25  | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |   |
|                                       | 2 1/2 |     | 2 1/2 |       |       | R25                | 4.750<br>120.65   | 4.000<br>101.60 | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |   |
|                                       |       |     |       |       |       | R26                | 5.000<br>127.00   | 4.000<br>101.60 | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |   |
|                                       |       |     |       |       | 2     | R26                | 5.250<br>133.35   | 4.000<br>101.60 | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |   |

# Ring Joint Facings - ASME/ANSI B16.5 & B16.47

Ring joint facing dimensions - ASME/ANSI B16.5 and B16.47 Series A (MSS SP-44) and Series B (API 605) (Continued)

| Class (lb)              |                |       |                |     |       |       | Groove/Ring Number | Groove            |                  |                    |                |                  |
|-------------------------|----------------|-------|----------------|-----|-------|-------|--------------------|-------------------|------------------|--------------------|----------------|------------------|
| 150                     | 300            | 400   | 600            | 900 | 1500  | 2500  |                    | G                 | K                | L                  | M              | R                |
| Nominal Pipe Size (NPS) |                |       |                |     |       |       |                    | Face Diameter min | Pitch Diameter   | Depth <sup>1</sup> | Width          | Radius at Bottom |
|                         |                |       |                |     |       |       |                    | in mm             | in mm            | in mm              | in mm          | in mm            |
|                         |                |       |                |     | 2 1/2 |       | R27                | 5.380<br>136.65   | 4.250<br>107.95  | 0.31<br>27.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |                |       |                |     |       | 2 1/2 | R28                | 5.880<br>149.35   | 4.37511<br>1.13  | 0.375<br>9.53      | 0.531<br>13.49 | 0.06<br>1.52     |
| 3                       |                |       |                |     |       |       | R29                | 5.250<br>133.35   | 4.500<br>114.30  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |
|                         | _2             |       | _2             |     |       |       | R30                | -                 | 4.625<br>117.48  | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         | 3 <sup>2</sup> |       | 3 <sup>2</sup> |     |       |       | R31                | 5.750<br>146.05   | 4.875<br>123.83  | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |                |       |                | 3   |       |       | R31                | 6.120<br>155.45   | 4.875<br>123.83  | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |                |       |                |     | 3     |       | R32                | 6.620<br>168.15   | 5.000<br>127.00  | 0.375<br>9.53      | 0.531<br>13.49 | 0.06<br>1.52     |
|                         | 3 1/2          |       |                |     |       |       | R33                | 6.060<br>153.92   | 5.188<br>131.78  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |
|                         |                | 3 1/2 | 3 1/2          |     |       |       | R34                | 6.250<br>158.75   | 5.188<br>131.78  | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |                |       |                |     | 3     |       | R35                | 6.620<br>168.15   | 5.375<br>136.53  | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
| 4                       |                |       |                |     |       |       | R36                | 6.750<br>171.45   | 5.875<br>149.23  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |
|                         | 4              | 4     | 4              |     |       |       | R37                | 6.880<br>174.75   | 5.875<br>149.23  | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |                |       |                | 4   |       |       | R37                | 7.120<br>180.85   | 5.875<br>149.23  | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |                |       |                |     | 4     |       | R38                | 8.000<br>203.20   | 6.1881<br>57.18  | 0.438<br>11.13     | 0.656<br>16.66 | 0.06<br>1.52     |
|                         |                |       |                |     | 4     |       | R39                | 7.620<br>193.55   | 6.375<br>161.93  | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
| 5                       |                |       |                |     |       |       | R40                | 7.620<br>193.55   | 6.750<br>171.45  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |
|                         | 5              | 5     | 5              |     |       |       | R41                | 8.250<br>209.55   | 7.125<br>180.98  | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |                |       |                | 5   |       |       | R41                | 8.500<br>215.90   | 7.125<br>180.98  | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |                |       |                |     | 5     |       | R42                | 9.500<br>241.30   | 7.500<br>190.50  | 0.500<br>12.70     | 0.781<br>19.84 | 0.06<br>1.52     |
| 6                       |                |       |                |     |       |       | R43                | 8.620<br>218.95   | 7.625<br>193.68  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |
|                         |                |       |                |     | 5     |       | R44                | 9.000<br>228.60   | 7.625<br>193.68  | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         | 6              | 6     | 6              |     |       |       | R45                | 9.500<br>241.30   | 8.312<br>211.12  | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |                |       |                | 6   |       |       | R45                | 9.500<br>241.30   | 8.312<br>211.12  | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |                |       |                |     | 6     |       | R46                | 9.750<br>247.65   | 8.312<br>211.12  | 0.375<br>9.53      | 0.531<br>13.49 | 0.06<br>1.52     |
|                         |                |       |                |     | 6     |       | R47                | 11.000<br>279.40  | 9.000<br>228.60  | 0.500<br>12.70     | 0.781<br>19.84 | 0.06<br>1.52     |
| 8                       |                |       |                |     |       |       | R48                | 10.750<br>273.05  | 9.750<br>247.65  | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |
|                         | 8              | 8     | 8              |     |       |       | R49                | 11.880<br>301.75  | 10.625<br>269.88 | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |                |       |                | 8   |       |       | R49                | 12.120<br>307.85  | 10.625<br>269.88 | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |                |       |                |     | 8     |       | R50                | 12.500<br>317.50  | 10.625<br>269.88 | 0.438<br>11.13     | 0.656<br>16.66 | 0.06<br>1.52     |
|                         |                |       |                |     | 8     |       | R51                | 13.380<br>339.85  | 11.000<br>279.40 | 0.562<br>14.27     | 0.906<br>23.01 | 0.06<br>1.52     |
| 10                      |                |       |                |     |       |       | R52                | 13.000<br>330.20  | 12.000<br>304.80 | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |
|                         | 10             | 10    | 10             |     |       |       | R53                | 14.000<br>355.60  | 12.750<br>323.85 | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |                |       |                | 10  |       |       | R53                | 14.250<br>361.95  | 12.750<br>323.85 | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |                |       |                |     | 10    |       | R54                | 14.620<br>371.35  | 12.750<br>323.85 | 0.438<br>11.13     | 0.656<br>16.66 | 0.06<br>1.52     |

# Ring Joint Facings - ASME/ANSI B16.5 & B16.47



- Note
- Values for minimum flange thickness, C, and overall length, D, are detailed in the flange tables.
  - For ring joint tolerances see page 8-9.

Ring joint facing dimensions - ASME/ANSI B16.5 and B16.47 Series A (MSS SP-44) and Series B (API 605) (Continued)

| Class (lb)              |     |     |     |     |      |      | Groove/Ring Number | Raised Face       | Groove           |                    |                |                  |
|-------------------------|-----|-----|-----|-----|------|------|--------------------|-------------------|------------------|--------------------|----------------|------------------|
| 150                     | 300 | 400 | 600 | 900 | 1500 | 2500 |                    | G                 | K                | L                  | M              | R                |
| Nominal Pipe Size (NPS) |     |     |     |     |      |      |                    | Face Diameter min | Pitch Diameter   | Depth <sup>1</sup> | Width          | Radius at Bottom |
|                         |     |     |     |     |      |      |                    | in mm             | in mm            | in mm              | in mm          | in mm            |
|                         |     |     |     |     |      | 10   | R55                | 16.750<br>425.45  | 13.500<br>342.90 | 0.688<br>17.48     | 1.188<br>30.18 | 0.09<br>2.29     |
| 12                      |     |     |     |     |      |      | R56                | 16.000<br>406.40  | 15.000<br>381.00 | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |
|                         | 12  | 12  | 12  |     |      |      | R57                | 16.250<br>412.75  | 15.000<br>381.00 | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |     |     |     | 12  |      |      | R57                | 16.500<br>419.10  | 15.000<br>381.00 | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |     |     |     |     | 12   |      | R58                | 17.250<br>438.15  | 15.000<br>381.00 | 0.562<br>14.27     | 0.906<br>23.01 | 0.06<br>1.52     |
| 14                      |     |     |     |     |      |      | R59                | 16.750<br>425.45  | 15.625<br>396.88 | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |
|                         |     |     |     |     |      | 12   | R60                | 19.500<br>495.30  | 16.000<br>406.40 | 0.688<br>17.48     | 1.312<br>33.32 | 0.09<br>2.29     |
|                         | 14  | 14  | 14  |     |      |      | R61                | 18.000<br>457.20  | 16.500<br>419.10 | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |     |     |     | 14  |      |      | R62                | 18.380<br>466.85  | 16.500<br>419.10 | 0.438<br>11.13     | 0.656<br>16.66 | 0.06<br>1.52     |
|                         |     |     |     |     | 14   |      | R63                | 19.250<br>488.95  | 16.500<br>419.10 | 0.625<br>15.88     | 1.062<br>26.97 | 0.09<br>2.29     |
| 16                      |     |     |     |     |      |      | R64                | 19.000<br>482.60  | 17.875<br>454.03 | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |
|                         | 16  | 16  | 16  |     |      |      | R65                | 20.000<br>508.00  | 18.500<br>469.90 | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |     |     |     | 16  |      |      | R66                | 20.620<br>523.75  | 18.500<br>469.90 | 0.438<br>11.13     | 0.656<br>16.66 | 0.06<br>1.52     |
|                         |     |     |     |     | 16   |      | R67                | 21.500<br>546.10  | 18.500<br>469.90 | 0.688<br>17.48     | 1.188<br>30.18 | 0.09<br>2.29     |
| 18                      |     |     |     |     |      |      | R68                | 21.500<br>546.10  | 20.375<br>517.53 | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |
|                         | 18  | 18  | 18  |     |      |      | R69                | 22.620<br>574.55  | 21.000<br>533.40 | 0.312<br>7.92      | 0.469<br>11.91 | 0.03<br>0.76     |
|                         |     |     |     | 18  |      |      | R70                | 23.380<br>593.85  | 21.000<br>533.40 | 0.500<br>12.70     | 0.781<br>19.84 | 0.06<br>1.52     |
|                         |     |     |     |     | 18   |      | R71                | 24.120<br>612.65  | 21.000<br>533.40 | 0.688<br>17.48     | 1.188<br>30.18 | 0.09<br>2.29     |
| 20                      |     |     |     |     |      |      | R72                | 23.500<br>596.90  | 22.000<br>558.80 | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |
|                         | 20  | 20  | 20  |     |      |      | R73                | 25.000<br>635.00  | 23.000<br>584.20 | 0.375<br>9.53      | 0.531<br>13.49 | 0.06<br>1.52     |
|                         |     |     |     | 20  |      |      | R74                | 25.500<br>647.70  | 23.000<br>584.20 | 0.500<br>12.70     | 0.781<br>19.84 | 0.06<br>1.52     |
|                         |     |     |     |     | 20   |      | R75                | 26.500<br>673.10  | 23.000<br>584.20 | 0.688<br>17.48     | 1.312<br>33.32 | 0.09<br>2.29     |
| 24                      |     |     |     |     |      |      | R76                | 28.000<br>711.20  | 26.500<br>673.10 | 0.250<br>6.35      | 0.344<br>8.74  | 0.03<br>0.76     |
|                         | 24  | 24  | 24  |     |      |      | R77                | 29.500<br>749.30  | 27.250<br>692.15 | 0.438<br>11.13     | 0.656<br>16.66 | 0.06<br>1.52     |
|                         |     |     |     | 24  |      |      | R78                | 30.380<br>771.65  | 27.250<br>692.15 | 0.625<br>15.88     | 1.062<br>26.97 | 0.09<br>2.29     |



# Ring Joint Facings - ASME/ANSI B16.5 & B16.47

## Ring joint facing dimensions - ASME/ANSI B16.5 and B16.47 Series A (MSS SP-44) and Series B (API 605) (Continued)

| Class (lb)  |     |     |     |     |      |      | Groove/Ring Number | Raised Face       |                  | Groove             |                |                  |  |  |
|---|-----|-----|-----|-----|------|------|--------------------|-------------------|------------------|--------------------|----------------|------------------|--|--|
| 150   | 300 | 400 | 600 | 900 | 1500 | 2500 |                    | G                 | K                | L                  | M              | R                |  |  |
| Nominal Pipe Size (NPS)   |     |     |     |     |      |      |                    | Face Diameter min | Pitch Diameter   | Depth <sup>1</sup> | Width          | Radius at Bottom |  |  |
|   |     |     |     |     |      |      | in mm              | in mm             | in mm            | in mm              | in mm          |                  |  |  |
|   |     |     |     |     | 24   |      | R79                | 31.250<br>793.75  | 27.250<br>692.15 | 0.812<br>20.62     | 1.438<br>36.53 | 0.09<br>2.29     |  |  |
| MSS SP-44 only, covers NPS 22:  |     |     |     |     |      |      |                    |                   |                  |                    |                |                  |  |  |
|   | 22  | 22  | 22  |     |      |      | R81                | 27.000<br>685.80  | 25.000<br>635.00 | 0.438<br>11.13     | 0.594<br>15.09 | 0.06<br>1.52     |  |  |
| ASME/ANSI B16.47 (MSS SP-44 & API 605) covers NPS 26 to 36. (There are no ring joint facings >NPS 36) |     |     |     |     |      |      |                    |                   |                  |                    |                |                  |  |  |
|   | 26  | 26  | 26  |     |      |      | R93                | 31.880<br>809.75  | 29.500<br>749.30 | 0.500<br>12.70     | 0.781<br>19.84 | 0.06<br>1.52     |  |  |
|   | 28  | 28  | 28  |     |      |      | R94                | 33.880<br>860.55  | 31.500<br>800.10 | 0.500<br>12.70     | 0.781<br>19.84 | 0.06<br>1.52     |  |  |
|   | 30  | 30  | 30  |     |      |      | R95                | 36.120<br>917.45  | 33.750<br>857.25 | 0.500<br>12.70     | 0.781<br>19.84 | 0.06<br>1.52     |  |  |
|   | 32  | 32  | 32  |     |      |      | R96                | 38.750<br>984.25  | 36.000<br>914.40 | 0.562<br>14.27     | 0.906<br>23.01 | 0.06<br>1.52     |  |  |
|   | 34  | 34  | 34  |     |      |      | R97                | 40.750<br>1035.1  | 38.000<br>965.20 | 0.562<br>14.27     | 0.906<br>23.01 | 0.06<br>1.52     |  |  |
|   | 36  | 36  | 36  |     |      |      | R98                | 43.000<br>1092.2  | 40.250<br>1022.4 | 0.562<br>14.27     | 0.906<br>23.01 | 0.06<br>1.52     |  |  |
|   |     |     |     | 26  |      |      | R100               | 32.750<br>831.85  | 29.500<br>749.30 | 0.688<br>17.48     | 1.188<br>30.18 | 0.09<br>2.29     |  |  |
|   |     |     |     | 28  |      |      | R101               | 35.000<br>889.00  | 31.500<br>800.10 | 0.688<br>17.48     | 1.312<br>33.32 | 0.09<br>2.29     |  |  |
|   |     |     |     | 30  |      |      | R102               | 37.250<br>946.15  | 33.750<br>857.25 | 0.688<br>17.48     | 1.312<br>33.32 | 0.09<br>2.29     |  |  |
|   |     |     |     | 32  |      |      | R103               | 39.500<br>1003.3  | 36.000<br>914.40 | 0.688<br>17.48     | 1.312<br>33.32 | 0.09<br>2.29     |  |  |
|   |     |     |     | 34  |      |      | R104               | 42.000<br>1066.8  | 38.000<br>965.20 | 0.812<br>20.62     | 1.438<br>36.53 | 0.09<br>2.29     |  |  |
|   |     |     |     | 36  |      |      | R105               | 44.250<br>1124.0  | 40.250<br>1022.4 | 0.812<br>20.62     | 1.438<br>36.53 | 0.09<br>2.29     |  |  |

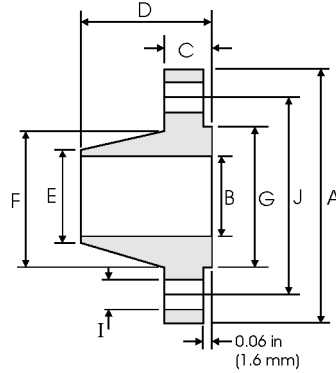
### Notes

- Ring joint gasket dimensions conform to ASME B16.20 (not covered in this summary).
  - Use Class 600 lb in sizes NPS 1/2 to NPS 3 1/2 for Class 400 lb.
  - Use Class 1500 lb in sizes NPS 1/2 to NPS 2 1/2 for Class 900 lb.
  - Tolerances are as shown in the table below.
- 1 The height of the raised portion is equal to the depth of groove dimension L, but is not subject to the tolerances for L.
  - 2 Ring joints with lapped flanges in Classes 300 lb and 600 lb use R30 instead of R31.

### Ring joint facing tolerances (ASME/ANSI B16.5 and B16.47)

| Dimension                                      | Range       | Tolerance  |            |
|--|-------------|------------|------------|
|  |             | in         | mm         |
| L (depth)                                      | All         | +0.016, -0 | +0.406, -0 |
| M (width)                                      | All         | ±0.008     | ±0.203     |
| K (pitch diameter)                             | All         | ±0.005     | ±0.127     |
| R (radius at bottom)                           | R ≤ 0.06 in | +0.03, -0  | +0.762, -0 |
|  | R > 0.06 in | ±0.03      | ±0.762     |
| D (overall length) for flanges with ring joint | ≤ NPS 10    | ±0.06      | ±1.52      |
|  | ≥ NPS 12    | ±0.12      | ±3.05      |

# Weld Neck Flanges - ANSI B16.5



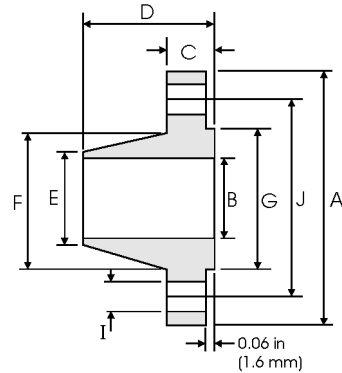
## Class 150 lb

| Pipe              |                  | Flange Data      |                              |                      |                | Hub Data               |                | Raised Face    | Drilling Data   |                    |                             | Weight    |
|-------------------|------------------|------------------|------------------------------|----------------------|----------------|------------------------|----------------|----------------|-----------------|--------------------|-----------------------------|-----------|
| Nominal Pipe Size |                  | <b>A</b>         | <b>B</b>                     | <b>C</b>             | <b>D</b>       | <b>E</b>               | <b>F</b>       | <b>G</b>       | <b>H</b>        | <b>I</b>           | <b>J</b>                    |           |
|                   | Outside Diameter | Overall Diameter | Inside Diameter              | Flange Thickness min | Overall Length | Diameter at Weld Bevel | Hub Diameter   | Face Diameter  | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in<br>mm         | in<br>mm         | in<br>mm                     | in<br>mm             | in<br>mm       | in<br>mm               | in<br>mm       | in<br>mm       |                 | in<br>mm           | in<br>mm                    |           |
| 1/2               | 0.840<br>21.30   | 3.500<br>88.90   | 0.620<br>15.70               | 0.440<br>11.20       | 1.880<br>47.80 | 0.840<br>21.30         | 1.190<br>30.20 | 1.380<br>35.00 | 4               | 0.620<br>15.70     | 2.380<br>60.45              | 0.48      |
| 3/4               | 1.050<br>26.70   | 3.880<br>98.60   | 0.820<br>20.80               | 0.500<br>12.70       | 2.060<br>52.30 | 1.050<br>26.70         | 1.500<br>38.10 | 1.690<br>42.90 | 4               | 0.620<br>15.70     | 2.750<br>69.85              | 0.71      |
| 1                 | 1.315<br>33.40   | 4.250<br>108.0   | 1.050<br>26.70               | 0.560<br>14.20       | 2.190<br>55.60 | 1.320<br>33.50         | 1.940<br>49.30 | 2.000<br>50.80 | 4               | 0.620<br>15.70     | 3.120<br>79.25              | 1.01      |
| 1 1/4             | 1.660<br>42.20   | 4.620<br>117.3   | 1.380<br>35.10               | 0.620<br>15.70       | 2.250<br>57.15 | 1.660<br>42.20         | 2.310<br>58.70 | 2.500<br>63.50 | 4               | 0.620<br>15.70     | 3.500<br>88.90              | 1.33      |
| 1 1/2             | 1.900<br>48.30   | 5.000<br>127.0   | 1.610<br>40.90               | 0.690<br>17.50       | 2.440<br>62.00 | 1.900<br>48.30         | 2.560<br>65.00 | 2.880<br>73.15 | 4               | 0.620<br>15.70     | 3.880<br>98.60              | 1.72      |
| 2                 | 2.375<br>60.30   | 6.000<br>152.4   | 2.070<br>52.60               | 0.750<br>19.10       | 2.500<br>63.50 | 2.380<br>60.45         | 3.060<br>77.70 | 3.620<br>91.90 | 4               | 0.750<br>19.10     | 4.750<br>120.7              | 2.58      |
| 2 1/2             | 2.875<br>73.00   | 7.000<br>177.8   | 2.470<br>62.70               | 0.880<br>22.40       | 2.750<br>69.85 | 2.880<br>73.15         | 3.560<br>90.40 | 4.120<br>104.6 | 4               | 0.750<br>19.10     | 5.500<br>139.7              | 4.11      |
| 3                 | 3.500<br>88.90   | 7.500<br>190.5   | 3.070<br>78.00               | 0.940<br>23.90       | 2.750<br>69.85 | 3.500<br>88.90         | 4.250<br>108.0 | 5.000<br>127.0 | 4               | 0.750<br>19.10     | 6.000<br>152.4              | 4.92      |
| 3 1/2             | 4.000<br>101.6   | 8.500<br>215.9   | 3.550<br>90.20               | 0.940<br>23.90       | 2.810<br>71.40 | 4.000<br>101.6         | 4.810<br>122.2 | 5.500<br>139.7 | 8               | 0.750<br>19.10     | 7.000<br>177.8              | 6.08      |
| 4                 | 4.500<br>114.3   | 9.000<br>228.6   | 4.030<br>102.4               | 0.940<br>23.90       | 3.000<br>76.20 | 4.500<br>114.3         | 5.310<br>134.9 | 6.190<br>157.2 | 8               | 0.750<br>19.10     | 7.500<br>190.5              | 6.84      |
| 5                 | 5.563<br>141.3   | 10.00<br>254.0   | 5.050<br>128.3               | 0.940<br>23.90       | 3.500<br>88.90 | 5.560<br>141.2         | 6.440<br>163.6 | 7.310<br>185.7 | 8               | 0.880<br>22.40     | 8.500<br>215.9              | 8.56      |
| 6                 | 6.625<br>168.3   | 11.00<br>279.4   | 6.070<br>154.2               | 1.000<br>25.40       | 3.500<br>88.90 | 6.630<br>168.4         | 7.560<br>192.0 | 8.500<br>215.9 | 8               | 0.880<br>22.40     | 9.500<br>241.3              | 10.6      |
| 8                 | 8.625<br>219.1   | 13.50<br>342.9   | 7.980<br>202.7               | 1.120<br>28.40       | 4.000<br>101.6 | 8.630<br>219.2         | 9.690<br>246.1 | 10.62<br>269.7 | 8               | 0.880<br>22.40     | 11.75<br>298.5              | 17.6      |
| 10                | 10.75<br>273.0   | 16.00<br>406.4   | 10.02<br>254.5               | 1.190<br>30.20       | 4.000<br>101.6 | 10.75<br>273.0         | 12.00<br>304.8 | 12.75<br>323.8 | 12              | 1.000<br>25.40     | 14.25<br>362.0              | 24.0      |
| 12                | 12.75<br>323.8   | 19.00<br>482.6   | 12.00<br>304.8               | 1.250<br>31.75       | 4.500<br>114.3 | 12.75<br>323.8         | 14.38<br>365.3 | 15.00<br>381.0 | 12              | 1.000<br>25.40     | 17.00<br>431.8              | 36.5      |
| 14                | 14.00<br>355.6   | 21.00<br>533.4   | To be specified by Purchaser | 1.380<br>35.10       | 5.000<br>127.0 | 14.00<br>355.6         | 15.75<br>400.1 | 16.25<br>412.7 | 12              | 1.120<br>28.40     | 18.75<br>476.3              | 48.4      |
| 16                | 16.00<br>406.4   | 23.50<br>596.9   |                              | 1.440<br>36.60       | 5.000<br>127.0 | 16.00<br>406.4         | 18.00<br>475.2 | 18.50<br>469.9 | 16              | 1.120<br>28.40     | 21.25<br>539.8              | 60.6      |
| 18                | 18.00<br>457.2   | 25.00<br>635.0   |                              | 1.560<br>39.60       | 5.000<br>127.0 | 18.00<br>457.2         | 19.88<br>505.0 | 21.00<br>533.4 | 16              | 1.250<br>31.75     | 22.75<br>577.9              | 68.3      |
| 20                | 20.00<br>508.0   | 27.50<br>698.5   |                              | 1.690<br>42.90       | 5.690<br>144.5 | 20.00<br>508.0         | 22.00<br>558.8 | 23.00<br>584.2 | 20              | 1.250<br>31.75     | 25.00<br>635.0              | 84.5      |
| 24                | 24.00<br>609.6   | 32.00<br>812.8   |                              | 1.880<br>47.80       | 6.000<br>152.4 | 24.00<br>609.6         | 26.12<br>663.4 | 27.25<br>692.1 | 20              | 1.380<br>35.10     | 29.50<br>749.3              | 115       |

Notes

- Dimension B corresponds to the pipe inside diameter. Values quoted assume 40S/Standard wall thickness.
- Weights are based on manufacturer's data and are approximate.
- Flat face flanges may be provided at full thickness, C, or with raised face removed (the latter is nonstandard).
- For ring joint facings see page 8-6. For weld end bevel see page 8-5.
- For tolerances see page 8-4.

# Weld Neck Flanges - ANSI B16.5



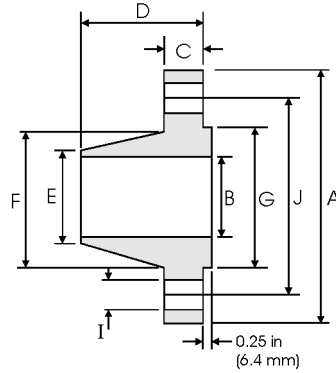
## Class 300 lb

| Nominal Pipe Size | Pipe             |                  | Flange Data                  |                      |                |                        | Hub Data       |                | Raised Face     | Drilling Data      |                             |           | Weight |
|-------------------|------------------|------------------|------------------------------|----------------------|----------------|------------------------|----------------|----------------|-----------------|--------------------|-----------------------------|-----------|--------|
|                   | Outside Diameter | Overall Diameter | Inside Diameter              | Flange Thickness min | Overall Length | Diameter at Weld Bevel | Hub Diameter   | Face Diameter  | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |        |
|                   |                  |                  |                              |                      |                |                        |                |                |                 |                    |                             |           | A      |
| 1/2               | 0.840<br>21.30   | 3.750<br>95.20   | 0.620<br>15.70               | 0.560<br>14.20       | 2.060<br>52.30 | 0.840<br>21.30         | 1.500<br>38.10 | 1.380<br>35.00 | 4               | 0.620<br>15.70     | 2.620<br>66.55              | 0.75      |        |
| 3/4               | 1.050<br>26.70   | 4.620<br>117.3   | 0.820<br>20.80               | 0.620<br>15.70       | 2.250<br>57.15 | 1.050<br>26.70         | 1.880<br>47.70 | 1.690<br>42.90 | 4               | 0.750<br>19.00     | 3.250<br>82.50              | 1.26      |        |
| 1                 | 1.315<br>33.40   | 4.880<br>123.9   | 1.050<br>26.70               | 0.690<br>17.50       | 2.440<br>62.00 | 1.320<br>33.50         | 2.120<br>53.80 | 2.000<br>50.80 | 4               | 0.750<br>19.00     | 3.500<br>88.90              | 1.52      |        |
| 1 1/4             | 1.660<br>42.20   | 5.250<br>133.3   | 1.380<br>35.10               | 0.750<br>19.00       | 2.560<br>65.00 | 1.660<br>42.20         | 2.500<br>63.50 | 2.500<br>63.50 | 4               | 0.750<br>19.00     | 3.880<br>98.50              | 2.03      |        |
| 1 1/2             | 1.900<br>48.30   | 6.120<br>155.4   | 1.610<br>40.90               | 0.810<br>20.60       | 2.690<br>68.30 | 1.900<br>48.30         | 2.750<br>69.85 | 2.880<br>73.15 | 4               | 0.880<br>22.30     | 4.500<br>114.3              | 2.89      |        |
| 2                 | 2.375<br>60.30   | 6.500<br>165.1   | 2.070<br>52.60               | 0.880<br>22.30       | 2.750<br>69.85 | 2.380<br>60.45         | 3.310<br>84.00 | 3.620<br>91.90 | 8               | 0.750<br>19.00     | 5.000<br>127.0              | 3.40      |        |
| 2 1/2             | 2.875<br>73.00   | 7.500<br>190.5   | 2.470<br>62.70               | 1.000<br>25.40       | 3.000<br>76.20 | 2.880<br>73.15         | 3.940<br>100.0 | 4.120<br>104.6 | 8               | 0.880<br>22.30     | 5.880<br>149.3              | 5.17      |        |
| 3                 | 3.500<br>88.90   | 8.250<br>209.5   | 3.070<br>78.00               | 1.120<br>28.40       | 3.120<br>79.25 | 3.500<br>88.90         | 4.620<br>117.3 | 5.000<br>127.0 | 8               | 0.880<br>22.30     | 6.620<br>168.1              | 6.93      |        |
| 3 1/2             | 4.000<br>101.6   | 9.000<br>228.6   | 3.550<br>90.20               | 1.190<br>30.20       | 3.190<br>81.00 | 4.000<br>101.6         | 5.250<br>133.3 | 5.500<br>139.7 | 8               | 0.880<br>22.30     | 7.250<br>184.1              | 8.67      |        |
| 4                 | 4.500<br>114.3   | 10.00<br>254.0   | 4.030<br>102.4               | 1.250<br>31.70       | 3.380<br>85.80 | 4.500<br>114.3         | 5.750<br>146.0 | 6.190<br>157.2 | 8               | 0.880<br>22.30     | 7.880<br>200.1              | 11.2      |        |
| 5                 | 5.563<br>141.3   | 11.00<br>279.4   | 5.050<br>128.3               | 1.380<br>35.00       | 3.880<br>98.50 | 5.560<br>141.2         | 7.000<br>177.8 | 7.310<br>185.7 | 8               | 0.880<br>22.30     | 9.250<br>234.9              | 15.1      |        |
| 6                 | 6.625<br>168.3   | 12.50<br>317.5   | 6.070<br>154.2               | 1.440<br>36.50       | 3.880<br>98.50 | 6.630<br>168.4         | 8.120<br>206.2 | 8.500<br>215.9 | 12              | 0.880<br>22.30     | 10.62<br>269.7              | 19.1      |        |
| 8                 | 8.625<br>219.1   | 15.00<br>381.0   | 7.980<br>202.7               | 1.620<br>41.10       | 4.380<br>111.2 | 8.630<br>219.2         | 10.25<br>260.3 | 10.62<br>269.7 | 12              | 1.000<br>25.40     | 13.00<br>330.2              | 29.9      |        |
| 10                | 10.75<br>273.0   | 17.50<br>444.5   | 10.02<br>254.5               | 1.880<br>47.70       | 4.620<br>117.3 | 10.75<br>273.0         | 12.62<br>320.5 | 12.75<br>323.8 | 16              | 1.120<br>28.40     | 15.25<br>387.3              | 42.7      |        |
| 12                | 12.75<br>323.8   | 20.50<br>520.7   | 12.00<br>304.8               | 2.000<br>50.80       | 5.120<br>130.0 | 12.75<br>323.8         | 14.75<br>374.6 | 15.00<br>381.0 | 16              | 1.250<br>31.70     | 17.75<br>450.8              | 61.8      |        |
| 14                | 14.00<br>355.6   | 23.00<br>584.2   | To be specified by Purchaser | 2.120<br>53.80       | 5.620<br>142.7 | 14.00<br>355.6         | 16.75<br>425.4 | 16.25<br>412.7 | 20              | 1.250<br>31.70     | 20.25<br>514.3              | 85.8      |        |
| 16                | 16.00<br>406.4   | 25.50<br>647.7   |                              | 2.250<br>57.15       | 5.750<br>146.0 | 16.00<br>406.4         | 19.00<br>482.6 | 18.50<br>469.9 | 20              | 1.380<br>35.00     | 22.50<br>571.5              | 106       |        |
| 18                | 18.00<br>457.2   | 28.00<br>711.2   |                              | 2.380<br>60.45       | 6.250<br>158.7 | 18.00<br>457.2         | 21.00<br>533.4 | 21.00<br>533.4 | 24              | 1.380<br>35.00     | 24.75<br>628.6              | 131       |        |
| 20                | 20.00<br>508.0   | 30.50<br>774.7   |                              | 2.500<br>63.50       | 6.380<br>162.0 | 20.00<br>508.0         | 23.12<br>587.2 | 23.00<br>584.2 | 24              | 1.380<br>35.00     | 27.00<br>685.8              | 158       |        |
| 24                | 24.00<br>609.6   | 36.00<br>914.4   |                              | 2.750<br>69.85       | 6.620<br>168.1 | 24.00<br>609.6         | 27.62<br>701.5 | 27.25<br>692.1 | 24              | 1.620<br>41.10     | 32.00<br>812.8              | 230       |        |



Notes

- Dimension B corresponds to the pipe inside diameter. Values quoted assume 40S/Standard wall thickness.
- Weights are based on manufacturer's data and are approximate.
- Flat face flanges may be provided at full thickness, C, or with raised face removed (the latter is nonstandard).
- For ring joint facings see page 8-6. For weld end bevel see page 8-5.
- For tolerances see page 8-4.

## Weld Neck Flanges - ANSI B16.5



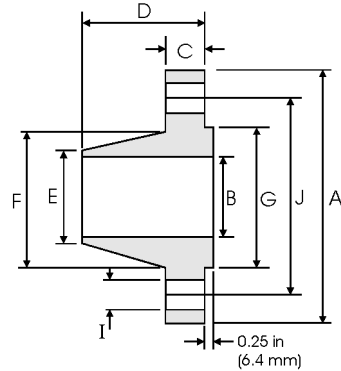
### Class 400 lb

| Pipe              |   | Flange Data      |                              |                      |                | Hub Data               |              | Raised Face   | Drilling Data   |                    |                             | Weight  |
|-------------------|---|------------------|------------------------------|----------------------|----------------|------------------------|--------------|---------------|-----------------|--------------------|-----------------------------|---|
| Nominal Pipe Size |  | <b>A</b>         | <b>B</b>                     | <b>C</b>             | <b>D</b>       | <b>E</b>               | <b>F</b>     | <b>G</b>      | <b>H</b>        | <b>I</b>           | <b>J</b>                    |  |
|                   | Outside Diameter  | Overall Diameter | Inside Diameter              | Flange Thickness min | Overall Length | Diameter at Weld Bevel | Hub Diameter | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece   |
|                   | in mm   | in mm            | in mm                        | in mm                | in mm          | in mm                  | in mm        | in mm         |                 | in mm              | in mm                       |   |
| 1/2               | 0.840   | 3.750            | To be specified by Purchaser | 0.560                | 2.060          | 0.840                  | 1.500        | 1.380         | 4               | 0.620              | 2.620                       | 0.87  |
|                   | 21.30   | 95.30            |                              | 14.20                | 52.30          | 21.30                  | 38.10        | 35.00         |                 | 15.70              | 66.55                       |   |
| 3/4               | 1.050   | 4.620            |                              | 0.620                | 2.250          | 1.050                  | 1.880        | 1.690         | 4               | 0.750              | 3.250                       | 1.45  |
|                   | 26.70   | 117.3            |                              | 15.70                | 57.15          | 26.70                  | 47.80        | 42.90         |                 | 19.10              | 82.60                       |   |
| 1                 | 1.315   | 4.880            |                              | 0.690                | 2.440          | 1.320                  | 2.120        | 2.000         | 4               | 0.750              | 3.500                       | 1.76  |
|                   | 33.40   | 124.0            |                              | 17.50                | 62.00          | 33.50                  | 53.80        | 50.80         |                 | 19.10              | 88.90                       |   |
| 1 1/4             | 1.660   | 5.250            |                              | 0.810                | 2.620          | 1.660                  | 2.500        | 2.500         | 4               | 0.750              | 3.880                       | 2.49  |
|                   | 42.20   | 133.4            |                              | 20.60                | 66.55          | 42.20                  | 63.50        | 63.50         |                 | 19.10              | 98.60                       |   |
| 1 1/2             | 1.900   | 6.120            |                              | 0.880                | 2.750          | 1.900                  | 2.750        | 2.880         | 4               | 0.880              | 4.500                       | 3.49  |
|                   | 48.30   | 155.4            |                              | 22.40                | 69.85          | 48.30                  | 69.85        | 73.15         |                 | 22.40              | 114.3                       |   |
| 2                 | 2.375   | 6.500            |                              | 1.000                | 2.880          | 2.380                  | 3.310        | 3.620         | 8               | 0.750              | 5.000                       | 4.36  |
|                   | 60.30   | 165.1            |                              | 25.40                | 73.15          | 60.45                  | 84.10        | 91.90         |                 | 19.10              | 127.0                       |   |
| 2 1/2             | 2.875   | 7.500            |                              | 1.120                | 3.120          | 2.880                  | 3.940        | 4.120         | 8               | 0.880              | 5.880                       | 6.43  |
|                   | 73.00   | 190.5            |                              | 28.40                | 79.25          | 73.15                  | 100.1        | 104.6         |                 | 22.40              | 149.4                       |   |
| 3                 | 3.500   | 8.250            |                              | 1.250                | 3.250          | 3.500                  | 4.620        | 5.000         | 8               | 0.880              | 6.620                       | 8.53  |
|                   | 88.90   | 209.6            |                              | 31.75                | 82.60          | 88.90                  | 117.3        | 127.0         |                 | 22.40              | 168.1                       |   |
| 3 1/2             | 4.000   | 9.000            |                              | 1.380                | 3.380          | 4.000                  | 5.250        | 5.500         | 8               | 1.000              | 7.250                       | 10.7  |
|                   | 101.6   | 228.6            |                              | 35.10                | 85.90          | 101.6                  | 133.4        | 139.7         |                 | 25.40              | 184.2                       |   |
| 4                 | 4.500   | 10.00            |                              | 1.380                | 3.500          | 4.500                  | 5.750        | 6.190         | 8               | 1.000              | 7.880                       | 12.8  |
|                   | 114.3   | 254.0            |                              | 35.10                | 88.90          | 114.3                  | 146.1        | 157.2         |                 | 25.40              | 200.2                       |   |
| 5                 | 5.563   | 11.00            | 1.500                        | 4.000                | 5.560          | 7.000                  | 7.310        | 8             | 1.000           | 9.250              | 16.9                        |   |
|                   | 141.3   | 279.4            | 38.10                        | 101.6                | 141.2          | 177.8                  | 185.7        |               | 25.40           | 235.0              |                             |   |
| 6                 | 6.625   | 12.50            | 1.620                        | 4.060                | 6.630          | 8.120                  | 8.500        | 12            | 1.000           | 10.62              | 22.0                        |   |
|                   | 168.3   | 317.5            | 41.10                        | 103.1                | 168.4          | 206.2                  | 215.9        |               | 25.40           | 269.7              |                             |   |
| 8                 | 8.625   | 15.00            | 1.880                        | 4.620                | 8.630          | 10.25                  | 10.62        | 12            | 1.120           | 13.00              | 34.7                        |   |
|                   | 219.1   | 381.0            | 47.80                        | 117.3                | 219.2          | 260.4                  | 269.7        |               | 28.40           | 330.2              |                             |   |
| 10                | 10.75   | 17.50            | 2.120                        | 4.880                | 10.75          | 12.62                  | 12.75        | 16            | 1.250           | 15.25              | 48.5                        |   |
|                   | 273.0   | 444.5            | 53.80                        | 124.0                | 273.0          | 320.5                  | 323.8        |               | 31.75           | 387.4              |                             |   |
| 12                | 12.75   | 20.50            | 2.250                        | 5.380                | 12.75          | 14.75                  | 15.00        | 16            | 1.380           | 17.75              | 69.6                        |   |
|                   | 323.8   | 520.7            | 57.15                        | 136.7                | 323.8          | 374.7                  | 381.0        |               | 35.10           | 450.9              |                             |   |
| 14                | 14.00   | 23.00            | 2.380                        | 5.880                | 14.00          | 16.75                  | 16.25        | 20            | 1.380           | 20.25              | 95.5                        |   |
|                   | 355.6   | 584.2            | 60.45                        | 149.4                | 355.6          | 425.5                  | 412.7        |               | 35.10           | 514.4              |                             |   |
| 16                | 16.00   | 25.50            | 2.500                        | 6.000                | 16.00          | 19.00                  | 18.50        | 20            | 1.500           | 22.50              | 118                         |   |
|                   | 406.4   | 647.7            | 63.50                        | 152.4                | 406.4          | 482.6                  | 469.9        |               | 38.10           | 571.5              |                             |   |
| 18                | 18.00   | 28.00            | 2.620                        | 6.500                | 18.00          | 21.00                  | 21.00        | 24            | 1.500           | 24.75              | 145                         |   |
|                   | 457.2   | 711.2            | 66.55                        | 165.1                | 457.2          | 533.4                  | 533.4        |               | 38.10           | 628.7              |                             |   |
| 20                | 20.00   | 30.50            | 2.750                        | 6.620                | 20.00          | 23.12                  | 23.00        | 24            | 1.620           | 27.00              | 173                         |   |
|                   | 508.0   | 774.7            | 69.85                        | 168.1                | 508.0          | 587.2                  | 584.2        |               | 41.10           | 685.8              |                             |   |
| 24                | 24.00   | 36.00            | 3.000                        | 6.880                | 24.00          | 27.62                  | 27.25        | 24            | 1.880           | 32.00              | 249                         |   |
|                   | 609.6   | 914.4            | 76.20                        | 174.8                | 609.6          | 701.5                  | 692.1        |               | 47.80           | 812.8              |                             |   |

#### Notes

- Dimension B corresponds to the pipe inside diameter. Values quoted assume 40S/Standard wall thickness.
- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-6. For weld end bevel see page 8-5.
- For tolerances see page 8-4.

# Weld Neck Flanges - ANSI B16.5



## Class 600 lb

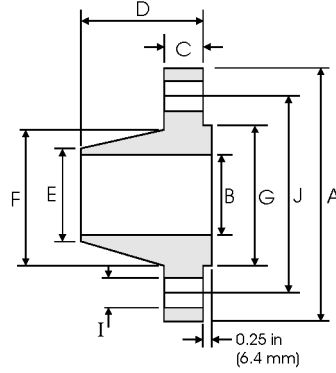
| Nominal Pipe Size | Pipe             |                  | Flange Data     |                      |                |                        | Hub Data     |               | Raised Face     | Drilling Data      |                             |           | Weight |
|-------------------|------------------|------------------|-----------------|----------------------|----------------|------------------------|--------------|---------------|-----------------|--------------------|-----------------------------|-----------|--------|
|                   | Outside Diameter | Overall Diameter | Inside Diameter | Flange Thickness min | Overall Length | Diameter at Weld Bevel | Hub Diameter | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |        |
|                   |                  |                  |                 |                      |                |                        |              |               |                 |                    |                             |           | A      |
| 1/2               | 0.840            | 3.750            | 0.560           | 2.060                | 0.840          | 1.500                  | 1.380        | 4             | 0.620           | 2.620              | 0.87                        |           |        |
|                   | 21.30            | 95.30            |                 |                      |                |                        |              |               |                 |                    |                             | 14.20     | 52.30  |
| 3/4               | 1.050            | 4.620            | 0.620           | 2.250                | 1.050          | 1.880                  | 1.690        | 4             | 0.750           | 3.250              | 1.45                        |           |        |
|                   | 26.70            | 117.3            |                 |                      |                |                        |              |               |                 |                    |                             | 15.70     | 57.15  |
| 1                 | 1.315            | 4.880            | 0.690           | 2.440                | 1.320          | 2.120                  | 2.000        | 4             | 0.750           | 3.500              | 1.76                        |           |        |
|                   | 33.40            | 124.0            |                 |                      |                |                        |              |               |                 |                    |                             | 17.50     | 62.00  |
| 1 1/4             | 1.660            | 5.250            | 0.810           | 2.620                | 1.660          | 2.500                  | 2.500        | 4             | 0.750           | 3.880              | 2.49                        |           |        |
|                   | 42.20            | 133.4            |                 |                      |                |                        |              |               |                 |                    |                             | 20.60     | 66.55  |
| 1 1/2             | 1.900            | 6.120            | 0.880           | 2.750                | 1.900          | 2.750                  | 2.880        | 4             | 0.880           | 4.500              | 3.49                        |           |        |
|                   | 48.30            | 155.4            |                 |                      |                |                        |              |               |                 |                    |                             | 22.40     | 69.85  |
| 2                 | 2.375            | 6.500            | 1.000           | 2.880                | 2.380          | 3.310                  | 3.620        | 8             | 0.750           | 5.000              | 4.36                        |           |        |
|                   | 60.30            | 165.1            |                 |                      |                |                        |              |               |                 |                    |                             | 25.40     | 73.15  |
| 2 1/2             | 2.875            | 7.500            | 1.120           | 3.120                | 2.880          | 3.940                  | 4.120        | 8             | 0.880           | 5.880              | 6.43                        |           |        |
|                   | 73.00            | 190.5            |                 |                      |                |                        |              |               |                 |                    |                             | 28.40     | 79.25  |
| 3                 | 3.500            | 8.250            | 1.250           | 3.250                | 3.500          | 4.620                  | 5.000        | 8             | 0.880           | 6.620              | 8.53                        |           |        |
|                   | 88.90            | 209.6            |                 |                      |                |                        |              |               |                 |                    |                             | 31.75     | 82.60  |
| 3 1/2             | 4.000            | 9.000            | 1.380           | 3.380                | 4.000          | 5.250                  | 5.500        | 8             | 1.000           | 7.250              | 10.7                        |           |        |
|                   | 101.6            | 228.6            |                 |                      |                |                        |              |               |                 |                    |                             | 35.10     | 85.90  |
| 4                 | 4.500            | 10.75            | 1.500           | 4.000                | 4.500          | 6.000                  | 6.190        | 8             | 1.000           | 8.500              | 17.4                        |           |        |
|                   | 114.3            | 273.1            |                 |                      |                |                        |              |               |                 |                    |                             | 38.10     | 101.6  |
| 5                 | 5.563            | 13.00            | 1.750           | 4.500                | 5.560          | 7.440                  | 7.310        | 8             | 1.120           | 10.50              | 29.2                        |           |        |
|                   | 141.3            | 330.2            |                 |                      |                |                        |              |               |                 |                    |                             | 44.50     | 114.3  |
| 6                 | 6.625            | 14.00            | 1.880           | 4.620                | 6.630          | 8.750                  | 8.500        | 12            | 1.120           | 11.50              | 34.9                        |           |        |
|                   | 168.3            | 355.6            |                 |                      |                |                        |              |               |                 |                    |                             | 47.80     | 117.3  |
| 8                 | 8.625            | 16.50            | 2.190           | 5.250                | 8.630          | 10.75                  | 10.62        | 12            | 1.250           | 13.75              | 53.9                        |           |        |
|                   | 219.1            | 419.1            |                 |                      |                |                        |              |               |                 |                    |                             | 55.60     | 133.4  |
| 10                | 10.75            | 20.00            | 2.500           | 6.000                | 10.75          | 13.50                  | 12.75        | 16            | 1.380           | 17.00              | 86.5                        |           |        |
|                   | 273.0            | 508.0            |                 |                      |                |                        |              |               |                 |                    |                             | 63.50     | 152.4  |
| 12                | 12.75            | 22.00            | 2.620           | 6.120                | 12.75          | 15.75                  | 15.00        | 20            | 1.380           | 19.25              | 103                         |           |        |
|                   | 323.8            | 558.8            |                 |                      |                |                        |              |               |                 |                    |                             | 66.55     | 155.4  |
| 14                | 14.00            | 23.75            | 2.750           | 6.500                | 14.00          | 17.00                  | 16.25        | 20            | 1.500           | 20.75              | 122                         |           |        |
|                   | 355.6            | 603.3            |                 |                      |                |                        |              |               |                 |                    |                             | 69.85     | 165.1  |
| 16                | 16.00            | 27.00            | 3.000           | 7.000                | 16.00          | 19.50                  | 18.50        | 20            | 1.620           | 23.75              | 170                         |           |        |
|                   | 406.4            | 685.8            |                 |                      |                |                        |              |               |                 |                    |                             | 76.20     | 177.8  |
| 18                | 18.00            | 29.25            | 3.250           | 7.250                | 18.00          | 21.50                  | 21.00        | 20            | 1.750           | 25.75              | 204                         |           |        |
|                   | 457.2            | 743.0            |                 |                      |                |                        |              |               |                 |                    |                             | 82.60     | 184.2  |
| 20                | 20.00            | 32.00            | 3.500           | 7.500                | 20.00          | 24.00                  | 23.00        | 24            | 1.750           | 28.50              | 254                         |           |        |
|                   | 508.0            | 812.8            |                 |                      |                |                        |              |               |                 |                    |                             | 88.90     | 190.5  |
| 24                | 24.00            | 37.00            | 4.000           | 8.000                | 24.00          | 28.25                  | 27.25        | 24            | 2.000           | 33.00              | 358                         |           |        |
|                   | 609.6            | 939.8            |                 |                      |                |                        |              |               |                 |                    |                             | 101.6     | 203.2  |

To be specified by Purchaser



**Notes**

- Dimension B corresponds to the pipe inside diameter. Values quoted assume 40S/Standard wall thickness.
- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-6. For weld end bevel see page 8-5.
- For tolerances see page 8-4.

# Weld Neck Flanges - ANSI B16.5



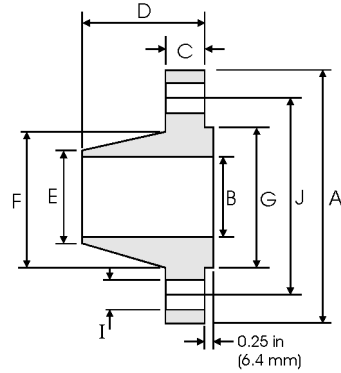
## Class 900 lb

| Pipe              |   | Flange Data      |                              |                      |                | Hub Data               |              | Raised Face   | Drilling Data   |                    |                             | Weight  |
|-------------------|---|------------------|------------------------------|----------------------|----------------|------------------------|--------------|---------------|-----------------|--------------------|-----------------------------|---|
| Nominal Pipe Size |  | <b>A</b>         | <b>B</b>                     | <b>C</b>             | <b>D</b>       | <b>E</b>               | <b>F</b>     | <b>G</b>      | <b>H</b>        | <b>I</b>           | <b>J</b>                    |  |
|                   | Outside Diameter  | Overall Diameter | Inside Diameter              | Flange Thickness min | Overall Length | Diameter at Weld Bevel | Hub Diameter | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece   |
|                   | in mm   | in mm            | in mm                        | in mm                | in mm          | in mm                  | in mm        | in mm         |                 | in mm              | in mm                       |   |
| 1/2               | 0.840   | 4.750            | To be specified by Purchaser | 0.880                | 2.380          | 0.840                  | 1.500        | 1.380         | 4               | 0.880              | 3.250                       | 1.87  |
|                   | 21.30   | 120.6            |                              | 22.30                | 60.45          | 21.30                  | 38.10        | 35.00         |                 | 22.30              | 82.50                       |   |
| 3/4               | 1.050   | 5.120            |                              | 1.000                | 2.750          | 1.050                  | 1.750        | 1.690         | 4               | 0.880              | 3.500                       | 2.56  |
|                   | 26.70   | 130.0            |                              | 25.40                | 69.85          | 26.70                  | 44.00        | 42.90         |                 | 22.30              | 88.90                       |   |
| 1                 | 1.315   | 5.880            |                              | 1.120                | 2.880          | 1.320                  | 2.060        | 2.000         | 4               | 1.000              | 4.000                       | 3.74  |
|                   | 33.40   | 149.3            |                              | 28.40                | 73.15          | 33.50                  | 52.30        | 50.80         |                 | 25.40              | 101.6                       |   |
| 1 1/4             | 1.660   | 6.250            |                              | 1.120                | 2.880          | 1.660                  | 2.500        | 2.500         | 4               | 1.000              | 4.380                       | 4.33  |
|                   | 42.20   | 158.7            |                              | 28.40                | 73.15          | 42.20                  | 63.50        | 63.50         |                 | 25.40              | 111.2                       |   |
| 1 1/2             | 1.900   | 7.000            |                              | 1.250                | 3.250          | 1.900                  | 2.750        | 2.880         | 4               | 1.120              | 4.880                       | 5.94  |
|                   | 48.30   | 177.8            |                              | 31.70                | 82.50          | 48.30                  | 69.85        | 73.15         |                 | 28.40              | 123.9                       |   |
| 2                 | 2.375   | 8.500            |                              | 1.500                | 4.000          | 2.380                  | 4.120        | 3.620         | 8               | 1.000              | 6.500                       | 10.8  |
|                   | 60.30   | 215.9            |                              | 38.10                | 101.6          | 60.45                  | 104.6        | 91.90         |                 | 25.40              | 165.1                       |   |
| 2 1/2             | 2.875   | 9.620            |                              | 1.620                | 4.120          | 2.880                  | 4.880        | 4.120         | 8               | 1.120              | 7.500                       | 15.0  |
|                   | 73.00   | 244.3            |                              | 41.10                | 104.6          | 73.15                  | 123.9        | 104.6         |                 | 28.40              | 190.5                       |   |
| 3                 | 3.500   | 9.500            |                              | 1.500                | 4.000          | 3.500                  | 5.000        | 5.000         | 8               | 1.000              | 7.500                       | 13.7  |
|                   | 88.90   | 241.3            |                              | 38.10                | 101.6          | 88.90                  | 127.0        | 127.0         |                 | 25.40              | 190.5                       |   |
| 4                 | 4.500   | 11.50            |                              | 1.750                | 4.500          | 4.500                  | 6.250        | 6.190         | 8               | 1.250              | 9.250                       | 22.5  |
|                   | 114.3   | 292.1            |                              | 44.40                | 114.3          | 114.3                  | 158.7        | 157.2         |                 | 31.70              | 234.9                       |   |
| 5                 | 5.563   | 13.75            |                              | 2.000                | 5.000          | 5.560                  | 7.500        | 7.310         | 8               | 1.380              | 11.00                       | 37.4  |
|                   | 141.3   | 349.2            |                              | 50.80                | 127.0          | 141.2                  | 190.5        | 185.7         |                 | 35.00              | 279.4                       |   |
| 6                 | 6.625   | 15.00            | 2.190                        | 5.500                | 6.630          | 9.250                  | 8.500        | 12            | 1.250           | 12.50              | 47.7                        |   |
|                   | 168.3   | 381.0            | 55.60                        | 139.7                | 168.4          | 234.9                  | 215.9        |               | 31.70           | 317.5              |                             |   |
| 8                 | 8.625   | 18.50            | 2.500                        | 6.380                | 8.630          | 11.75                  | 10.62        | 12            | 1.500           | 15.50              | 81.3                        |   |
|                   | 219.1   | 469.9            | 63.50                        | 162.0                | 219.2          | 298.4                  | 269.7        |               | 38.10           | 393.7              |                             |   |
| 10                | 10.75   | 21.50            | 2.750                        | 7.250                | 10.75          | 14.50                  | 12.75        | 16            | 1.500           | 18.50              | 119                         |   |
|                   | 273.0   | 546.1            | 69.85                        | 184.1                | 273.0          | 368.3                  | 323.8        |               | 38.10           | 469.9              |                             |   |
| 12                | 12.75   | 24.00            | 3.120                        | 7.880                | 12.75          | 16.50                  | 15.00        | 20            | 1.500           | 21.00              | 157                         |   |
|                   | 323.8   | 609.6            | 79.25                        | 200.1                | 323.8          | 419.1                  | 381.0        |               | 38.10           | 533.4              |                             |   |
| 14                | 14.00   | 25.25            | 3.380                        | 8.380                | 14.00          | 17.75                  | 16.25        | 20            | 1.620           | 22.00              | 180                         |   |
|                   | 355.6   | 641.3            | 85.80                        | 212.8                | 355.6          | 450.8                  | 412.7        |               | 41.10           | 558.8              |                             |   |
| 16                | 16.00   | 27.75            | 3.500                        | 8.500                | 16.00          | 20.00                  | 18.50        | 20            | 1.750           | 24.25              | 217                         |   |
|                   | 406.4   | 704.8            | 88.90                        | 215.9                | 406.4          | 508.0                  | 469.9        |               | 44.40           | 615.9              |                             |   |
| 18                | 18.00   | 31.00            | 4.000                        | 9.000                | 18.00          | 22.25                  | 21.00        | 20            | 2.000           | 27.00              | 292                         |   |
|                   | 457.2   | 787.4            | 101.6                        | 228.6                | 457.2          | 565.1                  | 533.4        |               | 50.80           | 685.8              |                             |   |
| 20                | 20.00   | 33.75            | 4.250                        | 9.750                | 20.00          | 24.50                  | 23.00        | 20            | 2.120           | 29.50              | 362                         |   |
|                   | 508.0   | 857.2            | 107.9                        | 247.6                | 508.0          | 622.3                  | 584.2        |               | 53.80           | 749.3              |                             |   |
| 24                | 24.00   | 41.00            | 5.500                        | 11.50                | 24.00          | 29.50                  | 27.25        | 20            | 2.620           | 35.50              | 665                         |   |
|                   | 609.6   | 1041.4           | 139.7                        | 292.1                | 609.6          | 749.3                  | 692.1        |               | 66.55           | 901.7              |                             |   |

Notes

- Dimension B corresponds to the pipe inside diameter. Values quoted assume 40S/Standard wall thickness.
- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-6. For weld end bevel see page 8-5.
- For tolerances see page 8-4.

# Weld Neck Flanges - ANSI B16.5



## Class 1500 lb

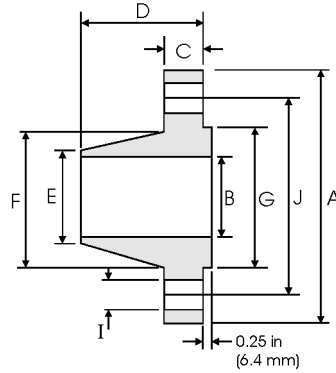
| Nominal Pipe Size | Pipe             |                  | Flange Data |   |                |                | Hub Data       |                | Raised Face    | Drilling Data |                |                | Weight    |
|-------------------|------------------|------------------|-------------|---|----------------|----------------|----------------|----------------|----------------|---------------|----------------|----------------|-----------|
|                   | Outside Diameter | Overall Diameter | A           | B | C              | D              | E              | F              | G              | H             | I              | J              | kg/ piece |
|                   |                  |                  |             |   |                |                |                |                |                |               |                |                |           |
| 1/2               | 0.840<br>21.30   | 4.750<br>120.6   |             |   | 0.880<br>22.30 | 2.380<br>60.45 | 0.840<br>21.30 | 1.500<br>38.10 | 1.380<br>35.00 | 4             | 0.880<br>22.30 | 3.250<br>82.50 | 1.87      |
| 3/4               | 1.050<br>26.70   | 5.120<br>130.0   |             |   | 1.000<br>25.40 | 2.750<br>69.85 | 1.050<br>26.70 | 1.750<br>44.00 | 1.690<br>42.90 | 4             | 0.880<br>22.30 | 3.500<br>88.90 | 2.56      |
| 1                 | 1.315<br>33.40   | 5.880<br>149.3   |             |   | 1.120<br>28.40 | 2.880<br>73.15 | 1.320<br>33.50 | 2.060<br>52.30 | 2.000<br>50.80 | 4             | 1.000<br>25.40 | 4.000<br>101.6 | 3.74      |
| 1 1/4             | 1.660<br>42.20   | 6.250<br>158.7   |             |   | 1.120<br>28.40 | 2.880<br>73.15 | 1.660<br>42.20 | 2.500<br>63.50 | 2.500<br>63.50 | 4             | 1.000<br>25.40 | 4.380<br>111.2 | 4.33      |
| 1 1/2             | 1.900<br>48.30   | 7.000<br>177.8   |             |   | 1.250<br>31.70 | 3.250<br>82.50 | 1.900<br>48.30 | 2.750<br>69.85 | 2.880<br>73.15 | 4             | 1.120<br>28.40 | 4.880<br>123.9 | 5.94      |
| 2                 | 2.375<br>60.30   | 8.500<br>215.9   |             |   | 1.500<br>38.10 | 4.000<br>101.6 | 2.380<br>60.45 | 4.120<br>104.6 | 3.620<br>91.90 | 8             | 1.000<br>25.40 | 6.500<br>165.1 | 10.8      |
| 2 1/2             | 2.875<br>73.00   | 9.620<br>244.3   |             |   | 1.620<br>41.10 | 4.120<br>104.6 | 2.880<br>73.15 | 4.880<br>123.9 | 4.120<br>104.6 | 8             | 1.120<br>28.40 | 7.500<br>190.5 | 15.0      |
| 3                 | 3.500<br>88.90   | 10.50<br>266.7   |             |   | 1.880<br>47.70 | 4.620<br>117.3 | 3.500<br>88.90 | 5.250<br>133.3 | 5.000<br>127.0 | 8             | 1.250<br>31.70 | 8.000<br>203.2 | 19.9      |
| 4                 | 4.500<br>114.3   | 12.25<br>311.1   |             |   | 2.120<br>53.80 | 4.880<br>123.9 | 4.500<br>114.3 | 6.380<br>162.0 | 6.190<br>157.2 | 8             | 1.380<br>35.00 | 9.500<br>241.3 | 29.9      |
| 5                 | 5.563<br>141.3   | 14.75<br>374.6   |             |   | 2.880<br>73.15 | 6.120<br>155.4 | 5.560<br>141.2 | 7.750<br>196.8 | 7.310<br>185.7 | 8             | 1.620<br>41.10 | 11.50<br>292.1 | 55.4      |
| 6                 | 6.625<br>168.3   | 15.50<br>393.7   |             |   | 3.250<br>82.50 | 6.750<br>171.4 | 6.630<br>168.4 | 9.000<br>228.6 | 8.500<br>215.9 | 12            | 1.500<br>38.10 | 12.50<br>317.5 | 68.4      |
| 8                 | 8.625<br>219.1   | 19.00<br>482.6   |             |   | 3.620<br>91.90 | 8.380<br>212.8 | 8.630<br>219.2 | 11.50<br>292.1 | 10.62<br>269.7 | 12            | 1.750<br>44.40 | 15.50<br>393.7 | 117       |
| 10                | 10.75<br>273.0   | 23.00<br>584.2   |             |   | 4.250<br>107.9 | 10.00<br>254.0 | 10.75<br>273.0 | 14.50<br>368.3 | 12.75<br>323.8 | 12            | 2.000<br>50.80 | 19.00<br>482.6 | 194       |
| 12                | 12.75<br>323.8   | 26.50<br>673.1   |             |   | 4.880<br>123.9 | 11.12<br>282.4 | 12.75<br>323.8 | 17.75<br>450.8 | 15.00<br>381.0 | 16            | 2.120<br>53.80 | 22.50<br>571.5 | 288       |
| 14                | 14.00<br>355.6   | 29.50<br>749.3   |             |   | 5.250<br>133.3 | 11.75<br>298.4 | 14.00<br>355.6 | 19.50<br>495.3 | 16.25<br>412.7 | 16            | 2.380<br>60.45 | 25.00<br>635.0 | 380       |
| 16                | 16.00<br>406.4   | 32.50<br>825.5   |             |   | 5.750<br>146.0 | 12.25<br>311.1 | 16.00<br>406.4 | 21.75<br>552.4 | 18.50<br>469.9 | 16            | 2.620<br>66.55 | 27.75<br>704.8 | 485       |
| 18                | 18.00<br>457.2   | 36.00<br>914.4   |             |   | 6.380<br>162.0 | 12.88<br>327.1 | 18.00<br>457.2 | 23.50<br>596.9 | 21.00<br>533.4 | 16            | 2.880<br>73.15 | 30.50<br>774.7 | 644       |
| 20                | 20.00<br>508.0   | 38.75<br>984.2   |             |   | 7.000<br>177.8 | 14.00<br>355.6 | 20.00<br>508.0 | 25.25<br>641.3 | 23.00<br>584.2 | 16            | 3.120<br>79.25 | 32.75<br>831.8 | 775       |
| 24                | 24.00<br>609.6   | 46.00<br>1168.4  |             |   | 8.000<br>203.2 | 16.00<br>406.4 | 24.00<br>609.6 | 30.00<br>762.0 | 27.25<br>692.1 | 16            | 3.620<br>91.90 | 39.00<br>990.6 | 1232      |

To be specified by Purchaser

### Notes

- Dimension B corresponds to the pipe inside diameter. Values quoted assume 40S/Standard wall thickness.
- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-6. For weld end bevel see page 8-5.
- For tolerances see page 8-4.

## Weld Neck Flanges - ANSI B16.5



### Class 2500 lb

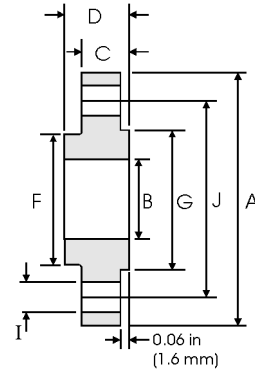
| Nominal Pipe Size | Pipe             |                  | Flange Data                  |                      |                |                        | Hub Data     |               | Raised Face     | Drilling Data      |                             |           | Weight |
|-------------------|------------------|------------------|------------------------------|----------------------|----------------|------------------------|--------------|---------------|-----------------|--------------------|-----------------------------|-----------|--------|
|                   |                  |                  |                              |                      |                |                        |              |               |                 |                    |                             |           |        |
|                   | Outside Diameter | Overall Diameter | Inside Diameter              | Flange Thickness min | Overall Length | Diameter at Weld Bevel | Hub Diameter | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |        |
| in mm             | in mm            | in mm            | in mm                        | in mm                | in mm          | in mm                  | in mm        | in mm         |                 | in mm              | in mm                       |           |        |
| 1/2               | 0.840            | 5.250            | To be specified by Purchaser | 1.190                | 2.880          | 0.840                  | 1.690        | 1.380         | 4               | 0.880              | 3.500                       | 3.12      |        |
|                   | 21.30            | 133.4            |                              | 30.20                | 73.15          | 21.30                  | 42.90        | 35.00         |                 | 22.40              | 88.90                       |           |        |
| 3/4               | 1.050            | 5.500            |                              | 1.250                | 3.120          | 1.050                  | 2.000        | 1.690         | 4               | 0.880              | 3.750                       | 3.70      |        |
|                   | 26.70            | 139.7            |                              | 31.75                | 79.25          | 26.70                  | 50.80        | 42.90         |                 | 22.40              | 95.30                       |           |        |
| 1                 | 1.315            | 6.250            |                              | 1.380                | 3.500          | 1.320                  | 2.250        | 2.000         | 4               | 1.000              | 4.250                       | 5.24      |        |
|                   | 33.40            | 158.8            |                              | 35.10                | 88.90          | 33.50                  | 57.15        | 50.80         |                 | 25.40              | 108.0                       |           |        |
| 1 1/4             | 1.660            | 7.250            |                              | 1.500                | 3.750          | 1.660                  | 2.880        | 2.500         | 4               | 1.120              | 5.120                       | 7.74      |        |
|                   | 42.20            | 184.2            |                              | 38.10                | 95.30          | 42.20                  | 73.15        | 63.50         |                 | 28.40              | 130.0                       |           |        |
| 1 1/2             | 1.900            | 8.000            |                              | 1.750                | 4.380          | 1.900                  | 3.120        | 2.880         | 4               | 1.250              | 5.750                       | 10.9      |        |
|                   | 48.30            | 203.2            |                              | 44.50                | 111.3          | 48.30                  | 79.25        | 73.15         |                 | 31.75              | 146.1                       |           |        |
| 2                 | 2.375            | 9.250            |                              | 2.000                | 5.000          | 2.380                  | 3.750        | 3.620         | 8               | 1.120              | 6.750                       | 16.2      |        |
|                   | 60.30            | 235.0            |                              | 50.80                | 127.0          | 60.45                  | 95.30        | 91.90         |                 | 28.40              | 171.5                       |           |        |
| 2 1/2             | 2.875            | 10.50            | 2.250                        | 5.620                | 2.880          | 4.500                  | 4.120        | 8             | 1.250           | 7.750              | 23.7                        |           |        |
|                   | 73.00            | 266.7            | 57.15                        | 142.7                | 73.15          | 114.3                  | 104.6        |               | 31.75           | 196.9              |                             |           |        |
| 3                 | 3.500            | 12.00            | 2.620                        | 6.620                | 3.500          | 5.250                  | 5.000        | 8             | 1.380           | 9.000              | 36.2                        |           |        |
|                   | 88.90            | 304.8            | 66.55                        | 168.1                | 88.90          | 133.4                  | 127.0        |               | 35.10           | 228.6              |                             |           |        |
| 4                 | 4.500            | 14.00            | 3.000                        | 7.500                | 4.500          | 6.500                  | 6.190        | 8             | 1.620           | 10.75              | 55.3                        |           |        |
|                   | 114.3            | 355.6            | 76.20                        | 190.5                | 114.3          | 165.1                  | 157.2        |               | 41.10           | 273.1              |                             |           |        |
| 5                 | 5.563            | 16.50            | 3.620                        | 9.000                | 5.560          | 8.000                  | 7.310        | 8             | 1.880           | 12.75              | 92.5                        |           |        |
|                   | 141.3            | 419.1            | 91.90                        | 228.6                | 141.2          | 203.2                  | 185.7        |               | 47.80           | 323.9              |                             |           |        |
| 6                 | 6.625            | 19.00            | 4.250                        | 10.75                | 6.630          | 9.250                  | 8.500        | 8             | 2.120           | 14.50              | 143                         |           |        |
|                   | 168.3            | 482.6            | 108.0                        | 273.1                | 168.4          | 235.0                  | 215.9        |               | 53.80           | 368.3              |                             |           |        |
| 8                 | 8.625            | 21.75            | 5.000                        | 12.50                | 8.630          | 12.00                  | 10.62        | 12            | 2.120           | 17.25              | 215                         |           |        |
|                   | 219.1            | 552.5            | 127.0                        | 317.5                | 219.2          | 304.8                  | 269.7        |               | 53.80           | 438.2              |                             |           |        |
| 10                | 10.75            | 26.50            | 6.500                        | 16.50                | 10.75          | 14.75                  | 12.75        | 12            | 2.620           | 21.25              | 406                         |           |        |
|                   | 273.0            | 673.1            | 165.1                        | 419.1                | 273.0          | 374.7                  | 323.8        |               | 66.55           | 539.8              |                             |           |        |
| 12                | 12.75            | 30.00            | 7.250                        | 18.25                | 12.75          | 17.38                  | 15.00        | 12            | 2.880           | 24.38              | 572                         |           |        |
|                   | 323.8            | 762.0            | 184.2                        | 463.6                | 323.8          | 441.5                  | 381.0        |               | 73.15           | 619.3              |                             |           |        |

#### Notes

- Dimension B corresponds to the pipe inside diameter. Values quoted assume 40S/Standard wall thickness.
- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-6. For weld end bevel see page 8-5.
- For tolerances see page 8-4.



# Slip On Flanges - ANSI B16.5



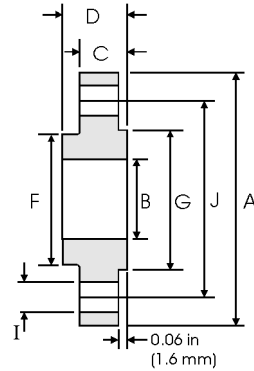
## Class 150 lb

| Nominal Pipe Size | Pipe             |                  | Flange Data     |                      |                |              | Hub           | Raised Face     | Drilling Data      |                             |           | Weight |
|-------------------|------------------|------------------|-----------------|----------------------|----------------|--------------|---------------|-----------------|--------------------|-----------------------------|-----------|--------|
|                   |                  | <b>A</b>         | <b>B</b>        | <b>C</b>             | <b>D</b>       | <b>F</b>     | <b>G</b>      | <b>H</b>        | <b>I</b>           | <b>J</b>                    |           |        |
|                   | Outside Diameter | Overall Diameter | Inside Diameter | Flange Thickness min | Overall Length | Hub Diameter | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |        |
| in mm             | in mm            | in mm            | in mm           | in mm                | in mm          | in mm        | in mm         |                 | in mm              | in mm                       |           |        |
| 1/2               | 0.840            | 3.500            | 0.880           | 0.440                | 0.620          | 1.190        | 1.380         | 4               | 0.620              | 2.380                       | 0.39      |        |
|                   | 21.30            | 88.90            | 22.40           | 11.20                | 15.70          | 30.20        | 35.10         |                 | 15.70              | 60.45                       |           |        |
| 3/4               | 1.050            | 3.880            | 1.090           | 0.500                | 0.620          | 1.500        | 1.690         | 4               | 0.620              | 2.750                       | 0.56      |        |
|                   | 26.70            | 98.60            | 27.70           | 12.70                | 15.70          | 38.10        | 42.90         |                 | 15.70              | 69.85                       |           |        |
| 1                 | 1.315            | 4.250            | 1.360           | 0.560                | 0.690          | 1.940        | 2.000         | 4               | 0.620              | 3.120                       | 0.78      |        |
|                   | 33.40            | 108.0            | 34.50           | 14.20                | 17.50          | 49.30        | 50.80         |                 | 15.70              | 79.25                       |           |        |
| 1 1/4             | 1.660            | 4.620            | 1.700           | 0.620                | 0.810          | 2.310        | 2.500         | 4               | 0.620              | 3.500                       | 1.03      |        |
|                   | 42.20            | 117.3            | 43.20           | 15.70                | 20.60          | 58.70        | 63.50         |                 | 15.70              | 88.90                       |           |        |
| 1 1/2             | 1.900            | 5.000            | 1.950           | 0.690                | 0.880          | 2.560        | 2.880         | 4               | 0.620              | 3.880                       | 1.32      |        |
|                   | 48.30            | 127.0            | 49.50           | 17.50                | 22.40          | 65.00        | 73.15         |                 | 15.70              | 98.60                       |           |        |
| 2                 | 2.375            | 6.000            | 2.440           | 0.750                | 1.000          | 3.060        | 3.620         | 4               | 0.750              | 4.750                       | 2.06      |        |
|                   | 60.30            | 152.4            | 62.00           | 19.10                | 25.40          | 77.70        | 91.90         |                 | 19.10              | 120.7                       |           |        |
| 2 1/2             | 2.875            | 7.000            | 2.940           | 0.880                | 1.120          | 3.560        | 4.120         | 4               | 0.750              | 5.500                       | 3.28      |        |
|                   | 73.00            | 177.8            | 74.70           | 22.40                | 28.40          | 90.40        | 104.6         |                 | 19.10              | 139.7                       |           |        |
| 3                 | 3.500            | 7.500            | 3.570           | 0.940                | 1.190          | 4.250        | 5.000         | 4               | 0.750              | 6.000                       | 3.85      |        |
|                   | 88.90            | 190.5            | 90.70           | 23.90                | 30.20          | 108.0        | 127.0         |                 | 19.10              | 152.4                       |           |        |
| 3 1/2             | 4.000            | 8.500            | 4.070           | 0.940                | 1.250          | 4.810        | 5.500         | 8               | 0.750              | 7.000                       | 4.81      |        |
|                   | 101.6            | 215.9            | 103.4           | 23.90                | 31.75          | 122.2        | 139.7         |                 | 19.10              | 177.8                       |           |        |
| 4                 | 4.500            | 9.000            | 4.570           | 0.940                | 1.310          | 5.310        | 6.190         | 8               | 0.750              | 7.500                       | 5.30      |        |
|                   | 114.3            | 228.6            | 116.1           | 23.90                | 33.30          | 134.9        | 157.2         |                 | 19.10              | 190.5                       |           |        |
| 5                 | 5.563            | 10.00            | 5.660           | 0.940                | 1.440          | 6.440        | 7.310         | 8               | 0.880              | 8.500                       | 6.07      |        |
|                   | 141.3            | 254.0            | 143.8           | 23.90                | 36.60          | 163.6        | 185.7         |                 | 22.40              | 215.9                       |           |        |
| 6                 | 6.625            | 11.00            | 6.720           | 1.000                | 1.560          | 7.560        | 8.500         | 8               | 0.880              | 9.500                       | 7.45      |        |
|                   | 168.3            | 279.4            | 170.7           | 25.40                | 39.60          | 192.0        | 215.9         |                 | 22.40              | 241.3                       |           |        |
| 8                 | 8.625            | 13.50            | 8.720           | 1.120                | 1.750          | 9.690        | 10.62         | 8               | 0.880              | 11.75                       | 12.1      |        |
|                   | 219.1            | 342.9            | 221.5           | 28.40                | 44.50          | 246.1        | 269.7         |                 | 22.40              | 298.5                       |           |        |
| 10                | 10.75            | 16.00            | 10.88           | 1.190                | 1.940          | 12.00        | 12.75         | 12              | 1.000              | 14.25                       | 16.5      |        |
|                   | 273.0            | 406.4            | 276.3           | 30.20                | 49.30          | 304.8        | 323.9         |                 | 25.40              | 362.0                       |           |        |
| 12                | 12.75            | 19.00            | 12.88           | 1.250                | 2.190          | 14.38        | 15.00         | 12              | 1.000              | 17.00                       | 26.2      |        |
|                   | 323.8            | 482.6            | 327.1           | 31.75                | 55.60          | 365.3        | 381.0         |                 | 25.40              | 431.8                       |           |        |
| 14                | 14.00            | 21.00            | 14.14           | 1.380                | 2.250          | 15.75        | 16.25         | 12              | 1.120              | 18.75                       | 34.6      |        |
|                   | 355.6            | 533.4            | 359.1           | 35.10                | 57.15          | 400.1        | 412.8         |                 | 28.40              | 476.3                       |           |        |
| 16                | 16.00            | 23.50            | 16.16           | 1.440                | 2.500          | 18.00        | 18.50         | 16              | 1.120              | 21.25                       | 44.8      |        |
|                   | 406.4            | 596.9            | 410.5           | 36.60                | 63.50          | 457.2        | 469.9         |                 | 28.40              | 539.8                       |           |        |
| 18                | 18.00            | 25.00            | 18.18           | 1.560                | 2.690          | 19.88        | 21.00         | 16              | 1.250              | 22.75                       | 48.9      |        |
|                   | 457.2            | 635.0            | 461.8           | 39.60                | 68.30          | 505.0        | 533.4         |                 | 31.75              | 577.9                       |           |        |
| 20                | 20.00            | 27.50            | 20.20           | 1.690                | 2.880          | 22.00        | 23.00         | 20              | 1.250              | 25.00                       | 61.9      |        |
|                   | 508.0            | 698.5            | 513.1           | 42.90                | 73.15          | 558.8        | 584.2         |                 | 31.75              | 635.0                       |           |        |
| 24                | 24.00            | 32.00            | 24.25           | 1.880                | 3.250          | 26.12        | 27.25         | 20              | 1.380              | 29.50                       | 86.9      |        |
|                   | 609.6            | 812.8            | 616.0           | 47.80                | 82.60          | 663.4        | 692.2         |                 | 35.10              | 749.3                       |           |        |

Notes

- Weights are based on manufacturer's data and are approximate.
- Flat face flanges may be provided at full thickness, C, or with raised face removed (the latter is nonstandard).
- For ring joint facings see page 8-6.
- For tolerances see page 8-4.

## Slip On Flanges - ANSI B16.5



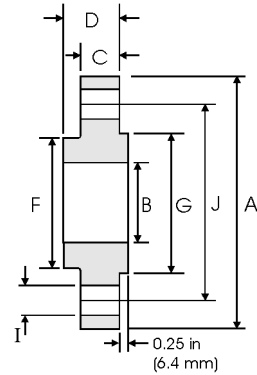
### Class 300 lb

| Nominal Pipe Size | Pipe             | Flange Data      |                 |                      |                | Hub          | Raised Face   | Drilling Data   |                    |                             | Weight    |
|-------------------|------------------|------------------|-----------------|----------------------|----------------|--------------|---------------|-----------------|--------------------|-----------------------------|-----------|
|                   |                  | <b>A</b>         | <b>B</b>        | <b>C</b>             | <b>D</b>       | <b>F</b>     | <b>G</b>      | <b>H</b>        | <b>I</b>           | <b>J</b>                    |           |
|                   | Outside Diameter | Overall Diameter | Inside Diameter | Flange Thickness min | Overall Length | Hub Diameter | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm           | in mm                | in mm          | in mm        | in mm         |                 | in mm              | in mm                       |           |
| 1/2               | 0.840            | 3.750            | 0.880           | 0.560                | 0.880          | 1.500        | 1.380         | 4               | 0.620              | 2.620                       | 0.64      |
|                   | 21.30            | 95.20            | 22.40           | 14.20                | 22.40          | 38.10        | 35.10         |                 | 15.70              | 66.55                       |           |
| 3/4               | 1.050            | 4.620            | 1.090           | 0.620                | 1.000          | 1.880        | 1.690         | 4               | 0.750              | 3.250                       | 1.12      |
|                   | 26.70            | 117.3            | 27.70           | 15.70                | 25.40          | 47.70        | 42.90         |                 | 19.10              | 82.50                       |           |
| 1                 | 1.315            | 4.880            | 1.360           | 0.690                | 1.060          | 2.120        | 2.000         | 4               | 0.750              | 3.500                       | 1.36      |
|                   | 33.40            | 123.9            | 34.50           | 17.50                | 26.90          | 53.80        | 50.80         |                 | 19.10              | 88.90                       |           |
| 1 1/4             | 1.660            | 5.250            | 1.700           | 0.750                | 1.060          | 2.500        | 2.500         | 4               | 0.750              | 3.880                       | 1.68      |
|                   | 42.20            | 133.3            | 43.20           | 19.00                | 26.90          | 63.50        | 63.50         |                 | 19.10              | 98.60                       |           |
| 1 1/2             | 1.900            | 6.120            | 1.950           | 0.810                | 1.190          | 2.750        | 2.880         | 4               | 0.880              | 4.500                       | 2.49      |
|                   | 48.30            | 155.4            | 49.50           | 20.60                | 30.20          | 69.85        | 73.15         |                 | 22.40              | 114.3                       |           |
| 2                 | 2.375            | 6.500            | 2.440           | 0.880                | 1.310          | 3.310        | 3.620         | 8               | 0.750              | 5.000                       | 2.87      |
|                   | 60.30            | 165.1            | 62.00           | 22.30                | 33.20          | 84.00        | 91.90         |                 | 19.10              | 127.0                       |           |
| 2 1/2             | 2.875            | 7.500            | 2.940           | 1.000                | 1.500          | 3.940        | 4.120         | 8               | 0.880              | 5.880                       | 4.32      |
|                   | 73.00            | 190.5            | 74.70           | 25.40                | 38.10          | 100.0        | 104.6         |                 | 22.40              | 149.4                       |           |
| 3                 | 3.500            | 8.250            | 3.570           | 1.120                | 1.690          | 4.620        | 5.000         | 8               | 0.880              | 6.620                       | 5.85      |
|                   | 88.90            | 209.5            | 90.70           | 28.40                | 42.90          | 117.3        | 127.0         |                 | 22.40              | 168.1                       |           |
| 3 1/2             | 4.000            | 9.000            | 4.070           | 1.190                | 1.750          | 5.250        | 5.500         | 8               | 0.880              | 7.250                       | 7.34      |
|                   | 101.6            | 228.6            | 103.4           | 30.20                | 44.40          | 133.3        | 139.7         |                 | 22.40              | 184.2                       |           |
| 4                 | 4.500            | 10.00            | 4.570           | 1.250                | 1.880          | 5.750        | 6.190         | 8               | 0.880              | 7.880                       | 9.61      |
|                   | 114.3            | 254.0            | 116.1           | 31.70                | 47.70          | 146.0        | 157.2         |                 | 22.40              | 200.1                       |           |
| 5                 | 5.563            | 11.00            | 5.660           | 1.380                | 2.000          | 7.000        | 7.310         | 8               | 0.880              | 9.250                       | 12.3      |
|                   | 141.3            | 279.4            | 143.8           | 35.00                | 50.80          | 177.8        | 185.7         |                 | 22.40              | 234.9                       |           |
| 6                 | 6.625            | 12.50            | 6.720           | 1.440                | 2.060          | 8.120        | 8.500         | 12              | 0.880              | 10.62                       | 15.6      |
|                   | 168.3            | 317.5            | 170.7           | 36.50                | 52.30          | 206.2        | 215.9         |                 | 22.40              | 269.7                       |           |
| 8                 | 8.625            | 15.00            | 8.720           | 1.620                | 2.440          | 10.25        | 10.62         | 12              | 1.000              | 13.00                       | 24.2      |
|                   | 219.1            | 381.0            | 221.5           | 41.10                | 61.90          | 260.3        | 269.7         |                 | 25.40              | 330.2                       |           |
| 10                | 10.75            | 17.50            | 10.88           | 1.880                | 2.620          | 12.62        | 12.75         | 16              | 1.120              | 15.25                       | 34.1      |
|                   | 273.0            | 444.5            | 276.3           | 47.70                | 66.55          | 320.5        | 323.9         |                 | 28.40              | 387.3                       |           |
| 12                | 12.75            | 20.50            | 12.88           | 2.000                | 2.880          | 14.75        | 15.00         | 16              | 1.250              | 17.75                       | 49.8      |
|                   | 323.8            | 520.7            | 327.1           | 50.80                | 73.15          | 374.6        | 381.0         |                 | 31.70              | 450.8                       |           |
| 14                | 14.00            | 23.00            | 14.14           | 2.120                | 3.000          | 16.75        | 16.25         | 20              | 1.250              | 20.25                       | 69.9      |
|                   | 355.6            | 584.2            | 359.1           | 53.80                | 76.20          | 425.4        | 412.8         |                 | 31.70              | 514.4                       |           |
| 16                | 16.00            | 25.50            | 16.16           | 2.250                | 3.250          | 19.00        | 18.50         | 20              | 1.380              | 22.50                       | 88.1      |
|                   | 406.4            | 647.7            | 410.5           | 57.15                | 82.50          | 482.6        | 469.9         |                 | 35.00              | 571.5                       |           |
| 18                | 18.00            | 28.00            | 18.18           | 2.380                | 3.500          | 21.00        | 21.00         | 24              | 1.380              | 24.75                       | 109       |
|                   | 457.2            | 711.2            | 461.8           | 60.45                | 88.90          | 533.4        | 533.4         |                 | 35.00              | 628.7                       |           |
| 20                | 20.00            | 30.50            | 20.20           | 2.500                | 3.750          | 23.12        | 23.00         | 24              | 1.380              | 27.00                       | 134       |
|                   | 508.0            | 774.7            | 513.1           | 63.50                | 95.20          | 587.2        | 584.2         |                 | 35.00              | 685.8                       |           |
| 24                | 24.00            | 36.00            | 24.25           | 2.750                | 4.190          | 27.62        | 27.25         | 24              | 1.620              | 32.00                       | 201       |
|                   | 609.6            | 914.4            | 616.0           | 69.85                | 106.4          | 701.5        | 692.2         |                 | 41.00              | 812.8                       |           |

#### Notes

- Weights are based on manufacturer's data and are approximate.
- Flat face flanges may be provided at full thickness, C, or with raised face removed (the latter is nonstandard).
- For ring joint facings see page 8-6.
- For tolerances see page 8-4.

# Slip On Flanges - ANSI B16.5



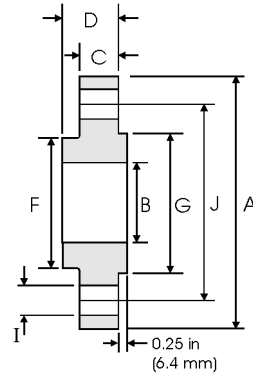
## Class 400 lb

| Pipe              |                  | Flange Data      |                 |                      |                | Hub          | Raised Face   | Drilling Data   |                    |                             | Weight    |
|-------------------|------------------|------------------|-----------------|----------------------|----------------|--------------|---------------|-----------------|--------------------|-----------------------------|-----------|
| Nominal Pipe Size |                  | <b>A</b>         | <b>B</b>        | <b>C</b>             | <b>D</b>       | <b>F</b>     | <b>G</b>      | <b>H</b>        | <b>I</b>           | <b>J</b>                    |           |
|                   | Outside Diameter | Overall Diameter | Inside Diameter | Flange Thickness min | Overall Length | Hub Diameter | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm           | in mm                | in mm          | in mm        | in mm         |                 | in mm              | in mm                       |           |
| 1/2               | 0.840            | 3.750            | 0.880           | 0.560                | 0.880          | 1.500        | 1.380         | 4               | 0.620              | 2.620                       | 0.74      |
|                   | 21.30            | 95.30            | 22.40           | 14.20                | 22.40          | 38.10        | 35.10         |                 | 15.70              | 66.55                       |           |
| 3/4               | 1.050            | 4.620            | 1.090           | 0.620                | 1.000          | 1.880        | 1.690         | 4               | 0.750              | 3.250                       | 1.27      |
|                   | 26.70            | 117.3            | 27.70           | 15.70                | 25.40          | 47.70        | 42.90         |                 | 19.10              | 82.50                       |           |
| 1                 | 1.315            | 4.880            | 1.360           | 0.690                | 1.060          | 2.120        | 2.000         | 4               | 0.750              | 3.500                       | 1.52      |
|                   | 33.40            | 124.0            | 34.50           | 17.50                | 26.90          | 53.80        | 50.80         |                 | 19.10              | 88.90                       |           |
| 1 1/4             | 1.660            | 5.250            | 1.700           | 0.810                | 1.120          | 2.500        | 2.500         | 4               | 0.750              | 3.880                       | 2.03      |
|                   | 42.20            | 133.4            | 43.20           | 20.60                | 28.40          | 63.50        | 63.50         |                 | 19.10              | 98.60                       |           |
| 1 1/2             | 1.900            | 6.120            | 1.950           | 0.880                | 1.250          | 2.750        | 2.880         | 4               | 0.880              | 4.500                       | 2.96      |
|                   | 48.30            | 155.4            | 49.50           | 22.40                | 31.75          | 69.85        | 73.15         |                 | 22.40              | 114.3                       |           |
| 2                 | 2.375            | 6.500            | 2.440           | 1.000                | 1.440          | 3.310        | 3.620         | 8               | 0.750              | 5.000                       | 3.62      |
|                   | 60.30            | 165.1            | 62.00           | 25.40                | 36.60          | 84.00        | 91.90         |                 | 19.10              | 127.0                       |           |
| 2 1/2             | 2.875            | 7.500            | 2.940           | 1.120                | 1.620          | 3.940        | 4.120         | 8               | 0.880              | 5.880                       | 5.28      |
|                   | 73.00            | 190.5            | 74.70           | 28.40                | 41.10          | 100.0        | 104.6         |                 | 22.40              | 149.4                       |           |
| 3                 | 3.500            | 8.250            | 3.570           | 1.250                | 1.810          | 4.620        | 5.000         | 8               | 0.880              | 6.620                       | 7.00      |
|                   | 88.90            | 209.6            | 90.70           | 31.75                | 46.00          | 117.3        | 127.0         |                 | 22.40              | 168.1                       |           |
| 3 1/2             | 4.000            | 9.000            | 4.070           | 1.380                | 1.940          | 5.250        | 5.500         | 8               | 1.000              | 7.250                       | 8.84      |
|                   | 101.6            | 228.6            | 103.4           | 35.10                | 49.30          | 133.3        | 139.7         |                 | 25.40              | 184.2                       |           |
| 4                 | 4.500            | 10.00            | 4.570           | 1.380                | 2.000          | 5.750        | 6.190         | 8               | 1.000              | 7.880                       | 11.1      |
|                   | 114.3            | 254.0            | 116.1           | 35.10                | 50.80          | 146.0        | 157.2         |                 | 25.40              | 200.1                       |           |
| 5                 | 5.563            | 11.00            | 5.660           | 1.500                | 2.120          | 7.000        | 7.310         | 8               | 1.000              | 9.250                       | 13.9      |
|                   | 141.3            | 279.4            | 143.8           | 38.10                | 53.80          | 177.8        | 185.7         |                 | 25.40              | 234.9                       |           |
| 6                 | 6.625            | 12.50            | 6.720           | 1.620                | 2.250          | 8.120        | 8.500         | 12              | 1.000              | 10.62                       | 18.3      |
|                   | 168.3            | 317.5            | 170.7           | 41.10                | 57.15          | 206.2        | 215.9         |                 | 25.40              | 269.7                       |           |
| 8                 | 8.625            | 15.00            | 8.720           | 1.880                | 2.690          | 10.25        | 10.62         | 12              | 1.120              | 13.00                       | 28.6      |
|                   | 219.1            | 381.0            | 221.5           | 47.80                | 68.30          | 260.3        | 269.7         |                 | 28.40              | 330.2                       |           |
| 10                | 10.75            | 17.50            | 10.88           | 2.120                | 2.880          | 12.62        | 12.75         | 16              | 1.250              | 15.25                       | 39.2      |
|                   | 273.0            | 444.5            | 276.3           | 53.80                | 73.15          | 320.5        | 323.9         |                 | 31.75              | 387.3                       |           |
| 12                | 12.75            | 20.50            | 12.88           | 2.250                | 3.120          | 14.75        | 15.00         | 16              | 1.380              | 17.75                       | 57.0      |
|                   | 323.8            | 520.7            | 327.1           | 57.15                | 79.25          | 374.6        | 381.0         |                 | 35.10              | 450.8                       |           |
| 14                | 14.00            | 23.00            | 14.14           | 2.380                | 3.310          | 16.75        | 16.25         | 20              | 1.380              | 20.25                       | 79.1      |
|                   | 355.6            | 584.2            | 359.1           | 60.05                | 84.10          | 425.4        | 412.8         |                 | 35.10              | 514.4                       |           |
| 16                | 16.00            | 25.50            | 16.16           | 2.500                | 3.690          | 19.00        | 18.50         | 20              | 1.500              | 22.50                       | 101       |
|                   | 406.4            | 647.7            | 410.5           | 63.50                | 93.70          | 482.6        | 469.9         |                 | 38.10              | 571.5                       |           |
| 18                | 18.00            | 28.00            | 18.18           | 2.620                | 3.880          | 21.00        | 21.00         | 24              | 1.500              | 24.75                       | 123       |
|                   | 457.2            | 711.2            | 461.8           | 66.55                | 98.60          | 533.4        | 533.4         |                 | 38.10              | 628.7                       |           |
| 20                | 20.00            | 30.50            | 20.20           | 2.750                | 4.000          | 23.12        | 23.00         | 24              | 1.620              | 27.00                       | 146       |
|                   | 508.0            | 774.7            | 513.1           | 69.85                | 101.6          | 587.2        | 584.2         |                 | 41.10              | 685.8                       |           |
| 24                | 24.00            | 36.00            | 24.25           | 3.000                | 4.500          | 27.62        | 27.25         | 24              | 1.880              | 32.00                       | 219       |
|                   | 609.6            | 914.4            | 616.0           | 76.20                | 114.3          | 701.5        | 692.2         |                 | 47.80              | 812.8                       |           |

Notes

- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-6.
- For tolerances see page 8-4.

# Slip On Flanges - ANSI B16.5



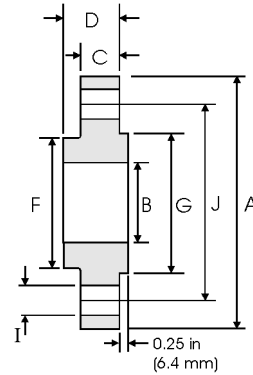
## Class 600 lb

| Nominal Pipe Size | Pipe             | Flange Data      |                 |                      |                | Hub          | Raised Face   | Drilling Data   |                    |                             | Weight    |
|-------------------|------------------|------------------|-----------------|----------------------|----------------|--------------|---------------|-----------------|--------------------|-----------------------------|-----------|
|                   |                  | <b>A</b>         | <b>B</b>        | <b>C</b>             | <b>D</b>       | <b>F</b>     | <b>G</b>      | <b>H</b>        | <b>I</b>           | <b>J</b>                    |           |
|                   | Outside Diameter | Overall Diameter | Inside Diameter | Flange Thickness min | Overall Length | Hub Diameter | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm           | in mm                | in mm          | in mm        | in mm         |                 | in mm              | in mm                       |           |
| 1/2               | 0.840            | 3.750            | 0.880           | 0.560                | 0.880          | 1.500        | 1.380         | 4               | 0.620              | 2.620                       | 0.74      |
|                   | 21.30            | 95.30            | 22.40           | 14.20                | 22.40          | 38.10        | 35.10         |                 | 15.70              | 66.55                       |           |
| 3/4               | 1.050            | 4.620            | 1.090           | 0.620                | 1.000          | 1.880        | 1.690         | 4               | 0.750              | 3.250                       | 1.27      |
|                   | 26.70            | 117.3            | 27.70           | 15.70                | 25.40          | 47.80        | 42.90         |                 | 19.10              | 82.60                       |           |
| 1                 | 1.315            | 4.880            | 1.360           | 0.690                | 1.060          | 2.120        | 2.000         | 4               | 0.750              | 3.500                       | 1.52      |
|                   | 33.40            | 124.0            | 34.50           | 17.50                | 26.90          | 53.80        | 50.80         |                 | 19.10              | 88.90                       |           |
| 1 1/4             | 1.660            | 5.250            | 1.700           | 0.810                | 1.120          | 2.500        | 2.500         | 4               | 0.750              | 3.880                       | 2.03      |
|                   | 42.20            | 133.4            | 43.20           | 20.60                | 28.40          | 63.50        | 63.50         |                 | 19.10              | 98.60                       |           |
| 1 1/2             | 1.900            | 6.120            | 1.950           | 0.880                | 1.250          | 2.750        | 2.880         | 4               | 0.880              | 4.500                       | 2.96      |
|                   | 48.30            | 155.4            | 49.50           | 22.40                | 31.75          | 69.85        | 73.15         |                 | 22.40              | 114.3                       |           |
| 2                 | 2.375            | 6.500            | 2.440           | 1.000                | 1.440          | 3.310        | 3.620         | 8               | 0.750              | 5.000                       | 3.62      |
|                   | 60.30            | 165.1            | 62.00           | 25.40                | 36.60          | 84.10        | 91.90         |                 | 19.10              | 127.0                       |           |
| 2 1/2             | 2.875            | 7.500            | 2.940           | 1.120                | 1.620          | 3.940        | 4.120         | 8               | 0.880              | 5.880                       | 5.28      |
|                   | 73.00            | 190.5            | 74.70           | 28.40                | 41.10          | 100.1        | 104.6         |                 | 22.40              | 149.4                       |           |
| 3                 | 3.500            | 8.250            | 3.570           | 1.250                | 1.810          | 4.620        | 5.000         | 8               | 0.880              | 6.620                       | 7.00      |
|                   | 88.90            | 209.6            | 90.70           | 31.75                | 46.00          | 117.3        | 127.0         |                 | 22.40              | 168.1                       |           |
| 3 1/2             | 4.000            | 9.000            | 4.070           | 1.380                | 1.940          | 5.250        | 5.500         | 8               | 1.000              | 7.250                       | 8.84      |
|                   | 101.6            | 228.6            | 103.4           | 35.10                | 49.30          | 133.4        | 139.7         |                 | 25.40              | 184.2                       |           |
| 4                 | 4.500            | 10.75            | 4.570           | 1.500                | 2.120          | 6.000        | 6.190         | 8               | 1.000              | 8.500                       | 14.5      |
|                   | 114.3            | 273.1            | 116.1           | 38.10                | 53.80          | 152.4        | 157.2         |                 | 25.40              | 215.9                       |           |
| 5                 | 5.563            | 13.00            | 5.660           | 1.750                | 2.380          | 7.440        | 7.310         | 8               | 1.120              | 10.50                       | 24.4      |
|                   | 141.3            | 330.2            | 143.8           | 44.50                | 60.45          | 189.0        | 185.7         |                 | 28.40              | 266.7                       |           |
| 6                 | 6.625            | 14.00            | 6.720           | 1.880                | 2.620          | 8.750        | 8.500         | 12              | 1.120              | 11.50                       | 28.7      |
|                   | 168.3            | 355.6            | 170.7           | 47.80                | 66.55          | 222.3        | 215.9         |                 | 28.40              | 292.1                       |           |
| 8                 | 8.625            | 16.50            | 8.720           | 2.190                | 3.000          | 10.75        | 10.62         | 12              | 1.250              | 13.75                       | 43.4      |
|                   | 219.1            | 419.1            | 221.5           | 55.60                | 76.20          | 273.1        | 269.7         |                 | 31.75              | 349.3                       |           |
| 10                | 10.75            | 20.00            | 10.88           | 2.500                | 3.380          | 13.50        | 12.75         | 16              | 1.380              | 17.00                       | 70.3      |
|                   | 273.0            | 508.0            | 276.3           | 63.50                | 85.90          | 342.9        | 323.9         |                 | 35.10              | 431.8                       |           |
| 12                | 12.75            | 22.00            | 12.88           | 2.620                | 3.620          | 15.75        | 15.00         | 20              | 1.380              | 19.25                       | 84.2      |
|                   | 323.8            | 558.8            | 327.1           | 66.55                | 91.90          | 400.1        | 381.0         |                 | 35.10              | 489.0                       |           |
| 14                | 14.00            | 23.75            | 14.14           | 2.750                | 3.690          | 17.00        | 16.25         | 20              | 1.500              | 20.75                       | 98.7      |
|                   | 355.6            | 603.3            | 359.1           | 69.85                | 93.70          | 431.8        | 412.8         |                 | 38.10              | 527.1                       |           |
| 16                | 16.00            | 27.00            | 16.16           | 3.000                | 4.190          | 19.50        | 18.50         | 20              | 1.620              | 23.75                       | 142       |
|                   | 406.4            | 685.8            | 410.5           | 76.20                | 106.4          | 495.3        | 469.9         |                 | 41.10              | 603.3                       |           |
| 18                | 18.00            | 29.25            | 18.18           | 3.250                | 4.620          | 21.50        | 21.00         | 20              | 1.750              | 25.75                       | 173       |
|                   | 457.2            | 743.0            | 461.8           | 82.60                | 117.3          | 546.1        | 533.4         |                 | 44.50              | 654.1                       |           |
| 20                | 20.00            | 32.00            | 20.20           | 3.500                | 5.000          | 24.00        | 23.00         | 24              | 1.750              | 28.50                       | 220       |
|                   | 508.0            | 812.8            | 513.1           | 88.90                | 127.0          | 609.6        | 584.2         |                 | 44.50              | 723.9                       |           |
| 24                | 24.00            | 37.00            | 24.25           | 4.000                | 5.500          | 28.25        | 27.25         | 24              | 2.000              | 33.00                       | 312       |
|                   | 609.6            | 939.8            | 616.0           | 101.6                | 139.7          | 717.6        | 692.2         |                 | 50.80              | 838.2                       |           |

Notes

- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-6.
- For tolerances see page 8-4.

# Slip On Flanges - ANSI B16.5



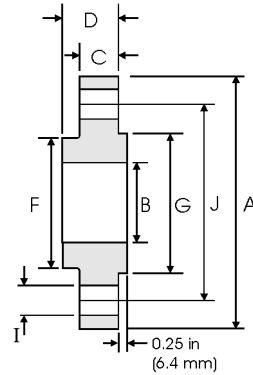
## Class 900 lb

| Pipe              |                  | Flange Data      |                 |                      |                | Hub            | Raised Face    | Drilling Data   |                    |                             | Weight    |
|-------------------|------------------|------------------|-----------------|----------------------|----------------|----------------|----------------|-----------------|--------------------|-----------------------------|-----------|
| Nominal Pipe Size |                  | <b>A</b>         | <b>B</b>        | <b>C</b>             | <b>D</b>       | <b>F</b>       | <b>G</b>       | <b>H</b>        | <b>I</b>           | <b>J</b>                    |           |
|                   | Outside Diameter | Overall Diameter | Inside Diameter | Flange Thickness min | Overall Length | Hub Diameter   | Face Diameter  | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm           | in mm                | in mm          | in mm          | in mm          |                 | in mm              | in mm                       |           |
| 1/2               | 0.840<br>21.30   | 4.750<br>120.6   | 0.880<br>22.40  | 0.880<br>22.40       | 1.250<br>31.70 | 1.500<br>38.10 | 1.380<br>35.10 | 4               | 0.880<br>22.40     | 3.250<br>82.50              | 1.74      |
| 3/4               | 1.050<br>26.70   | 5.120<br>130.0   | 1.090<br>27.70  | 1.000<br>25.40       | 1.380<br>35.00 | 1.750<br>44.40 | 1.690<br>42.90 | 4               | 0.880<br>22.40     | 3.500<br>88.90              | 2.34      |
| 1                 | 1.315<br>33.40   | 5.880<br>149.3   | 1.360<br>34.50  | 1.120<br>28.40       | 1.620<br>41.10 | 2.060<br>52.30 | 2.000<br>50.80 | 4               | 1.000<br>25.40     | 4.000<br>101.6              | 3.44      |
| 1 1/4             | 1.660<br>42.20   | 6.250<br>158.7   | 1.700<br>43.20  | 1.120<br>28.40       | 1.620<br>41.10 | 2.500<br>63.50 | 2.500<br>63.50 | 4               | 1.000<br>25.40     | 4.380<br>111.2              | 3.91      |
| 1 1/2             | 1.900<br>48.30   | 7.000<br>177.8   | 1.950<br>49.50  | 1.250<br>31.70       | 1.750<br>44.50 | 2.750<br>69.85 | 2.880<br>73.15 | 4               | 1.120<br>28.40     | 4.880<br>123.9              | 5.36      |
| 2                 | 2.375<br>60.30   | 8.500<br>215.9   | 2.440<br>62.00  | 1.500<br>38.10       | 2.250<br>57.15 | 4.120<br>104.6 | 3.620<br>91.90 | 8               | 1.000<br>25.40     | 6.500<br>165.1              | 9.85      |
| 2 1/2             | 2.875<br>73.00   | 9.620<br>244.3   | 2.940<br>74.70  | 1.620<br>41.10       | 2.500<br>63.50 | 4.880<br>123.9 | 4.120<br>104.6 | 8               | 1.120<br>28.40     | 7.500<br>190.5              | 13.7      |
| 3                 | 3.500<br>88.90   | 9.500<br>241.3   | 3.570<br>90.70  | 1.500<br>38.10       | 2.120<br>53.80 | 5.000<br>127.0 | 5.000<br>127.0 | 8               | 1.000<br>25.40     | 7.500<br>190.5              | 11.6      |
| 4                 | 4.500<br>114.3   | 11.50<br>292.1   | 4.570<br>116.1  | 1.750<br>44.40       | 2.750<br>69.85 | 6.250<br>158.7 | 6.190<br>157.2 | 8               | 1.250<br>31.70     | 9.250<br>234.9              | 19.7      |
| 5                 | 5.563<br>141.3   | 13.75<br>349.2   | 5.660<br>143.8  | 2.000<br>50.80       | 3.120<br>79.25 | 7.500<br>190.5 | 7.310<br>185.7 | 8               | 1.380<br>35.00     | 11.00<br>279.4              | 31.9      |
| 6                 | 6.625<br>168.3   | 15.00<br>381.0   | 6.720<br>170.7  | 2.190<br>55.60       | 3.380<br>85.80 | 9.250<br>234.9 | 8.500<br>215.9 | 12              | 1.250<br>31.70     | 12.50<br>317.5              | 41.1      |
| 8                 | 8.625<br>219.1   | 18.50<br>469.9   | 8.720<br>221.5  | 2.500<br>63.50       | 4.000<br>101.6 | 11.75<br>298.4 | 10.62<br>269.7 | 12              | 1.500<br>38.10     | 15.50<br>393.7              | 70.7      |
| 10                | 10.75<br>273.0   | 21.50<br>546.1   | 10.88<br>276.3  | 2.750<br>69.85       | 4.250<br>107.9 | 14.50<br>368.3 | 12.75<br>323.9 | 16              | 1.500<br>38.10     | 18.50<br>469.9              | 101       |
| 12                | 12.75<br>323.8   | 24.00<br>609.6   | 12.88<br>327.1  | 3.120<br>79.25       | 4.620<br>117.3 | 16.50<br>419.1 | 15.00<br>381.0 | 20              | 1.500<br>38.10     | 21.00<br>533.4              | 133       |
| 14                | 14.00<br>355.6   | 25.25<br>641.3   | 14.14<br>359.1  | 3.380<br>85.80       | 5.120<br>130.0 | 17.75<br>450.8 | 16.25<br>412.8 | 20              | 1.620<br>41.10     | 22.00<br>558.8              | 153       |
| 16                | 16.00<br>406.4   | 27.75<br>704.8   | 16.16<br>410.5  | 3.500<br>88.90       | 5.250<br>133.3 | 20.00<br>508.0 | 18.50<br>469.9 | 20              | 1.750<br>44.40     | 24.25<br>615.9              | 185       |
| 18                | 18.00<br>457.2   | 31.00<br>787.4   | 18.18<br>461.8  | 4.000<br>101.6       | 6.000<br>152.4 | 22.25<br>565.1 | 21.00<br>533.4 | 20              | 2.000<br>50.80     | 27.00<br>685.8              | 258       |
| 20                | 20.00<br>508.0   | 33.75<br>857.2   | 20.20<br>513.1  | 4.250<br>107.9       | 6.250<br>158.7 | 24.50<br>622.3 | 23.00<br>584.2 | 20              | 2.120<br>53.80     | 29.50<br>749.3              | 317       |
| 24                | 24.00<br>609.6   | 41.00<br>1041.4  | 24.25<br>616.0  | 5.500<br>139.7       | 8.000<br>203.2 | 29.50<br>749.3 | 27.25<br>692.2 | 20              | 2.620<br>66.55     | 35.50<br>901.7              | 606       |



Notes

- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-6.
- For tolerances see page 8-4.

## Slip On Flanges - ANSI B16.5



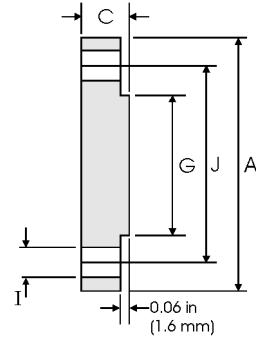
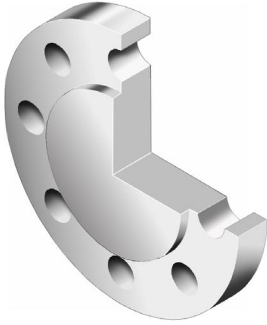
### Class 1500 lb

| Pipe              |   | Flange Data      |                 |                      |                | Hub          | Raised Face   | Drilling Data   |                    |                             | Weight  |
|-------------------|---|------------------|-----------------|----------------------|----------------|--------------|---------------|-----------------|--------------------|-----------------------------|---|
| Nominal Pipe Size |  | <b>A</b>         | <b>B</b>        | <b>C</b>             | <b>D</b>       | <b>F</b>     | <b>G</b>      | <b>H</b>        | <b>I</b>           | <b>J</b>                    |  |
|                   | Outside Diameter  | Overall Diameter | Inside Diameter | Flange Thickness min | Overall Length | Hub Diameter | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece   |
|                   | in mm   | in mm            | in mm           | in mm                | in mm          | in mm        | in mm         |                 | in mm              | in mm                       |   |
| 1/2               | 0.840   | 4.750            | 0.880           | 0.880                | 1.250          | 1.500        | 1.380         | 4               | 0.880              | 3.250                       | 1.74  |
|                   | 21.30   | 120.6            | 22.40           | 22.40                | 31.70          | 38.10        | 35.10         |                 | 22.40              | 82.50                       |   |
| 3/4               | 1.050   | 5.120            | 1.090           | 1.000                | 1.380          | 1.750        | 1.690         | 4               | 0.880              | 3.500                       | 2.34  |
|                   | 26.70   | 130.0            | 27.70           | 25.40                | 35.00          | 44.40        | 42.90         |                 | 22.40              | 88.90                       |   |
| 1                 | 1.315   | 5.880            | 1.360           | 1.120                | 1.620          | 2.060        | 2.000         | 4               | 1.000              | 4.000                       | 3.44  |
|                   | 33.40   | 149.3            | 34.50           | 28.40                | 41.10          | 52.30        | 50.80         |                 | 25.40              | 101.6                       |   |
| 1 1/4             | 1.660   | 6.250            | 1.700           | 1.120                | 1.620          | 2.500        | 2.500         | 4               | 1.000              | 4.380                       | 3.91  |
|                   | 42.20   | 158.7            | 43.20           | 28.40                | 41.10          | 63.50        | 63.50         |                 | 25.40              | 111.2                       |   |
| 1 1/2             | 1.900   | 7.000            | 1.950           | 1.250                | 1.750          | 2.750        | 2.880         | 4               | 1.120              | 4.880                       | 5.36  |
|                   | 48.30   | 177.8            | 49.50           | 31.70                | 44.50          | 69.85        | 73.15         |                 | 28.40              | 123.9                       |   |
| 2                 | 2.375   | 8.500            | 2.440           | 1.500                | 2.250          | 4.120        | 3.620         | 8               | 1.000              | 6.500                       | 9.85  |
|                   | 60.30   | 215.9            | 62.00           | 38.10                | 57.15          | 104.6        | 91.90         |                 | 25.40              | 165.1                       |   |
| 2 1/2             | 2.875   | 9.620            | 2.940           | 1.620                | 2.500          | 4.880        | 4.120         | 8               | 1.120              | 7.500                       | 13.7  |
|                   | 73.00   | 244.3            | 74.70           | 41.10                | 63.50          | 123.9        | 104.6         |                 | 28.40              | 190.5                       |   |



#### Notes

- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-6.
- For tolerances see page 8-4.

# Blind Flanges - ANSI B16.5



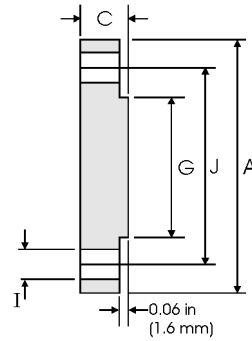
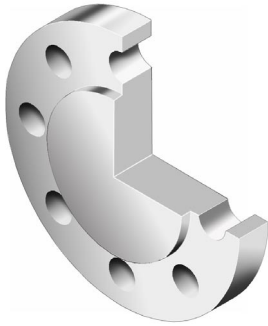
## Class 150 lb

| Pipe              |   | Flange Data      |                      |               | Raised Face     | Drilling Data      |                             |   | Weight |
|-------------------|---|------------------|----------------------|---------------|-----------------|--------------------|-----------------------------|---|--------|
| Nominal Pipe Size |  | <b>A</b>         | <b>C</b>             | <b>G</b>      | <b>H</b>        | <b>I</b>           | <b>J</b>                    |  |        |
|                   | Outside Diameter  | Overall Diameter | Flange Thickness min | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/piece  |        |
|                   | in mm   | in mm            | in mm                | in mm         |                 | in mm              | in mm                       |   |        |
| 1/2               | 0.840   | 3.500            | 0.440                | 1.380         | 4               | 0.620              | 2.380                       | 0.42  |        |
|                   | 21.30   | 88.90            | 11.20                | 35.10         |                 | 15.70              | 60.45                       |   |        |
| 3/4               | 1.050   | 3.880            | 0.500                | 1.690         | 4               | 0.620              | 2.750                       | 0.61  |        |
|                   | 26.70   | 98.60            | 12.70                | 42.90         |                 | 15.70              | 69.85                       |   |        |
| 1                 | 1.315   | 4.250            | 0.560                | 2.000         | 4               | 0.620              | 3.120                       | 0.86  |        |
|                   | 33.40   | 108.0            | 14.20                | 50.80         |                 | 15.70              | 79.25                       |   |        |
| 1 1/4             | 1.660   | 4.620            | 0.620                | 2.500         | 4               | 0.620              | 3.500                       | 1.17  |        |
|                   | 42.20   | 117.3            | 15.70                | 63.50         |                 | 15.70              | 88.90                       |   |        |
| 1 1/2             | 1.900   | 5.000            | 0.690                | 2.880         | 4               | 0.620              | 3.880                       | 1.53  |        |
|                   | 48.30   | 127.0            | 17.50                | 73.15         |                 | 15.70              | 98.60                       |   |        |
| 2                 | 2.375   | 6.000            | 0.750                | 3.620         | 4               | 0.750              | 4.750                       | 2.42  |        |
|                   | 60.30   | 152.4            | 19.10                | 91.90         |                 | 19.10              | 120.7                       |   |        |
| 2 1/2             | 2.875   | 7.000            | 0.880                | 4.120         | 4               | 0.750              | 5.500                       | 3.94  |        |
|                   | 73.00   | 177.8            | 22.40                | 104.6         |                 | 19.10              | 139.7                       |   |        |
| 3                 | 3.500   | 7.500            | 0.940                | 5.000         | 4               | 0.750              | 6.000                       | 4.93  |        |
|                   | 88.90   | 190.5            | 23.90                | 127.0         |                 | 19.10              | 152.4                       |   |        |
| 3 1/2             | 4.000   | 8.500            | 0.940                | 5.500         | 8               | 0.750              | 7.000                       | 6.17  |        |
|                   | 101.6   | 215.9            | 23.90                | 139.7         |                 | 19.10              | 177.8                       |   |        |
| 4                 | 4.500   | 9.000            | 0.940                | 6.190         | 8               | 0.750              | 7.500                       | 7.00  |        |
|                   | 114.3   | 228.6            | 23.90                | 157.2         |                 | 19.10              | 190.5                       |   |        |
| 5                 | 5.563   | 10.00            | 0.940                | 7.310         | 8               | 0.880              | 8.500                       | 8.63  |        |
|                   | 141.3   | 254.0            | 23.90                | 185.7         |                 | 22.40              | 215.9                       |   |        |
| 6                 | 6.625   | 11.00            | 1.000                | 8.500         | 8               | 0.880              | 9.500                       | 11.3  |        |
|                   | 168.3   | 279.4            | 25.40                | 215.9         |                 | 22.40              | 241.3                       |   |        |
| 8                 | 8.625   | 13.50            | 1.120                | 10.62         | 8               | 0.880              | 11.75                       | 19.6  |        |
|                   | 219.1   | 342.9            | 28.40                | 269.7         |                 | 22.40              | 298.5                       |   |        |
| 10                | 10.75   | 16.00            | 1.190                | 12.75         | 12              | 1.000              | 14.25                       | 28.8  |        |
|                   | 273.0   | 406.4            | 30.20                | 323.9         |                 | 25.40              | 362.0                       |   |        |
| 12                | 12.75   | 19.00            | 1.250                | 15.00         | 12              | 1.000              | 17.00                       | 43.2  |        |
|                   | 323.8   | 482.6            | 31.75                | 381.0         |                 | 25.40              | 431.8                       |   |        |
| 14                | 14.00   | 21.00            | 1.380                | 16.25         | 12              | 1.120              | 18.75                       | 58.1  |        |
|                   | 355.6   | 533.4            | 35.10                | 412.8         |                 | 28.40              | 476.3                       |   |        |
| 16                | 16.00   | 23.50            | 1.440                | 18.50         | 16              | 1.120              | 21.25                       | 76.0  |        |
|                   | 406.4   | 596.9            | 36.60                | 469.9         |                 | 28.40              | 539.8                       |   |        |
| 18                | 18.00   | 25.00            | 1.560                | 21.00         | 16              | 1.250              | 22.75                       | 93.7  |        |
|                   | 457.2   | 635.0            | 39.60                | 533.4         |                 | 31.75              | 577.9                       |   |        |
| 20                | 20.00   | 27.50            | 1.690                | 23.00         | 20              | 1.250              | 25.00                       | 122   |        |
|                   | 508.0   | 698.5            | 42.90                | 584.2         |                 | 31.75              | 635.0                       |   |        |
| 24                | 24.00   | 32.00            | 1.880                | 27.25         | 20              | 1.380              | 29.50                       | 185   |        |
|                   | 609.6   | 812.8            | 47.80                | 692.2         |                 | 35.10              | 749.3                       |   |        |



Notes

- Weights are based on manufacturer's data and are approximate.
- Flat face flanges may be provided at full thickness, C, or with raised face removed (the latter is nonstandard).
- For ring joint facings see page 8-6.
- For tolerances see page 8-4.

## Blind Flanges - ANSI B16.5



### Class 300 lb

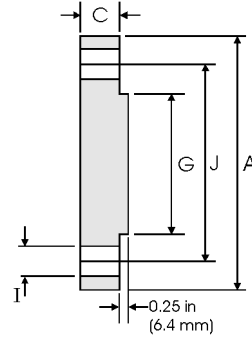
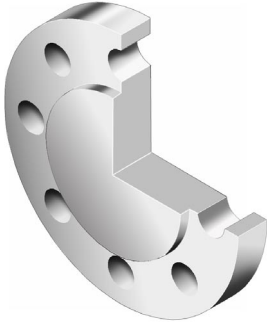
| Nominal Pipe Size | Pipe  | Flange Data      |                      | Raised Face   | Drilling Data   |                    | Weight                      |   |
|-------------------|---|------------------|----------------------|---------------|-----------------|--------------------|-----------------------------|---|
|                   |  | <b>A</b>         | <b>C</b>             | <b>G</b>      | <b>H</b>        | <b>I</b>           | <b>J</b>                    |  |
|                   | Outside Diameter  | Overall Diameter | Flange Thickness min | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/piece  |
| in<br>mm          | in<br>mm  | in<br>mm         | in<br>mm             | in<br>mm      |                 | in<br>mm           |                             |   |
| 1/2               | 0.840   | 3.750            | 0.560                | 1.380         | 4               | 0.620              | 2.620                       | 0.64  |
|                   | 21.30   | 95.20            | 14.20                | 35.10         |                 | 15.70              | 66.55                       |   |
| 3/4               | 1.050   | 4.620            | 0.620                | 1.690         | 4               | 0.750              | 3.250                       | 1.11  |
|                   | 26.70   | 117.3            | 15.70                | 42.90         |                 | 19.00              | 82.50                       |   |
| 1                 | 1.315   | 4.880            | 0.690                | 2.000         | 4               | 0.750              | 3.500                       | 1.39  |
|                   | 33.40   | 123.9            | 17.50                | 50.80         |                 | 19.00              | 88.90                       |   |
| 1 1/4             | 1.660   | 5.250            | 0.750                | 2.500         | 4               | 0.750              | 3.880                       | 1.79  |
|                   | 42.20   | 133.3            | 19.00                | 63.50         |                 | 19.00              | 98.50                       |   |
| 1 1/2             | 1.900   | 6.120            | 0.810                | 2.880         | 4               | 0.880              | 4.500                       | 2.66  |
|                   | 48.30   | 155.4            | 20.60                | 73.15         |                 | 22.3               | 114.3                       |   |
| 2                 | 2.375   | 6.500            | 0.880                | 3.620         | 8               | 0.750              | 5.000                       | 3.18  |
|                   | 60.30   | 165.1            | 22.30                | 91.90         |                 | 19.10              | 127.0                       |   |
| 2 1/2             | 2.875   | 7.500            | 1.000                | 4.120         | 8               | 0.880              | 5.880                       | 4.85  |
|                   | 73.00   | 190.5            | 25.40                | 104.6         |                 | 22.30              | 1.493                       |   |
| 3                 | 3.500   | 8.250            | 1.120                | 5.000         | 8               | 0.880              | 6.620                       | 6.81  |
|                   | 88.90   | 209.5            | 28.40                | 127.0         |                 | 22.30              | 168.1                       |   |
| 3 1/2             | 4.000   | 9.000            | 1.190                | 5.500         | 8               | 0.880              | 7.250                       | 8.71  |
|                   | 101.6   | 228.6            | 30.20                | 139.7         |                 | 22.30              | 184.1                       |   |
| 4                 | 4.500   | 10.00            | 1.250                | 6.190         | 8               | 0.880              | 7.800                       | 11.5  |
|                   | 114.3   | 254.0            | 31.70                | 157.2         |                 | 22.30              | 200.1                       |   |
| 5                 | 5.563   | 11.00            | 1.380                | 7.310         | 8               | 0.880              | 9.250                       | 15.6  |
|                   | 141.3   | 279.4            | 35.00                | 185.7         |                 | 22.30              | 234.9                       |   |
| 6                 | 6.625   | 12.50            | 1.440                | 8.500         | 12              | 0.880              | 10.62                       | 20.9  |
|                   | 168.3   | 317.5            | 36.50                | 215.9         |                 | 22.30              | 269.7                       |   |
| 8                 | 8.625   | 15.00            | 1.620                | 10.62         | 12              | 1.000              | 13.00                       | 34.3  |
|                   | 219.1   | 381.0            | 41.10                | 269.7         |                 | 25.40              | 330.2                       |   |
| 10                | 10.75   | 17.50            | 1.880                | 12.75         | 16              | 1.120              | 15.25                       | 53.3  |
|                   | 273.0   | 444.5            | 47.70                | 323.9         |                 | 28.40              | 387.3                       |   |
| 12                | 12.75   | 20.50            | 2.000                | 15.00         | 16              | 1.250              | 17.75                       | 78.8  |
|                   | 323.8   | 520.7            | 50.80                | 381.0         |                 | 31.70              | 450.8                       |   |
| 14                | 14.00   | 23.00            | 2.120                | 16.25         | 20              | 1.250              | 20.25                       | 105   |
|                   | 355.6   | 584.2            | 53.80                | 412.8         |                 | 31.70              | 514.3                       |   |
| 16                | 16.00   | 25.50            | 2.250                | 18.50         | 20              | 1.380              | 22.50                       | 137   |
|                   | 406.4   | 647.7            | 57.15                | 469.9         |                 | 35.00              | 571.5                       |   |
| 18                | 18.00   | 28.00            | 2.380                | 21.00         | 24              | 1.380              | 24.75                       | 175   |
|                   | 457.2   | 711.2            | 60.45                | 533.4         |                 | 35.00              | 628.6                       |   |
| 20                | 20.00   | 30.50            | 2.500                | 23.00         | 24              | 1.380              | 27.00                       | 221   |
|                   | 508.0   | 774.7            | 63.50                | 584.2         |                 | 35.00              | 685.8                       |   |
| 24                | 24.00   | 36.00            | 2.750                | 27.25         | 24              | 1.620              | 32.00                       | 339   |
|                   | 609.6   | 914.4            | 69.85                | 692.2         |                 | 41.10              | 812.8                       |   |

#### Notes



- Weights are based on manufacturer's data and are approximate.
- Flat face flanges may be provided at full thickness, C, or with raised face removed (the latter is nonstandard).
- For ring joint facings see page 8-6.
- For tolerances see page 8-4.



# Blind Flanges - ANSI B16.5



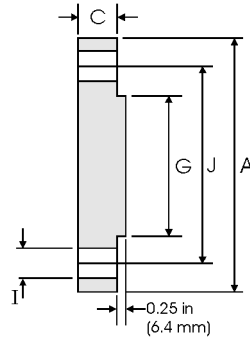
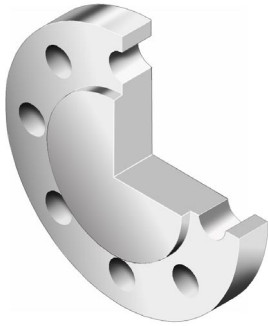
## Class 400 lb

| Pipe              |   | Flange Data      |                      |               | Raised Face     | Drilling Data      |                             |   | Weight |
|-------------------|---|------------------|----------------------|---------------|-----------------|--------------------|-----------------------------|---|--------|
| Nominal Pipe Size |  | <b>A</b>         | <b>C</b>             | <b>G</b>      | <b>H</b>        | <b>I</b>           | <b>J</b>                    |  |        |
|                   | Outside Diameter  | Overall Diameter | Flange Thickness min | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/piece  |        |
|                   | in mm   | in mm            | in mm                | in mm         |                 | in mm              | in mm                       |   |        |
| 1/2               | 0.840   | 3.750            | 0.560                | 1.380         | 4               | 0.620              | 2.620                       | 0.76  |        |
|                   | 21.30   | 95.20            | 14.20                | 35.10         |                 | 15.70              | 66.55                       |   |        |
| 3/4               | 1.050   | 4.620            | 0.620                | 1.690         | 4               | 0.750              | 3.250                       | 1.28  |        |
|                   | 26.70   | 117.3            | 15.70                | 42.90         |                 | 19.10              | 82.60                       |   |        |
| 1                 | 1.315   | 4.880            | 0.690                | 2.000         | 4               | 0.750              | 3.500                       | 1.60  |        |
|                   | 33.40   | 123.9            | 17.50                | 50.80         |                 | 19.10              | 88.90                       |   |        |
| 1 1/4             | 1.660   | 5.250            | 0.810                | 2.500         | 4               | 0.750              | 3.880                       | 2.23  |        |
|                   | 42.20   | 133.3            | 20.60                | 63.50         |                 | 19.10              | 98.60                       |   |        |
| 1 1/2             | 1.900   | 6.120            | 0.880                | 2.880         | 4               | 0.880              | 4.500                       | 3.25  |        |
|                   | 48.30   | 155.4            | 22.30                | 73.15         |                 | 22.40              | 114.3                       |   |        |
| 2                 | 2.375   | 6.500            | 1.000                | 3.620         | 8               | 0.750              | 5.000                       | 4.15  |        |
|                   | 60.30   | 165.1            | 25.40                | 91.90         |                 | 19.10              | 127.0                       |   |        |
| 2 1/2             | 2.875   | 7.500            | 1.120                | 4.120         | 8               | 0.880              | 5.880                       | 6.13  |        |
|                   | 73.00   | 190.5            | 28.40                | 104.6         |                 | 22.40              | 149.4                       |   |        |
| 3                 | 3.500   | 8.250            | 1.250                | 5.000         | 8               | 0.880              | 6.620                       | 8.44  |        |
|                   | 88.90   | 209.5            | 31.70                | 127.0         |                 | 22.40              | 168.1                       |   |        |
| 3 1/2             | 4.000   | 9.000            | 1.380                | 5.500         | 8               | 1.000              | 7.250                       | 11.0  |        |
|                   | 101.6   | 228.6            | 35.00                | 139.7         |                 | 25.40              | 184.2                       |   |        |
| 4                 | 4.500   | 10.00            | 1.380                | 6.190         | 8               | 1.000              | 7.880                       | 13.7  |        |
|                   | 114.3   | 254.0            | 35.10                | 157.2         |                 | 25.40              | 200.2                       |   |        |
| 5                 | 5.563   | 11.00            | 1.500                | 7.310         | 8               | 1.000              | 9.250                       | 18.5  |        |
|                   | 141.3   | 279.4            | 38.10                | 185.7         |                 | 25.40              | 235.0                       |   |        |
| 6                 | 6.625   | 12.50            | 1.620                | 8.500         | 12              | 1.000              | 10.62                       | 25.5  |        |
|                   | 168.3   | 317.5            | 41.10                | 215.9         |                 | 25.40              | 269.7                       |   |        |
| 8                 | 8.625   | 15.00            | 1.880                | 10.62         | 12              | 1.120              | 13.00                       | 42.6  |        |
|                   | 219.1   | 381.0            | 47.80                | 269.7         |                 | 28.40              | 330.2                       |   |        |
| 10                | 10.75   | 17.50            | 2.120                | 12.75         | 16              | 1.250              | 15.25                       | 64.5  |        |
|                   | 273.0   | 444.5            | 53.80                | 323.9         |                 | 31.75              | 387.4                       |   |        |
| 12                | 12.75   | 20.50            | 2.250                | 15.00         | 16              | 1.380              | 17.75                       | 94.30   |        |
|                   | 323.8   | 520.7            | 57.15                | 381.0         |                 | 35.10              | 450.9                       |   |        |
| 14                | 14.00   | 23.00            | 2.380                | 16.25         | 20              | 1.380              | 20.25                       | 124   |        |
|                   | 355.6   | 584.2            | 60.45                | 412.8         |                 | 35.10              | 514.4                       |   |        |
| 16                | 16.00   | 25.50            | 2.500                | 18.50         | 20              | 1.500              | 22.50                       | 162   |        |
|                   | 406.4   | 647.7            | 63.50                | 469.9         |                 | 38.10              | 571.5                       |   |        |
| 18                | 18.00   | 28.00            | 2.620                | 21.00         | 24              | 1.500              | 24.75                       | 205   |        |
|                   | 457.2   | 711.2            | 66.55                | 533.4         |                 | 38.10              | 628.7                       |   |        |
| 20                | 20.00   | 30.50            | 2.750                | 23.00         | 24              | 1.620              | 27.00                       | 254   |        |
|                   | 508.0   | 774.7            | 69.85                | 584.2         |                 | 41.10              | 685.8                       |   |        |
| 24                | 24.00   | 36.00            | 3.000                | 27.25         | 24              | 1.880              | 32.00                       | 386   |        |
|                   | 609.6   | 914.4            | 76.20                | 692.2         |                 | 47.80              | 812.8                       |   |        |

Notes

- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-6.
- For tolerances see page 8-4.

# Blind Flanges - ANSI B16.5



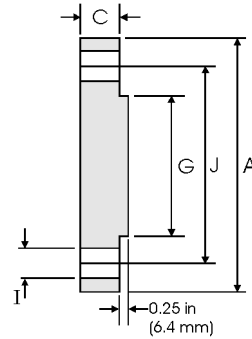
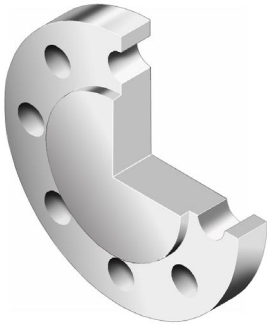
## Class 600 lb

| Nominal Pipe Size | Pipe             | Flange Data      |                      |               | Raised Face     | Drilling Data      |                             | Weight   |
|-------------------|------------------|------------------|----------------------|---------------|-----------------|--------------------|-----------------------------|----------|
|                   |                  | <b>A</b>         | <b>C</b>             | <b>G</b>      | <b>H</b>        | <b>I</b>           | <b>J</b>                    |          |
|                   | Outside Diameter | Overall Diameter | Flange Thickness min | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/piece |
| in<br>mm          | in<br>mm         | in<br>mm         | in<br>mm             | in<br>mm      |                 | in<br>mm           |                             |          |
| 1/2               | 0.840            | 3.750            | 0.560                | 1.380         | 4               | 0.620              | 2.620                       | 0.76     |
|                   | 21.30            | 95.20            | 14.20                | 35.10         |                 | 15.70              | 66.55                       |          |
| 3/4               | 1.050            | 4.620            | 0.620                | 1.690         | 4               | 0.750              | 3.250                       | 1.28     |
|                   | 26.70            | 117.3            | 15.70                | 42.90         |                 | 19.10              | 82.60                       |          |
| 1                 | 1.315            | 4.880            | 0.690                | 2.000         | 4               | 0.750              | 3.500                       | 1.60     |
|                   | 33.40            | 123.9            | 17.50                | 50.80         |                 | 19.10              | 88.90                       |          |
| 1 1/4             | 1.660            | 5.250            | 0.810                | 2.500         | 4               | 0.750              | 3.880                       | 2.23     |
|                   | 42.20            | 133.3            | 20.60                | 63.50         |                 | 19.10              | 98.60                       |          |
| 1 1/2             | 1.900            | 6.120            | 0.880                | 2.880         | 4               | 0.880              | 4.500                       | 3.25     |
|                   | 48.30            | 155.4            | 22.30                | 73.15         |                 | 22.40              | 114.3                       |          |
| 2                 | 2.375            | 6.500            | 1.000                | 3.620         | 8               | 0.750              | 5.000                       | 4.15     |
|                   | 60.30            | 165.1            | 25.40                | 91.90         |                 | 19.10              | 127.0                       |          |
| 2 1/2             | 2.875            | 7.500            | 1.120                | 4.120         | 8               | 0.880              | 5.880                       | 6.13     |
|                   | 73.00            | 190.5            | 28.40                | 104.6         |                 | 22.40              | 149.4                       |          |
| 3                 | 3.500            | 8.250            | 1.250                | 5.000         | 8               | 0.880              | 6.620                       | 8.44     |
|                   | 88.90            | 209.5            | 31.70                | 127.0         |                 | 22.40              | 168.1                       |          |
| 3 1/2             | 4.000            | 9.000            | 1.380                | 5.500         | 8               | 1.000              | 7.250                       | 11.0     |
|                   | 101.6            | 228.6            | 35.00                | 139.7         |                 | 25.40              | 184.2                       |          |
| 4                 | 4.500            | 10.75            | 1.500                | 6.190         | 8               | 1.000              | 8.500                       | 17.3     |
|                   | 114.3            | 273.1            | 38.10                | 157.2         |                 | 25.40              | 215.9                       |          |
| 5                 | 5.563            | 13.00            | 1.750                | 7.310         | 8               | 1.120              | 10.50                       | 29.4     |
|                   | 141.3            | 330.2            | 44.50                | 185.7         |                 | 28.40              | 266.7                       |          |
| 6                 | 6.625            | 14.00            | 1.880                | 8.500         | 12              | 1.120              | 11.50                       | 36.1     |
|                   | 168.3            | 355.6            | 47.80                | 215.9         |                 | 28.40              | 292.1                       |          |
| 8                 | 8.625            | 16.50            | 2.190                | 10.62         | 12              | 1.250              | 13.75                       | 58.9     |
|                   | 219.1            | 419.1            | 55.60                | 269.7         |                 | 31.75              | 349.3                       |          |
| 10                | 10.75            | 20.00            | 2.500                | 12.75         | 16              | 1.380              | 17.00                       | 97.5     |
|                   | 273.0            | 508.0            | 63.50                | 323.9         |                 | 35.10              | 431.8                       |          |
| 12                | 12.75            | 22.00            | 2.620                | 15.00         | 20              | 1.380              | 19.25                       | 124      |
|                   | 323.8            | 558.8            | 66.55                | 381.0         |                 | 35.10              | 489.0                       |          |
| 14                | 14.00            | 23.75            | 2.750                | 16.25         | 20              | 1.500              | 20.75                       | 151      |
|                   | 355.6            | 603.3            | 69.85                | 412.8         |                 | 38.10              | 527.1                       |          |
| 16                | 16.00            | 27.00            | 3.000                | 18.50         | 20              | 1.620              | 23.75                       | 214      |
|                   | 406.4            | 685.8            | 76.20                | 469.9         |                 | 41.10              | 603.3                       |          |
| 18                | 18.00            | 29.25            | 3.250                | 21.00         | 20              | 1.750              | 25.75                       | 272      |
|                   | 457.2            | 743.0            | 82.60                | 533.4         |                 | 44.50              | 654.1                       |          |
| 20                | 20.00            | 32.00            | 3.500                | 23.00         | 24              | 1.750              | 28.50                       | 349      |
|                   | 508.0            | 812.8            | 88.90                | 584.2         |                 | 44.50              | 723.9                       |          |
| 24                | 24.00            | 37.00            | 4.000                | 27.25         | 24              | 2.000              | 33.00                       | 533      |
|                   | 609.6            | 939.8            | 101.6                | 692.2         |                 | 50.80              | 838.2                       |          |

Notes

- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-6.
- For tolerances see page 8-4.

# Blind Flanges - ANSI B16.5



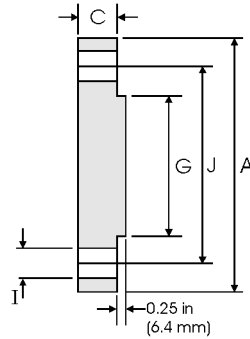
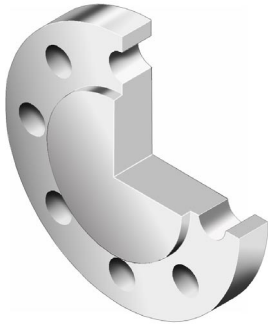
## Class 900 lb

| Pipe              |                  | Flange Data      |                      |               | Raised Face     | Drilling Data      |                             |          | Weight |
|-------------------|------------------|------------------|----------------------|---------------|-----------------|--------------------|-----------------------------|----------|--------|
| Nominal Pipe Size |                  | <b>A</b>         | <b>C</b>             | <b>G</b>      | <b>H</b>        | <b>I</b>           | <b>J</b>                    |          |        |
|                   | Outside Diameter | Overall Diameter | Flange Thickness min | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/piece |        |
|                   | in mm            | in mm            | in mm                | in mm         |                 | in mm              | in mm                       |          |        |
| 1/2               | 0.840            | 4.750            | 0.880                | 1.380         | 4               | 0.880              | 3.250                       | 1.77     |        |
|                   | 21.30            | 120.6            | 22.30                | 35.10         |                 | 22.30              | 82.50                       |          |        |
| 3/4               | 1.050            | 5.120            | 1.000                | 1.690         | 4               | 0.880              | 3.500                       | 2.42     |        |
|                   | 26.70            | 130.0            | 25.40                | 42.90         |                 | 22.30              | 88.90                       |          |        |
| 1                 | 1.315            | 5.880            | 1.120                | 2.000         | 4               | 1.000              | 4.000                       | 3.57     |        |
|                   | 33.40            | 149.3            | 28.40                | 50.80         |                 | 25.40              | 101.6                       |          |        |
| 1 1/4             | 1.660            | 6.250            | 1.120                | 2.500         | 4               | 1.000              | 4.380                       | 4.15     |        |
|                   | 42.20            | 158.7            | 28.40                | 63.50         |                 | 25.40              | 111.2                       |          |        |
| 1 1/2             | 1.900            | 7.000            | 1.250                | 2.880         | 4               | 1.120              | 4.880                       | 5.75     |        |
|                   | 48.30            | 177.8            | 31.70                | 73.15         |                 | 28.40              | 123.9                       |          |        |
| 2                 | 2.375            | 8.500            | 1.500                | 3.620         | 8               | 1.000              | 6.500                       | 10.1     |        |
|                   | 60.30            | 215.9            | 38.10                | 91.90         |                 | 25.40              | 165.1                       |          |        |
| 2 1/2             | 2.875            | 9.620            | 1.620                | 4.120         | 8               | 1.120              | 7.500                       | 14.0     |        |
|                   | 73.00            | 244.3            | 41.10                | 104.6         |                 | 28.40              | 190.5                       |          |        |
| 3                 | 3.500            | 9.500            | 1.500                | 5.000         | 8               | 1.000              | 7.500                       | 13.1     |        |
|                   | 88.90            | 241.3            | 38.10                | 127.0         |                 | 25.40              | 190.5                       |          |        |
| 4                 | 4.500            | 11.50            | 1.750                | 6.190         | 8               | 1.250              | 9.250                       | 26.9     |        |
|                   | 114.3            | 292.1            | 44.50                | 157.2         |                 | 31.70              | 234.9                       |          |        |
| 5                 | 5.563            | 13.75            | 2.000                | 7.310         | 8               | 1.380              | 11.00                       | 36.5     |        |
|                   | 141.3            | 349.2            | 50.80                | 185.7         |                 | 35.00              | 279.4                       |          |        |
| 6                 | 6.625            | 15.00            | 2.190                | 8.500         | 12              | 1.250              | 12.50                       | 47.40    |        |
|                   | 168.3            | 381.0            | 55.60                | 215.9         |                 | 31.70              | 317.0                       |          |        |
| 8                 | 8.625            | 18.50            | 2.500                | 10.62         | 12              | 1.500              | 15.50                       | 82.5     |        |
|                   | 219.1            | 469.9            | 63.50                | 269.7         |                 | 38.10              | 393.7                       |          |        |
| 10                | 10.75            | 21.50            | 2.750                | 12.75         | 16              | 1.500              | 18.50                       | 122      |        |
|                   | 273.0            | 546.1            | 69.85                | 323.9         |                 | 38.10              | 469.9                       |          |        |
| 12                | 12.75            | 24.00            | 3.120                | 15.00         | 20              | 1.500              | 21.00                       | 173      |        |
|                   | 323.8            | 609.6            | 79.25                | 381.0         |                 | 38.10              | 533.4                       |          |        |
| 14                | 14.00            | 25.25            | 3.380                | 16.25         | 20              | 1.620              | 22.00                       | 206      |        |
|                   | 355.6            | 641.3            | 85.80                | 412.8         |                 | 41.10              | 558.8                       |          |        |
| 16                | 16.00            | 27.75            | 3.500                | 18.50         | 20              | 1.750              | 24.25                       | 259      |        |
|                   | 406.4            | 704.8            | 88.90                | 469.9         |                 | 44.40              | 615.9                       |          |        |
| 18                | 18.00            | 31.00            | 4.000                | 21.00         | 20              | 2.000              | 27.00                       | 367      |        |
|                   | 457.2            | 787.4            | 101.6                | 533.4         |                 | 50.80              | 685.8                       |          |        |
| 20                | 20.00            | 33.75            | 4.250                | 23.00         | 20              | 2.120              | 29.50                       | 463      |        |
|                   | 508.0            | 857.2            | 107.9                | 584.2         |                 | 53.80              | 749.3                       |          |        |
| 24                | 24.00            | 41.00            | 5.500                | 27.25         | 20              | 2.620              | 35.50                       | 876      |        |
|                   | 609.6            | 1041.4           | 139.7                | 692.2         |                 | 66.55              | 901.7                       |          |        |



Notes

- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-6.
- For tolerances see page 8-4.

# Blind Flanges - ANSI B16.5



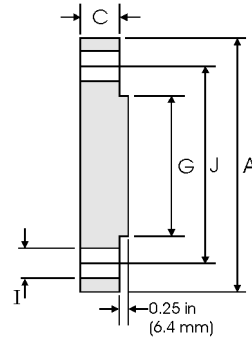
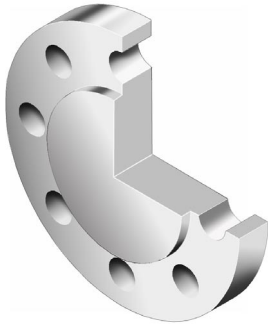
## Class 1500 lb

| Nominal Pipe Size | Pipe  | Flange Data      |                      |               | Raised Face     | Drilling Data      |                             | Weight  |
|-------------------|---|------------------|----------------------|---------------|-----------------|--------------------|-----------------------------|---|
|                   |  | <b>A</b>         | <b>C</b>             | <b>G</b>      | <b>H</b>        | <b>I</b>           | <b>J</b>                    |  |
|                   | Outside Diameter  | Overall Diameter | Flange Thickness min | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/piece  |
| in<br>mm          | in<br>mm  | in<br>mm         | in<br>mm             | in<br>mm      |                 | in<br>mm           |                             |   |
| 1/2               | 0.840   | 4.750            | 0.880                | 1.380         | 4               | 0.880              | 3.250                       | 1.77  |
|                   | 21.30   | 120.6            | 22.30                | 35.10         |                 | 22.30              | 82.50                       |   |
| 3/4               | 1.050   | 5.120            | 1.000                | 1.690         | 4               | 0.880              | 3.500                       | 2.42  |
|                   | 26.70   | 130.0            | 25.40                | 42.90         |                 | 22.30              | 88.90                       |   |
| 1                 | 1.315   | 5.880            | 1.120                | 2.000         | 4               | 1.000              | 4.000                       | 3.57  |
|                   | 33.40   | 149.3            | 28.40                | 50.80         |                 | 25.40              | 101.6                       |   |
| 1 1/4             | 1.660   | 6.250            | 1.120                | 2.500         | 4               | 1.000              | 4.380                       | 4.15  |
|                   | 42.20   | 158.7            | 28.40                | 63.50         |                 | 25.40              | 111.2                       |   |
| 1 1/2             | 1.900   | 7.000            | 1.250                | 2.880         | 4               | 1.120              | 4.880                       | 5.75  |
|                   | 48.30   | 177.8            | 31.70                | 73.15         |                 | 28.40              | 123.9                       |   |
| 2                 | 2.375   | 8.500            | 1.500                | 3.620         | 8               | 1.000              | 6.500                       | 10.1  |
|                   | 60.30   | 215.9            | 38.10                | 91.90         |                 | 25.40              | 165.1                       |   |
| 2 1/2             | 2.875   | 9.620            | 1.620                | 4.120         | 8               | 1.120              | 7.500                       | 14.0  |
|                   | 73.00   | 244.3            | 41.10                | 104.6         |                 | 28.40              | 190.5                       |   |
| 3                 | 3.500   | 10.50            | 1.880                | 5.000         | 8               | 1.250              | 8.000                       | 19.1  |
|                   | 88.90   | 266.7            | 47.70                | 127.0         |                 | 31.70              | 203.2                       |   |
| 4                 | 4.500   | 12.25            | 2.120                | 6.190         | 8               | 1.380              | 9.500                       | 29.9  |
|                   | 114.3   | 311.1            | 53.80                | 157.2         |                 | 35.00              | 241.3                       |   |
| 5                 | 5.563   | 14.75            | 2.880                | 7.310         | 8               | 1.620              | 11.50                       | 58.4  |
|                   | 141.3   | 374.6            | 73.15                | 185.7         |                 | 41.10              | 292.1                       |   |
| 6                 | 6.625   | 15.50            | 3.250                | 8.500         | 12              | 1.500              | 12.50                       | 71.8  |
|                   | 168.3   | 393.7            | 82.50                | 215.9         |                 | 38.10              | 317.5                       |   |
| 8                 | 8.625   | 19.00            | 3.620                | 10.62         | 12              | 1.750              | 15.50                       | 122   |
|                   | 219.1   | 482.6            | 91.90                | 269.7         |                 | 44.40              | 393.7                       |   |
| 10                | 10.75   | 23.00            | 4.250                | 12.75         | 12              | 2.000              | 19.00                       | 210   |
|                   | 273.0   | 584.2            | 107.9                | 323.9         |                 | 50.80              | 482.6                       |   |
| 12                | 12.75   | 26.50            | 4.880                | 15.00         | 16              | 2.120              | 22.50                       | 316   |
|                   | 323.8   | 673.1            | 123.9                | 381.0         |                 | 53.8               | 571.5                       |   |
| 14                | 14.00   | 29.50            | 5.250                | 16.25         | 16              | 2.380              | 25.00                       | 420   |
|                   | 355.6   | 749.3            | 133.3                | 412.8         |                 | 60.45              | 635.0                       |   |
| 16                | 16.00   | 32.50            | 5.750                | 18.50         | 16              | 2.620              | 27.75                       | 558   |
|                   | 406.4   | 825.5            | 146.0                | 469.9         |                 | 66.55              | 704.8                       |   |
| 18                | 18.00   | 36.00            | 6.380                | 21.00         | 16              | 2.880              | 30.50                       | 760   |
|                   | 457.2   | 914.4            | 162.0                | 533.4         |                 | 73.15              | 774.7                       |   |
| 20                | 20.00   | 38.75            | 7.000                | 23.00         | 16              | 3.120              | 32.75                       | 965   |
|                   | 508.0   | 984.2            | 177.8                | 584.2         |                 | 79.25              | 831.8                       |   |
| 24                | 24.00   | 46.00            | 8.000                | 27.25         | 16              | 3.620              | 39.00                       | 1558  |
|                   | 609.6   | 1168.4           | 203.2                | 692.2         |                 | 91.90              | 990.6                       |   |

Notes

- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-6.
- For tolerances see page 8-4.

# Blind Flanges - ANSI B16.5



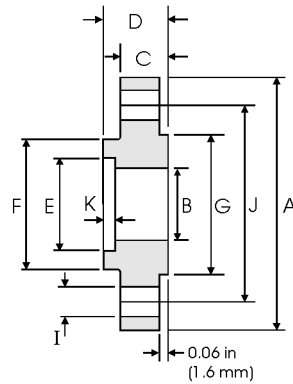
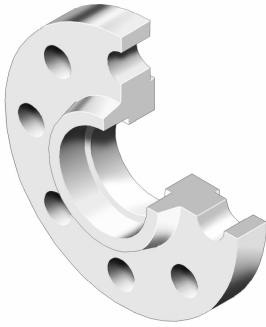
## Class 2500 lb

| Nominal Pipe Size | Pipe             | Flange Data      |                      |               | Raised Face     | Drilling Data      |                             |          | Weight |
|-------------------|------------------|------------------|----------------------|---------------|-----------------|--------------------|-----------------------------|----------|--------|
|                   |                  | <b>A</b>         | <b>C</b>             | <b>G</b>      | <b>H</b>        | <b>I</b>           | <b>J</b>                    |          |        |
|                   | Outside Diameter | Overall Diameter | Flange Thickness min | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/piece |        |
| in mm             | in mm            | in mm            | in mm                | in mm         |                 | in mm              |                             |          |        |
| 1/2               | 0.840            | 5.250            | 1.190                | 1.380         | 4               | 0.880              | 3.500                       | 2.99     |        |
|                   | 21.30            | 133.4            | 30.20                | 35.10         |                 | 22.40              | 88.90                       |          |        |
| 3/4               | 1.050            | 5.500            | 1.250                | 1.690         | 4               | 0.880              | 3.750                       | 3.50     |        |
|                   | 26.70            | 139.7            | 31.70                | 42.90         |                 | 22.40              | 95.30                       |          |        |
| 1                 | 1.315            | 6.250            | 1.380                | 2.000         | 4               | 1.000              | 4.250                       | 4.96     |        |
|                   | 33.40            | 158.8            | 35.10                | 50.80         |                 | 25.40              | 108.0                       |          |        |
| 1 1/4             | 1.660            | 7.250            | 1.500                | 2.500         | 4               | 1.120              | 5.120                       | 7.35     |        |
|                   | 42.20            | 184.2            | 38.10                | 63.50         |                 | 28.40              | 130.0                       |          |        |
| 1 1/2             | 1.900            | 8.000            | 1.750                | 2.880         | 4               | 1.250              | 5.750                       | 10.4     |        |
|                   | 48.30            | 203.2            | 44.50                | 73.15         |                 | 31.75              | 146.1                       |          |        |
| 2                 | 2.375            | 9.250            | 2.000                | 3.620         | 8               | 1.120              | 6.750                       | 15.6     |        |
|                   | 60.30            | 235.0            | 50.80                | 91.90         |                 | 28.40              | 171.5                       |          |        |
| 2 1/2             | 2.875            | 10.50            | 2.250                | 4.120         | 8               | 1.250              | 7.750                       | 22.6     |        |
|                   | 73.00            | 266.7            | 57.15                | 104.6         |                 | 31.75              | 196.9                       |          |        |
| 3                 | 3.500            | 12.00            | 2.620                | 5.000         | 8               | 1.380              | 9.000                       | 34.8     |        |
|                   | 88.90            | 304.8            | 66.55                | 127.0         |                 | 35.10              | 228.6                       |          |        |
| 4                 | 4.500            | 14.00            | 3.000                | 6.190         | 8               | 1.620              | 10.75                       | 53.9     |        |
|                   | 114.3            | 355.6            | 76.20                | 157.2         |                 | 41.10              | 273.1                       |          |        |
| 5                 | 5.563            | 16.50            | 3.620                | 7.310         | 8               | 1.888              | 12.75                       | 90.8     |        |
|                   | 141.3            | 419.1            | 91.90                | 185.7         |                 | 47.88              | 323.9                       |          |        |
| 6                 | 6.625            | 19.00            | 4.250                | 8.500         | 8               | 2.120              | 14.50                       | 141      |        |
|                   | 168.3            | 482.6            | 108.0                | 215.9         |                 | 53.80              | 368.3                       |          |        |
| 8                 | 8.625            | 21.75            | 5.000                | 10.62         | 12              | 2.120              | 17.25                       | 214      |        |
|                   | 219.1            | 552.5            | 127.0                | 269.7         |                 | 53.80              | 438.2                       |          |        |
| 10                | 10.75            | 26.50            | 6.500                | 12.75         | 12              | 2.620              | 21.25                       | 411      |        |
|                   | 273.0            | 673.1            | 165.1                | 323.9         |                 | 66.55              | 539.8                       |          |        |
| 12                | 12.75            | 30.00            | 7.250                | 15.00         | 12              | 2.880              | 24.38                       | 592      |        |
|                   | 323.8            | 762.0            | 184.2                | 381.0         |                 | 73.15              | 619.3                       |          |        |

Notes

- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-6.
- For tolerances see page 8-4.

# Socket Welding Flanges - ANSI B16.5



## Class 150 lb

| Pipe              | Flange           |                 |                      |                |                 |                 | Hub            | Raised Face    | Drilling Data  |                    |                             | Weight         |      |
|-------------------|------------------|-----------------|----------------------|----------------|-----------------|-----------------|----------------|----------------|----------------|--------------------|-----------------------------|----------------|------|
| Nominal Pipe Size | A                | B               | C                    | D              | E               | K               | F              | G              | H              | I                  | J                           | kg/piece       |      |
| Outside Diameter  | Overall Diameter | Inside Diameter | Flange Thickness min | Overall Length | Socket Diameter | Depth of Socket | Hub Diameter   | Face Diameter  | No. of Holes   | Bolt Hole Diameter | Diameter of Circle of Holes | kg/piece       |      |
| in mm             | in mm            | in mm           | in mm                | in mm          | in mm           | in mm           | in mm          | in mm          |                | in mm              | in mm                       |                |      |
| 1/2               | 0.840<br>21.30   | 3.500<br>88.90  | 0.620<br>15.70       | 0.440<br>11.20 | 0.620<br>15.70  | 0.880<br>22.40  | 0.380<br>9.600 | 1.190<br>30.20 | 1.380<br>35.10 | 4                  | 0.620<br>15.70              | 2.380<br>60.45 | 0.42 |
| 3/4               | 1.050<br>26.70   | 3.880<br>98.60  | 0.820<br>20.80       | 0.500<br>12.70 | 0.620<br>15.70  | 1.090<br>27.70  | 0.440<br>11.10 | 1.500<br>38.10 | 1.690<br>42.90 | 4                  | 0.620<br>15.70              | 2.750<br>69.85 | 0.59 |
| 1                 | 1.315<br>33.40   | 4.250<br>108.0  | 1.050<br>26.70       | 0.560<br>14.20 | 0.690<br>17.50  | 1.360<br>34.50  | 0.500<br>12.70 | 1.940<br>49.30 | 2.000<br>50.80 | 4                  | 0.620<br>15.70              | 3.120<br>79.25 | 0.81 |
| 1 1/4             | 1.660<br>42.20   | 4.620<br>117.3  | 1.380<br>35.10       | 0.620<br>15.70 | 0.810<br>20.60  | 1.700<br>43.20  | 0.560<br>14.20 | 2.310<br>58.70 | 2.500<br>63.50 | 4                  | 0.620<br>15.70              | 3.500<br>88.90 | 1.07 |
| 1 1/2             | 1.900<br>48.30   | 5.000<br>127.0  | 1.610<br>40.90       | 0.690<br>17.50 | 0.880<br>22.30  | 1.950<br>49.50  | 0.620<br>15.70 | 2.560<br>65.00 | 2.880<br>73.15 | 4                  | 0.620<br>15.70              | 3.880<br>98.60 | 1.36 |
| 2                 | 2.375<br>60.30   | 6.000<br>152.4  | 2.070<br>52.60       | 0.750<br>19.10 | 1.000<br>25.40  | 2.440<br>62.00  | 0.690<br>17.50 | 3.060<br>77.70 | 3.620<br>91.90 | 4                  | 0.750<br>19.10              | 4.750<br>120.7 | 2.10 |
| 2 1/2             | 2.875<br>73.00   | 7.000<br>177.8  | 2.470<br>62.70       | 0.880<br>22.40 | 1.120<br>28.40  | 2.940<br>74.70  | 0.750<br>19.00 | 3.560<br>90.40 | 4.120<br>104.6 | 4                  | 0.750<br>19.10              | 5.500<br>139.7 | 3.33 |
| 3                 | 3.500<br>88.90   | 7.500<br>190.5  | 3.070<br>78.00       | 0.940<br>23.90 | 1.190<br>30.20  | 3.570<br>90.70  | 0.810<br>20.60 | 4.250<br>108.0 | 5.000<br>127.0 | 4                  | 0.750<br>19.10              | 6.000<br>152.4 | 3.90 |

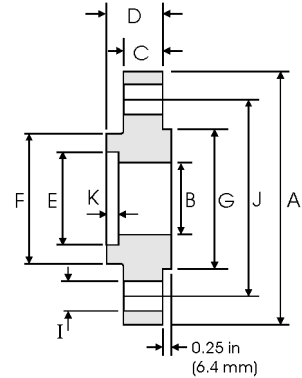
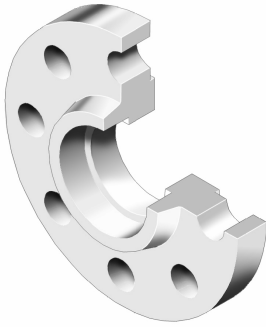
## Class 300 lb

| Pipe              | Flange           |                 |                      |                |                 |                 | Hub            | Raised Face    | Drilling Data  |                    |                             | Weight         |      |
|-------------------|------------------|-----------------|----------------------|----------------|-----------------|-----------------|----------------|----------------|----------------|--------------------|-----------------------------|----------------|------|
| Nominal Pipe Size | A                | B               | C                    | D              | E               | K               | F              | G              | H              | I                  | J                           | kg/piece       |      |
| Outside Diameter  | Overall Diameter | Inside Diameter | Flange Thickness min | Overall Length | Socket Diameter | Depth of Socket | Hub Diameter   | Face Diameter  | No. of Holes   | Bolt Hole Diameter | Diameter of Circle of Holes | kg/piece       |      |
| in mm             | in mm            | in mm           | in mm                | in mm          | in mm           | in mm           | in mm          | in mm          |                | in mm              | in mm                       |                |      |
| 1/2               | 0.840<br>21.30   | 3.750<br>95.20  | 0.620<br>15.70       | 0.560<br>14.20 | 0.880<br>22.30  | 0.880<br>22.40  | 0.380<br>9.600 | 1.500<br>38.10 | 1.380<br>35.10 | 4                  | 0.620<br>15.70              | 2.620<br>66.55 | 0.66 |
| 3/4               | 1.050<br>26.70   | 4.620<br>117.3  | 0.820<br>20.80       | 0.620<br>15.70 | 1.000<br>25.40  | 1.090<br>27.70  | 0.440<br>11.10 | 1.880<br>47.70 | 1.690<br>42.90 | 4                  | 0.750<br>19.10              | 3.250<br>82.50 | 1.15 |
| 1                 | 1.315<br>33.40   | 4.880<br>123.9  | 1.050<br>26.70       | 0.690<br>17.50 | 1.060<br>26.90  | 1.360<br>34.50  | 0.500<br>12.70 | 2.120<br>53.80 | 2.000<br>50.80 | 4                  | 0.750<br>19.10              | 3.500<br>88.90 | 1.40 |
| 1 1/4             | 1.660<br>42.20   | 5.250<br>133.3  | 1.380<br>35.10       | 0.750<br>19.00 | 1.060<br>26.90  | 1.700<br>43.20  | 0.560<br>14.20 | 2.500<br>63.50 | 2.500<br>63.50 | 4                  | 0.750<br>19.10              | 3.880<br>98.60 | 1.75 |
| 1 1/2             | 1.900<br>48.30   | 6.120<br>155.4  | 1.610<br>40.90       | 0.810<br>20.60 | 1.190<br>30.20  | 1.950<br>49.50  | 0.620<br>15.70 | 2.750<br>69.85 | 2.880<br>73.15 | 4                  | 0.880<br>22.30              | 4.500<br>114.3 | 2.55 |
| 2                 | 2.375<br>60.30   | 6.500<br>165.1  | 2.070<br>52.60       | 0.880<br>22.30 | 1.310<br>33.20  | 2.440<br>62.00  | 0.690<br>17.50 | 3.310<br>84.00 | 3.620<br>91.90 | 8                  | 0.750<br>19.10              | 5.000<br>127.0 | 2.93 |
| 2 1/2             | 2.875<br>73.00   | 7.500<br>190.5  | 2.470<br>62.70       | 1.000<br>25.40 | 1.500<br>38.10  | 2.940<br>74.70  | 0.750<br>19.00 | 3.940<br>100.0 | 4.120<br>104.6 | 8                  | 0.880<br>22.30              | 5.880<br>149.3 | 4.40 |
| 3                 | 3.500<br>88.90   | 8.250<br>209.5  | 3.070<br>78.00       | 1.120<br>28.40 | 1.690<br>42.90  | 3.570<br>90.70  | 0.810<br>20.60 | 4.620<br>117.3 | 5.000<br>127.0 | 8                  | 0.880<br>22.30              | 6.620<br>168.1 | 5.92 |

Notes

- Dimension B corresponds to the pipe inside diameter. Values quoted assume 40S/Standard wall thickness.
- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-6. For tolerances see page 8-4.

# Socket Welding Flanges - ANSI B16.5



## Class 600 lb

| Pipe              |                  | Flange           |                                  |                      |                |                 | Hub             | Raised Face    | Drilling Data  |              |                    | Weight                      |           |
|-------------------|------------------|------------------|----------------------------------|----------------------|----------------|-----------------|-----------------|----------------|----------------|--------------|--------------------|-----------------------------|-----------|
| Nominal Pipe Size |                  | A                | B                                | C                    | D              | E               | K               | F              | G              | H            | I                  | J                           |           |
|                   | Outside Diameter | Overall Diameter | Inside Diameter                  | Flange Thickness min | Overall Length | Socket Diameter | Depth of Socket | Hub Diameter   | Face Diameter  | No. of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm                            | in mm                | in mm          | in mm           | in mm           | in mm          | in mm          |              | in mm              | in mm                       |           |
| 1/2               | 0.840<br>21.30   | 3.750<br>95.20   | To be specified by the Purchaser | 0.560<br>14.20       | 0.880<br>22.30 | 0.880<br>22.40  | 0.380<br>9.600  | 1.500<br>38.10 | 1.380<br>35.10 | 4            | 0.620<br>15.70     | 2.620<br>66.55              | 0.76      |
|                   | 3/4              | 1.050<br>26.70   |                                  | 4.620<br>117.3       | 0.620<br>15.70 | 1.000<br>25.40  | 1.090<br>27.70  | 0.440<br>11.10 | 1.880<br>47.70 |              | 1.690<br>42.90     | 0.750<br>19.10              |           |
| 1                 | 1.315<br>33.40   | 4.880<br>123.9   |                                  | 0.690<br>17.50       | 1.060<br>26.90 | 1.360<br>34.50  | 0.500<br>12.70  | 2.120<br>53.80 | 2.000<br>50.80 | 4            | 0.750<br>19.10     | 3.500<br>88.90              | 1.55      |
|                   | 1 1/4            | 1.660<br>42.20   |                                  | 5.250<br>133.3       | 0.810<br>20.60 | 1.120<br>28.40  | 1.700<br>43.20  | 0.560<br>14.20 | 2.500<br>63.50 |              | 2.500<br>63.50     | 0.750<br>19.10              |           |
| 1 1/2             | 1.900<br>48.30   | 6.120<br>155.4   |                                  | 0.880<br>22.30       | 1.250<br>31.75 | 1.950<br>49.50  | 0.620<br>15.70  | 2.750<br>69.85 | 2.880<br>73.15 | 4            | 0.880<br>22.30     | 4.500<br>114.3              | 3.00      |
|                   | 2                | 2.375<br>60.30   |                                  | 6.500<br>165.1       | 1.000<br>25.40 | 1.440<br>36.60  | 2.440<br>62.00  | 0.690<br>17.50 | 3.310<br>84.00 |              | 3.620<br>91.90     | 8                           |           |
| 2 1/2             | 2.875<br>73.00   | 7.500<br>190.5   |                                  | 1.120<br>28.40       | 1.620<br>41.10 | 2.940<br>74.70  | 0.750<br>19.00  | 3.940<br>100.0 | 4.120<br>104.6 | 8            | 0.880<br>22.30     | 5.880<br>149.3              | 5.35      |
|                   | 3                | 3.500<br>88.90   |                                  | 8.250<br>209.5       | 1.250<br>31.75 | 1.810<br>46.00  | 3.570<br>90.70  | 0.810<br>20.60 | 4.620<br>117.3 |              | 5.000<br>127.0     | 8                           |           |

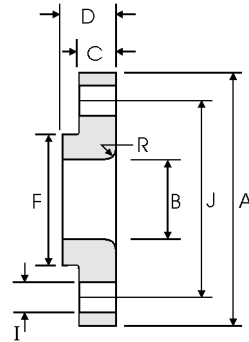
## Class 1500 lb

| Pipe              |                  | Flange           |                                  |                      |                |                 | Hub             | Raised Face    | Drilling Data  |              |                    | Weight                      |           |
|-------------------|------------------|------------------|----------------------------------|----------------------|----------------|-----------------|-----------------|----------------|----------------|--------------|--------------------|-----------------------------|-----------|
| Nominal Pipe Size |                  | A                | B                                | C                    | D              | E               | K               | F              | G              | H            | I                  | J                           |           |
|                   | Outside Diameter | Overall Diameter | Inside Diameter                  | Flange Thickness min | Overall Length | Socket Diameter | Depth of Socket | Hub Diameter   | Face Diameter  | No. of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm                            | in mm                | in mm          | in mm           | in mm           | in mm          | in mm          |              | in mm              | in mm                       |           |
| 1/2               | 0.840<br>21.30   | 4.750<br>120.6   | To be specified by the Purchaser | 0.880<br>22.30       | 1.250<br>31.70 | 0.880<br>22.40  | 0.380<br>9.600  | 1.500<br>38.10 | 1.380<br>35.10 | 4            | 0.880<br>22.30     | 3.250<br>82.50              | 1.80      |
|                   | 3/4              | 1.050<br>26.70   |                                  | 5.120<br>130.0       | 1.000<br>25.40 | 1.380<br>35.00  | 1.090<br>27.70  | 0.440<br>11.10 | 1.750<br>44.40 |              | 1.690<br>42.90     | 4                           |           |
| 1                 | 1.315<br>33.40   | 5.880<br>149.3   |                                  | 1.120<br>28.40       | 1.620<br>41.10 | 1.360<br>34.50  | 0.500<br>12.70  | 2.060<br>52.30 | 2.000<br>50.80 | 4            | 1.000<br>25.40     | 4.000<br>101.6              | 3.55      |
|                   | 1 1/4            | 1.660<br>42.20   |                                  | 6.250<br>158.7       | 1.120<br>28.40 | 1.620<br>41.10  | 1.700<br>43.20  | 0.560<br>14.20 | 2.500<br>63.50 |              | 2.500<br>63.50     | 4                           |           |
| 1 1/2             | 1.900<br>48.30   | 7.000<br>177.8   |                                  | 1.250<br>31.75       | 1.750<br>44.50 | 1.950<br>49.50  | 0.620<br>15.70  | 2.750<br>69.85 | 2.880<br>73.15 | 4            | 1.120<br>28.40     | 4.880<br>123.9              | 5.45      |
|                   | 2                | 2.375<br>60.30   |                                  | 8.500<br>215.9       | 1.500<br>38.10 | 2.250<br>57.15  | 2.440<br>62.00  | 0.690<br>17.50 | 4.120<br>104.6 |              | 3.620<br>91.90     | 8                           |           |
| 2 1/2             | 2.875<br>73.00   | 9.620<br>244.3   |                                  | 1.620<br>41.10       | 2.500<br>63.50 | 2.940<br>74.70  | 0.750<br>19.00  | 4.880<br>123.9 | 4.120<br>104.6 | 8            | 1.120<br>28.40     | 7.500<br>190.5              | 13.9      |

Notes

- Class 400 socket weld flanges may be provided in NPS 1/2 to 2 1/2 using Class 600 dimensions
- Dimension B corresponds to the pipe inside diameter. Values quoted assume 40S/Standard wall thickness.
- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-6. For tolerances see page 8-4.

# Lap Joint Flanges - ANSI B16.5



## Class 150 lb

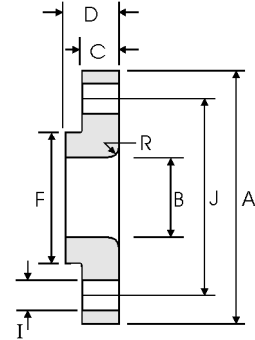
| Nominal Pipe Size | Pipe             | Flange Data      |                 |                      |                | Lap        | Hub          | Drilling Data   |                    |                             | Weight    |
|-------------------|------------------|------------------|-----------------|----------------------|----------------|------------|--------------|-----------------|--------------------|-----------------------------|-----------|
|                   |                  | A                | B               | C                    | D              | R          | F            | H               | I                  | J                           |           |
|                   | Outside Diameter | Overall Diameter | Inside Diameter | Flange Thickness min | Overall Length | Lap Radius | Hub Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm           | in mm                | in mm          | in mm      | in mm        |                 | in mm              | in mm                       |           |
| 1/2               | 0.840            | 3.500            | 0.900           | 0.440                | 0.620          | 0.120      | 1.190        | 4               | 0.620              | 2.380                       | 0.38      |
|                   | 21.30            | 88.90            | 22.90           | 11.20                | 15.70          | 3.000      | 30.20        |                 | 15.70              | 60.45                       |           |
| 3/4               | 1.050            | 3.880            | 1.110           | 0.500                | 0.620          | 0.120      | 1.500        | 4               | 0.620              | 2.750                       | 0.55      |
|                   | 26.70            | 98.60            | 28.20           | 12.70                | 15.70          | 3.000      | 38.10        |                 | 15.70              | 69.85                       |           |
| 1                 | 1.315            | 4.250            | 1.380           | 0.560                | 0.690          | 0.120      | 1.940        | 4               | 0.620              | 3.120                       | 0.76      |
|                   | 33.40            | 108.0            | 35.10           | 14.20                | 17.50          | 3.000      | 49.30        |                 | 15.70              | 79.25                       |           |
| 1 1/4             | 1.660            | 4.620            | 1.720           | 0.620                | 0.810          | 0.190      | 2.310        | 4               | 0.620              | 3.500                       | 1.01      |
|                   | 42.20            | 117.3            | 43.70           | 15.70                | 20.60          | 4.800      | 58.70        |                 | 15.70              | 88.90                       |           |
| 1 1/2             | 1.900            | 5.000            | 1.970           | 0.690                | 0.880          | 0.250      | 2.560        | 4               | 0.620              | 3.880                       | 1.30      |
|                   | 48.30            | 127.0            | 50.00           | 17.50                | 22.40          | 6.400      | 65.00        |                 | 15.70              | 98.60                       |           |
| 2                 | 2.375            | 6.000            | 2.460           | 0.750                | 1.000          | 0.310      | 3.060        | 4               | 0.750              | 4.750                       | 2.03      |
|                   | 60.30            | 152.4            | 62.50           | 19.10                | 25.40          | 7.900      | 77.70        |                 | 19.10              | 120.7                       |           |
| 2 1/2             | 2.875            | 7.000            | 2.970           | 0.880                | 1.120          | 0.310      | 3.560        | 4               | 0.750              | 5.500                       | 3.25      |
|                   | 73.00            | 177.8            | 75.40           | 22.40                | 28.40          | 7.900      | 90.40        |                 | 19.10              | 139.7                       |           |
| 3                 | 3.500            | 7.500            | 3.600           | 0.940                | 1.190          | 0.380      | 4.250        | 4               | 0.750              | 6.000                       | 3.81      |
|                   | 88.90            | 190.5            | 91.40           | 23.90                | 30.20          | 9.700      | 108.0        |                 | 19.10              | 152.4                       |           |
| 3 1/2             | 4.000            | 8.500            | 4.100           | 0.940                | 1.250          | 0.380      | 4.810        | 8               | 0.750              | 7.000                       | 4.76      |
|                   | 101.6            | 215.9            | 104.1           | 23.90                | 31.75          | 9.700      | 122.2        |                 | 19.10              | 177.8                       |           |
| 4                 | 4.500            | 9.000            | 4.600           | 0.940                | 1.310          | 0.440      | 5.310        | 8               | 0.750              | 7.500                       | 5.25      |
|                   | 114.3            | 228.6            | 116.8           | 23.90                | 33.30          | 11.20      | 134.9        |                 | 19.10              | 190.5                       |           |
| 5                 | 5.563            | 10.00            | 5.690           | 0.940                | 1.440          | 0.440      | 6.440        | 8               | 0.880              | 8.500                       | 6.02      |
|                   | 141.3            | 254.0            | 114.5           | 23.90                | 36.60          | 11.20      | 163.6        |                 | 22.40              | 215.9                       |           |
| 6                 | 6.625            | 11.00            | 6.750           | 1.000                | 1.560          | 0.500      | 7.560        | 8               | 0.880              | 9.500                       | 7.40      |
|                   | 168.3            | 279.4            | 171.5           | 25.40                | 39.60          | 12.70      | 192.0        |                 | 22.40              | 241.3                       |           |
| 8                 | 8.625            | 13.50            | 8.750           | 1.120                | 1.750          | 0.500      | 9.690        | 8               | 0.880              | 11.75                       | 12.1      |
|                   | 219.1            | 342.9            | 222.3           | 28.40                | 44.50          | 12.70      | 246.1        |                 | 22.40              | 298.5                       |           |
| 10                | 10.75            | 16.00            | 10.92           | 1.190                | 1.940          | 0.500      | 12.00        | 12              | 1.000              | 14.25                       | 16.4      |
|                   | 273.0            | 406.4            | 277.4           | 30.20                | 49.30          | 12.70      | 304.8        |                 | 25.40              | 362.0                       |           |
| 12                | 12.75            | 19.00            | 12.92           | 1.250                | 2.190          | 0.500      | 14.38        | 12              | 1.000              | 17.00                       | 26.1      |
|                   | 323.8            | 482.6            | 328.2           | 31.75                | 55.60          | 12.70      | 365.3        |                 | 25.40              | 431.8                       |           |
| 14                | 14.00            | 21.00            | 14.18           | 1.380                | 3.120          | 0.500      | 15.75        | 12              | 1.120              | 18.75                       | 34.5      |
|                   | 355.6            | 533.4            | 360.2           | 35.10                | 79.25          | 12.70      | 400.1        |                 | 28.40              | 476.3                       |           |
| 16                | 16.00            | 23.50            | 16.19           | 1.440                | 3.440          | 0.500      | 18.00        | 16              | 1.120              | 21.25                       | 44.6      |
|                   | 406.4            | 596.9            | 411.2           | 36.60                | 87.40          | 12.70      | 457.2        |                 | 28.40              | 539.8                       |           |
| 18                | 18.00            | 25.00            | 18.20           | 1.560                | 3.810          | 0.500      | 19.88        | 16              | 1.250              | 22.75                       | 48.7      |
|                   | 457.2            | 635.0            | 462.3           | 39.60                | 96.80          | 12.70      | 505.0        |                 | 31.75              | 577.9                       |           |
| 20                | 20.00            | 27.50            | 20.25           | 1.690                | 4.060          | 0.500      | 22.00        | 20              | 1.250              | 25.00                       | 61.6      |
|                   | 508.0            | 698.5            | 514.4           | 42.90                | 103.1          | 12.70      | 558.8        |                 | 31.75              | 635.0                       |           |
| 24                | 24.00            | 32.00            | 24.25           | 1.880                | 4.380          | 0.500      | 26.12        | 20              | 1.380              | 29.50                       | 86.6      |
|                   | 609.6            | 812.8            | 616.0           | 47.80                | 111.3          | 12.70      | 663.4        |                 | 35.10              | 749.3                       |           |

Notes

- Weights are based on manufacturer's data and are approximate.
- For tolerances see page 8-4.



# Lap Joint Flanges - ANSI B16.5



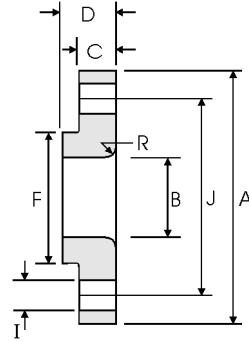
## Class 300 lb

| Nominal Pipe Size | Pipe             | Flange Data      |                 |                      |                | Lap        | Hub          | Drilling Data   |                    |                             | Weight    |
|-------------------|------------------|------------------|-----------------|----------------------|----------------|------------|--------------|-----------------|--------------------|-----------------------------|-----------|
|                   |                  | A                | B               | C                    | D              | R          | F            | H               | I                  | J                           |           |
|                   | Outside Diameter | Overall Diameter | Inside Diameter | Flange Thickness min | Overall Length | Lap Radius | Hub Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm           | in mm                | in mm          | in mm      | in mm        |                 | in mm              | in mm                       |           |
| 1/2               | 0.840            | 3.750            | 0.900           | 0.560                | 0.880          | 0.120      | 1.500        | 4               | 0.620              | 2.620                       | 0.62      |
|                   | 21.30            | 95.20            | 22.90           | 14.20                | 22.30          | 3.000      | 38.10        |                 | 15.70              | 66.55                       |           |
| 3/4               | 1.050            | 4.620            | 1.110           | 0.620                | 1.000          | 0.120      | 1.880        | 4               | 0.750              | 3.250                       | 1.10      |
|                   | 26.70            | 117.3            | 28.20           | 15.70                | 25.40          | 3.000      | 47.70        |                 | 19.00              | 82.50                       |           |
| 1                 | 1.315            | 4.880            | 1.380           | 0.690                | 1.060          | 0.120      | 2.120        | 4               | 0.750              | 3.500                       | 1.33      |
|                   | 33.40            | 123.9            | 35.10           | 17.50                | 26.90          | 3.000      | 53.80        |                 | 19.0               | 88.90                       |           |
| 1 1/4             | 1.660            | 5.250            | 1.720           | 0.750                | 1.060          | 0.190      | 2.500        | 4               | 0.750              | 3.880                       | 1.65      |
|                   | 42.20            | 133.3            | 43.70           | 19.00                | 26.90          | 4.800      | 63.50        |                 | 19.00              | 98.50                       |           |
| 1 1/2             | 1.900            | 6.120            | 1.970           | 0.810                | 1.190          | 0.250      | 2.750        | 4               | 0.880              | 4.500                       | 2.44      |
|                   | 48.30            | 155.4            | 50.00           | 20.60                | 30.20          | 6.400      | 69.85        |                 | 22.30              | 114.3                       |           |
| 2                 | 2.375            | 6.500            | 2.460           | 0.880                | 1.310          | 0.310      | 3.310        | 8               | 0.750              | 5.000                       | 2.83      |
|                   | 60.30            | 165.1            | 62.50           | 22.30                | 33.20          | 7.900      | 84.00        |                 | 19.10              | 127.0                       |           |
| 2 1/2             | 2.875            | 7.500            | 2.970           | 1.000                | 1.500          | 0.310      | 3.940        | 8               | 0.880              | 5.880                       | 4.25      |
|                   | 73.00            | 190.5            | 75.40           | 25.40                | 38.10          | 7.900      | 100.0        |                 | 22.30              | 149.3                       |           |
| 3                 | 3.500            | 8.250            | 3.600           | 1.120                | 1.690          | 0.380      | 4.620        | 8               | 0.880              | 6.620                       | 5.78      |
|                   | 88.90            | 209.5            | 91.40           | 28.40                | 42.90          | 9.700      | 117.3        |                 | 22.30              | 168.1                       |           |
| 3 1/2             | 4.000            | 9.000            | 4.100           | 1.190                | 1.750          | 0.380      | 5.250        | 8               | 0.880              | 7.250                       | 7.27      |
|                   | 101.6            | 228.6            | 104.1           | 30.20                | 44.40          | 9.700      | 133.3        |                 | 22.30              | 184.1                       |           |
| 4                 | 4.500            | 10.00            | 4.600           | 1.250                | 1.880          | 0.440      | 5.750        | 8               | 0.880              | 7.880                       | 9.55      |
|                   | 114.3            | 254.0            | 116.8           | 31.70                | 47.70          | 11.20      | 146.0        |                 | 22.30              | 200.1                       |           |
| 5                 | 5.563            | 11.00            | 5.690           | 1.380                | 2.000          | 0.440      | 7.000        | 8               | 0.880              | 9.250                       | 12.2      |
|                   | 141.3            | 279.4            | 114.5           | 35.00                | 50.80          | 11.20      | 177.8        |                 | 22.30              | 234.9                       |           |
| 6                 | 6.625            | 12.50            | 6.750           | 1.440                | 2.060          | 0.500      | 8.120        | 12              | 0.880              | 10.62                       | 15.5      |
|                   | 168.3            | 317.5            | 171.5           | 36.50                | 52.30          | 12.70      | 206.2        |                 | 22.30              | 269.7                       |           |
| 8                 | 8.625            | 15.00            | 8.750           | 1.620                | 2.440          | 0.500      | 10.25        | 12              | 1.000              | 13.00                       | 24.1      |
|                   | 219.1            | 381.0            | 222.3           | 41.10                | 61.90          | 12.70      | 260.3        |                 | 25.40              | 330.2                       |           |
| 10                | 10.75            | 17.50            | 10.92           | 1.880                | 3.750          | 0.500      | 12.62        | 16              | 1.120              | 15.25                       | 34.4      |
|                   | 273.0            | 444.5            | 277.4           | 47.70                | 95.20          | 12.70      | 320.5        |                 | 28.40              | 387.3                       |           |
| 12                | 12.75            | 20.50            | 12.92           | 2.000                | 4.000          | 0.500      | 14.75        | 16              | 1.250              | 17.75                       | 50.4      |
|                   | 323.8            | 520.7            | 328.2           | 50.80                | 101.6          | 12.70      | 374.6        |                 | 31.70              | 450.8                       |           |
| 14                | 14.00            | 23.00            | 14.18           | 2.120                | 4.380          | 0.500      | 16.75        | 20              | 1.250              | 20.25                       | 70.9      |
|                   | 355.6            | 584.2            | 360.2           | 53.80                | 111.2          | 12.70      | 425.4        |                 | 31.70              | 514.3                       |           |
| 16                | 16.00            | 25.50            | 16.19           | 2.250                | 4.750          | 0.500      | 19.00        | 20              | 1.380              | 22.50                       | 89.5      |
|                   | 406.4            | 647.7            | 411.2           | 57.15                | 120.6          | 12.70      | 482.6        |                 | 35.00              | 571.5                       |           |
| 18                | 18.00            | 28.00            | 18.20           | 2.380                | 5.120          | 0.500      | 21.00        | 24              | 1.380              | 24.75                       | 111       |
|                   | 457.2            | 711.2            | 462.3           | 60.45                | 130.0          | 12.70      | 533.4        |                 | 35.00              | 628.6                       |           |
| 20                | 20.00            | 30.50            | 20.25           | 2.500                | 5.500          | 0.500      | 23.12        | 24              | 1.380              | 27.00                       | 137       |
|                   | 508.0            | 774.7            | 514.4           | 63.50                | 139.7          | 12.70      | 587.2        |                 | 35.0               | 685.8                       |           |
| 24                | 24.00            | 36.00            | 24.25           | 2.750                | 6.000          | 0.500      | 27.62        | 24              | 1.620              | 32.00                       | 204       |
|                   | 609.6            | 914.4            | 616.0           | 69.8                 | 152.4          | 12.70      | 701.5        |                 | 41.10              | 812.8                       |           |

Notes

- Weights are based on manufacturer's data and are approximate.
- For tolerances see page 8-4.

# Lap Joint Flanges - ANSI B16.5



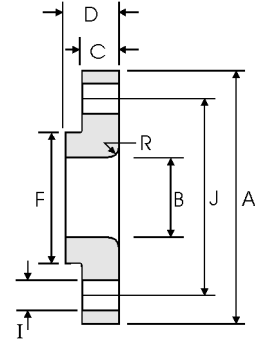
## Class 400 lb

| Nominal Pipe Size | Pipe             | Flange Data      |                 |                      |                | Lap        | Hub          | Drilling Data   |                    |                             | Weight    |
|-------------------|------------------|------------------|-----------------|----------------------|----------------|------------|--------------|-----------------|--------------------|-----------------------------|-----------|
|                   |                  | A                | B               | C                    | D              | R          | F            | H               | I                  | J                           |           |
|                   | Outside Diameter | Overall Diameter | Inside Diameter | Flange Thickness min | Overall Length | Lap Radius | Hub Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm           | in mm                | in mm          | in mm      | in mm        |                 | in mm              | in mm                       |           |
| 1/2               | 0.840            | 3.750            | 0.900           | 0.560                | 0.880          | 0.120      | 1.500        | 4               | 0.620              | 2.620                       | 0.72      |
|                   | 21.30            | 95.30            | 22.90           | 14.20                | 22.40          | 3.000      | 38.10        |                 | 15.70              | 66.55                       |           |
| 3/4               | 1.050            | 4.620            | 1.110           | 0.620                | 1.000          | 0.120      | 1.880        | 4               | 0.750              | 3.250                       | 1.25      |
|                   | 26.70            | 117.3            | 28.20           | 15.70                | 25.40          | 3.000      | 47.80        |                 | 19.10              | 82.60                       |           |
| 1                 | 1.315            | 4.880            | 1.380           | 0.690                | 1.060          | 0.120      | 2.120        | 4               | 0.750              | 3.500                       | 1.50      |
|                   | 33.40            | 124.0            | 35.10           | 17.50                | 26.90          | 3.000      | 53.80        |                 | 19.10              | 88.90                       |           |
| 1 1/4             | 1.660            | 5.250            | 1.720           | 0.810                | 1.120          | 0.190      | 2.500        | 4               | 0.750              | 3.880                       | 2.00      |
|                   | 42.20            | 133.4            | 43.70           | 20.60                | 28.40          | 4.800      | 63.50        |                 | 19.10              | 98.60                       |           |
| 1 1/2             | 1.900            | 6.120            | 1.970           | 0.880                | 1.250          | 0.250      | 2.750        | 4               | 0.880              | 4.500                       | 2.92      |
|                   | 48.30            | 155.4            | 50.00           | 22.40                | 31.75          | 6.400      | 69.85        |                 | 22.40              | 114.3                       |           |
| 2                 | 2.375            | 6.500            | 2.460           | 1.000                | 1.440          | 0.310      | 3.310        | 8               | 0.750              | 5.000                       | 3.55      |
|                   | 60.30            | 165.1            | 62.50           | 25.40                | 36.60          | 7.900      | 84.10        |                 | 19.10              | 127.0                       |           |
| 2 1/2             | 2.875            | 7.500            | 2.970           | 1.120                | 1.620          | 0.310      | 3.940        | 8               | 0.880              | 5.880                       | 5.23      |
|                   | 73.00            | 190.5            | 75.40           | 28.40                | 41.10          | 7.900      | 100.1        |                 | 22.40              | 149.4                       |           |
| 3                 | 3.500            | 8.250            | 3.600           | 1.125                | 1.810          | 0.380      | 4.620        | 8               | 0.880              | 6.620                       | 6.95      |
|                   | 88.90            | 209.6            | 91.40           | 31.75                | 46.00          | 9.700      | 117.3        |                 | 22.40              | 168.1                       |           |
| 3 1/2             | 4.000            | 9.000            | 4.100           | 1.380                | 1.940          | 0.380      | 5.250        | 8               | 1.000              | 7.250                       | 8.78      |
|                   | 101.6            | 228.6            | 104.1           | 35.10                | 49.30          | 9.700      | 133.4        |                 | 25.40              | 184.2                       |           |
| 4                 | 4.500            | 10.00            | 4.600           | 1.380                | 2.000          | 0.440      | 5.750        | 8               | 1.000              | 7.880                       | 10.9      |
|                   | 114.3            | 254.0            | 116.8           | 35.10                | 50.80          | 11.20      | 146.1        |                 | 25.40              | 200.2                       |           |
| 5                 | 5.563            | 11.00            | 5.690           | 1.500                | 2.120          | 0.440      | 7.000        | 8               | 1.000              | 9.250                       | 13.7      |
|                   | 141.3            | 279.4            | 114.5           | 38.10                | 53.80          | 11.20      | 177.8        |                 | 25.40              | 235.0                       |           |
| 6                 | 6.625            | 12.50            | 6.750           | 1.620                | 2.250          | 0.500      | 8.120        | 12              | 1.000              | 10.62                       | 18.0      |
|                   | 168.3            | 317.5            | 171.5           | 41.10                | 57.15          | 12.70      | 206.2        |                 | 25.40              | 269.7                       |           |
| 8                 | 8.625            | 15.00            | 8.750           | 1.880                | 2.690          | 0.500      | 10.25        | 12              | 1.120              | 13.00                       | 28.3      |
|                   | 219.1            | 381.0            | 222.3           | 47.80                | 68.30          | 12.70      | 260.4        |                 | 28.40              | 330.2                       |           |
| 10                | 10.75            | 17.50            | 10.92           | 2.120                | 4.000          | 0.500      | 12.62        | 16              | 1.250              | 15.25                       | 38.8      |
|                   | 273.0            | 444.5            | 277.4           | 53.80                | 101.6          | 12.70      | 320.5        |                 | 31.75              | 387.4                       |           |
| 12                | 12.75            | 20.50            | 12.92           | 2.250                | 4.250          | 0.500      | 14.75        | 16              | 1.380              | 17.75                       | 56.6      |
|                   | 323.8            | 520.7            | 328.2           | 57.15                | 108.0          | 12.70      | 374.7        |                 | 35.10              | 450.9                       |           |
| 14                | 14.00            | 23.00            | 14.18           | 2.380                | 4.620          | 0.500      | 16.75        | 20              | 1.380              | 20.25                       | 78.6      |
|                   | 355.6            | 584.2            | 360.2           | 60.45                | 117.3          | 12.70      | 425.5        |                 | 35.10              | 514.4                       |           |
| 16                | 16.00            | 25.50            | 16.19           | 2.500                | 5.000          | 0.500      | 19.00        | 20              | 1.500              | 22.50                       | 100       |
|                   | 406.4            | 647.7            | 411.2           | 63.50                | 127.0          | 12.70      | 482.6        |                 | 38.10              | 571.5                       |           |
| 18                | 18.00            | 28.00            | 18.20           | 2.620                | 5.380          | 0.500      | 21.00        | 24              | 1.500              | 24.75                       | 122       |
|                   | 457.2            | 711.2            | 462.3           | 66.55                | 136.7          | 12.70      | 533.4        |                 | 38.10              | 628.7                       |           |
| 20                | 20.00            | 30.50            | 20.25           | 2.750                | 5.750          | 0.500      | 23.12        | 24              | 1.620              | 27.00                       | 145       |
|                   | 508.0            | 774.7            | 514.4           | 69.85                | 146.1          | 12.70      | 587.2        |                 | 41.10              | 685.8                       |           |
| 24                | 24.00            | 36.00            | 24.25           | 3.000                | 6.250          | 0.500      | 27.62        | 24              | 1.880              | 32.00                       | 217       |
|                   | 609.6            | 914.4            | 616.0           | 76.20                | 158.8          | 12.70      | 701.5        |                 | 47.80              | 812.8                       |           |

Notes

- Weights are based on manufacturer's data and are approximate.
- For tolerances see page 8-4.

# Lap Joint Flanges - ANSI B16.5



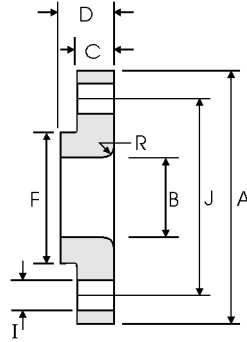
## Class 600 lb

| Nominal Pipe Size | Pipe             | Flange Data      |                 |                      |                | Lap        | Hub          | Drilling Data   |                    |                             | Weight    |
|-------------------|------------------|------------------|-----------------|----------------------|----------------|------------|--------------|-----------------|--------------------|-----------------------------|-----------|
|                   |                  | A                | B               | C                    | D              | R          | F            | H               | I                  | J                           |           |
|                   | Outside Diameter | Overall Diameter | Inside Diameter | Flange Thickness min | Overall Length | Lap Radius | Hub Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm           | in mm                | in mm          | in mm      | in mm        |                 | in mm              | in mm                       |           |
| 1/2               | 0.840            | 3.750            | 0.900           | 0.560                | 0.880          | 0.120      | 1.500        | 4               | 0.620              | 2.620                       | 0.72      |
|                   | 21.30            | 95.30            | 22.90           | 14.20                | 22.40          | 3.000      | 38.10        |                 | 15.70              | 66.55                       |           |
| 3/4               | 1.050            | 4.620            | 1.110           | 0.620                | 1.000          | 0.120      | 1.880        | 4               | 0.750              | 3.250                       | 1.25      |
|                   | 26.70            | 117.3            | 28.20           | 15.70                | 25.40          | 3.000      | 47.80        |                 | 19.10              | 82.60                       |           |
| 1                 | 1.315            | 4.880            | 1.380           | 0.690                | 1.060          | 0.120      | 2.120        | 4               | 0.750              | 3.500                       | 1.50      |
|                   | 33.40            | 124.0            | 35.10           | 17.50                | 26.90          | 3.000      | 53.80        |                 | 19.10              | 88.90                       |           |
| 1 1/4             | 1.660            | 5.250            | 1.720           | 0.810                | 1.120          | 0.190      | 2.500        | 4               | 0.750              | 3.880                       | 2.00      |
|                   | 42.20            | 133.4            | 43.70           | 20.60                | 28.40          | 4.800      | 63.50        |                 | 19.10              | 98.60                       |           |
| 1 1/2             | 1.900            | 6.120            | 1.970           | 0.880                | 1.250          | 0.250      | 2.750        | 4               | 0.880              | 4.500                       | 2.92      |
|                   | 48.30            | 155.4            | 50.00           | 22.40                | 31.75          | 6.400      | 69.85        |                 | 22.40              | 114.3                       |           |
| 2                 | 2.375            | 6.500            | 2.460           | 1.000                | 1.440          | 0.310      | 3.310        | 8               | 0.750              | 5.000                       | 3.55      |
|                   | 60.30            | 165.1            | 62.50           | 25.40                | 36.60          | 7.900      | 84.10        |                 | 19.10              | 127.0                       |           |
| 2 1/2             | 2.875            | 7.500            | 2.970           | 1.120                | 1.620          | 0.310      | 3.940        | 8               | 0.880              | 5.880                       | 5.23      |
|                   | 73.00            | 190.5            | 75.40           | 28.40                | 41.10          | 7.900      | 100.1        |                 | 22.40              | 149.4                       |           |
| 3                 | 3.500            | 8.250            | 3.600           | 1.125                | 1.810          | 0.380      | 4.620        | 8               | 0.880              | 6.620                       | 6.95      |
|                   | 88.90            | 209.6            | 91.40           | 31.75                | 46.00          | 9.700      | 117.3        |                 | 22.40              | 168.1                       |           |
| 3 1/2             | 4.000            | 9.000            | 4.100           | 1.380                | 1.940          | 0.380      | 5.250        | 8               | 1.000              | 7.250                       | 8.78      |
|                   | 101.6            | 228.6            | 104.1           | 35.10                | 49.30          | 9.700      | 133.4        |                 | 25.40              | 184.2                       |           |
| 4                 | 4.500            | 10.75            | 4.600           | 1.500                | 2.120          | 0.440      | 6.000        | 8               | 1.000              | 8.500                       | 14.4      |
|                   | 114.3            | 273.1            | 116.8           | 38.10                | 53.80          | 11.20      | 152.4        |                 | 25.40              | 215.9                       |           |
| 5                 | 5.563            | 13.00            | 5.690           | 1.750                | 2.380          | 0.440      | 7.440        | 8               | 1.120              | 10.50                       | 24.3      |
|                   | 141.3            | 330.2            | 114.5           | 44.50                | 60.45          | 11.20      | 189.0        |                 | 28.40              | 266.7                       |           |
| 6                 | 6.625            | 14.00            | 6.750           | 1.880                | 2.620          | 0.500      | 8.750        | 12              | 1.120              | 11.50                       | 28.5      |
|                   | 168.3            | 355.6            | 171.5           | 47.80                | 66.55          | 12.70      | 222.3        |                 | 28.40              | 292.1                       |           |
| 8                 | 8.625            | 16.50            | 8.750           | 2.190                | 3.000          | 0.500      | 10.75        | 12              | 1.250              | 13.75                       | 43.1      |
|                   | 219.1            | 419.1            | 222.3           | 55.60                | 76.20          | 12.70      | 273.1        |                 | 31.75              | 349.3                       |           |
| 10                | 10.75            | 20.00            | 10.92           | 2.500                | 4.380          | 0.500      | 13.50        | 16              | 1.380              | 17.00                       | 70.5      |
|                   | 273.0            | 508.0            | 277.4           | 63.50                | 111.3          | 12.70      | 342.9        |                 | 35.10              | 431.8                       |           |
| 12                | 12.75            | 22.00            | 12.92           | 2.620                | 4.620          | 0.500      | 15.75        | 20              | 1.380              | 19.25                       | 86.1      |
|                   | 323.8            | 558.8            | 328.2           | 66.55                | 117.3          | 12.70      | 400.1        |                 | 35.10              | 489.0                       |           |
| 14                | 14.00            | 23.75            | 14.18           | 2.750                | 5.000          | 0.500      | 17.00        | 20              | 1.500              | 20.75                       | 100       |
|                   | 355.6            | 603.3            | 360.2           | 69.85                | 127.0          | 12.70      | 431.8        |                 | 38.10              | 527.1                       |           |
| 16                | 16.00            | 27.00            | 16.19           | 3.000                | 5.500          | 0.500      | 19.50        | 20              | 1.620              | 23.75                       | 145       |
|                   | 406.4            | 685.8            | 411.2           | 76.20                | 139.7          | 12.70      | 495.3        |                 | 41.10              | 603.3                       |           |
| 18                | 18.00            | 29.25            | 18.20           | 3.250                | 6.000          | 0.500      | 21.50        | 20              | 1.750              | 25.75                       | 177       |
|                   | 457.2            | 743.0            | 462.3           | 82.60                | 152.4          | 12.70      | 546.1        |                 | 44.50              | 654.1                       |           |
| 20                | 20.00            | 32.00            | 20.25           | 3.500                | 6.500          | 0.500      | 24.00        | 24              | 1.750              | 28.50                       | 225       |
|                   | 508.0            | 812.8            | 514.4           | 88.90                | 165.1          | 12.70      | 609.6        |                 | 44.50              | 723.9                       |           |
| 24                | 24.00            | 37.00            | 24.25           | 4.000                | 7.250          | 0.500      | 28.25        | 24              | 2.000              | 33.00                       | 318       |
|                   | 609.6            | 939.8            | 616.0           | 101.6                | 184.2          | 12.70      | 717.6        |                 | 50.80              | 838.2                       |           |

Notes

- Weights are based on manufacturer's data and are approximate.
- For tolerances see page 8-4.

# Lap Joint Flanges - ANSI B16.5



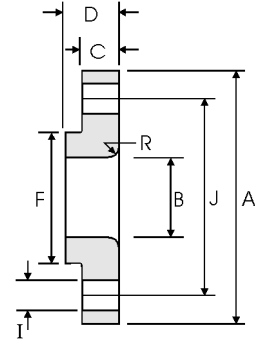
## Class 900 lb

| Nominal Pipe Size | Pipe             | Flange Data      |                 |                      |                | Lap        | Hub          | Drilling Data   |                    |                             | Weight    |
|-------------------|------------------|------------------|-----------------|----------------------|----------------|------------|--------------|-----------------|--------------------|-----------------------------|-----------|
|                   |                  | A                | B               | C                    | D              | R          | F            | H               | I                  | J                           |           |
|                   | Outside Diameter | Overall Diameter | Inside Diameter | Flange Thickness min | Overall Length | Lap Radius | Hub Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm           | in mm                | in mm          | in mm      | in mm        |                 | in mm              | in mm                       |           |
| 1/2               | 0.840            | 4.750            | 0.900           | 0.880                | 1.250          | 0.120      | 1.500        | 4               | 0.880              | 3.250                       | 1.71      |
|                   | 21.30            | 120.6            | 22.90           | 22.30                | 31.70          | 3.000      | 38.10        |                 | 22.30              | 82.50                       |           |
| 3/4               | 1.050            | 5.120            | 1.110           | 1.000                | 1.380          | 0.120      | 1.750        | 4               | 0.880              | 3.500                       | 2.30      |
|                   | 26.70            | 130.0            | 28.20           | 25.40                | 35.00          | 3.000      | 44.40        |                 | 22.30              | 88.90                       |           |
| 1                 | 1.315            | 5.880            | 1.380           | 1.120                | 1.620          | 0.120      | 2.060        | 4               | 1.000              | 4.000                       | 3.40      |
|                   | 33.40            | 149.3            | 35.10           | 28.40                | 41.10          | 3.000      | 52.30        |                 | 25.40              | 101.6                       |           |
| 1 1/4             | 1.660            | 6.250            | 1.720           | 1.120                | 1.620          | 0.190      | 2.500        | 4               | 1.000              | 4.380                       | 3.85      |
|                   | 42.20            | 158.7            | 43.70           | 28.40                | 41.10          | 4.800      | 63.50        |                 | 25.40              | 111.2                       |           |
| 1 1/2             | 1.900            | 7.000            | 1.970           | 1.250                | 1.750          | 0.250      | 2.750        | 4               | 1.120              | 4.880                       | 5.28      |
|                   | 48.30            | 177.8            | 50.00           | 31.70                | 44.40          | 6.400      | 69.85        |                 | 28.40              | 123.9                       |           |
| 2                 | 2.375            | 8.500            | 2.460           | 1.500                | 2.250          | 0.310      | 4.120        | 8               | 1.000              | 6.500                       | 9.78      |
|                   | 60.30            | 215.9            | 62.50           | 38.10                | 57.15          | 7.900      | 104.6        |                 | 25.40              | 165.1                       |           |
| 2 1/2             | 2.875            | 9.620            | 2.970           | 1.620                | 2.500          | 0.310      | 4.880        | 8               | 1.120              | 7.500                       | 13.6      |
|                   | 73.00            | 244.3            | 75.40           | 41.10                | 63.50          | 7.900      | 123.9        |                 | 28.40              | 190.5                       |           |
| 3                 | 3.500            | 9.500            | 3.600           | 1.500                | 2.120          | 0.380      | 5.000        | 8               | 1.000              | 7.500                       | 11.3      |
|                   | 88.90            | 241.3            | 91.40           | 38.10                | 53.80          | 9.700      | 127.0        |                 | 25.40              | 190.5                       |           |
| 4                 | 4.500            | 11.50            | 4.600           | 1.750                | 2.750          | 0.440      | 6.250        | 8               | 1.250              | 9.250                       | 19.2      |
|                   | 114.3            | 292.1            | 116.8           | 44.40                | 69.85          | 11.20      | 158.7        |                 | 31.70              | 234.9                       |           |
| 5                 | 5.563            | 13.75            | 5.690           | 2.000                | 3.120          | 0.440      | 7.500        | 8               | 1.380              | 11.00                       | 31.20     |
|                   | 141.3            | 349.2            | 114.5           | 50.80                | 79.25          | 11.20      | 190.5        |                 | 35.00              | 279.4                       |           |
| 6                 | 6.625            | 15.00            | 6.750           | 2.190                | 3.380          | 0.500      | 9.250        | 12              | 1.250              | 12.50                       | 40.50     |
|                   | 168.3            | 381.0            | 171.5           | 55.60                | 85.80          | 12.70      | 234.9        |                 | 31.70              | 317.5                       |           |
| 8                 | 8.625            | 18.50            | 8.750           | 2.500                | 4.500          | 0.500      | 11.75        | 12              | 1.500              | 15.50                       | 71.5      |
|                   | 219.1            | 469.9            | 222.3           | 63.50                | 114.3          | 12.70      | 298.4        |                 | 38.10              | 393.7                       |           |
| 10                | 10.75            | 21.50            | 10.92           | 2.750                | 5.000          | 0.500      | 14.50        | 16              | 1.500              | 18.50                       | 104       |
|                   | 273.0            | 546.1            | 277.4           | 69.85                | 127.0          | 12.70      | 368.3        |                 | 38.10              | 469.9                       |           |
| 12                | 12.75            | 24.00            | 12.92           | 3.120                | 5.620          | 0.500      | 16.50        | 20              | 1.500              | 21.00                       | 139       |
|                   | 323.8            | 609.6            | 328.2           | 79.25                | 142.7          | 12.70      | 419.1        |                 | 38.10              | 533.4                       |           |
| 14                | 14.00            | 25.25            | 14.18           | 3.380                | 6.120          | 0.500      | 17.75        | 20              | 1.620              | 22.00                       | 161       |
|                   | 355.6            | 641.3            | 360.2           | 85.80                | 155.4          | 12.70      | 450.8        |                 | 41.10              | 558.8                       |           |
| 16                | 16.00            | 27.75            | 16.19           | 3.500                | 6.500          | 0.500      | 20.00        | 20              | 1.750              | 24.25                       | 194       |
|                   | 406.4            | 704.8            | 411.2           | 88.90                | 165.1          | 12.70      | 508.0        |                 | 44.40              | 615.9                       |           |
| 18                | 18.00            | 31.00            | 18.20           | 4.000                | 7.500          | 0.500      | 22.25        | 20              | 2.000              | 27.00                       | 267       |
|                   | 457.2            | 787.4            | 462.3           | 101.6                | 190.5          | 12.70      | 565.1        |                 | 50.80              | 685.8                       |           |
| 20                | 20.00            | 33.75            | 20.25           | 4.250                | 8.250          | 0.500      | 24.50        | 20              | 2.120              | 29.50                       | 334       |
|                   | 508.0            | 857.2            | 514.4           | 107.9                | 209.5          | 12.70      | 622.3        |                 | 53.80              | 749.3                       |           |
| 24                | 24.00            | 41.00            | 24.25           | 50.50                | 10.50          | 0.500      | 29.50        | 20              | 2.620              | 35.50                       | 618       |
|                   | 609.6            | 1041.4           | 616.0           | 139.7                | 266.7          | 12.70      | 749.3        |                 | 66.55              | 901.7                       |           |

Notes

- Weights are based on manufacturer's data and are approximate.
- For tolerances see page 8-4.

# Lap Joint Flanges - ANSI B16.5



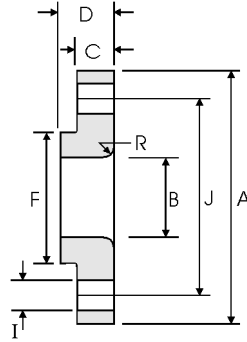
## Class 1500 lb

| Nominal Pipe Size | Pipe             | Flange Data      |                 |                      |                | Lap        | Hub          | Drilling Data   |                    |                             | Weight    |
|-------------------|------------------|------------------|-----------------|----------------------|----------------|------------|--------------|-----------------|--------------------|-----------------------------|-----------|
|                   |                  | A                | B               | C                    | D              | R          | F            | H               | I                  | J                           |           |
|                   | Outside Diameter | Overall Diameter | Inside Diameter | Flange Thickness min | Overall Length | Lap Radius | Hub Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm           | in mm                | in mm          | in mm      | in mm        |                 | in mm              | in mm                       |           |
| 1/2               | 0.840            | 4.750            | 0.900           | 0.880                | 1.250          | 0.120      | 1.500        | 4               | 0.880              | 3.250                       | 1.71      |
|                   | 21.30            | 120.6            | 22.90           | 22.30                | 31.70          | 3.000      | 38.10        |                 | 22.30              | 82.50                       |           |
| 3/4               | 1.050            | 5.120            | 1.110           | 1.000                | 1.380          | 0.120      | 1.750        | 4               | 0.880              | 3.500                       | 2.30      |
|                   | 26.70            | 130.0            | 28.20           | 25.40                | 35.00          | 3.000      | 44.40        |                 | 22.30              | 88.90                       |           |
| 1                 | 1.315            | 5.880            | 1.380           | 1.120                | 1.620          | 0.120      | 2.060        | 4               | 1.000              | 4.000                       | 3.40      |
|                   | 33.40            | 149.3            | 35.10           | 28.40                | 41.10          | 3.000      | 52.30        |                 | 25.40              | 101.6                       |           |
| 1 1/4             | 1.660            | 6.250            | 1.720           | 1.120                | 1.620          | 0.190      | 2.500        | 4               | 1.000              | 4.380                       | 3.85      |
|                   | 42.20            | 158.7            | 43.70           | 28.40                | 41.10          | 4.800      | 63.50        |                 | 25.40              | 111.2                       |           |
| 1 1/2             | 1.900            | 7.000            | 1.970           | 1.250                | 1.750          | 0.250      | 2.750        | 4               | 1.120              | 4.880                       | 5.28      |
|                   | 48.30            | 177.8            | 50.00           | 31.70                | 44.40          | 6.400      | 69.85        |                 | 28.40              | 123.9                       |           |
| 2                 | 2.375            | 8.500            | 2.460           | 1.500                | 2.250          | 0.310      | 4.120        | 8               | 1.000              | 6.500                       | 9.78      |
|                   | 60.30            | 215.9            | 62.50           | 38.10                | 57.15          | 7.900      | 104.6        |                 | 25.40              | 165.1                       |           |
| 2 1/2             | 2.875            | 9.620            | 2.970           | 1.620                | 2.500          | 0.310      | 4.880        | 8               | 1.120              | 7.500                       | 13.6      |
|                   | 73.00            | 244.3            | 75.40           | 41.10                | 63.50          | 7.900      | 123.9        |                 | 28.40              | 190.5                       |           |
| 3                 | 3.500            | 10.50            | 3.600           | 1.880                | 2.880          | 0.380      | 5.250        | 8               | 1.250              | 8.000                       | 17.8      |
|                   | 88.90            | 266.7            | 91.40           | 47.70                | 73.15          | 9.700      | 133.3        |                 | 31.70              | 203.2                       |           |
| 4                 | 4.500            | 12.25            | 4.600           | 2.120                | 3.560          | 0.440      | 6.380        | 8               | 1.380              | 9.500                       | 27.5      |
|                   | 114.3            | 311.1            | 116.8           | 53.80                | 90.40          | 11.20      | 162.0        |                 | 35.00              | 241.3                       |           |
| 5                 | 5.563            | 14.75            | 5.690           | 2.880                | 4.120          | 0.440      | 7.750        | 8               | 1.620              | 11.50                       | 51.5      |
|                   | 141.3            | 374.6            | 114.5           | 73.15                | 104.6          | 11.20      | 196.8        |                 | 41.10              | 292.1                       |           |
| 6                 | 6.625            | 15.50            | 6.750           | 3.250                | 4.690          | 0.500      | 9.000        | 12              | 1.500              | 12.50                       | 62.0      |
|                   | 168.3            | 399.7            | 171.5           | 82.50                | 119.1          | 12.70      | 228.6        |                 | 38.10              | 317.5                       |           |
| 8                 | 8.625            | 19.00            | 8.750           | 3.620                | 5.620          | 0.500      | 11.50        | 12              | 1.750              | 15.50                       | 105       |
|                   | 219.1            | 482.6            | 222.3           | 91.90                | 142.7          | 12.70      | 292.1        |                 | 44.40              | 393.7                       |           |
| 10                | 10.75            | 23.00            | 10.92           | 4.250                | 7.000          | 0.500      | 14.50        | 12              | 2.000              | 19.00                       | 179       |
|                   | 273.0            | 584.2            | 277.4           | 107.9                | 177.8          | 12.70      | 368.3        |                 | 50.80              | 482.6                       |           |
| 12                | 12.75            | 26.50            | 12.92           | 4.880                | 8.620          | 0.500      | 17.75        | 16              | 2.120              | 22.50                       | 269       |
|                   | 323.8            | 673.1            | 328.2           | 123.9                | 218.9          | 12.70      | 450.8        |                 | 53.80              | 571.5                       |           |
| 14                | 14.00            | 29.50            | 14.18           | 5.250                | 9.500          | 0.500      | 19.50        | 16              | 2.380              | 25.00                       | 365       |
|                   | 355.6            | 749.3            | 360.2           | 133.3                | 241.3          | 12.70      | 495.3        |                 | 60.45              | 635.0                       |           |
| 16                | 16.00            | 32.50            | 16.19           | 5.750                | 10.25          | 0.500      | 21.75        | 16              | 2.620              | 27.75                       | 459       |
|                   | 406.4            | 825.5            | 411.2           | 146.0                | 260.3          | 12.70      | 552.4        |                 | 66.55              | 704.8                       |           |
| 18                | 18.00            | 36.00            | 18.20           | 6.380                | 10.88          | 0.500      | 23.50        | 16              | 2.880              | 30.50                       | 598       |
|                   | 457.2            | 914.4            | 462.3           | 162.0                | 276.3          | 12.70      | 596.9        |                 | 73.15              | 774.7                       |           |
| 20                | 20.00            | 38.75            | 20.25           | 7.000                | 11.50          | 0.500      | 25.25        | 16              | 3.120              | 32.75                       | 712       |
|                   | 508.0            | 984.2            | 514.4           | 177.8                | 292.1          | 12.70      | 641.3        |                 | 79.25              | 831.8                       |           |
| 24                | 24.00            | 46.00            | 24.25           | 8.000                | 13.00          | 0.500      | 30.00        | 16              | 3.620              | 39.00                       | 1090      |
|                   | 609.6            | 1168.4           | 616.0           | 203.2                | 330.2          | 12.70      | 762.0        |                 | 91.90              | 990.6                       |           |

Notes

- Weights are based on manufacturer's data and are approximate.
- For tolerances see page 8-4.

# Lap Joint Flanges - ANSI B16.5



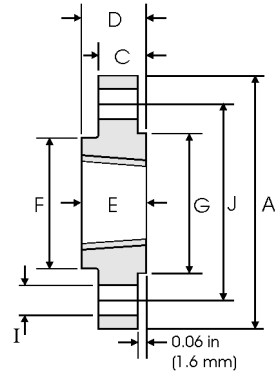
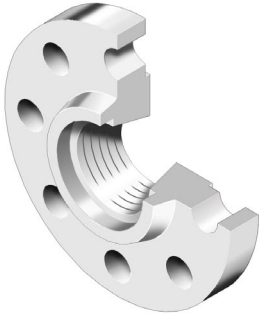
## Class 2500 lb

| Nominal Pipe Size | Pipe             | Flange Data      |                 |                      |                | Lap        | Hub          | Drilling Data   |                    |                             | Weight    |
|-------------------|------------------|------------------|-----------------|----------------------|----------------|------------|--------------|-----------------|--------------------|-----------------------------|-----------|
|                   |                  | A                | B               | C                    | D              | R          | F            | H               | I                  | J                           |           |
|                   | Outside Diameter | Overall Diameter | Inside Diameter | Flange Thickness min | Overall Length | Lap Radius | Hub Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm           | in mm                | in mm          | in mm      | in mm        |                 | in mm              | in mm                       |           |
| 1/2               | 0.840            | 5.255            | 0.900           | 1.190                | 1.560          | 0.120      | 1.690        | 4               | 0.880              | 3.500                       | 2.92      |
|                   | 21.30            | 133.4            | 22.90           | 30.20                | 39.60          | 3.000      | 42.90        |                 | 22.40              | 88.90                       |           |
| 3/4               | 1.050            | 5.500            | 1.110           | 1.250                | 1.690          | 0.120      | 2.000        | 4               | 0.880              | 3.750                       | 3.40      |
|                   | 26.70            | 139.7            | 28.20           | 31.75                | 42.90          | 3.000      | 50.80        |                 | 22.40              | 95.30                       |           |
| 1                 | 1.315            | 6.250            | 1.380           | 1.380                | 1.880          | 0.120      | 2.250        | 4               | 1.000              | 4.250                       | 4.77      |
|                   | 33.40            | 158.8            | 35.10           | 35.10                | 47.80          | 3.000      | 57.15        |                 | 25.40              | 108.0                       |           |
| 1 1/4             | 1.660            | 7.250            | 1.720           | 1.500                | 2.060          | 0.190      | 2.880        | 4               | 1.120              | 5.120                       | 7.08      |
|                   | 42.20            | 184.2            | 43.70           | 38.10                | 52.30          | 4.800      | 73.15        |                 | 28.40              | 130.0                       |           |
| 1 1/2             | 1.900            | 8.000            | 1.970           | 1.750                | 2.380          | 0.250      | 3.120        | 4               | 1.250              | 5.750                       | 9.93      |
|                   | 48.30            | 203.2            | 50.00           | 44.50                | 60.45          | 6.400      | 79.25        |                 | 31.75              | 146.1                       |           |
| 2                 | 2.375            | 9.250            | 2.460           | 2.000                | 2.750          | 0.310      | 3.750        | 8               | 1.120              | 6.750                       | 14.7      |
|                   | 60.30            | 235.0            | 62.50           | 50.80                | 69.85          | 7.900      | 95.30        |                 | 28.40              | 171.5                       |           |
| 2 1/2             | 2.875            | 10.50            | 2.970           | 2.250                | 3.120          | 0.310      | 4.500        | 8               | 1.250              | 7.750                       | 21.3      |
|                   | 73.00            | 266.7            | 75.40           | 57.15                | 79.25          | 7.900      | 114.3        |                 | 31.75              | 196.9                       |           |
| 3                 | 3.500            | 12.00            | 3.600           | 2.620                | 3.620          | 0.380      | 5.250        | 8               | 1.380              | 9.000                       | 32.3      |
|                   | 88.90            | 304.8            | 91.40           | 66.55                | 91.90          | 9.700      | 133.4        |                 | 35.10              | 228.6                       |           |
| 4                 | 4.500            | 14.00            | 4.600           | 3.000                | 4.250          | 0.440      | 6.500        | 8               | 1.620              | 10.75                       | 52.5      |
|                   | 114.3            | 355.6            | 116.8           | 76.20                | 108.0          | 11.20      | 165.1        |                 | 41.10              | 273.1                       |           |
| 5                 | 5.563            | 16.50            | 5.690           | 3.620                | 5.120          | 0.440      | 8.000        | 8               | 1.880              | 12.75                       | 82.6      |
|                   | 141.3            | 419.1            | 114.5           | 91.90                | 130.0          | 11.20      | 203.2        |                 | 47.80              | 323.9                       |           |
| 6                 | 6.625            | 19.00            | 6.750           | 4.250                | 6.000          | 0.500      | 9.250        | 8               | 2.120              | 14.50                       | 127       |
|                   | 168.3            | 482.6            | 171.5           | 108.0                | 152.4          | 12.70      | 235.0        |                 | 53.80              | 368.3                       |           |
| 8                 | 8.625            | 21.75            | 8.750           | 5.000                | 7.000          | 0.500      | 12.00        | 12              | 2.120              | 17.25                       | 186       |
|                   | 219.1            | 552.5            | 222.3           | 127.0                | 177.8          | 12.70      | 304.8        |                 | 53.80              | 438.2                       |           |
| 10                | 10.75            | 26.50            | 10.92           | 6.500                | 9.000          | 0.500      | 14.75        | 12              | 2.620              | 21.25                       | 352       |
|                   | 273.0            | 673.1            | 277.4           | 165.1                | 228.6          | 12.70      | 374.7        |                 | 66.55              | 539.8                       |           |
| 12                | 12.75            | 30.00            | 12.92           | 7.250                | 10.00          | 0.500      | 17.38        | 12              | 2.880              | 24.38                       | 501       |
|                   | 323.8            | 762.0            | 328.2           | 184.2                | 254.0          | 12.70      | 441.5        |                 | 73.15              | 619.3                       |           |

Notes

- Weights are based on manufacturer's data and are approximate.
- For tolerances see page 8-4.

# Threaded Flanges - ANSI B16.5



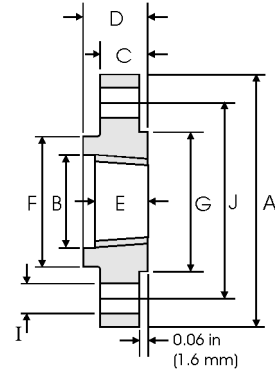
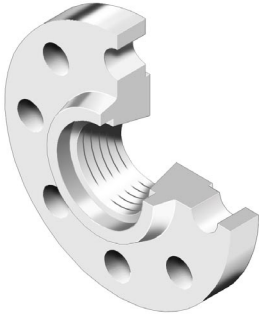
## Class 150 lb

| Pipe              |                  | Flange Data      |                      |                |                     | Hub            | Raised Face    | Drilling Data   |                    |                             | Weight    |
|-------------------|------------------|------------------|----------------------|----------------|---------------------|----------------|----------------|-----------------|--------------------|-----------------------------|-----------|
| Nominal Pipe Size |                  | <b>A</b>         | <b>C</b>             | <b>D</b>       | <b>E</b>            | <b>F</b>       | <b>G</b>       | <b>H</b>        | <b>I</b>           | <b>J</b>                    |           |
|                   | Outside Diameter | Overall Diameter | Flange Thickness min | Overall Length | Threaded length min | Hub Diameter   | Face Diameter  | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm                | in mm          | in mm               | in mm          | in mm          |                 | in mm              | in mm                       |           |
| 1/2               | 0.840<br>21.30   | 3.500<br>88.90   | 0.440<br>11.20       | 0.620<br>15.70 | 0.620<br>15.70      | 1.190<br>30.20 | 1.380<br>35.10 | 4               | 0.620<br>15.70     | 2.380<br>60.45              | 0.39      |
| 3/4               | 1.050<br>26.70   | 3.880<br>98.60   | 0.500<br>12.70       | 0.620<br>15.70 | 0.620<br>15.70      | 1.500<br>38.10 | 1.690<br>42.90 | 4               | 0.620<br>15.70     | 2.750<br>69.85              | 0.56      |
| 1                 | 1.315<br>33.40   | 4.250<br>108.0   | 0.560<br>14.20       | 0.690<br>17.50 | 0.690<br>17.50      | 1.940<br>49.30 | 2.000<br>50.80 | 4               | 0.620<br>15.70     | 3.120<br>79.25              | 0.78      |
| 1 1/4             | 1.660<br>42.20   | 4.620<br>117.3   | 0.620<br>15.70       | 0.810<br>20.60 | 0.810<br>20.60      | 2.310<br>58.70 | 2.500<br>63.50 | 4               | 0.620<br>15.70     | 3.500<br>88.90              | 1.03      |
| 1 1/2             | 1.900<br>48.30   | 5.000<br>127.0   | 0.690<br>17.50       | 0.880<br>22.40 | 0.880<br>22.30      | 2.560<br>65.00 | 2.880<br>73.15 | 4               | 0.620<br>15.70     | 3.880<br>98.60              | 1.32      |
| 2                 | 2.375<br>60.30   | 6.000<br>152.4   | 0.750<br>19.10       | 1.000<br>25.40 | 1.000<br>25.40      | 3.060<br>77.70 | 3.620<br>91.90 | 4               | 0.750<br>19.10     | 4.750<br>120.7              | 2.06      |
| 2 1/2             | 2.875<br>73.00   | 7.000<br>177.8   | 0.880<br>22.40       | 1.120<br>28.40 | 1.120<br>28.40      | 3.560<br>90.40 | 4.120<br>104.6 | 4               | 0.750<br>19.10     | 5.500<br>139.7              | 3.28      |
| 3                 | 3.500<br>88.90   | 7.500<br>190.5   | 0.940<br>23.90       | 1.190<br>30.20 | 1.190<br>30.20      | 4.250<br>108.0 | 5.000<br>127.0 | 4               | 0.750<br>19.10     | 6.000<br>152.4              | 3.85      |
| 3 1/2             | 4.000<br>101.6   | 8.500<br>215.9   | 0.940<br>23.90       | 1.250<br>31.75 | 1.250<br>31.75      | 4.810<br>122.2 | 5.500<br>139.7 | 8               | 0.750<br>19.10     | 7.000<br>177.8              | 4.81      |
| 4                 | 4.500<br>114.3   | 9.000<br>228.6   | 0.940<br>23.90       | 1.310<br>33.30 | 1.310<br>33.30      | 5.310<br>134.9 | 6.190<br>157.2 | 8               | 0.750<br>19.10     | 7.500<br>190.5              | 5.30      |
| 5                 | 5.563<br>141.3   | 10.00<br>254.0   | 0.940<br>23.90       | 1.440<br>36.60 | 1.440<br>36.60      | 6.440<br>163.6 | 7.310<br>185.7 | 8               | 0.880<br>22.40     | 8.500<br>215.9              | 6.07      |
| 6                 | 6.625<br>168.3   | 11.00<br>279.4   | 1.000<br>25.40       | 1.560<br>39.60 | 1.560<br>39.60      | 7.560<br>192.0 | 8.500<br>215.9 | 8               | 0.880<br>22.40     | 9.500<br>241.3              | 7.45      |
| 8                 | 8.625<br>219.1   | 13.50<br>342.9   | 1.120<br>28.40       | 1.750<br>44.50 | 1.750<br>44.50      | 9.690<br>246.1 | 10.62<br>269.7 | 8               | 0.880<br>22.40     | 11.75<br>298.5              | 12.1      |
| 10                | 10.75<br>273.0   | 16.00<br>406.4   | 1.190<br>30.20       | 1.940<br>49.30 | 1.940<br>49.30      | 12.00<br>304.8 | 12.75<br>323.9 | 12              | 1.000<br>25.40     | 14.25<br>362.0              | 16.5      |
| 12                | 12.75<br>323.8   | 19.00<br>482.6   | 1.250<br>31.75       | 2.190<br>55.60 | 2.190<br>55.60      | 14.38<br>365.3 | 15.00<br>381.0 | 12              | 1.000<br>25.40     | 17.00<br>431.8              | 26.2      |
| 14                | 14.00<br>355.6   | 21.00<br>533.4   | 1.380<br>35.10       | 2.250<br>57.15 | 2.250<br>57.15      | 15.75<br>400.1 | 16.25<br>412.7 | 12              | 1.120<br>28.40     | 18.75<br>476.3              | 34.6      |
| 16                | 16.00<br>406.4   | 23.50<br>596.9   | 1.440<br>36.60       | 2.500<br>63.50 | 2.500<br>63.50      | 18.00<br>457.2 | 18.50<br>469.9 | 16              | 1.120<br>28.40     | 21.25<br>539.8              | 44.8      |
| 18                | 18.00<br>457.2   | 25.00<br>635.0   | 1.560<br>39.60       | 2.690<br>68.30 | 2.690<br>68.30      | 19.88<br>505.0 | 21.00<br>533.4 | 16              | 1.250<br>31.75     | 22.75<br>577.9              | 48.9      |
| 20                | 20.00<br>508.0   | 27.50<br>698.5   | 1.690<br>42.90       | 2.880<br>73.15 | 2.880<br>73.15      | 22.00<br>558.8 | 23.00<br>584.2 | 20              | 1.250<br>31.75     | 25.00<br>635.0              | 61.9      |
| 24                | 24.00<br>609.6   | 32.00<br>812.8   | 1.880<br>47.80       | 3.250<br>82.60 | 3.250<br>82.60      | 26.12<br>663.4 | 27.25<br>692.2 | 20              | 1.380<br>35.10     | 29.50<br>749.3              | 86.9      |

Notes

- The thread conforms to ASME B1.20.1 NTP threads as described in Section 10. (The only exceptions are small male and female plain face threaded flanges which use NPSL recount threads.)
- Class 150 threaded flanges are made without a counterbore. Threads are chamfered to the major diameter (approx.) at an angle of 45° (approx.) at the back of the flange.
- Weights are based on manufacturer's data and are approximate.
- For tolerances see page 8-4.

# Threaded Flanges - ANSI B16.5



## Class 300 lb

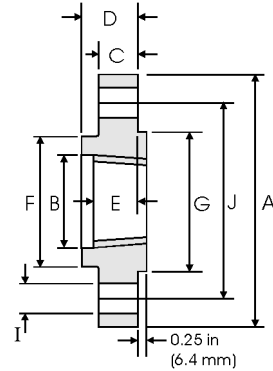
| Pipe              |                  | Flange Data      |                  |                      |                |                     | Hub          | Raised Face   | Drilling Data   |                    |                             | Weight    |
|-------------------|------------------|------------------|------------------|----------------------|----------------|---------------------|--------------|---------------|-----------------|--------------------|-----------------------------|-----------|
| Nominal Pipe Size |                  | A                | B                | C                    | D              | E                   | F            | G             | H               | I                  | J                           |           |
|                   | Outside Diameter | Overall Diameter | Counter-bore min | Flange Thickness min | Overall Length | Threaded length min | Hub Diameter | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm            | in mm                | in mm          | in mm               | in mm        | in mm         |                 |                    |                             |           |
| 1/2               | 0.840            | 3.750            | 0.930            | 0.560                | 0.880          | 0.620               | 1.500        | 1.380         | 4               | 0.620              | 2.620                       | 0.64      |
|                   | 21.30            | 95.20            | 23.60            | 14.20                | 22.30          | 15.70               | 38.10        | 35.00         |                 |                    |                             |           |
| 3/4               | 1.050            | 4.620            | 1.140            | 0.620                | 1.000          | 0.620               | 1.880        | 1.690         | 4               | 0.750              | 3.250                       | 1.12      |
|                   | 26.70            | 117.3            | 29.00            | 15.70                | 25.40          | 15.70               | 47.70        | 42.90         |                 |                    |                             |           |
| 1                 | 1.315            | 4.880            | 1.410            | 0.690                | 1.060          | 0.690               | 2.120        | 2.000         | 4               | 0.750              | 3.500                       | 1.36      |
|                   | 33.40            | 123.9            | 35.80            | 17.50                | 26.90          | 17.50               | 53.80        | 50.80         |                 |                    |                             |           |
| 1 1/4             | 1.660            | 5.250            | 1.750            | 0.750                | 1.060          | 0.810               | 2.500        | 2.500         | 4               | 0.750              | 3.880                       | 1.68      |
|                   | 42.20            | 133.3            | 44.40            | 19.00                | 26.90          | 20.60               | 63.50        | 63.50         |                 |                    |                             |           |
| 1 1/2             | 1.900            | 6.120            | 1.980            | 0.810                | 1.190          | 0.880               | 2.750        | 2.880         | 4               | 0.880              | 4.500                       | 2.49      |
|                   | 48.30            | 155.4            | 50.50            | 20.60                | 30.20          | 22.30               | 69.85        | 73.15         |                 |                    |                             |           |
| 2                 | 2.375            | 6.500            | 2.500            | 0.880                | 1.310          | 1.120               | 3.310        | 3.620         | 8               | 0.750              | 5.000                       | 2.87      |
|                   | 60.30            | 165.1            | 63.50            | 22.30                | 33.20          | 28.40               | 84.00        | 91.90         |                 |                    |                             |           |
| 2 1/2             | 2.875            | 7.500            | 3.000            | 1.000                | 1.500          | 1.250               | 3.940        | 4.120         | 8               | 0.880              | 5.880                       | 4.32      |
|                   | 73.00            | 190.5            | 76.20            | 25.40                | 38.10          | 31.70               | 100.0        | 104.6         |                 |                    |                             |           |
| 3                 | 3.500            | 8.250            | 3.630            | 1.120                | 1.690          | 1.250               | 4.620        | 5.000         | 8               | 0.880              | 6.620                       | 5.85      |
|                   | 88.90            | 209.5            | 92.20            | 28.40                | 42.90          | 31.70               | 117.3        | 127.0         |                 |                    |                             |           |
| 3 1/2             | 4.000            | 9.000            | 4.130            | 1.190                | 1.750          | 1.440               | 5.250        | 5.500         | 8               | 0.880              | 7.250                       | 7.34      |
|                   | 101.6            | 228.6            | 104.9            | 30.20                | 44.40          | 36.50               | 133.3        | 139.7         |                 |                    |                             |           |
| 4                 | 4.500            | 10.00            | 4.630            | 1.250                | 1.880          | 1.440               | 5.750        | 6.190         | 8               | 0.880              | 7.880                       | 9.61      |
|                   | 114.3            | 254.0            | 117.6            | 31.70                | 47.70          | 36.50               | 146.0        | 157.2         |                 |                    |                             |           |
| 5                 | 5.563            | 11.00            | 5.690            | 1.380                | 2.000          | 1.690               | 7.000        | 7.310         | 8               | 0.880              | 9.250                       | 12.3      |
|                   | 141.3            | 279.4            | 144.5            | 35.00                | 50.80          | 42.90               | 177.8        | 185.7         |                 |                    |                             |           |
| 6                 | 6.625            | 12.50            | 6.750            | 1.440                | 2.060          | 1.810               | 8.120        | 8.500         | 12              | 0.880              | 10.62                       | 15.6      |
|                   | 168.3            | 317.5            | 171.4            | 36.50                | 52.30          | 45.90               | 206.2        | 215.9         |                 |                    |                             |           |
| 8                 | 8.625            | 15.00            | 8.750            | 1.620                | 2.440          | 2.000               | 10.25        | 10.62         | 12              | 1.000              | 13.00                       | 24.2      |
|                   | 219.1            | 381.0            | 222.2            | 41.10                | 61.90          | 50.80               | 260.3        | 269.7         |                 |                    |                             |           |
| 10                | 10.75            | 17.50            | 10.88            | 1.880                | 2.620          | 2.190               | 12.62        | 12.75         | 16              | 1.120              | 15.25                       | 34.1      |
|                   | 273.0            | 444.5            | 276.3            | 47.70                | 66.55          | 55.60               | 320.5        | 323.9         |                 |                    |                             |           |
| 12                | 12.75            | 20.50            | 12.94            | 2.000                | 2.880          | 2.380               | 14.75        | 15.00         | 16              | 1.250              | 17.75                       | 49.8      |
|                   | 323.8            | 520.7            | 328.7            | 50.80                | 73.15          | 60.45               | 374.6        | 381.0         |                 |                    |                             |           |
| 14                | 14.00            | 23.00            | 14.19            | 2.120                | 3.000          | 2.500               | 16.75        | 16.25         | 20              | 1.250              | 20.25                       | 69.9      |
|                   | 355.6            | 584.2            | 360.4            | 53.80                | 76.20          | 63.50               | 425.4        | 412.7         |                 |                    |                             |           |
| 16                | 16.00            | 25.50            | 16.19            | 2.250                | 3.250          | 2.690               | 19.00        | 18.50         | 20              | 1.380              | 22.50                       | 88.1      |
|                   | 406.4            | 647.7            | 411.2            | 57.15                | 82.50          | 68.30               | 482.6        | 469.9         |                 |                    |                             |           |
| 18                | 18.00            | 28.00            | 18.19            | 2.380                | 3.500          | 2.750               | 21.00        | 21.00         | 24              | 1.380              | 24.75                       | 109       |
|                   | 457.2            | 711.2            | 462.0            | 60.45                | 88.90          | 69.85               | 533.4        | 533.4         |                 |                    |                             |           |
| 20                | 20.00            | 30.50            | 20.19            | 2.500                | 3.750          | 2.880               | 23.12        | 23.00         | 24              | 1.380              | 27.00                       | 134       |
|                   | 508.0            | 774.7            | 512.8            | 63.50                | 95.2           | 73.15               | 587.2        | 584.2         |                 |                    |                             |           |
| 24                | 24.00            | 36.00            | 24.19            | 2.750                | 4.190          | 3.250               | 27.62        | 27.25         | 24              | 1.620              | 32.00                       | 201       |
|                   | 609.6            | 914.4            | 614.4            | 69.85                | 106.4          | 82.50               | 701.5        | 692.2         |                 |                    |                             |           |

Notes

- The thread conforms to ASME B1.20.1 NTP threads as described in Section 10. (The only exceptions are small male and female plain face threaded flanges which use NPSL locknut threads.)
- Class 300 and higher threaded flanges are counter-bored. Threads are chamfered to the counterbore at an angle of 45° (approx).
- Weights are based on manufacturer's data and are approximate.
- For tolerances see page 8-4.



# Threaded Flanges - ANSI B16.5



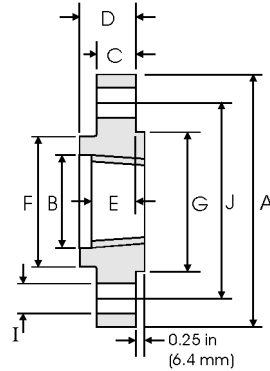
## Class 400 lb

| Pipe              |                  | Flange Data      |                  |                      |                |                     | Hub          | Raised Face   | Drilling Data   |                    |                             | Weight    |
|-------------------|------------------|------------------|------------------|----------------------|----------------|---------------------|--------------|---------------|-----------------|--------------------|-----------------------------|-----------|
| Nominal Pipe Size |                  | A                | B                | C                    | D              | E                   | F            | G             | H               | I                  | J                           |           |
|                   | Outside Diameter | Overall Diameter | Counter-bore min | Flange Thickness min | Overall Length | Threaded length min | Hub Diameter | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm            | in mm                | in mm          | in mm               | in mm        | in mm         |                 | in mm              | in mm                       |           |
| 1/2               | 0.840            | 3.750            | 0.930            | 0.560                | 0.880          | 0.620               | 1.500        | 1.380         | 4               | 0.620              | 2.620                       | 0.74      |
|                   | 21.30            | 95.30            | 23.60            | 14.20                | 22.40          | 15.70               | 38.10        | 35.10         |                 | 15.70              | 66.55                       |           |
| 3/4               | 1.050            | 4.620            | 1.140            | 0.620                | 1.000          | 0.620               | 1.880        | 1.690         | 4               | 0.750              | 3.250                       | 1.27      |
|                   | 26.70            | 117.3            | 29.00            | 15.70                | 25.40          | 15.70               | 47.80        | 42.90         |                 | 19.10              | 82.60                       |           |
| 1                 | 1.315            | 4.880            | 1.410            | 0.690                | 1.060          | 0.690               | 2.120        | 2.000         | 4               | 0.750              | 3.500                       | 1.52      |
|                   | 33.40            | 124.0            | 35.80            | 17.50                | 26.90          | 17.50               | 53.80        | 50.80         |                 | 19.10              | 88.90                       |           |
| 1 1/4             | 1.660            | 5.250            | 1.750            | 0.810                | 1.120          | 0.810               | 2.500        | 2.500         | 4               | 0.750              | 3.880                       | 2.03      |
|                   | 42.20            | 133.4            | 44.50            | 20.60                | 28.40          | 20.60               | 63.50        | 63.50         |                 | 19.10              | 98.60                       |           |
| 1 1/2             | 1.900            | 6.120            | 1.990            | 0.880                | 1.250          | 0.880               | 2.750        | 2.880         | 4               | 0.880              | 4.500                       | 2.96      |
|                   | 48.30            | 155.4            | 50.50            | 22.40                | 31.75          | 22.40               | 69.85        | 73.15         |                 | 22.40              | 114.3                       |           |
| 2                 | 2.375            | 6.500            | 2.500            | 1.000                | 1.440          | 1.120               | 3.310        | 3.620         | 8               | 0.750              | 5.000                       | 3.62      |
|                   | 60.30            | 165.1            | 63.50            | 25.40                | 36.60          | 28.40               | 84.10        | 91.90         |                 | 19.10              | 127.0                       |           |
| 2 1/2             | 2.875            | 7.500            | 3.000            | 1.120                | 1.620          | 1.250               | 3.940        | 4.120         | 8               | 0.880              | 5.880                       | 5.28      |
|                   | 73.00            | 190.5            | 76.20            | 28.40                | 41.10          | 31.75               | 100.1        | 104.6         |                 | 22.40              | 149.4                       |           |
| 3                 | 3.500            | 8.250            | 3.630            | 1.250                | 1.810          | 1.380               | 4.620        | 5.000         | 8               | 0.880              | 6.620                       | 7.00      |
|                   | 88.90            | 209.6            | 92.20            | 31.75                | 46.00          | 35.10               | 117.3        | 127.0         |                 | 22.40              | 168.1                       |           |
| 3 1/2             | 4.000            | 9.000            | 4.130            | 1.380                | 1.940          | 1.560               | 5.250        | 5.500         | 8               | 1.000              | 7.250                       | 8.84      |
|                   | 101.6            | 228.6            | 104.9            | 35.10                | 49.30          | 39.60               | 133.4        | 139.7         |                 | 25.40              | 184.2                       |           |
| 4                 | 4.500            | 10.00            | 4.630            | 1.380                | 2.000          | 1.440               | 5.750        | 6.190         | 8               | 1.000              | 7.880                       | 11.1      |
|                   | 114.3            | 254.0            | 117.6            | 35.10                | 50.80          | 36.60               | 146.1        | 157.2         |                 | 25.40              | 200.2                       |           |
| 5                 | 5.563            | 11.00            | 5.690            | 1.500                | 2.120          | 1.690               | 7.000        | 7.310         | 8               | 1.000              | 9.250                       | 13.9      |
|                   | 141.3            | 279.4            | 144.5            | 38.10                | 53.80          | 42.90               | 177.8        | 185.7         |                 | 25.40              | 235.0                       |           |
| 6                 | 6.625            | 12.50            | 6.750            | 1.620                | 2.250          | 1.810               | 8.120        | 8.500         | 12              | 1.000              | 10.62                       | 18.3      |
|                   | 168.3            | 317.5            | 171.5            | 41.10                | 57.15          | 46.00               | 206.2        | 215.9         |                 | 25.40              | 269.7                       |           |
| 8                 | 8.625            | 15.00            | 8.750            | 1.880                | 2.690          | 2.000               | 10.25        | 10.62         | 12              | 1.120              | 13.00                       | 28.6      |
|                   | 219.1            | 381.0            | 222.3            | 47.80                | 68.30          | 50.80               | 260.4        | 269.7         |                 | 28.40              | 330.2                       |           |
| 10                | 10.75            | 17.50            | 10.88            | 2.120                | 2.880          | 2.190               | 12.62        | 12.75         | 16              | 1.250              | 15.25                       | 39.2      |
|                   | 273.0            | 444.5            | 276.4            | 53.80                | 73.15          | 55.60               | 320.5        | 323.9         |                 | 31.75              | 387.4                       |           |
| 12                | 12.75            | 20.50            | 12.94            | 2.250                | 3.120          | 2.380               | 14.75        | 15.00         | 16              | 1.380              | 17.75                       | 57.0      |
|                   | 323.8            | 520.7            | 328.7            | 57.15                | 79.25          | 60.45               | 374.7        | 381.0         |                 | 35.10              | 450.9                       |           |
| 14                | 14.00            | 23.00            | 14.19            | 2.380                | 3.310          | 2.500               | 16.75        | 16.25         | 20              | 1.380              | 20.25                       | 79.1      |
|                   | 355.6            | 584.2            | 360.4            | 60.45                | 84.10          | 63.50               | 425.5        | 412.8         |                 | 35.10              | 514.4                       |           |
| 16                | 16.00            | 25.50            | 16.19            | 2.500                | 3.690          | 2.690               | 19.00        | 18.50         | 20              | 1.500              | 22.50                       | 101       |
|                   | 406.4            | 647.7            | 411.2            | 63.50                | 93.70          | 68.30               | 482.6        | 469.9         |                 | 38.10              | 571.5                       |           |
| 18                | 18.00            | 28.00            | 18.19            | 2.620                | 3.880          | 2.750               | 21.00        | 21.00         | 24              | 1.500              | 24.75                       | 123       |
|                   | 457.2            | 711.2            | 462.0            | 66.55                | 98.60          | 69.85               | 533.4        | 533.4         |                 | 38.10              | 628.7                       |           |
| 20                | 20.00            | 30.50            | 20.19            | 2.750                | 4.000          | 2.880               | 23.12        | 23.00         | 24              | 1.620              | 27.00                       | 146       |
|                   | 508.0            | 774.7            | 512.8            | 69.85                | 101.6          | 73.15               | 587.2        | 584.2         |                 | 41.10              | 685.8                       |           |
| 24                | 24.00            | 36.00            | 24.19            | 3.000                | 4.500          | 3.250               | 27.62        | 27.25         | 24              | 1.880              | 32.00                       | 219       |
|                   | 609.6            | 914.4            | 614.4            | 76.20                | 114.3          | 82.60               | 701.5        | 692.2         |                 | 47.80              | 812.8                       |           |



Notes

- The thread conforms to ASME B1.20.1 NTP threads as described in Section 10. (The only exceptions are small male and female plain face threaded flanges which use NPSL locknut threads.)
- Class 300 and higher threaded flanges are counter-bored. Threads are chamfered to the counter-bore at an angle of 45° (approx).
- Weights are based on manufacturer's data and are approximate.
- For tolerances see page 8-4.

# Threaded Flanges - ANSI B16.5



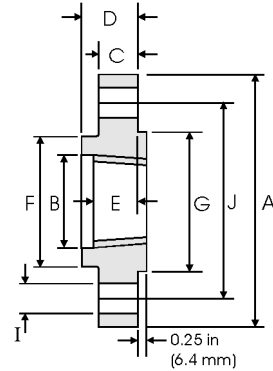
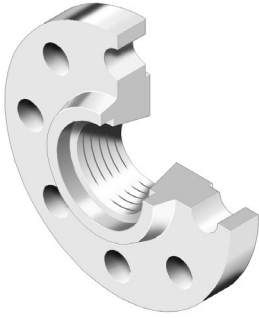
## Class 600 lb

| Pipe              |   | Flange Data      |                  |                      |                |                     | Hub          | Raised Face   | Drilling Data   |                    |                             | Weight  |
|-------------------|---|------------------|------------------|----------------------|----------------|---------------------|--------------|---------------|-----------------|--------------------|-----------------------------|---|
| Nominal Pipe Size |  | <b>A</b>         | <b>B</b>         | <b>C</b>             | <b>D</b>       | <b>E</b>            | <b>F</b>     | <b>G</b>      | <b>H</b>        | <b>I</b>           | <b>J</b>                    |  |
|                   | Outside Diameter  | Overall Diameter | Counter-bore min | Flange Thickness min | Overall Length | Threaded length min | Hub Diameter | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece   |
|                   | in mm   | in mm            | in mm            | in mm                | in mm          | in mm               | in mm        | in mm         |                 | in mm              | in mm                       |   |
| 1/2               | 0.840   | 3.750            | 0.930            | 0.560                | 0.880          | 0.620               | 1.500        | 1.380         | 4               | 0.620              | 2.620                       | 0.74  |
|                   | 21.30   | 95.20            | 23.60            | 14.20                | 22.40          | 15.70               | 38.10        | 35.10         |                 | 15.70              | 66.55                       |   |
| 3/4               | 1.050   | 4.620            | 1.140            | 0.620                | 1.000          | 0.620               | 1.880        | 1.690         | 4               | 0.750              | 3.250                       | 1.27  |
|                   | 26.70   | 117.3            | 29.00            | 15.70                | 25.40          | 15.70               | 47.80        | 42.90         |                 | 19.10              | 82.60                       |   |
| 1                 | 1.315   | 4.880            | 1.410            | 0.690                | 1.060          | 0.690               | 2.120        | 2.000         | 4               | 0.750              | 3.500                       | 1.52  |
|                   | 33.40   | 124.0            | 35.80            | 17.50                | 26.90          | 17.50               | 53.80        | 50.80         |                 | 19.10              | 88.90                       |   |
| 1 1/4             | 1.660   | 5.250            | 1.750            | 0.810                | 1.120          | 0.810               | 2.500        | 2.500         | 4               | 0.750              | 3.880                       | 2.03  |
|                   | 42.20   | 133.4            | 44.50            | 20.60                | 28.40          | 20.60               | 63.50        | 63.50         |                 | 19.10              | 98.60                       |   |
| 1 1/2             | 1.900   | 6.120            | 1.990            | 0.880                | 1.250          | 0.880               | 2.750        | 2.880         | 4               | 0.880              | 4.500                       | 2.96  |
|                   | 48.30   | 155.4            | 50.50            | 22.40                | 31.75          | 22.40               | 69.85        | 73.15         |                 | 22.40              | 114.3                       |   |
| 2                 | 2.375   | 6.500            | 2.500            | 1.000                | 1.440          | 1.120               | 3.310        | 3.620         | 8               | 0.750              | 5.000                       | 3.62  |
|                   | 60.30   | 165.1            | 63.50            | 25.40                | 36.60          | 28.40               | 84.10        | 91.90         |                 | 19.10              | 127.0                       |   |
| 2 1/2             | 2.875   | 7.500            | 3.000            | 1.120                | 1.620          | 1.250               | 3.940        | 4.120         | 8               | 0.880              | 5.880                       | 5.28  |
|                   | 73.00   | 190.5            | 76.20            | 28.40                | 41.10          | 31.75               | 100.1        | 104.6         |                 | 22.40              | 149.4                       |   |
| 3                 | 3.500   | 8.250            | 3.630            | 1.250                | 1.810          | 1.380               | 4.620        | 5.000         | 8               | 0.880              | 6.620                       | 7.00  |
|                   | 88.90   | 209.6            | 92.20            | 31.75                | 46.00          | 35.10               | 117.3        | 127.0         |                 | 22.40              | 168.1                       |   |
| 3 1/2             | 4.000   | 9.000            | 4.130            | 1.380                | 1.940          | 1.560               | 5.250        | 5.500         | 8               | 1.000              | 7.250                       | 8.84  |
|                   | 101.6   | 228.6            | 104.9            | 35.10                | 49.30          | 39.60               | 133.4        | 139.7         |                 | 25.40              | 184.2                       |   |
| 4                 | 4.500   | 10.75            | 4.630            | 1.500                | 2.120          | 1.620               | 6.000        | 6.190         | 8               | 1.000              | 8.500                       | 14.5  |
|                   | 114.3   | 273.1            | 117.6            | 38.10                | 53.80          | 41.10               | 152.4        | 157.2         |                 | 25.40              | 215.9                       |   |
| 5                 | 5.563   | 13.00            | 5.690            | 1.750                | 2.380          | 1.880               | 7.440        | 7.310         | 8               | 1.120              | 10.50                       | 24.4  |
|                   | 141.3   | 330.2            | 144.5            | 44.50                | 60.45          | 47.80               | 189.0        | 185.7         |                 | 28.40              | 266.7                       |   |
| 6                 | 6.625   | 14.00            | 6.750            | 1.880                | 2.620          | 2.000               | 8.750        | 8.500         | 12              | 1.120              | 11.50                       | 28.7  |
|                   | 168.3   | 355.6            | 171.5            | 47.80                | 66.55          | 50.80               | 222.3        | 215.9         |                 | 28.40              | 292.1                       |   |
| 8                 | 8.625   | 16.50            | 8.750            | 2.190                | 3.000          | 2.250               | 10.75        | 10.62         | 12              | 1.250              | 13.75                       | 43.4  |
|                   | 219.1   | 419.1            | 222.3            | 55.60                | 76.20          | 57.15               | 273.1        | 269.7         |                 | 31.75              | 349.3                       |   |
| 10                | 10.75   | 20.00            | 10.88            | 2.500                | 3.380          | 2.560               | 13.50        | 12.75         | 16              | 1.380              | 17.00                       | 70.3  |
|                   | 273.0   | 508.0            | 276.4            | 63.50                | 85.90          | 65.00               | 342.9        | 323.9         |                 | 35.10              | 431.8                       |   |
| 12                | 12.75   | 22.00            | 12.94            | 2.620                | 3.620          | 2.750               | 15.75        | 15.00         | 20              | 1.380              | 19.25                       | 84.2  |
|                   | 323.8   | 558.8            | 328.7            | 66.55                | 91.90          | 69.85               | 400.1        | 381.0         |                 | 35.10              | 489.0                       |   |
| 14                | 14.00   | 23.75            | 14.19            | 2.750                | 3.690          | 2.880               | 17.00        | 16.25         | 20              | 1.500              | 20.75                       | 98.7  |
|                   | 355.6   | 603.3            | 360.4            | 69.85                | 93.70          | 73.15               | 431.8        | 412.8         |                 | 38.10              | 527.1                       |   |
| 16                | 16.00   | 27.00            | 16.19            | 3.000                | 4.190          | 3.060               | 19.50        | 18.50         | 20              | 1.620              | 23.75                       | 142   |
|                   | 406.4   | 685.8            | 411.2            | 76.20                | 106.4          | 77.70               | 495.3        | 469.9         |                 | 41.10              | 603.3                       |   |
| 18                | 18.00   | 29.25            | 18.19            | 3.250                | 4.620          | 3.120               | 21.50        | 21.00         | 20              | 1.750              | 25.75                       | 173   |
|                   | 457.2   | 743.0            | 462.0            | 82.60                | 117.3          | 79.25               | 546.1        | 533.4         |                 | 44.50              | 654.1                       |   |
| 20                | 20.00   | 32.00            | 20.19            | 3.500                | 5.000          | 3.250               | 24.00        | 23.00         | 24              | 1.750              | 28.50                       | 220   |
|                   | 508.0   | 812.8            | 512.8            | 88.90                | 127.0          | 82.60               | 609.6        | 584.2         |                 | 44.50              | 723.9                       |   |
| 24                | 24.00   | 37.00            | 24.19            | 4.000                | 5.500          | 3.620               | 28.25        | 27.25         | 24              | 2.000              | 33.00                       | 312   |
|                   | 609.6   | 939.8            | 614.4            | 101.6                | 139.7          | 91.90               | 717.6        | 692.2         |                 | 50.80              | 838.2                       |   |

Notes

- The thread conforms to ASME B1.20.1 NTP threads as described in Section 10. (The only exceptions are small male and female plain face threaded flanges which use NPSL locknut threads.)
- Class 300 and higher threaded flanges are counter-bored. Threads are chamfered to the counter-bore at an angle of 45° (approx).
- Weights are based on manufacturer's data and are approximate.
- For tolerances see page 8-4.

# Threaded Flanges - ANSI B16.5



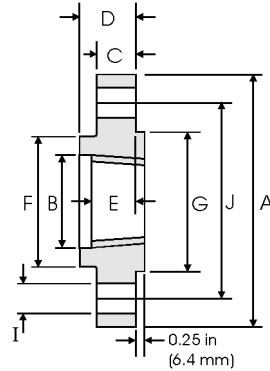
## Class 900 lb

| Nominal Pipe Size | Pipe             | Flange Data      |                  |                      |                |                     | Hub          | Raised Face   | Drilling Data   |                    |                             | Weight    |
|-------------------|------------------|------------------|------------------|----------------------|----------------|---------------------|--------------|---------------|-----------------|--------------------|-----------------------------|-----------|
|                   |                  | A                | B                | C                    | D              | E                   | F            | G             | H               | I                  | J                           |           |
|                   | Outside Diameter | Diameter Overall | Counter-bore min | Flange Thickness min | Overall Length | Threaded length min | Hub Diameter | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm            | in mm                | in mm          | in mm               | in mm        | in mm         |                 | in mm              | in mm                       |           |
| 1/2               | 0.840            | 4.750            | 0.930            | 0.880                | 1.250          | 0.880               | 1.500        | 1.380         | 4               | 0.880              | 3.250                       | 1.74      |
|                   | 21.30            | 120.6            | 23.60            | 22.30                | 31.70          | 22.30               | 38.10        | 35.10         |                 | 22.30              | 82.50                       |           |
| 3/4               | 1.050            | 5.120            | 1.140            | 1.000                | 1.380          | 1.000               | 1.750        | 1.690         | 4               | 0.880              | 3.500                       | 2.34      |
|                   | 26.70            | 130.0            | 29.00            | 25.40                | 35.00          | 25.40               | 44.40        | 42.90         |                 | 22.30              | 88.90                       |           |
| 1                 | 1.315            | 5.880            | 1.410            | 1.120                | 1.620          | 1.120               | 2.060        | 2.000         | 4               | 1.000              | 4.000                       | 3.44      |
|                   | 33.40            | 149.3            | 35.80            | 28.40                | 41.10          | 28.40               | 52.30        | 50.80         |                 | 25.40              | 101.6                       |           |
| 1 1/4             | 1.660            | 6.250            | 1.750            | 1.120                | 1.620          | 1.190               | 2.500        | 2.500         | 4               | 1.000              | 4.380                       | 3.91      |
|                   | 42.20            | 158.7            | 44.40            | 28.40                | 41.10          | 30.20               | 63.50        | 63.50         |                 | 25.40              | 111.2                       |           |
| 1 1/2             | 1.900            | 7.000            | 1.990            | 1.250                | 1.750          | 1.250               | 2.750        | 2.880         | 4               | 1.120              | 4.880                       | 5.36      |
|                   | 48.30            | 177.8            | 50.50            | 31.70                | 44.50          | 31.70               | 69.85        | 73.15         |                 | 28.40              | 123.9                       |           |
| 2                 | 2.375            | 8.500            | 2.500            | 1.500                | 2.250          | 1.500               | 4.120        | 3.620         | 8               | 1.000              | 6.500                       | 9.85      |
|                   | 60.30            | 215.9            | 63.50            | 38.10                | 57.15          | 38.10               | 104.6        | 91.90         |                 | 25.40              | 165.1                       |           |
| 2 1/2             | 2.875            | 9.620            | 3.000            | 1.620                | 2.500          | 1.880               | 4.880        | 4.120         | 8               | 1.120              | 7.500                       | 13.7      |
|                   | 73.00            | 244.3            | 76.20            | 41.10                | 63.50          | 47.70               | 123.9        | 104.6         |                 | 28.40              | 190.5                       |           |
| 3                 | 3.500            | 9.500            | 3.630            | 1.500                | 2.120          | 1.620               | 5.000        | 5.000         | 8               | 1.000              | 7.500                       | 11.6      |
|                   | 88.90            | 241.3            | 92.20            | 38.10                | 53.80          | 41.10               | 127.0        | 127.0         |                 | 25.40              | 190.5                       |           |
| 4                 | 4.500            | 11.50            | 4.630            | 1.750                | 2.750          | 1.880               | 6.250        | 6.190         | 8               | 1.250              | 9.250                       | 19.7      |
|                   | 114.3            | 292.1            | 117.6            | 44.40                | 69.85          | 47.80               | 158.7        | 157.2         |                 | 31.70              | 234.9                       |           |
| 5                 | 5.563            | 13.75            | 5.690            | 2.000                | 3.120          | 2.120               | 7.500        | 7.310         | 8               | 1.380              | 11.00                       | 31.9      |
|                   | 141.3            | 349.2            | 144.5            | 50.80                | 79.25          | 53.80               | 190.5        | 185.7         |                 | 35.00              | 279.4                       |           |
| 6                 | 6.625            | 15.00            | 6.750            | 2.190                | 3.380          | 2.250               | 9.250        | 8.500         | 12              | 1.250              | 12.50                       | 41.1      |
|                   | 168.3            | 381.0            | 171.4            | 55.60                | 85.80          | 57.15               | 234.9        | 215.9         |                 | 31.70              | 317.5                       |           |
| 8                 | 8.625            | 18.50            | 8.750            | 2.500                | 4.000          | 2.500               | 11.75        | 10.62         | 12              | 1.500              | 15.50                       | 70.7      |
|                   | 219.1            | 469.9            | 222.2            | 63.50                | 101.6          | 63.50               | 298.4        | 269.7         |                 | 38.10              | 393.7                       |           |
| 10                | 10.75            | 21.50            | 10.88            | 2.750                | 4.250          | 2.810               | 14.50        | 12.75         | 16              | 1.500              | 18.50                       | 101       |
|                   | 273.0            | 546.1            | 276.3            | 69.85                | 107.9          | 71.40               | 368.3        | 323.9         |                 | 38.10              | 469.9                       |           |
| 12                | 12.75            | 24.00            | 12.94            | 3.120                | 4.620          | 3.000               | 16.50        | 15.00         | 20              | 1.500              | 21.00                       | 133       |
|                   | 323.8            | 609.6            | 328.7            | 79.40                | 117.3          | 76.20               | 419.1        | 381.0         |                 | 38.10              | 533.4                       |           |
| 14                | 14.00            | 25.25            | 14.19            | 3.380                | 5.120          | 3.250               | 17.75        | 16.25         | 20              | 1.620              | 22.00                       | 153       |
|                   | 355.6            | 641.3            | 360.4            | 85.70                | 130.0          | 82.50               | 450.8        | 412.7         |                 | 41.10              | 558.8                       |           |
| 16                | 16.00            | 27.75            | 16.19            | 3.500                | 5.250          | 3.380               | 20.00        | 18.50         | 20              | 1.750              | 24.25                       | 185       |
|                   | 406.4            | 704.8            | 411.2            | 88.90                | 133.3          | 85.90               | 508.0        | 469.9         |                 | 44.40              | 618.9                       |           |
| 18                | 18.00            | 31.00            | 18.19            | 4.000                | 6.000          | 3.500               | 22.25        | 21.00         | 20              | 2.000              | 27.00                       | 258       |
|                   | 457.2            | 787.4            | 462.0            | 101.6                | 152.4          | 88.90               | 565.1        | 533.4         |                 | 50.80              | 685.8                       |           |
| 20                | 20.00            | 33.75            | 20.19            | 4.250                | 6.250          | 3.620               | 24.50        | 23.00         | 20              | 2.120              | 29.50                       | 317       |
|                   | 508.0            | 857.2            | 512.8            | 107.9                | 158.7          | 91.90               | 622.3        | 584.2         |                 | 53.80              | 749.3                       |           |
| 24                | 24.00            | 41.00            | 24.19            | 5.500                | 8.000          | 4.000               | 29.50        | 27.25         | 20              | 2.620              | 35.50                       | 606       |
|                   | 609.6            | 1041.4           | 614.4            | 139.7                | 203.2          | 101.6               | 749.3        | 692.2         |                 | 66.55              | 901.7                       |           |



Notes

- The thread conforms to ASME B1.20.1 NTP threads as described in Section 10. (The only exceptions are small male and female plain face threaded flanges which use NPSL locknut threads.)
- Class 300 and higher threaded flanges are counter-bored. Threads are chamfered to the counterbore at an angle of 45° (approx).
- Weights are based on manufacturer's data and are approximate.
- For tolerances see page 8-4.

## Threaded Flanges - ANSI B16.5



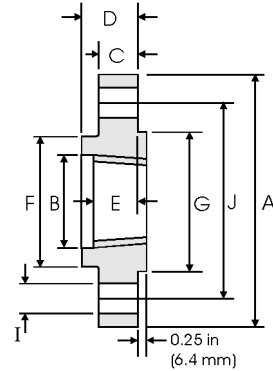
### Class 1500 lb

| Pipe              |   | Flange Data      |                  |                      |                |                     | Hub          | Raised Face   | Drilling Data   |                    |                             | Weight  |
|-------------------|---|------------------|------------------|----------------------|----------------|---------------------|--------------|---------------|-----------------|--------------------|-----------------------------|---|
| Nominal Pipe Size |  | <b>A</b>         | <b>B</b>         | <b>C</b>             | <b>D</b>       | <b>E</b>            | <b>F</b>     | <b>G</b>      | <b>H</b>        | <b>I</b>           | <b>J</b>                    |  |
|                   | Outside Diameter  | Overall Diameter | Counter-bore min | Flange Thickness min | Overall Length | Threaded length min | Hub Diameter | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece   |
| in mm             | in mm   | in mm            | in mm            | in mm                | in mm          | in mm               | in mm        | in mm         |                 | in mm              | in mm                       |   |
| 1/2               | 0.840   | 4.750            | 0.930            | 0.880                | 1.250          | 0.880               | 1.500        | 1.380         | 4               | 0.880              | 3.250                       | 1.74  |
|                   | 21.30   | 120.6            | 23.60            | 22.30                | 31.70          | 22.30               | 38.10        | 35.00         |                 | 22.30              | 82.50                       |   |
| 3/4               | 1.050   | 5.120            | 1.140            | 1.000                | 1.380          | 1.000               | 1.750        | 1.690         | 4               | 0.880              | 3.500                       | 2.34  |
|                   | 26.70   | 130.0            | 29.00            | 25.40                | 35.00          | 25.40               | 44.40        | 42.90         |                 | 22.30              | 88.90                       |   |
| 1                 | 1.315   | 5.880            | 1.410            | 1.120                | 1.620          | 1.120               | 2.060        | 2.000         | 4               | 1.000              | 4.000                       | 3.44  |
|                   | 33.40   | 149.3            | 35.80            | 28.40                | 41.10          | 28.40               | 52.30        | 50.80         |                 | 25.40              | 101.6                       |   |
| 1 1/4             | 1.660   | 6.250            | 1.750            | 1.120                | 1.620          | 1.190               | 2.500        | 2.500         | 4               | 1.000              | 4.380                       | 3.91  |
|                   | 42.20   | 158.7            | 44.40            | 28.40                | 41.10          | 30.20               | 63.50        | 63.50         |                 | 25.40              | 111.2                       |   |
| 1 1/2             | 1.900   | 7.000            | 1.990            | 1.250                | 1.750          | 1.250               | 2.750        | 2.880         | 4               | 1.120              | 4.880                       | 5.36  |
|                   | 48.30   | 177.8            | 50.50            | 31.70                | 44.50          | 31.70               | 69.85        | 73.15         |                 | 28.40              | 123.9                       |   |
| 2                 | 2.375   | 8.500            | 2.500            | 1.500                | 2.250          | 1.500               | 4.120        | 3.620         | 8               | 1.000              | 6.500                       | 9.85  |
|                   | 60.30   | 215.9            | 63.50            | 38.10                | 57.15          | 38.10               | 104.6        | 91.90         |                 | 25.40              | 165.1                       |   |
| 2 1/2             | 2.875   | 9.620            | 3.000            | 1.620                | 2.500          | 1.880               | 4.880        | 4.120         | 8               | 1.120              | 7.500                       | 13.7  |
|                   | 73.00   | 244.3            | 76.20            | 41.10                | 63.50          | 47.70               | 123.9        | 104.6         |                 | 28.40              | 190.5                       |   |

#### Notes

- The thread conforms to ASME B1.20.1 NTP threads as described in Section 10. (The only exceptions are small male and female plain face threaded flanges which use NPSL locknut threads.)
- Class 300 and higher threaded flanges are counter-bored. Threads are chamfered to the counterbore at an angle of 45° (approx).
- Weights are based on manufacturer's data and are approximate.
- For tolerances see page 8-4.

# Threaded Flanges - ANSI B16.5



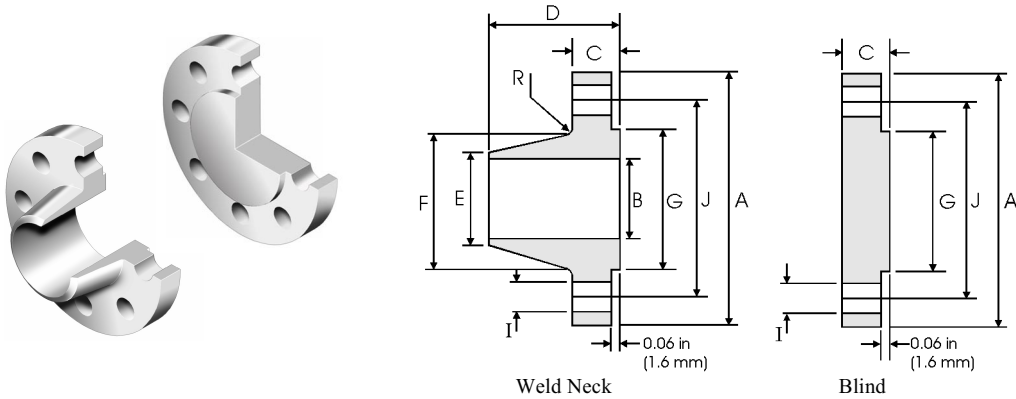
## Class 2500 lb

| Pipe              |                  | Flange Data      |                  |                      |                |                     | Hub          | Raised Face   | Drilling Data   |                    |                             | Weight    |
|-------------------|------------------|------------------|------------------|----------------------|----------------|---------------------|--------------|---------------|-----------------|--------------------|-----------------------------|-----------|
| Nominal Pipe Size |                  | A                | B                | C                    | D              | E                   | F            | G             | H               | I                  | J                           |           |
|                   | Outside Diameter | Overall Diameter | Counter-bore min | Flange Thickness min | Overall Length | Threaded length min | Hub Diameter | Face Diameter | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | kg/ piece |
|                   | in mm            | in mm            | in mm            | in mm                | in mm          | in mm               | in mm        | in mm         |                 | in mm              | in mm                       |           |
| 1/2               | 0.840            | 5.250            | 0.930            | 1.190                | 1.560          | 1.120               | 1.690        | 1.380         | 4               | 0.880              | 3.500                       | 2.95      |
|                   | 21.30            | 133.4            | 23.60            | 30.20                | 39.60          | 28.40               | 42.90        | 35.10         |                 |                    |                             |           |
| 3/4               | 1.050            | 5.500            | 1.140            | 1.250                | 1.690          | 1.250               | 2.000        | 1.690         | 4               | 0.880              | 3.750                       | 3.44      |
|                   | 26.70            | 139.7            | 29.00            | 31.75                | 42.90          | 31.75               | 50.80        | 42.90         |                 |                    |                             |           |
| 1                 | 1.315            | 6.250            | 1.410            | 1.380                | 1.880          | 1.380               | 2.250        | 2.000         | 4               | 1.000              | 4.250                       | 4.82      |
|                   | 33.40            | 158.8            | 35.80            | 35.10                | 47.80          | 35.10               | 57.15        | 50.80         |                 |                    |                             |           |
| 1 1/4             | 1.660            | 7.250            | 1.750            | 1.500                | 2.060          | 1.500               | 2.880        | 2.500         | 4               | 1.120              | 5.120                       | 7.14      |
|                   | 42.20            | 184.2            | 44.50            | 38.10                | 52.30          | 38.10               | 73.15        | 63.50         |                 |                    |                             |           |
| 1 1/2             | 1.900            | 8.000            | 1.990            | 1.750                | 2.380          | 1.750               | 3.120        | 2.880         | 4               | 1.250              | 5.750                       | 10.0      |
|                   | 48.30            | 203.2            | 50.50            | 44.50                | 60.45          | 44.50               | 79.25        | 73.15         |                 |                    |                             |           |
| 2                 | 2.375            | 9.250            | 2.500            | 2.000                | 2.750          | 2.000               | 3.750        | 3.620         | 8               | 1.120              | 6.750                       | 14.8      |
|                   | 60.30            | 235.0            | 63.50            | 50.80                | 69.85          | 50.80               | 95.30        | 91.90         |                 |                    |                             |           |
| 2 1/2             | 2.875            | 10.50            | 3.000            | 2.250                | 3.120          | 2.250               | 4.500        | 4.120         | 8               | 1.250              | 7.750                       | 21.5      |
|                   | 73.00            | 266.7            | 76.20            | 57.15                | 79.25          | 57.15               | 114.3        | 104.6         |                 |                    |                             |           |

### Notes

- The thread conforms to ASME B1.20.1 NTP threads as described in Section 10. (The only exceptions are small male and female plain face threaded flanges which use NPSL locknut threads.)
- Class 300 and higher threaded flanges are counter-bored. Threads are chamfered to the counterbore at an angle of 45° (approx).
- Weights are based on manufacturer's data and are approximate.
- For tolerances see page 8-4.

## ASME B16.47 Series A (MSS SP-44) Flanges



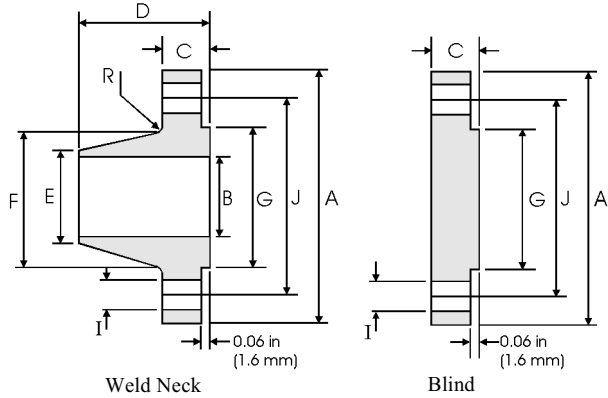
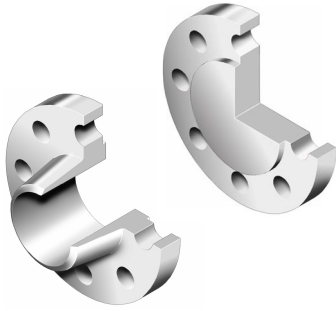
### Class 150 lb

| Pipe              | Flange Data      |                          |                            | Hub Data           |                        |                 | Raised Face     | Drilling Data   |                    |                             | Radius        |
|-------------------|------------------|--------------------------|----------------------------|--------------------|------------------------|-----------------|-----------------|-----------------|--------------------|-----------------------------|---------------|
| Nominal Pipe Size | A                | C                        |                            | D                  | E                      | F               | G               | H               | I                  | J                           | R             |
|                   | Overall Diameter | WNF Flange Thickness min | Blind Flange Thickness min | Overall Length WNF | Diameter at Weld Bevel | Hub Diameter    | Face Diameter   | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | Fillet        |
|                   | in mm            | in mm                    | in mm                      | in mm              | in mm                  | in mm           | in mm           |                 | in mm              | in mm                       | in mm         |
| 22                | 29.50<br>749.30  | 1.81<br>45.97            | 1.81<br>45.97              | 5.88<br>149.35     | 22.00<br>558.80        | 24.00<br>609.60 | 25.25<br>641.35 | 20              | 1.38<br>35.05      | 27.25<br>692.15             | 0.38<br>9.65  |
| 26                | 34.25<br>869.95  | 2.69<br>68.33            | 2.69<br>68.33              | 4.75<br>120.65     | 26.00<br>660.40        | 26.62<br>676.15 | 29.50<br>749.30 | 24              | 1.38<br>35.05      | 31.75<br>806.45             | 0.38<br>9.65  |
| 28                | 36.50<br>927.10  | 2.81<br>71.37            | 2.81<br>71.37              | 4.94<br>125.48     | 28.00<br>711.20        | 28.62<br>726.95 | 31.50<br>800.10 | 28              | 1.38<br>35.05      | 34.00<br>863.60             | 0.44<br>11.18 |
| 30                | 38.75<br>984.25  | 2.94<br>74.68            | 2.94<br>74.68              | 5.38<br>136.65     | 30.00<br>762.00        | 30.75<br>781.05 | 33.75<br>857.25 | 28              | 1.38<br>35.05      | 36.00<br>914.40             | 0.44<br>11.18 |
| 32                | 41.75<br>1060.5  | 3.19<br>81.03            | 3.19<br>81.03              | 5.69<br>144.53     | 32.00<br>812.80        | 32.75<br>831.85 | 36.00<br>914.40 | 28              | 1.62<br>41.15      | 38.50<br>977.90             | 0.44<br>11.18 |
| 34                | 43.75<br>1111.3  | 3.25<br>82.55            | 3.25<br>82.55              | 5.88<br>149.35     | 34.00<br>863.60        | 34.75<br>882.65 | 38.00<br>965.20 | 32              | 1.62<br>41.15      | 40.50<br>1028.7             | 0.50<br>12.70 |
| 36                | 46.00<br>1168.4  | 3.56<br>90.42            | 3.56<br>90.42              | 6.19<br>157.23     | 36.00<br>914.40        | 36.75<br>933.45 | 40.25<br>1022.4 | 32              | 1.62<br>41.15      | 42.75<br>1085.9             | 0.50<br>12.70 |
| 38                | 48.75<br>1238.3  | 3.44<br>87.38            | 3.44<br>87.38              | 6.19<br>157.23     | 38.00<br>965.20        | 39.00<br>990.60 | 42.25<br>1073.2 | 32              | 1.62<br>41.15      | 45.25<br>1149.4             | 0.50<br>12.70 |
| 40                | 50.75<br>1289.1  | 3.56<br>90.42            | 3.56<br>90.42              | 6.44<br>163.58     | 40.00<br>1016.0        | 41.00<br>1041.4 | 44.25<br>1124.0 | 36              | 1.62<br>41.15      | 47.25<br>1200.2             | 0.50<br>12.70 |
| 42                | 53.00<br>1346.2  | 3.81<br>96.77            | 3.81<br>96.77              | 6.75<br>171.45     | 42.00<br>1066.8        | 43.00<br>1092.2 | 47.00<br>1193.8 | 36              | 1.62<br>41.15      | 49.50<br>1257.3             | 0.50<br>12.70 |
| 44                | 55.25<br>1403.4  | 4.00<br>101.60           | 4.00<br>101.60             | 7.00<br>177.80     | 44.00<br>1117.6        | 45.00<br>1143.0 | 49.00<br>1244.6 | 40              | 1.62<br>41.15      | 51.75<br>1314.5             | 0.50<br>12.70 |
| 46                | 57.25<br>1454.2  | 4.06<br>103.12           | 4.06<br>103.12             | 7.31<br>185.67     | 46.00<br>1168.4        | 47.12<br>1196.9 | 51.00<br>1295.4 | 40              | 1.62<br>41.15      | 53.75<br>1365.3             | 0.50<br>12.70 |
| 48                | 59.50<br>1511.3  | 4.25<br>107.95           | 4.25<br>107.95             | 7.56<br>192.02     | 48.00<br>1219.2        | 49.12<br>1247.7 | 53.50<br>1358.9 | 44              | 1.62<br>41.15      | 56.00<br>1422.4             | 0.50<br>12.70 |

#### Notes

- ASME B16.47 Series A flanges (≥ NPS 26) are MSS SP-44 flanges. MSS SP-44 also covers NPS 12 to NPS 24 flanges which are equivalent to ASME B16.5. MSS SP-44 is the only source for the NPS 22 flange dimensions above.
- Dimension B is to be specified by the purchaser. It corresponds to the pipe inside diameter.
- Flat face flanges may be provided at full thickness, C, or with raised face removed (the latter is nonstandard).
- WNF = Weld Neck Flange.
- The large end of the hub may be straight or tapered.
- For ring joint facings see page 8-6. For weld end bevel see page 8-5.
- For tolerances see page 8-4.

# ASME B16.47 Series A (MSS SP-44) Flanges



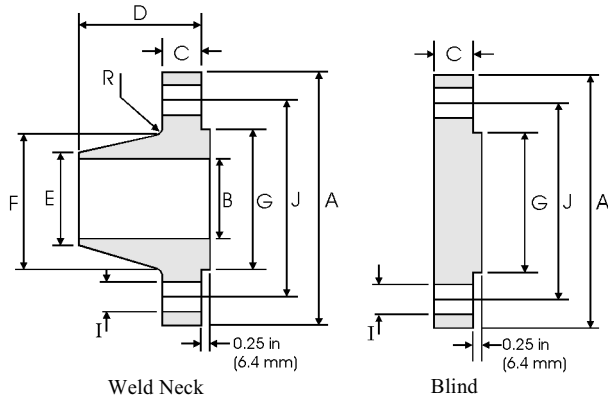
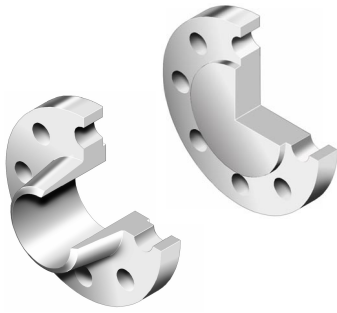
## Class 300 lb

| Pipe              | Flange Data      |                          |                            | Hub Data           |                        | Raised Face     | Drilling Data   |                 |                    | Radius                      |               |
|-------------------|------------------|--------------------------|----------------------------|--------------------|------------------------|-----------------|-----------------|-----------------|--------------------|-----------------------------|---------------|
| Nominal Pipe Size | A                | C                        | D                          | E                  | F                      | G               | H               | I               | J                  | R                           |               |
|                   | Overall Diameter | WNF Flange Thickness min | Blind Flange Thickness min | Overall Length WNF | Diameter at Weld Bevel | Hub Diameter    | Face Diameter   | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | Fillet        |
|                   | in mm            | in mm                    | in mm                      | in mm              | in mm                  | in mm           | in mm           |                 | in mm              | in mm                       | in mm         |
| 22                | 33.00<br>838.20  | 2.62<br>66.55            | 2.62<br>66.55              | 6.50<br>165.10     | 22.00<br>558.80        | 25.25<br>641.35 | 25.25<br>641.35 | 24              | 1.62<br>41.15      | 29.25<br>742.95             | 0.38<br>9.65  |
| 26                | 38.25<br>971.55  | 3.12<br>79.25            | 3.31<br>84.07              | 7.25<br>184.15     | 26.00<br>660.40        | 28.38<br>720.85 | 29.50<br>749.30 | 28              | 1.75<br>44.45      | 34.50<br>876.30             | 0.38<br>9.65  |
| 28                | 40.75<br>1035.1  | 3.38<br>85.85            | 3.56<br>90.42              | 7.75<br>196.85     | 28.00<br>711.20        | 30.50<br>774.70 | 31.50<br>800.10 | 28              | 1.75<br>44.45      | 37.00<br>939.80             | 0.44<br>11.18 |
| 30                | 43.00<br>1092.2  | 3.62<br>91.95            | 3.75<br>95.25              | 8.25<br>209.55     | 30.00<br>762.00        | 32.56<br>827.02 | 33.75<br>857.25 | 28              | 1.88<br>47.75      | 39.25<br>996.95             | 0.44<br>11.18 |
| 32                | 45.25<br>1149.4  | 3.88<br>98.55            | 3.94<br>100.08             | 8.75<br>222.25     | 32.00<br>812.80        | 34.69<br>881.13 | 36.00<br>914.40 | 28              | 2.00<br>50.80      | 41.50<br>1054.1             | 0.44<br>11.18 |
| 34                | 47.50<br>1205.0  | 4.00<br>101.60           | 4.12<br>104.65             | 9.12<br>231.65     | 34.00<br>863.60        | 36.88<br>936.75 | 38.00<br>965.20 | 28              | 2.00<br>50.80      | 43.50<br>1104.9             | 0.50<br>12.70 |
| 36                | 50.00<br>1270.0  | 4.12<br>104.65           | 4.38<br>111.25             | 9.50<br>241.30     | 36.00<br>914.40        | 39.00<br>990.60 | 40.25<br>1022.4 | 32              | 2.12<br>53.85      | 46.00<br>1168.4             | 0.50<br>12.70 |
| 38                | 46.00<br>1168.4  | 4.25<br>107.95           | 4.25<br>107.95             | 7.12<br>180.85     | 38.00<br>965.20        | 39.12<br>993.65 | 40.50<br>1028.7 | 32              | 1.62<br>41.15      | 43.00<br>1092.2             | 0.50<br>12.70 |
| 40                | 48.75<br>1238.3  | 4.50<br>114.30           | 4.50<br>114.30             | 7.62<br>193.55     | 40.00<br>1016.0        | 41.25<br>1047.8 | 42.75<br>1085.9 | 32              | 1.75<br>44.45      | 45.50<br>1155.7             | 0.50<br>12.70 |
| 42                | 50.75<br>1289.1  | 4.69<br>119.13           | 4.69<br>119.13             | 7.88<br>200.15     | 42.00<br>1066.8        | 43.25<br>1098.6 | 44.75<br>1136.7 | 32              | 1.75<br>44.45      | 47.50<br>1206.6             | 0.50<br>12.70 |
| 44                | 53.25<br>1352.6  | 4.88<br>123.95           | 4.88<br>123.95             | 8.12<br>206.25     | 44.00<br>1117.6        | 45.25<br>1149.4 | 47.00<br>1193.8 | 32              | 1.88<br>47.75      | 49.75<br>1263.7             | 0.50<br>12.70 |
| 46                | 55.75<br>1416.1  | 5.06<br>128.52           | 5.06<br>128.52             | 8.50<br>215.90     | 46.00<br>1168.4        | 47.38<br>1203.5 | 49.00<br>1244.0 | 28              | 2.00<br>50.80      | 52.00<br>1320.8             | 0.50<br>12.70 |
| 48                | 57.75<br>1466.9  | 5.25<br>133.35           | 5.25<br>133.35             | 8.81<br>223.77     | 48.00<br>1219.2        | 49.38<br>1254.3 | 51.25<br>1301.8 | 32              | 2.00<br>50.80      | 54.00<br>1371.6             | 0.50<br>12.70 |

### Notes

- ASME B16.47 Series A flanges (≥ NPS 26) are MSS SP-44 flanges. MSS SP-44 also covers NPS 12 to NPS 24 flanges which are equivalent to ASME B16.5. MSS SP-44 is the only source for the NPS 22 flange dimensions above.
- Dimension B is to be specified by the purchaser. It corresponds to the pipe inside diameter.
- Flat face flanges may be provided at full thickness, C, or with raised face removed (the latter is nonstandard).
- WNF = Weld Neck Flange.
- The large end of the hub may be straight or tapered.
- For ring joint facings see page 8-6. For weld end bevel see page 8-5.
- For tolerances see page 8-4.

## ASME B16.47 Series A (MSS SP-44) Flanges



### Class 400 lb

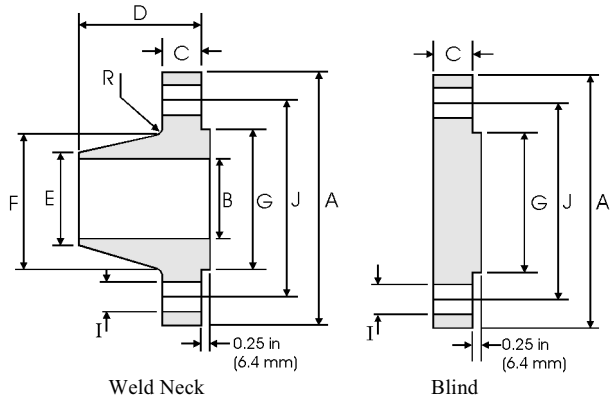
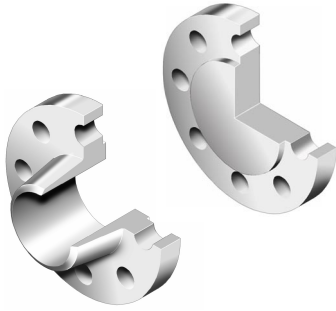
| Pipe              | Flange Data      |                          |                            | Hub Data           |                        |                 | Raised Face     | Drilling Data   |                    |                             | Radius        |
|-------------------|------------------|--------------------------|----------------------------|--------------------|------------------------|-----------------|-----------------|-----------------|--------------------|-----------------------------|---------------|
| Nominal Pipe Size | A                | C                        |                            | D                  | E                      | F               | G               | H               | I                  | J                           | R             |
|                   | Overall Diameter | WNF Flange Thickness min | Blind Flange Thickness min | Overall Length WNF | Diameter at Weld Bevel | Hub Diameter    | Face Diameter   | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | Fillet        |
|                   | in mm            | in mm                    | in mm                      | in mm              | in mm                  | in mm           | in mm           |                 | in mm              | in mm                       | in mm         |
| 22                | 33.00<br>838.20  | 2.88<br>73.15            | 2.88<br>73.15              | 6.75<br>171.45     | 22.00<br>558.80        | 25.25<br>641.35 | 25.25<br>641.35 | 24              | 1.75<br>44.45      | 29.25<br>742.95             | 0.44<br>11.18 |
| 26                | 38.25<br>971.55  | 3.50<br>88.90            | 3.88<br>98.55              | 7.62<br>193.55     | 26.00<br>660.40        | 28.62<br>726.95 | 29.50<br>749.30 | 28              | 1.88<br>47.75      | 34.50<br>876.30             | 0.44<br>11.18 |
| 28                | 40.75<br>1035.1  | 3.75<br>95.25            | 4.12<br>104.65             | 8.12<br>206.25     | 28.00<br>711.20        | 30.81<br>782.57 | 31.50<br>800.10 | 28              | 2.00<br>50.80      | 37.00<br>939.80             | 0.50<br>12.70 |
| 30                | 43.00<br>1092.2  | 4.00<br>101.60           | 4.38<br>111.25             | 8.62<br>218.95     | 30.00<br>762.00        | 32.94<br>836.68 | 33.75<br>857.25 | 28              | 2.12<br>53.85      | 39.25<br>996.95             | 0.50<br>12.70 |
| 32                | 45.25<br>1149.4  | 4.25<br>107.95           | 4.56<br>115.82             | 9.12<br>231.65     | 32.00<br>812.80        | 35.00<br>889.00 | 36.00<br>914.40 | 28              | 2.12<br>53.85      | 41.50<br>1054.1             | 0.50<br>12.70 |
| 34                | 47.50<br>1206.5  | 4.38<br>111.25           | 4.81<br>122.17             | 9.50<br>241.30     | 34.00<br>863.60        | 37.19<br>944.63 | 38.00<br>965.20 | 28              | 2.12<br>53.85      | 43.50<br>1104.9             | 0.56<br>14.22 |
| 36                | 50.00<br>1270.0  | 4.50<br>114.30           | 5.06<br>128.52             | 9.88<br>250.95     | 36.00<br>914.40        | 39.38<br>1000.3 | 40.25<br>1022.4 | 32              | 2.12<br>53.85      | 46.00<br>1168.4             | 0.56<br>14.22 |
| 38                | 47.50<br>1206.5  | 4.88<br>123.95           | 4.88<br>123.95             | 8.12<br>206.25     | 48.00<br>1219.2        | 39.50<br>1003.3 | 40.75<br>1035.1 | 32              | 1.88<br>47.75      | 44.00<br>1117.6             | 0.56<br>14.22 |
| 40                | 50.00<br>1270.0  | 5.12<br>130.05           | 5.12<br>130.05             | 8.50<br>215.90     | 40.00<br>1016.0        | 41.50<br>1054.1 | 43.00<br>1092.2 | 32              | 2.00<br>50.80      | 46.25<br>1174.8             | 0.56<br>14.22 |
| 42                | 52.00<br>1320.8  | 5.25<br>133.35           | 5.25<br>133.35             | 8.81<br>223.77     | 42.00<br>1066.8        | 43.62<br>1107.9 | 45.00<br>1143.0 | 32              | 2.00<br>50.80      | 48.25<br>1225.6             | 0.56<br>14.22 |
| 44                | 54.50<br>1384.3  | 5.50<br>139.70           | 5.50<br>139.70             | 9.18<br>233.17     | 44.00<br>1117.6        | 45.62<br>1158.7 | 47.25<br>1200.2 | 32              | 2.12<br>53.85      | 50.50<br>1282.7             | 0.56<br>14.22 |
| 46                | 56.75<br>1441.5  | 5.75<br>146.05           | 5.75<br>146.05             | 9.62<br>244.35     | 46.00<br>1168.4        | 47.75<br>1212.9 | 49.50<br>1257.3 | 36              | 2.12<br>53.85      | 52.75<br>1339.9             | 0.56<br>14.22 |
| 48                | 59.50<br>1511.3  | 6.00<br>152.40           | 6.00<br>152.40             | 10.12<br>257.05    | 48.00<br>1219.2        | 49.88<br>1267.0 | 51.50<br>1308.1 | 28              | 2.38<br>60.45      | 55.25<br>1403.4             | 0.56<br>14.22 |

#### Notes

- ASME B16.47 Series A flanges ( $\geq$  NPS 26) are MSS SP-44 flanges. MSS SP-44 also covers NPS 12 to NPS 24 flanges which are equivalent to ASME B16.5. MSS SP-44 is the only source for the NPS 22 flange dimensions above.
- Class 400 Series A dimensions at NPS 38 and larger also apply to Class 400 Series B flanges.
- Dimension B is to be specified by the purchaser. It corresponds to the pipe inside diameter.
- Flat face flanges may be provided at full thickness, C + raised face, or with raised face removed (the latter is nonstandard).
- WNF = Weld Neck Flange.
- The large end of the hub may be straight or tapered.
- For ring joint facings see page 8-6. For weld end bevel see page 8-5.
- For tolerances see page 8-4.



# ASME B16.47 Series A (MSS SP-44) Flanges



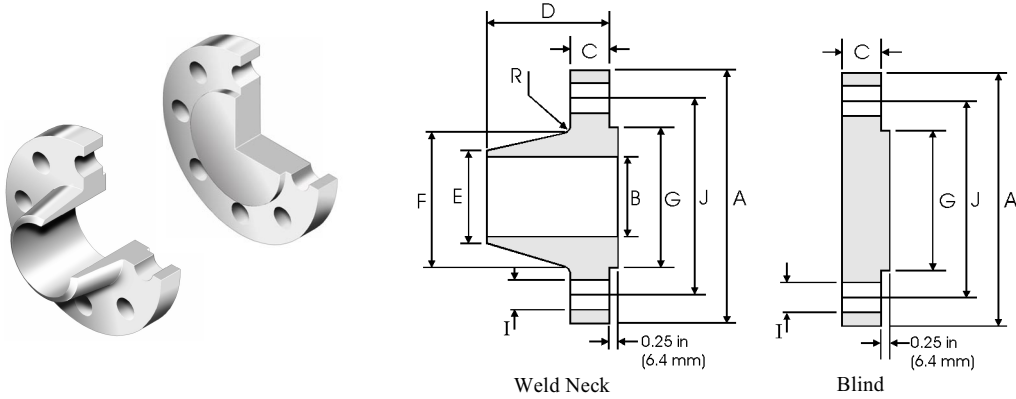
## Class 600 lb

| Pipe              | Flange Data      |                          |                            | Hub Data           |                        | Raised Face      | Drilling Data    |                 |                    | Radius                      |                 |
|-------------------|------------------|--------------------------|----------------------------|--------------------|------------------------|------------------|------------------|-----------------|--------------------|-----------------------------|-----------------|
| Nominal Pipe Size | A                | C                        | D                          | E                  | F                      | G                | H                | I               | J                  | R                           |                 |
|                   | Overall Diameter | WNF Flange Thickness min | Blind Flange Thickness min | Overall Length WNF | Diameter at Weld Bevel | Hub Diameter     | Face Diameter    | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | Fillet          |
|                   | in mm            | in mm                    | in mm                      | in mm              | in mm                  | in mm            | in mm            |                 | in mm              | in mm                       | in mm           |
| 22                | 34.25<br>869.95  | 3.75<br>95.25            | 3.75<br>95.25              | 7.75<br>196.85     | 22.00<br>558.80        | 26.25<br>666.75  | 25.25<br>641.35  | 24              | 1.88<br>47.75      | 30.62<br>777.75             | 0.44<br>11.18   |
| 26                | 40.00<br>1016.0  | 4.25<br>107.95           | 4.94<br>125.48             | 8.75<br>222.25     | 26.00<br>660.40        | 29.44<br>747.78  | 29.50<br>749.30  |                 | 28                 | 2.00<br>50.80               | 36.00<br>914.40 |
| 28                | 42.25<br>1073.2  | 4.38<br>111.25           | 5.19<br>131.83             | 9.25<br>234.95     | 28.00<br>711.20        | 31.62<br>803.15  | 31.50<br>800.10  | 28              | 2.12<br>53.85      | 38.00<br>965.20             | 0.50<br>12.70   |
| 30                | 44.50<br>1130.3  | 4.50<br>114.30           | 5.50<br>139.70             | 9.75<br>247.65     | 30.00<br>762.00        | 33.94<br>862.08  | 33.75<br>857.25  | 28              | 2.12<br>53.85      | 40.25<br>1022.4             | 0.50<br>12.70   |
| 32                | 47.00<br>1193.8  | 4.62<br>117.35           | 5.81<br>147.57             | 10.25<br>260.35    | 32.00<br>812.80        | 36.12<br>917.45  | 36.00<br>914.40  | 28              | 2.38<br>60.45      | 42.50<br>1079.5             | 0.50<br>12.70   |
| 34                | 49.00<br>1244.6  | 4.75<br>120.65           | 6.06<br>153.92             | 10.62<br>269.75    | 34.00<br>863.60        | 38.31<br>973.07  | 38.00<br>965.20  | 28              | 2.38<br>60.45      | 44.50<br>1130.3             | 0.56<br>14.22   |
| 36                | 51.75<br>1314.5  | 4.88<br>123.95           | 6.38<br>162.05             | 11.12<br>282.45    | 36.00<br>914.40        | 40.62<br>1031.75 | 40.25<br>1022.35 | 28              | 2.62<br>66.55      | 47.00<br>1193.0             | 0.56<br>14.22   |
| 38                | 50.00<br>1270.0  | 6.00<br>152.40           | 6.12<br>155.45             | 10.00<br>254.00    | 38.00<br>965.20        | 40.25<br>1022.35 | 41.50<br>1054.10 | 28              | 2.38<br>60.45      | 45.75<br>1162.1             | 0.56<br>14.22   |
| 40                | 52.00<br>1320.8  | 6.25<br>158.75           | 6.38<br>162.05             | 10.38<br>263.65    | 40.00<br>1016.0        | 42.25<br>1073.2  | 43.75<br>1111.3  | 32              | 2.38<br>60.45      | 47.75<br>1212.9             | 0.56<br>14.22   |
| 42                | 55.25<br>1403.4  | 6.62<br>168.15           | 6.75<br>171.45             | 11.00<br>279.40    | 42.00<br>1066.8        | 44.38<br>1127.3  | 46.00<br>1168.4  | 28              | 2.62<br>66.55      | 50.50<br>1282.7             | 0.56<br>14.22   |
| 44                | 57.25<br>1454.2  | 6.81<br>172.97           | 7.00<br>177.80             | 11.38<br>289.05    | 44.00<br>1117.6        | 46.50<br>1181.1  | 48.25<br>1225.6  | 32              | 2.62<br>66.55      | 52.50<br>1333.5             | 0.56<br>14.22   |
| 46                | 59.50<br>1511.3  | 7.06<br>179.32           | 7.31<br>185.67             | 11.81<br>299.97    | 46.00<br>1168.4        | 48.62<br>1235.0  | 50.25<br>1276.4  | 32              | 2.62<br>66.55      | 54.75<br>1390.7             | 0.56<br>14.22   |
| 48                | 62.75<br>1593.9  | 7.44<br>188.98           | 7.69<br>195.33             | 12.44<br>315.98    | 48.00<br>1219.2        | 50.75<br>1289.1  | 52.50<br>1333.5  | 32              | 2.88<br>73.15      | 57.50<br>1460.5             | 0.56<br>14.22   |

### Notes

- ASME B16.47 Series A flanges (≥ NPS 26) are MSS SP-44 flanges. MSS SP-44 also covers NPS 12 to NPS 24 flanges which are equivalent to ASME B16.5. MSS SP-44 is the only source for the NPS 22 flange dimensions above.
- Class 600 Series A dimensions at NPS 38 and larger also apply to Class 600 Series B flanges.
- Dimension B is to be specified by the purchaser. It corresponds to the pipe inside diameter.
- Flat face flanges may be provided at full thickness, C + raised face, or with raised face removed (the latter is nonstandard).
- WNF = Weld Neck Flange.
- The large end of the hub may be straight or tapered.
- For ring joint facings see page 8-6. For weld end bevel see page 8-5.
- For tolerances see page 8-4.

## ASME B16.47 Series A (MSS SP-44) Flanges



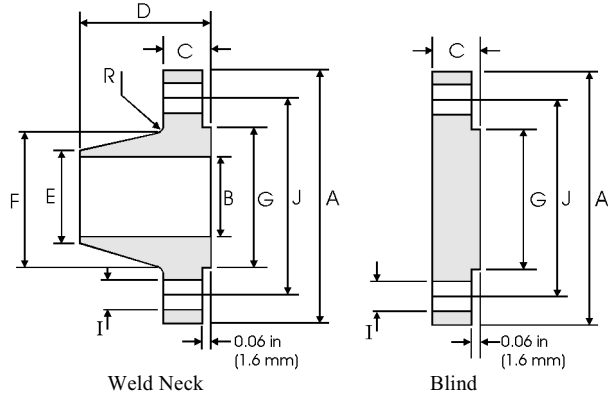
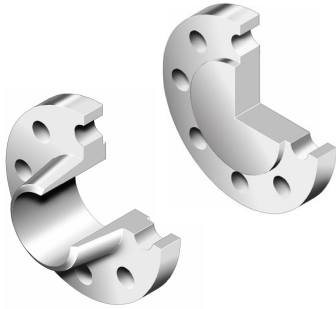
### Class 900 lb

| Pipe              | Flange Data      |                          |                            | Hub Data           |                        |                 | Raised Face     | Drilling Data   |                    |                             | Radius        |
|-------------------|------------------|--------------------------|----------------------------|--------------------|------------------------|-----------------|-----------------|-----------------|--------------------|-----------------------------|---------------|
| Nominal Pipe Size | A                | C                        | D                          | E                  | F                      | G               | H               | I               | J                  | R                           |               |
|                   | Overall Diameter | WNF Flange Thickness min | Blind Flange Thickness min | Overall Length WNF | Diameter at Weld Bevel | Hub Diameter    | Face Diameter   | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | Fillet        |
|                   | in mm            | in mm                    | in mm                      | in mm              | in mm                  | in mm           | in mm           |                 | in mm              | in mm                       | in mm         |
| 26                | 42.75<br>1085.9  | 5.50<br>139.70           | 6.31<br>160.27             | 11.25<br>285.75    | 26.00<br>660.40        | 30.50<br>774.70 | 29.50<br>749.30 | 20              | 2.88<br>73.15      | 37.50<br>952.50             | 0.44<br>11.18 |
| 28                | 46.00<br>1168.4  | 5.62<br>142.75           | 6.75<br>171.45             | 11.75<br>298.45    | 28.00<br>711.20        | 32.75<br>831.85 | 31.50<br>800.10 | 20              | 3.12<br>79.25      | 40.25<br>1022.4             | 0.50<br>12.70 |
| 30                | 48.50<br>1231.9  | 5.88<br>149.35           | 7.18<br>182.37             | 12.25<br>311.15    | 30.00<br>762.00        | 35.00<br>889.00 | 33.75<br>857.25 | 20              | 3.12<br>79.25      | 42.75<br>1085.9             | 0.50<br>12.70 |
| 32                | 51.75<br>1314.5  | 6.25<br>158.75           | 7.62<br>193.55             | 13.00<br>330.20    | 32.00<br>812.80        | 37.25<br>946.15 | 36.00<br>914.40 | 20              | 3.38<br>85.85      | 45.50<br>1155.7             | 0.50<br>12.70 |
| 34                | 55.00<br>1397.0  | 6.50<br>165.10           | 8.06<br>204.72             | 13.75<br>349.25    | 34.00<br>863.60        | 39.62<br>1006.4 | 38.00<br>965.20 | 20              | 3.62<br>91.95      | 48.25<br>1225.6             | 0.56<br>14.22 |
| 36                | 57.50<br>1460.5  | 6.75<br>171.45           | 8.44<br>214.38             | 14.25<br>361.95    | 36.00<br>914.40        | 41.88<br>1063.8 | 40.25<br>1022.4 | 20              | 3.62<br>91.95      | 50.75<br>1289.1             | 0.56<br>14.22 |
| 38                | 57.50<br>1460.5  | 7.50<br>190.50           | 8.50<br>215.90             | 13.88<br>352.55    | 38.00<br>965.20        | 42.25<br>1073.2 | 43.25<br>1098.6 | 20              | 3.62<br>91.95      | 50.75<br>1289.1             | 0.75<br>19.05 |
| 40                | 59.50<br>1511.3  | 7.75<br>196.85           | 8.81<br>223.77             | 14.31<br>363.47    | 40.00<br>1016.0        | 44.38<br>1127.3 | 45.75<br>1162.1 | 24              | 3.62<br>91.95      | 52.75<br>1339.9             | 0.81<br>20.57 |
| 42                | 61.50<br>1562.1  | 8.12<br>206.25           | 9.12<br>231.65             | 14.62<br>371.35    | 42.00<br>1066.8        | 46.31<br>1176.3 | 47.75<br>1212.9 | 24              | 3.62<br>91.95      | 54.75<br>1390.7             | 0.81<br>20.57 |
| 44                | 64.88<br>1648.0  | 8.44<br>214.38           | 9.56<br>242.82             | 15.38<br>390.65    | 44.00<br>1117.6        | 48.62<br>1235.0 | 50.00<br>1270.0 | 24              | 3.88<br>98.55      | 57.62<br>1463.6             | 0.88<br>22.35 |
| 46                | 68.25<br>1733.6  | 8.88<br>225.55           | 10.06<br>255.52            | 16.18<br>410.97    | 46.00<br>1168.4        | 50.88<br>1292.4 | 52.50<br>1333.5 | 24              | 4.12<br>104.65     | 60.50<br>1536.7             | 0.88<br>22.35 |
| 48                | 70.25<br>1784.4  | 9.19<br>233.43           | 10.38<br>263.65            | 16.50<br>419.10    | 48.00<br>1219.2        | 52.88<br>1343.2 | 54.50<br>1384.3 | 24              | 4.12<br>104.65     | 62.50<br>1587.5             | 0.94<br>23.88 |

#### Notes

- ASME B16.47 Series A flanges (≥ NPS 26) are MSS SP-44 flanges. MSS SP-44 also covers NPS 12 to NPS 24 flanges which are equivalent to ASME B16.5. MSS SP-44 is the only source for the NPS 22 flange dimensions above.
- Class 900 Series A dimensions at NPS 38 and larger also apply to Class 900 Series B flanges.
- Dimension B is to be specified by the purchaser. It corresponds to the pipe inside diameter.
- Flat face flanges may be provided at full thickness, C + raised face, or with raised face removed (the latter is nonstandard).
- WNF = Weld Neck Flange.
- The large end of the hub may be straight or tapered.
- For ring joint facings see page 8-6. For weld end bevel see page 8-5.
- For tolerances see page 8-4.

# ASME B16.47 Series B (API 605) Flanges



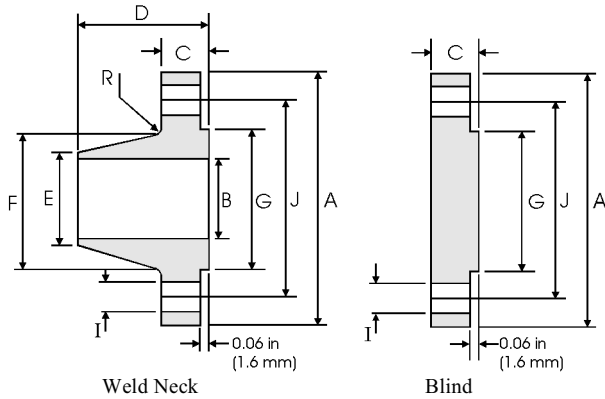
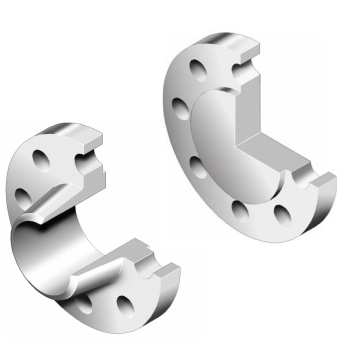
## Class 75 lb

| Pipe<br>Nominal<br>Pipe Size | Flange Data         |                                   |                                     | Hub Data                 |                              |                  | Raised<br>Face   | Drilling Data      |                       |                                   | Radius       |
|------------------------------|---------------------|-----------------------------------|-------------------------------------|--------------------------|------------------------------|------------------|------------------|--------------------|-----------------------|-----------------------------------|--------------|
|                              | A                   | C                                 |                                     | D                        | E                            | F                | G                | H                  | I                     | J                                 | R            |
|                              | Overall<br>Diameter | WNF<br>Flange<br>Thickness<br>min | Blind<br>Flange<br>Thickness<br>min | Overall<br>Length<br>WNF | Diameter<br>at Weld<br>Bevel | Hub<br>Diameter  | Face<br>Diameter | Number of<br>Holes | Bolt Hole<br>Diameter | Diameter<br>of Circle of<br>Holes | Filllet      |
| in<br>mm                     | in<br>mm            | in<br>mm                          | in<br>mm                            | in<br>mm                 | in<br>mm                     | in<br>mm         | in<br>mm         |                    | in<br>mm              | in<br>mm                          | in<br>mm     |
| 26                           | 30.00<br>762.00     | 1.31<br>33.27                     | 1.31<br>33.27                       | 2.31<br>58.67            | 26.06<br>661.92              | 26.62<br>676.15  | 27.75<br>704.85  | 36                 | 0.75<br>19.05         | 28.50<br>723.90                   | 0.31<br>7.87 |
| 28                           | 32.00<br>812.80     | 1.31<br>33.27                     | 1.31<br>33.27                       | 2.44<br>61.98            | 28.06<br>712.72              | 28.62<br>726.95  | 29.75<br>755.65  | 40                 | 0.75<br>19.05         | 30.50<br>774.70                   | 0.31<br>7.87 |
| 30                           | 34.00<br>863.60     | 1.31<br>33.27                     | 1.31<br>33.27                       | 2.56<br>65.02            | 30.06<br>763.52              | 30.62<br>777.75  | 31.75<br>806.45  | 44                 | 0.75<br>19.05         | 32.50<br>825.50                   | 0.31<br>7.87 |
| 32                           | 36.00<br>914.40     | 1.38<br>35.05                     | 1.44<br>36.58                       | 2.75<br>69.85            | 32.06<br>814.32              | 32.62<br>828.55  | 33.75<br>857.25  | 48                 | 0.75<br>19.05         | 34.50<br>876.30                   | 0.31<br>7.87 |
| 34                           | 38.00<br>965.20     | 1.38<br>35.05                     | 1.50<br>38.10                       | 2.88<br>73.15            | 34.06<br>865.12              | 34.62<br>879.35  | 35.75<br>908.05  | 52                 | 0.75<br>19.05         | 36.50<br>927.10                   | 0.31<br>7.87 |
| 36                           | 40.69<br>1033.5     | 1.44<br>36.58                     | 1.67<br>42.42                       | 3.38<br>85.85            | 36.06<br>915.92              | 36.81<br>934.97  | 38.00<br>965.20  | 40                 | 0.88<br>22.35         | 39.06<br>992.12                   | 0.38<br>9.65 |
| 38                           | 42.69<br>1084.3     | 1.50<br>38.10                     | 1.75<br>44.45                       | 3.50<br>88.90            | 38.06<br>966.72              | 38.81<br>985.77  | 40.00<br>1016.0  | 40                 | 0.88<br>22.35         | 41.06<br>1042.9                   | 0.38<br>9.65 |
| 40                           | 44.69<br>1135.1     | 1.50<br>38.10                     | 1.75<br>44.45                       | 3.62<br>91.95            | 40.06<br>1017.5              | 40.81<br>1036.57 | 42.0<br>1066.8   | 44                 | 0.88<br>22.35         | 43.06<br>1093.7                   | 0.38<br>9.65 |
| 42                           | 46.69<br>1185.9     | 1.56<br>39.62                     | 1.88<br>47.75                       | 3.75<br>95.25            | 42.06<br>1068.3              | 42.81<br>1087.37 | 44.00<br>1117.6  | 48                 | 0.88<br>22.35         | 45.06<br>1144.5                   | 0.38<br>9.65 |
| 44                           | 49.25<br>1251.0     | 1.69<br>42.93                     | 1.94<br>49.28                       | 4.12<br>104.65           | 44.06<br>1119.1              | 44.88<br>1139.95 | 46.25<br>1174.8  | 36                 | 1.00<br>25.40         | 47.38<br>1203.5                   | 0.38<br>9.65 |
| 46                           | 51.25<br>1301.8     | 1.75<br>44.45                     | 2.00<br>50.80                       | 4.25<br>107.95           | 46.06<br>1169.9              | 46.88<br>1190.75 | 48.25<br>1225.6  | 40                 | 1.00<br>25.40         | 49.38<br>1254.3                   | 0.38<br>9.65 |
| 48                           | 53.25<br>1352.6     | 1.81<br>45.97                     | 2.12<br>53.85                       | 4.38<br>111.25           | 48.06<br>1220.7              | 48.88<br>1241.55 | 50.25<br>1276.4  | 44                 | 1.00<br>25.40         | 51.38<br>1305.1                   | 0.38<br>9.65 |

Notes

- ASME B16.47 Series B flanges are API 605 flanges. API 605 has been cancelled.
- Class 400 Series A dimensions at NPS 38 and larger also apply to Class 400 Series B flanges.
- Dimension B is to be specified by the purchaser. It corresponds to the pipe inside diameter.
- Flat face flanges may be provided at full thickness, C, or with raised face removed (the latter is nonstandard).
- WNF = Weld Neck Flange.
- The large end of the hub may be straight or tapered.
- For ring joint facings see page 8-6. For weld end bevel see page 8-5.
- For tolerances see page 8-4.

## ASME B16.47 Series B (API 605) Flanges



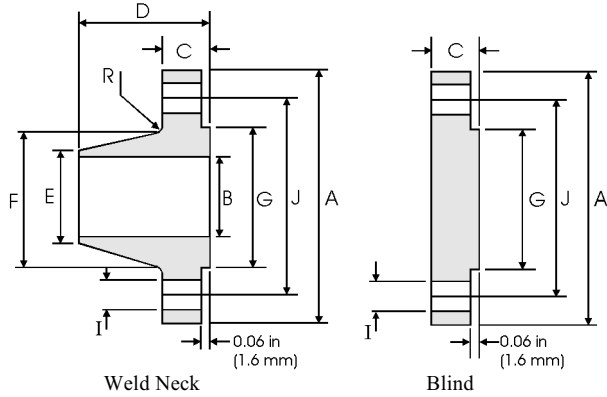
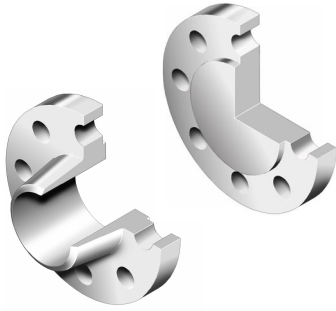
### Class 150 lb

| Pipe              | Flange Data      |                          |                            | Hub Data           |                        |                 | Raised Face     | Drilling Data   |                    |                             | Radius          |
|-------------------|------------------|--------------------------|----------------------------|--------------------|------------------------|-----------------|-----------------|-----------------|--------------------|-----------------------------|-----------------|
| Nominal Pipe Size | A                | C                        |                            | D                  | E                      | F               | G               | H               | I                  | J                           | R               |
|                   | Overall Diameter | WNF Flange Thickness min | Blind Flange Thickness min | Overall Length WNF | Diameter at Weld Bevel | Hub Diameter    | Face Diameter   | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | Fillet          |
|                   | in<br>mm         | in<br>mm                 | in<br>mm                   | in<br>mm           | in<br>mm               | in<br>mm        | in<br>mm        |                 |                    |                             |                 |
| 26                | 30.94<br>785.88  | 1.62<br>41.15            | 1.75<br>44.45              | 3.50<br>88.90      | 26.06<br>661.92        | 26.94<br>684.28 | 28.00<br>711.20 | 36              | 0.88<br>22.35      | 29.31<br>744.47             | 0.38<br>9.65    |
| 28                | 32.94<br>836.68  | 1.75<br>44.45            | 1.88<br>47.75              | 3.75<br>95.25      | 28.06<br>712.72        | 28.94<br>735.08 | 30.00<br>762.00 |                 | 40                 | 0.88<br>22.35               | 31.31<br>795.27 |
| 30                | 34.94<br>887.48  | 1.75<br>44.45            | 2.00<br>50.80              | 3.94<br>100.08     | 30.06<br>763.52        | 31.00<br>787.40 | 32.00<br>812.80 | 44              | 0.88<br>22.35      | 33.31<br>846.07             | 0.38<br>9.65    |
| 32                | 37.06<br>941.32  | 1.81<br>45.97            | 2.12<br>53.85              | 4.25<br>107.95     | 32.06<br>814.32        | 33.06<br>839.72 | 34.00<br>863.60 | 48              | 0.88<br>22.35      | 35.44<br>900.18             | 0.38<br>9.65    |
| 34                | 39.56<br>1004.8  | 1.94<br>49.28            | 2.25<br>57.15              | 4.34<br>110.24     | 34.06<br>865.12        | 35.12<br>892.05 | 36.25<br>920.75 | 40              | 1.00<br>25.40      | 37.69<br>957.33             | 0.38<br>9.65    |
| 36                | 41.62<br>1057.1  | 2.06<br>52.32            | 2.31<br>58.67              | 4.62<br>117.35     | 36.06<br>915.92        | 37.19<br>944.63 | 38.25<br>971.55 | 44              | 1.00<br>25.40      | 39.75<br>1009.7             | 0.38<br>9.65    |
| 38                | 44.25<br>1124.0  | 2.12<br>53.85            | 2.50<br>63.50              | 4.88<br>123.95     | 38.12<br>968.25        | 39.25<br>996.95 | 40.25<br>1022.4 | 40              | 1.12<br>28.45      | 42.12<br>1069.8             | 0.38<br>9.65    |
| 40                | 46.25<br>1174.8  | 2.19<br>55.63            | 2.62<br>66.55              | 5.06<br>128.52     | 40.12<br>1019.0        | 41.31<br>1049.3 | 42.50<br>1079.5 | 44              | 1.12<br>28.45      | 44.12<br>1120.6             | 0.38<br>9.65    |
| 42                | 48.25<br>1225.6  | 2.31<br>58.67            | 2.69<br>68.33              | 5.25<br>133.35     | 42.12<br>1069.8        | 43.38<br>1101.9 | 44.50<br>1130.3 | 48              | 1.12<br>28.45      | 46.12<br>1171.4             | 0.44<br>11.18   |
| 44                | 50.25<br>1276.4  | 2.38<br>60.45            | 2.81<br>71.37              | 5.38<br>136.65     | 44.12<br>1120.6        | 45.38<br>1152.7 | 46.50<br>1181.1 | 52              | 1.12<br>28.45      | 48.12<br>1222.2             | 0.44<br>11.18   |
| 46                | 52.81<br>1341.4  | 2.44<br>61.98            | 2.94<br>74.68              | 5.69<br>144.53     | 46.12<br>1171.4        | 47.44<br>1205.0 | 48.62<br>1234.9 | 40              | 1.25<br>31.75      | 50.56<br>1284.2             | 0.44<br>11.18   |
| 48                | 54.81<br>1392.2  | 2.56<br>65.02            | 3.06<br>77.72              | 5.88<br>149.35     | 48.12<br>1222.2        | 49.50<br>1257.3 | 50.75<br>1289.1 | 44              | 1.25<br>31.75      | 52.56<br>1335.0             | 0.44<br>11.18   |

#### Notes

- ASME B16.47 Series B flanges are API 605 flanges. API 605 has been cancelled.
- Dimension B is to be specified by the purchaser. It corresponds to the pipe inside diameter.
- Flat face flanges may be provided at full thickness, C, or with raised face removed (the latter is nonstandard).
- WNF = Weld Neck Flange.
- The large end of the hub may be straight or tapered.
- For ring joint facings see page 8-6. For weld end bevel see page 8-5.
- For tolerances see page 8-4.

# ASME B16.47 Series B (API 605) Flanges



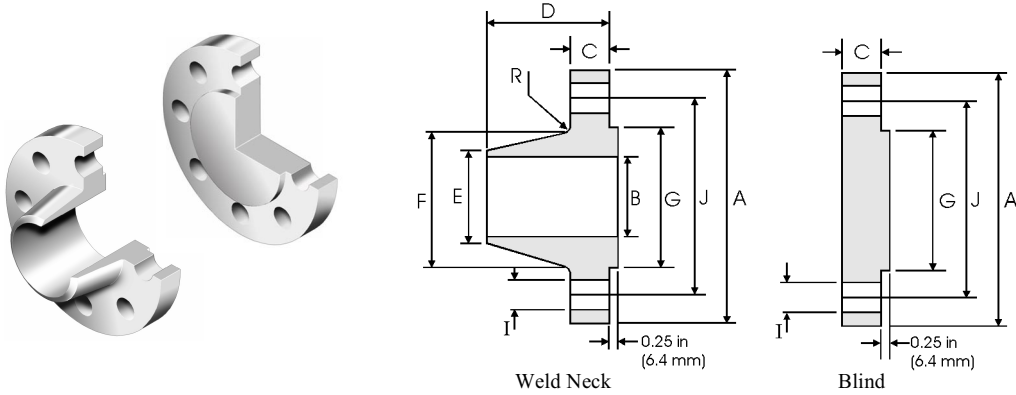
## Class 300 lb

| Pipe              | Flange Data      |                          |                            | Hub Data           |                        | Raised Face     | Drilling Data   |                 |                    | Radius                      |               |
|-------------------|------------------|--------------------------|----------------------------|--------------------|------------------------|-----------------|-----------------|-----------------|--------------------|-----------------------------|---------------|
| Nominal Pipe Size | A                | C                        |                            | D                  | E                      | F               | G               | H               | I                  | J                           | R             |
|                   | Overall Diameter | WNF Flange Thickness min | Blind Flange Thickness min | Overall Length WNF | Diameter at Weld Bevel | Hub Diameter    | Face Diameter   | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | Fillet        |
|                   | in mm            | in mm                    | in mm                      | in mm              | in mm                  | in mm           | in mm           |                 | in mm              | in mm                       | in mm         |
| 26                | 34.12<br>866.65  | 3.50<br>88.90            | 3.50<br>88.90              | 5.69<br>144.53     | 26.19<br>665.23        | 27.62<br>701.55 | 29.00<br>736.60 | 32              | 1.38<br>35.05      | 31.62<br>803.15             | 0.56<br>14.22 |
| 28                | 36.25<br>920.75  | 3.50<br>88.90            | 3.50<br>88.90              | 5.88<br>149.35     | 28.19<br>716.03        | 29.75<br>755.65 | 31.00<br>787.40 | 36              | 1.38<br>35.05      | 33.75<br>857.25             | 0.56<br>14.22 |
| 30                | 39.00<br>990.60  | 3.69<br>93.73            | 3.69<br>93.73              | 6.22<br>157.99     | 30.25<br>768.35        | 32.00<br>812.80 | 33.25<br>844.55 | 36              | 1.50<br>38.10      | 36.25<br>920.75             | 0.56<br>14.22 |
| 32                | 41.50<br>1054.1  | 4.06<br>103.12           | 4.06<br>103.12             | 6.62<br>168.15     | 32.25<br>819.15        | 34.00<br>863.60 | 35.50<br>901.70 | 32              | 1.62<br>41.15      | 38.50<br>977.90             | 0.62<br>15.75 |
| 34                | 43.62<br>1107.9  | 4.06<br>103.12           | 4.06<br>103.12             | 6.81<br>172.97     | 34.25<br>869.95        | 36.12<br>917.45 | 37.50<br>952.50 | 36              | 1.62<br>41.15      | 40.62<br>1031.7             | 0.62<br>15.75 |
| 36                | 46.12<br>1171.4  | 4.06<br>103.12           | 4.06<br>103.12             | 7.12<br>180.85     | 36.25<br>920.75        | 38.00<br>965.20 | 39.75<br>1009.7 | 32              | 1.75<br>44.45      | 42.88<br>1089.2             | 0.62<br>15.75 |
| 38                | 48.12<br>1222.2  | 4.38<br>111.25           | 4.38<br>111.25             | 7.56<br>192.02     | 38.25<br>971.55        | 40.00<br>1016.0 | 41.75<br>1060.5 | 36              | 1.75<br>44.45      | 44.88<br>1140.0             | 0.62<br>15.75 |
| 40                | 50.12<br>1273.0  | 4.56<br>115.82           | 4.56<br>115.82             | 7.81<br>198.37     | 40.25<br>1022.4        | 42.00<br>1066.8 | 43.88<br>1114.6 | 40              | 1.75<br>44.45      | 46.88<br>1190.8             | 0.62<br>15.75 |
| 42                | 52.50<br>1333.5  | 4.69<br>119.13           | 4.69<br>119.13             | 8.06<br>204.72     | 42.31<br>1074.7        | 44.00<br>1117.6 | 46.00<br>1168.4 | 36              | 1.88<br>47.75      | 49.00<br>1244.6             | 0.62<br>15.75 |
| 44                | 54.50<br>1384.3  | 5.00<br>127.00           | 5.00<br>127.00             | 8.44<br>214.38     | 44.31<br>1125.5        | 46.19<br>1173.2 | 48.00<br>1219.2 | 40              | 1.88<br>47.75      | 51.00<br>1295.4             | 0.62<br>15.75 |
| 46                | 57.50<br>1460.5  | 5.06<br>128.52           | 5.12<br>130.05             | 8.75<br>222.25     | 46.31<br>1176.3        | 48.38<br>1228.9 | 50.00<br>1270.0 | 36              | 2.00<br>50.80      | 53.75<br>1365.3             | 0.62<br>15.75 |
| 48                | 59.50<br>1511.3  | 5.06<br>128.52           | 5.31<br>134.87             | 8.81<br>223.77     | 48.31<br>1227.1        | 50.31<br>1277.9 | 52.25<br>1327.2 | 40              | 2.00<br>50.80      | 55.75<br>1416.1             | 0.62<br>15.75 |

### Notes

- ASME B16.47 Series B flanges are API 605 flanges. API 605 has been cancelled.
- Dimension B is to be specified by the purchaser. It corresponds to the pipe inside diameter.
- Flat face flanges may be provided at full thickness, C, or with raised face removed (the latter is nonstandard).
- WNF = Weld Neck Flange.
- The large end of the hub may be straight or tapered.
- For ring joint facings see page 8-6. For weld end bevel see page 8-5.
- For tolerances see page 8-4.

# ASME B16.47 Series B (API 605) Flanges



## Class 400 lb, 600 lb and 900 lb

| Pipe              | Flange Data      |                          |                            | Hub Data           |                        |                 | Raised Face     | Drilling Data   |                    |                             | Radius        |
|-------------------|------------------|--------------------------|----------------------------|--------------------|------------------------|-----------------|-----------------|-----------------|--------------------|-----------------------------|---------------|
| Nominal Pipe Size | A                | C                        | D                          | E                  | F                      | G               | H               | I               | J                  | R                           |               |
|                   | Overall Diameter | WNF Flange Thickness min | Blind Flange Thickness min | Overall Length WNF | Diameter at Weld Bevel | Hub Diameter    | Face Diameter   | Number of Holes | Bolt Hole Diameter | Diameter of Circle of Holes | Filllet       |
|                   | in<br>mm         | in<br>mm                 | in<br>mm                   | in<br>mm           | in<br>mm               | in<br>mm        | in<br>mm        |                 | in<br>mm           | in<br>mm                    | in<br>mm      |
| <b>Class 400</b>  |                  |                          |                            |                    |                        |                 |                 |                 |                    |                             |               |
| 26                | 33.50<br>850.90  | 3.50<br>88.90            | 3.50<br>88.90              | 5.88<br>149.35     | 26.00<br>660.40        | 27.12<br>688.85 | 28.00<br>711.20 | 28              | 1.50<br>38.10      | 30.75<br>781.05             | 0.44<br>11.18 |
| 28                | 36.00<br>914.40  | 3.75<br>95.25            | 3.75<br>95.25              | 6.25<br>158.90     | 28.00<br>711.20        | 29.12<br>739.65 | 30.00<br>762.00 | 24              | 1.62<br>41.15      | 33.00<br>838.20             | 0.50<br>12.70 |
| 30                | 38.25<br>971.55  | 4.00<br>101.60           | 4.00<br>101.60             | 6.69<br>169.93     | 30.00<br>762.00        | 31.25<br>793.75 | 32.25<br>825.00 | 28              | 1.62<br>41.15      | 35.25<br>895.35             | 0.50<br>12.70 |
| 32                | 40.75<br>1035.1  | 4.25<br>107.95           | 4.25<br>107.95             | 7.06<br>179.32     | 32.00<br>812.80        | 33.25<br>844.55 | 34.38<br>873.25 | 28              | 1.75<br>44.45      | 37.50<br>952.50             | 0.50<br>12.70 |
| 34                | 42.75<br>1085.9  | 4.38<br>111.25           | 4.38<br>111.25             | 7.38<br>187.45     | 34.00<br>863.60        | 35.38<br>898.65 | 36.50<br>927.10 | 32              | 1.75<br>44.45      | 39.50<br>1003.3             | 0.56<br>14.22 |
| 36                | 45.50<br>1155.7  | 4.69<br>119.13           | 4.69<br>119.13             | 7.88<br>200.15     | 36.00<br>914.40        | 37.50<br>952.50 | 38.62<br>980.95 | 28              | 1.88<br>47.75      | 42.00<br>1066.8             | 0.56<br>14.22 |
| <b>Class 600</b>  |                  |                          |                            |                    |                        |                 |                 |                 |                    |                             |               |
| 26                | 35.00<br>889.00  | 4.38<br>111.25           | 4.38<br>111.25             | 7.12<br>180.85     | 26.00<br>660.40        | 27.50<br>698.50 | 28.62<br>726.95 | 28              | 1.75<br>44.45      | 31.75<br>806.45             | 0.50<br>12.70 |
| 28                | 37.50<br>952.50  | 4.56<br>115.82           | 4.56<br>115.82             | 7.50<br>190.50     | 28.00<br>711.20        | 29.62<br>752.35 | 30.88<br>784.35 | 28              | 1.88<br>47.75      | 34.00<br>863.60             | 0.50<br>12.70 |
| 30                | 40.25<br>1022.4  | 4.94<br>125.48           | 5.00<br>127.00             | 8.06<br>204.72     | 30.00<br>762.00        | 31.75<br>806.45 | 33.12<br>841.25 | 28              | 2.00<br>50.80      | 36.50<br>927.10             | 0.50<br>12.70 |
| 32                | 42.75<br>1085.9  | 5.12<br>130.05           | 5.31<br>134.87             | 8.50<br>215.90     | 32.00<br>812.80        | 33.88<br>860.55 | 35.25<br>895.35 | 28              | 2.12<br>53.85      | 38.75<br>984.25             | 0.50<br>12.70 |
| 34                | 45.75<br>1162.1  | 5.56<br>141.22           | 5.68<br>144.27             | 9.19<br>233.43     | 34.00<br>863.60        | 36.00<br>914.40 | 37.50<br>952.50 | 24              | 2.38<br>60.45      | 41.50<br>1054.1             | 0.56<br>14.22 |
| 36                | 47.75<br>1212.9  | 5.75<br>146.05           | 5.94<br>150.88             | 9.56<br>242.82     | 36.00<br>914.40        | 38.12<br>968.25 | 39.75<br>1009.7 | 28              | 2.38<br>60.45      | 43.50<br>1104.9             | 0.56<br>14.22 |
| <b>Class 900</b>  |                  |                          |                            |                    |                        |                 |                 |                 |                    |                             |               |
| 26                | 40.25<br>1022.4  | 5.31<br>134.87           | 6.06<br>153.92             | 10.19<br>258.83    | 26.00<br>660.40        | 29.25<br>742.95 | 30.00<br>762.00 | 20              | 2.62<br>66.55      | 35.50<br>901.70             | 0.44<br>11.18 |
| 28                | 43.50<br>1104.9  | 5.81<br>147.57           | 6.56<br>166.62             | 10.88<br>276.35    | 28.00<br>711.20        | 31.38<br>797.05 | 32.25<br>819.15 | 20              | 2.88<br>73.15      | 38.25<br>971.55             | 0.50<br>12.70 |
| 30                | 46.50<br>1181.1  | 6.12<br>155.45           | 6.93<br>176.02             | 11.38<br>289.05    | 30.00<br>762.00        | 33.50<br>850.90 | 34.50<br>876.30 | 20              | 3.12<br>79.25      | 40.75<br>1035.1             | 0.50<br>12.70 |
| 32                | 48.75<br>1238.3  | 6.31<br>160.27           | 7.31<br>185.67             | 11.94<br>303.28    | 32.00<br>812.80        | 35.75<br>908.05 | 36.50<br>927.10 | 20              | 3.12<br>79.25      | 43.00<br>1092.2             | 0.50<br>12.70 |
| 34                | 51.75<br>1314.5  | 6.75<br>171.45           | 7.68<br>195.07             | 12.56<br>319.02    | 34.00<br>863.60        | 37.88<br>962.15 | 39.00<br>990.60 | 20              | 3.38<br>85.85      | 45.50<br>1155.7             | 0.56<br>14.22 |
| 36                | 53.00<br>1346.2  | 6.81<br>172.97           | 7.94<br>201.68             | 12.81<br>325.37    | 36.00<br>914.40        | 40.00<br>1016.0 | 40.50<br>1028.7 | 24              | 3.12<br>79.25      | 47.25<br>1200.2             | 0.56<br>14.22 |

Notes

- ASME B16.47 Series B flanges are API 605 flanges. API 605 has been cancelled.
- Refer to ASME B16.47 Series A dimensions for sizes NPS 38 and larger (see pages 8-48 to 8-50).
- Dimension B is to be specified by the purchaser. It corresponds to the pipe inside diameter.
- WNF = Weld Neck Flange.
- Flat face flanges may be provided at full thickness, C + raised face, or with raised face removed (the latter is nonstandard).
- The large end of the hub may be straight or tapered.
- For ring joint facings see page 8-6. For weld end bevel see page 8-5. For tolerances see page 8-4.

# BS 3293 : 1960

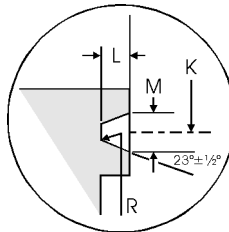
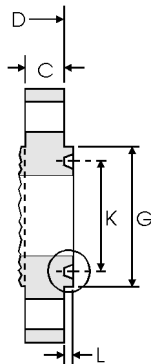
British Standard BS 3293 : 1960 - Carbon Steel Pipe Flanges (over 24 inches nominal size) for the Petroleum Industry, covers Class 150 lb to 600 lb weld neck and slip on flanges.

## Dimensions and Tolerances

Tolerances on flange dimensions (BS 3293 : 1960)

| Dimension  | Tolerance  |                |                |
|--|--|----------------|----------------|
|  | in   | mm             |                |
| Weld Neck and Slip On Flanges (pages 8-56 to 8-59)             | G (raised face diameter)                             | $\pm 1/64$     | $\pm 0.40$     |
|  | C (flange thickness)                                 | $+3/16, -0$    | $+4.76, -0$    |
|  | D (overall length)                                   | $\pm 1/8$      | $\pm 3.18$     |
|  | E (outside diameter at welding end of weld neck hub) | $+5/32, -1/32$ | $+3.97, -0.79$ |
|  | B (inside diameter of weld neck flange)              | $+1/8, -1/16$  | $+3.18, -1.59$ |
| Ring Joint Facing on Weld Neck and Slip On Flanges (see below) | B (inside diameter of slip on flange)                | $+1/16, -0$    | $+1.59, -0$    |
|  | L (depth of groove)                                  | $+1/64, -0$    | $+0.40, -0$    |
|  | M (width of groove)                                  | $\pm 0.008$    | $\pm 0.20$     |
|  | K (pitch diameter of groove)                         | $\pm 0.005$    | $\pm 0.13$     |

## Ring Joint Facings - BS 3293



Note

- Values for minimum flange thickness, C, and overall length, D, are detailed in the flange tables.
- For ring joint tolerances see above.
- R = 1/16 in (0.40 mm) max, corner radius at bottom of groove.

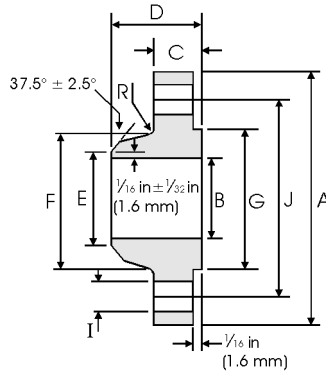
## Ring joint facing dimensions - BS 3293

| Class (lb)              |     |     |     | Groove/Ring Number | Raised Face                              | Groove                                   |  |   | Weight       |              |              |
|-------------------------|-----|-----|-----|--------------------|--|--|--|---|--------------|--------------|--------------|
| 150                     | 300 | 400 | 600 |                    | G  | K  | L                                      | M                                       | kg/piece     |              |              |
| Nominal Pipe Size (NPS) |     |     |     |                    | Face Diameter min                        | Pitch Diameter                           | Depth                                  | Width                                   | Class 300 lb | Class 400 lb | Class 600 lb |
|                         |     |     |     |                    | in mm                                    | in mm                                    | in mm                                  | in mm                                   | WNF Slip on  | WNF Slip on  | WNF Slip on  |
|                         | 26  | 26  | 26  | R93                | 31 <sup>7</sup> / <sub>8</sub><br>809.6  | 29 <sup>1</sup> / <sub>2</sub><br>749.3  | 1 <sup>1</sup> / <sub>2</sub><br>12.7  | 25 <sup>5</sup> / <sub>32</sub><br>19.8 | 298<br>270   | 349<br>304   | 446<br>417   |
|                         | 28  | 28  | 28  | R94                | 33 <sup>7</sup> / <sub>8</sub><br>860.4  | 31 <sup>1</sup> / <sub>2</sub><br>800.1  | 1 <sup>1</sup> / <sub>2</sub><br>12.7  | 25 <sup>5</sup> / <sub>32</sub><br>19.8 | 360<br>333   | 409<br>364   | 518<br>482   |
|                         | 30  | 30  | 30  | R95                | 36 <sup>1</sup> / <sub>8</sub><br>917.6  | 33 <sup>3</sup> / <sub>4</sub><br>857.2  | 1 <sup>1</sup> / <sub>2</sub><br>12.7  | 25 <sup>5</sup> / <sub>32</sub><br>19.8 | 412<br>376   | 465<br>419   | 570<br>537   |
|                         | 32  | 32  | 32  | R96                | 38 <sup>3</sup> / <sub>4</sub><br>984.2  | 36<br>914.4                              | 9 <sup>9</sup> / <sub>16</sub><br>14.3 | 29 <sup>5</sup> / <sub>32</sub><br>23.0 | 465<br>425   | 539<br>482   | 697<br>622   |
|                         | 34  | 34  | 34  | R97                | 40 <sup>3</sup> / <sub>4</sub><br>1035.0 | 38<br>965.2                              | 9 <sup>9</sup> / <sub>16</sub><br>14.3 | 29 <sup>5</sup> / <sub>32</sub><br>23.0 | 536<br>492   | 608<br>540   | 735<br>670   |
|                         | 36  | 36  | 36  | R98                | 43<br>1092.2                             | 40 <sup>1</sup> / <sub>4</sub><br>1022.3 | 9 <sup>9</sup> / <sub>16</sub><br>14.3 | 29 <sup>5</sup> / <sub>32</sub><br>23.0 | 595<br>548   | 689<br>621   | 800<br>764   |

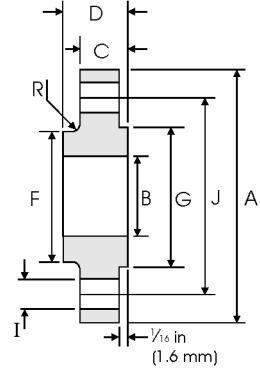
Note

- Weights are based on manufacturer's data and are approximate.

## Weld Neck and Slip On Flanges - BS 3293



Weld Neck



Slip On

### Class 150 lb

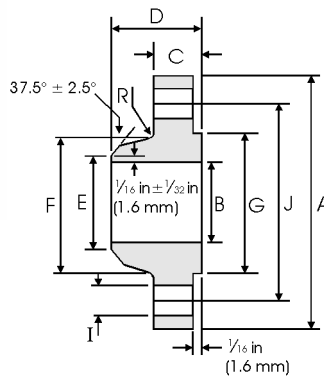
| Pipe<br>Nominal<br>Pipe Size | Flange Data                              |  |   |  | Hub Data                                |                                     | Raised<br>Face                           | Drilling Data                            |                       |                                       | Radius                                   | Weight                                  |                |
|------------------------------|--|--|---|--|---|-------------------------------------|--|--|-----------------------|---------------------------------------|--|---|----------------|
|                              | A  | B  | C                                       | D  |   | E                                   | F  | G  | H                     | I                                     | J  | R                                       |                |
|                              | Overall<br>Diameter                      | Slip on<br>Inside<br>Diameter            | Flange<br>Thickness                     | WNF<br>Overall<br>Length                 | Slip on<br>Overall<br>Length            | WNF<br>Diameter<br>at Weld<br>Bevel | WNF /<br>Slip on<br>Hub<br>Diameter      | Face<br>Diameter                         | Number<br>of<br>Holes | Bolt<br>Hole<br>Diam.                 | Diameter<br>of Circle<br>of Holes        | Fillet                                  | kg/<br>piece   |
| in<br>mm                     | in<br>mm                                 | in<br>mm                                 | in<br>mm                                | in<br>mm                                 | in<br>mm                                | in<br>mm                            | in<br>mm                                 | in<br>mm                                 |                       | in<br>mm                              | in<br>mm                                 | in<br>mm                                | WNF<br>Slip On |
| 26                           | 34 <sup>1</sup> / <sub>4</sub><br>869.9  | 26 <sup>1</sup> / <sub>4</sub><br>666.7  | 2<br>50.8                               | 5<br>127.0                               | 3 <sup>3</sup> / <sub>8</sub><br>85.7   | 26<br>660.4                         | 28 <sup>1</sup> / <sub>2</sub><br>723.9  | 29 <sup>1</sup> / <sub>4</sub><br>742.9  | 24                    | 1 <sup>3</sup> / <sub>8</sub><br>34.9 | 31 <sup>3</sup> / <sub>4</sub><br>806.4  | 1 <sup>1</sup> / <sub>4</sub><br>6.35   | 118<br>107     |
| 28                           | 36 <sup>1</sup> / <sub>2</sub><br>927.1  | 28 <sup>1</sup> / <sub>4</sub><br>717.6  | 2 <sup>1</sup> / <sub>16</sub><br>52.4  | 5 <sup>1</sup> / <sub>16</sub><br>128.6  | 3 <sup>7</sup> / <sub>16</sub><br>87.3  | 28<br>711.2                         | 30 <sup>3</sup> / <sub>4</sub><br>781.0  | 31 <sup>1</sup> / <sub>4</sub><br>793.7  | 28                    | 1 <sup>3</sup> / <sub>8</sub><br>34.9 | 34<br>863.6                              | 1 <sup>1</sup> / <sub>4</sub><br>6.35   | 134<br>122     |
| 30                           | 38 <sup>3</sup> / <sub>4</sub><br>984.2  | 30 <sup>1</sup> / <sub>4</sub><br>768.3  | 2 <sup>1</sup> / <sub>8</sub><br>54.0   | 5 <sup>1</sup> / <sub>8</sub><br>130.2   | 3 <sup>1</sup> / <sub>2</sub><br>88.9   | 30<br>762.0                         | 32 <sup>3</sup> / <sub>4</sub><br>831.8  | 33 <sup>3</sup> / <sub>4</sub><br>857.2  | 28                    | 1 <sup>3</sup> / <sub>8</sub><br>34.9 | 36<br>914.4                              | 1 <sup>1</sup> / <sub>4</sub><br>6.35   | 153<br>138     |
| 32                           | 41 <sup>3</sup> / <sub>4</sub><br>1060.4 | 32 <sup>1</sup> / <sub>4</sub><br>819.1  | 2 <sup>1</sup> / <sub>4</sub><br>57.1   | 5 <sup>1</sup> / <sub>4</sub><br>133.3   | 3 <sup>5</sup> / <sub>8</sub><br>92.1   | 32<br>812.8                         | 35<br>889.0                              | 35 <sup>3</sup> / <sub>4</sub><br>908.0  | 28                    | 1 <sup>5</sup> / <sub>8</sub><br>41.3 | 38 <sup>1</sup> / <sub>2</sub><br>977.9  | 5 <sup>1</sup> / <sub>16</sub><br>7.94  | 190<br>170     |
| 34                           | 43 <sup>3</sup> / <sub>4</sub><br>1111.2 | 34 <sup>1</sup> / <sub>4</sub><br>869.9  | 2 <sup>5</sup> / <sub>16</sub><br>58.7  | 5 <sup>5</sup> / <sub>16</sub><br>134.9  | 3 <sup>11</sup> / <sub>16</sub><br>93.7 | 34<br>863.6                         | 37<br>939.8                              | 37 <sup>3</sup> / <sub>4</sub><br>958.8  | 32                    | 1 <sup>5</sup> / <sub>8</sub><br>41.3 | 40 <sup>1</sup> / <sub>2</sub><br>1028.7 | 5 <sup>1</sup> / <sub>16</sub><br>7.94  | 212<br>184     |
| 36                           | 46<br>1168.4                             | 36 <sup>1</sup> / <sub>4</sub><br>920.7  | 2 <sup>3</sup> / <sub>8</sub><br>60.3   | 5 <sup>3</sup> / <sub>8</sub><br>136.5   | 3 <sup>3</sup> / <sub>4</sub><br>95.2   | 36<br>914.4                         | 39 <sup>1</sup> / <sub>4</sub><br>996.9  | 40 <sup>1</sup> / <sub>4</sub><br>1022.3 | 32                    | 1 <sup>5</sup> / <sub>8</sub><br>41.3 | 42 <sup>3</sup> / <sub>4</sub><br>1085.8 | 5 <sup>1</sup> / <sub>16</sub><br>7.94  | 242<br>211     |
| 38                           | 48 <sup>3</sup> / <sub>4</sub><br>1238.2 | 38 <sup>1</sup> / <sub>4</sub><br>971.5  | 2 <sup>3</sup> / <sub>8</sub><br>60.3   | 5 <sup>3</sup> / <sub>8</sub><br>136.5   | 3 <sup>3</sup> / <sub>4</sub><br>95.2   | 38<br>965.2                         | 41 <sup>3</sup> / <sub>4</sub><br>1060.4 | 42 <sup>1</sup> / <sub>4</sub><br>1073.1 | 32                    | 1 <sup>5</sup> / <sub>8</sub><br>41.3 | 45 <sup>1</sup> / <sub>4</sub><br>1149.3 | 3 <sup>8</sup> / <sub>16</sub><br>9.53  | 284<br>249     |
| 40                           | 50 <sup>3</sup> / <sub>4</sub><br>1289.0 | 40 <sup>1</sup> / <sub>4</sub><br>1022.3 | 2 <sup>1</sup> / <sub>2</sub><br>63.5   | 5 <sup>1</sup> / <sub>2</sub><br>139.7   | 3 <sup>7</sup> / <sub>8</sub><br>98.4   | 40<br>1016.0                        | 43 <sup>3</sup> / <sub>4</sub><br>1111.2 | 44 <sup>1</sup> / <sub>4</sub><br>1123.9 | 36                    | 1 <sup>5</sup> / <sub>8</sub><br>41.3 | 47 <sup>1</sup> / <sub>4</sub><br>1200.1 | 3 <sup>8</sup> / <sub>16</sub><br>9.53  | 311<br>272     |
| 42                           | 53<br>1346.2                             | 42 <sup>1</sup> / <sub>4</sub><br>1073.2 | 2 <sup>5</sup> / <sub>8</sub><br>66.7   | 5 <sup>5</sup> / <sub>8</sub><br>142.9   | 4<br>101.6                              | 42<br>1066.8                        | 46<br>1168.4                             | 47<br>1193.8                             | 36                    | 1 <sup>5</sup> / <sub>8</sub><br>41.3 | 49 <sup>1</sup> / <sub>2</sub><br>1257.3 | 3 <sup>8</sup> / <sub>16</sub><br>9.53  | 358<br>313     |
| 44                           | 55 <sup>1</sup> / <sub>4</sub><br>1403.3 | 44 <sup>1</sup> / <sub>4</sub><br>1123.9 | 2 <sup>5</sup> / <sub>8</sub><br>66.7   | 5 <sup>5</sup> / <sub>8</sub><br>142.9   | 4<br>101.6                              | 44<br>1117.6                        | 48<br>1219.2                             | 49<br>1244.6                             | 40                    | 1 <sup>5</sup> / <sub>8</sub><br>41.3 | 51 <sup>3</sup> / <sub>4</sub><br>1314.4 | 7 <sup>1</sup> / <sub>16</sub><br>11.11 | 376<br>331     |
| 46                           | 57 <sup>1</sup> / <sub>4</sub><br>1454.2 | 46 <sup>1</sup> / <sub>4</sub><br>1174.7 | 2 <sup>11</sup> / <sub>16</sub><br>68.3 | 5 <sup>11</sup> / <sub>16</sub><br>144.5 | 4 <sup>1</sup> / <sub>16</sub><br>103.2 | 46<br>1168.4                        | 50<br>1270.0                             | 51<br>1295.4                             | 40                    | 1 <sup>5</sup> / <sub>8</sub><br>41.3 | 53 <sup>3</sup> / <sub>4</sub><br>1365.2 | 7 <sup>1</sup> / <sub>16</sub><br>11.11 | 399<br>349     |
| 48                           | 59 <sup>1</sup> / <sub>2</sub><br>1511.1 | 48 <sup>1</sup> / <sub>4</sub><br>1225.5 | 2 <sup>3</sup> / <sub>4</sub><br>69.9   | 5 <sup>3</sup> / <sub>4</sub><br>146.1   | 4 <sup>1</sup> / <sub>8</sub><br>104.8  | 48<br>1219.2                        | 52 <sup>1</sup> / <sub>4</sub><br>1327.2 | 53 <sup>1</sup> / <sub>2</sub><br>1358.9 | 44                    | 1 <sup>5</sup> / <sub>8</sub><br>41.3 | 56<br>1422.4                             | 7 <sup>1</sup> / <sub>16</sub><br>11.11 | 440<br>381     |

#### Notes

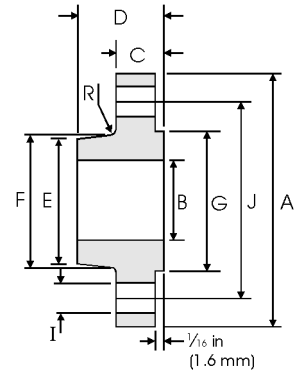
- For weld neck flanges, dimension B is to be specified by the purchaser. It corresponds to the pipe inside diameter.
- For slip on flanges, the hub may be cylindrical or have a draft of  $\leq 7^\circ$  on the outside surface.
- WNF = Weld Neck Flange.
- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-55.
- For tolerances see page 8-55.



# Weld Neck and Slip On Flanges - BS 3293



Weld Neck



Slip On

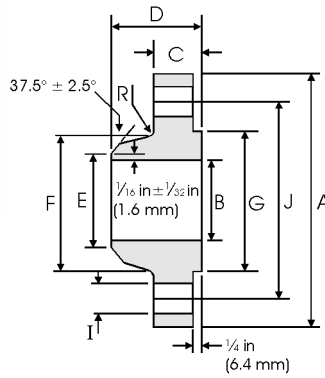
## Class 300 lb

| Nominal Pipe Size | Flange Data                              |   |  |  | Hub Data                                 |  |   | Raised Face                              | Drilling Data   |                                       |  | Radius                                | Weight      |
|-------------------|--|---|--|--|--|--|---|--|-----------------|---------------------------------------|--|---------------------------------------|-------------|
|                   | A  | B                                       | C                                      | D                                      | E  |  | F   | G  | H               | I                                     | J  | R                                     |             |
|                   | Overall Diameter                         | Slip on Inside Diameter                 | Flange Thickness                       | WNF / Slip on Overall Length           | WNF Diam. at Weld Bevel                  | Slip on Hub Diam. at Small End           | Hub Diameter                              | Face Diameter                            | Number of Holes | Bolt Hole Diam.                       | Diameter of Circle of Holes              | Fillet                                | kg/ piece   |
| in mm             | in mm                                    | in mm                                   | in mm                                  | in mm                                  | in mm                                    | in mm                                    | in mm                                     | in mm                                    |                 | in mm                                 | in mm                                    | in mm                                 | WNF Slip On |
| 26                | 38 <sup>1</sup> / <sub>4</sub><br>971.5  | 26 <sup>1</sup> / <sub>4</sub><br>666.7 | 3 <sup>1</sup> / <sub>8</sub><br>79.4  | 7 <sup>1</sup> / <sub>4</sub><br>184.1 | 26 <sup>1</sup> / <sub>4</sub><br>666.7  | 27 <sup>1</sup> / <sub>16</sub><br>687.4 | 28 <sup>3</sup> / <sub>8</sub><br>720.7   | 29 <sup>1</sup> / <sub>2</sub><br>749.3  | 28              | 1 <sup>3</sup> / <sub>4</sub><br>44.4 | 34 <sup>1</sup> / <sub>2</sub><br>876.3  | <sup>3</sup> / <sub>8</sub><br>9.53   | 279<br>251  |
| 28                | 40 <sup>3</sup> / <sub>4</sub><br>1035.0 | 28 <sup>1</sup> / <sub>4</sub><br>717.6 | 3 <sup>3</sup> / <sub>8</sub><br>85.7  | 7 <sup>3</sup> / <sub>4</sub><br>196.8 | 28 <sup>1</sup> / <sub>4</sub><br>717.5  | 29 <sup>1</sup> / <sub>8</sub><br>739.7  | 30 <sup>1</sup> / <sub>2</sub><br>774.7   | 31 <sup>1</sup> / <sub>2</sub><br>800.1  | 28              | 1 <sup>3</sup> / <sub>4</sub><br>44.4 | 37<br>939.8                              | <sup>7</sup> / <sub>16</sub><br>11.11 | 340<br>313  |
| 30                | 43<br>1092.2                             | 30 <sup>1</sup> / <sub>4</sub><br>768.3 | 3 <sup>5</sup> / <sub>8</sub><br>92.1  | 8 <sup>1</sup> / <sub>4</sub><br>209.5 | 30 <sup>1</sup> / <sub>4</sub><br>768.3  | 31 <sup>3</sup> / <sub>16</sub><br>792.2 | 32 <sup>9</sup> / <sub>16</sub><br>827.2  | 33 <sup>3</sup> / <sub>4</sub><br>857.2  | 28              | 1 <sup>7</sup> / <sub>8</sub><br>47.6 | 39 <sup>1</sup> / <sub>4</sub><br>996.9  | <sup>7</sup> / <sub>16</sub><br>11.11 | 390<br>354  |
| 32                | 45 <sup>1</sup> / <sub>4</sub><br>1149.3 | 32 <sup>1</sup> / <sub>4</sub><br>819.1 | 3 <sup>7</sup> / <sub>8</sub><br>98.4  | 8 <sup>3</sup> / <sub>4</sub><br>222.2 | 32 <sup>1</sup> / <sub>4</sub><br>819.1  | 33 <sup>1</sup> / <sub>4</sub><br>844.6  | 34 <sup>11</sup> / <sub>16</sub><br>881.1 | 36<br>914.4                              | 28              | 2<br>50.8                             | 41 <sup>1</sup> / <sub>2</sub><br>1054.1 | <sup>7</sup> / <sub>16</sub><br>11.11 | 435<br>395  |
| 34                | 47 <sup>1</sup> / <sub>2</sub><br>1206.5 | 34 <sup>1</sup> / <sub>4</sub><br>869.9 | 4<br>101.6                             | 9 <sup>1</sup> / <sub>8</sub><br>231.8 | 34 <sup>5</sup> / <sub>16</sub><br>871.5 | 35 <sup>5</sup> / <sub>16</sub><br>896.9 | 36 <sup>7</sup> / <sub>8</sub><br>936.6   | 38<br>965.2                              | 28              | 2<br>50.8                             | 43 <sup>1</sup> / <sub>2</sub><br>1104.9 | <sup>1</sup> / <sub>2</sub><br>12.7   | 504<br>460  |
| 36                | 50<br>1270.0                             | 36 <sup>1</sup> / <sub>4</sub><br>920.7 | 4 <sup>1</sup> / <sub>8</sub><br>104.8 | 9 <sup>1</sup> / <sub>2</sub><br>241.3 | 36 <sup>5</sup> / <sub>16</sub><br>922.3 | 37 <sup>3</sup> / <sub>8</sub><br>949.3  | 39<br>990.6                               | 40 <sup>1</sup> / <sub>4</sub><br>1022.3 | 32              | 2 <sup>1</sup> / <sub>8</sub><br>54.0 | 46<br>1168.4                             | <sup>1</sup> / <sub>2</sub><br>12.7   | 560<br>513  |

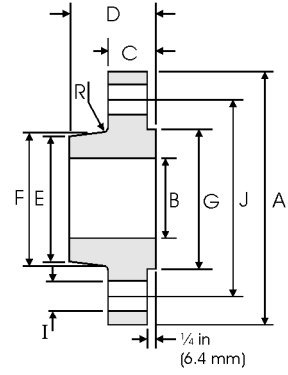
### Notes

- For weld neck flanges, dimension B is to be specified by the purchaser. It corresponds to the pipe inside diameter.
- For slip on flanges, the hub may be cylindrical or have a draft of  $\leq 7^\circ$  on the outside surface.
- WNF = Weld Neck Flange.
- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-55.
- For tolerances see page 8-55.

## Weld Neck and Slip On Flanges - BS 3293



Weld Neck



Slip On

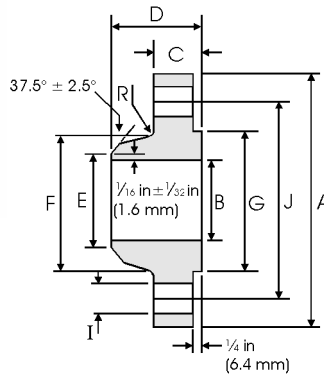
### Class 400 lb

| Pipe<br>Nominal<br>Pipe Size | Flange Data                              |   |  |  | Hub Data                                 |  |   | Raised<br>Face                           | Drilling Data         |                                       |  | Radius                                | Weight         |
|------------------------------|--|---|--|--|--|--|---|--|-----------------------|---------------------------------------|--|---------------------------------------|----------------|
|                              | A  | B                                       | C                                      | D                                      | E  | F  | G   | H  | I                     | J                                     | R  |                                       |                |
|                              | Overall<br>Diameter                      | Slip on<br>Inside<br>Diameter           | Flange<br>Thickness                    | WNF /<br>Slip on<br>Overall<br>Length  | WNF<br>Diam.<br>at Weld<br>Bevel         | Slip on<br>Hub<br>Diam.<br>at Small<br>End | Hub<br>Diameter                           | Face<br>Diameter                         | Number<br>of<br>Holes | Bolt<br>Hole<br>Diam.                 | Diameter<br>of Circle<br>of Holes        | Fillet                                | kg/<br>piece   |
| in<br>mm                     | in<br>mm                                 | in<br>mm                                | in<br>mm                               | in<br>mm                               | in<br>mm                                 | in<br>mm                                   | in<br>mm                                  | in<br>mm                                 |                       | in<br>mm                              | in<br>mm                                 | in<br>mm                              | WNF<br>Slip On |
| 26                           | 38 <sup>1</sup> / <sub>4</sub><br>971.5  | 26 <sup>1</sup> / <sub>4</sub><br>666.7 | 3 <sup>1</sup> / <sub>2</sub><br>88.9  | 7 <sup>5</sup> / <sub>8</sub><br>193.7 | 26 <sup>5</sup> / <sub>16</sub><br>668.3 | 27 <sup>5</sup> / <sub>16</sub><br>693.7   | 28 <sup>5</sup> / <sub>8</sub><br>727.1   | 29 <sup>1</sup> / <sub>2</sub><br>749.3  | 28                    | 1 <sup>7</sup> / <sub>8</sub><br>47.6 | 34 <sup>1</sup> / <sub>2</sub><br>876.3  | <sup>7</sup> / <sub>16</sub><br>11.11 | 340<br>295     |
| 28                           | 40 <sup>3</sup> / <sub>4</sub><br>1035.0 | 28 <sup>1</sup> / <sub>4</sub><br>717.6 | 3 <sup>3</sup> / <sub>4</sub><br>95.2  | 8 <sup>1</sup> / <sub>8</sub><br>206.4 | 28 <sup>5</sup> / <sub>16</sub><br>719.1 | 29 <sup>3</sup> / <sub>8</sub><br>746.1    | 30 <sup>13</sup> / <sub>16</sub><br>782.6 | 31 <sup>1</sup> / <sub>2</sub><br>800.1  | 28                    | 2<br>50.8                             | 37<br>939.8                              | <sup>1</sup> / <sub>2</sub><br>12.7   | 399<br>354     |
| 30                           | 43<br>1092.2                             | 30 <sup>1</sup> / <sub>4</sub><br>768.3 | 4<br>101.6                             | 8 <sup>5</sup> / <sub>8</sub><br>219.1 | 30 <sup>5</sup> / <sub>16</sub><br>769.6 | 31 <sup>1</sup> / <sub>2</sub><br>800.1    | 32 <sup>15</sup> / <sub>16</sub><br>836.6 | 33 <sup>3</sup> / <sub>4</sub><br>857.2  | 28                    | 2 <sup>1</sup> / <sub>8</sub><br>54.0 | 39 <sup>1</sup> / <sub>4</sub><br>996.9  | <sup>1</sup> / <sub>2</sub><br>12.7   | 454<br>408     |
| 32                           | 45 <sup>1</sup> / <sub>4</sub><br>1149.3 | 32 <sup>1</sup> / <sub>4</sub><br>819.1 | 4 <sup>1</sup> / <sub>4</sub><br>107.9 | 9 <sup>1</sup> / <sub>8</sub><br>231.8 | 32 <sup>3</sup> / <sub>8</sub><br>822.3  | 33 <sup>9</sup> / <sub>16</sub><br>852.5   | 35<br>889.0                               | 36<br>914.4                              | 28                    | 2 <sup>1</sup> / <sub>8</sub><br>54.0 | 41 <sup>1</sup> / <sub>2</sub><br>1054.1 | <sup>1</sup> / <sub>2</sub><br>12.7   | 522<br>465     |
| 34                           | 47 <sup>1</sup> / <sub>2</sub><br>1206.5 | 34 <sup>1</sup> / <sub>4</sub><br>869.9 | 4 <sup>3</sup> / <sub>8</sub><br>111.1 | 9 <sup>1</sup> / <sub>2</sub><br>241.3 | 34 <sup>3</sup> / <sub>8</sub><br>873.1  | 35 <sup>5</sup> / <sub>8</sub><br>904.9    | 37 <sup>3</sup> / <sub>16</sub><br>944.6  | 38<br>965.2                              | 28                    | 2 <sup>1</sup> / <sub>8</sub><br>54.0 | 43 <sup>1</sup> / <sub>2</sub><br>1104.9 | <sup>9</sup> / <sub>16</sub><br>14.29 | 590<br>522     |
| 36                           | 50<br>1270.0                             | 36 <sup>1</sup> / <sub>4</sub><br>920.8 | 4 <sup>1</sup> / <sub>2</sub><br>114.3 | 9 <sup>7</sup> / <sub>8</sub><br>250.8 | 36 <sup>7</sup> / <sub>16</sub><br>925.5 | 37 <sup>3</sup> / <sub>4</sub><br>958.8    | 39 <sup>7</sup> / <sub>8</sub><br>1012.9  | 40 <sup>1</sup> / <sub>4</sub><br>1022.3 | 32                    | 2 <sup>1</sup> / <sub>8</sub><br>54.0 | 46<br>1168.4                             | <sup>9</sup> / <sub>16</sub><br>14.29 | 669<br>601     |

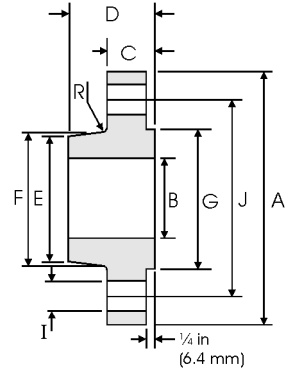
#### Notes

- For weld neck flanges, dimension B is to be specified by the purchaser. It corresponds to the pipe inside diameter.
- For slip on flanges, the hub may be cylindrical or have a draft of  $\leq 7^\circ$  on the outside surface.
- WNF = Weld Neck Flange.
- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-55.
- For tolerances see page 8-55.

# Weld Neck and Slip On Flanges - BS 3293



Weld Neck



Slip On

## Class 600 lb

| Pipe              | Flange Data                              |   |  |   | Hub Data                                  |   |   | Raised Face                              | Drilling Data   |                                       |  | Radius                                   | Weight     |
|-------------------|--|---|--|---|---|---|---|--|-----------------|---------------------------------------|--|--|------------|
| Nominal Pipe Size | A  | B                                       | C                                      | D                                       | E   |   | F   | G  | H               | I                                     | J  | R  |            |
|                   | Overall Diameter                         | Slip on Inside Diameter                 | Flange Thickness                       | WNF / Slip on Overall Length            | WNF Diam. at Weld Bevel                   | Slip on Hub Diam. at Small Lend           | Hub Diameter                              | Face Diameter                            | Number of Holes | Bolt Hole Diam.                       | Diameter of Circle of Holes              | Fillet                                   | kg/ piece  |
|                   | in mm                                    | in mm                                   | in mm                                  | in mm                                   | in mm                                     | in mm                                     | in mm                                     | in mm                                    |                 | in mm                                 | in mm                                    | in mm                                    | in mm      |
| 26                | 40<br>1016.0                             | 26 <sup>1</sup> / <sub>4</sub><br>666.7 | 4 <sup>1</sup> / <sub>4</sub><br>107.9 | 8 <sup>3</sup> / <sub>4</sub><br>222.2  | 26 <sup>7</sup> / <sub>16</sub><br>671.52 | 27 <sup>13</sup> / <sub>16</sub><br>706.4 | 29 <sup>7</sup> / <sub>16</sub><br>747.7  | 29 <sup>1</sup> / <sub>2</sub><br>749.3  | 28              | 2<br>50.8                             | 36<br>914.4                              | 9 <sup>9</sup> / <sub>16</sub><br>14.29  | 437<br>408 |
| 28                | 42 <sup>1</sup> / <sub>4</sub><br>1073.1 | 28 <sup>1</sup> / <sub>4</sub><br>717.6 | 4 <sup>3</sup> / <sub>8</sub><br>111.1 | 9 <sup>1</sup> / <sub>4</sub><br>234.9  | 28 <sup>1</sup> / <sub>2</sub><br>723.9   | 29 <sup>15</sup> / <sub>16</sub><br>760.4 | 31 <sup>5</sup> / <sub>8</sub><br>803.3   | 31 <sup>1</sup> / <sub>2</sub><br>800.1  | 28              | 2 <sup>1</sup> / <sub>8</sub><br>54.0 | 38<br>965.2                              | 5 <sup>5</sup> / <sub>8</sub><br>15.88   | 508<br>472 |
| 30                | 44 <sup>1</sup> / <sub>2</sub><br>1130.3 | 30 <sup>1</sup> / <sub>4</sub><br>768.3 | 4 <sup>1</sup> / <sub>2</sub><br>114.3 | 9 <sup>3</sup> / <sub>4</sub><br>247.6  | 30 <sup>1</sup> / <sub>2</sub><br>774.7   | 32 <sup>1</sup> / <sub>16</sub><br>814.4  | 33 <sup>15</sup> / <sub>16</sub><br>862.0 | 33 <sup>3</sup> / <sub>4</sub><br>857.2  | 28              | 2 <sup>1</sup> / <sub>8</sub><br>54.0 | 40 <sup>1</sup> / <sub>4</sub><br>1022.3 | 1 <sup>11</sup> / <sub>16</sub><br>17.46 | 559<br>526 |
| 32                | 47<br>1193.8                             | 32 <sup>1</sup> / <sub>4</sub><br>819.1 | 4 <sup>5</sup> / <sub>8</sub><br>117.5 | 10 <sup>1</sup> / <sub>4</sub><br>260.3 | 32 <sup>1</sup> / <sub>2</sub><br>825.5   | 34 <sup>3</sup> / <sub>16</sub><br>868.4  | 36 <sup>1</sup> / <sub>8</sub><br>917.6   | 36<br>914.4                              | 28              | 2 <sup>3</sup> / <sub>8</sub><br>60.3 | 42 <sup>1</sup> / <sub>2</sub><br>1079.5 | 1 <sup>11</sup> / <sub>16</sub><br>17.46 | 680<br>605 |
| 34                | 49<br>1244.6                             | 34 <sup>1</sup> / <sub>4</sub><br>869.9 | 4 <sup>3</sup> / <sub>4</sub><br>120.6 | 10 <sup>5</sup> / <sub>8</sub><br>269.9 | 34 <sup>9</sup> / <sub>16</sub><br>877.9  | 36 <sup>5</sup> / <sub>16</sub><br>922.3  | 38 <sup>5</sup> / <sub>16</sub><br>973.1  | 38<br>965.2                              | 28              | 2 <sup>3</sup> / <sub>8</sub><br>60.3 | 44 <sup>1</sup> / <sub>2</sub><br>1130.3 | 3 <sup>3</sup> / <sub>4</sub><br>19.05   | 717<br>652 |
| 36                | 51 <sup>3</sup> / <sub>4</sub><br>1314.4 | 36 <sup>1</sup> / <sub>4</sub><br>920.7 | 4 <sup>7</sup> / <sub>8</sub><br>123.8 | 11 <sup>1</sup> / <sub>8</sub><br>282.6 | 36 <sup>9</sup> / <sub>16</sub><br>928.7  | 38 <sup>7</sup> / <sub>16</sub><br>976.3  | 40 <sup>5</sup> / <sub>8</sub><br>1031.9  | 40 <sup>1</sup> / <sub>4</sub><br>1022.3 | 28              | 2 <sup>5</sup> / <sub>8</sub><br>66.7 | 47<br>1193.8                             | 3 <sup>3</sup> / <sub>4</sub><br>19.05   | 780<br>744 |

### Notes

- For weld neck flanges, dimension B is to be specified by the purchaser. It corresponds to the pipe inside diameter.
- For slip on flanges, the hub may be cylindrical or have a draft of  $\leq 7^\circ$  on the outside surface.
- WNF = Weld Neck Flange.
- Weights are based on manufacturer's data and are approximate.
- For ring joint facings see page 8-55.
- For tolerances see page 8-55.

## BS 4504 Circular Flanges - General

British Standard BS 4504 : Section 3.1 : 1989 - Circular Flanges for Pipes, Valves and Fittings (PN Designated), Specification for Steel Flanges. This covers flanges in nominal pressure ranges PN 2.5 to PN 40 and nominal sizes up to DN 4000 (see table below). BS 4504 substantially agrees with ISO 7005-1 : 1992 (E) Part 1 : Steel Flanges.

BS 4504 : 1969 is still commonly used. This older standard allows for manufacture from bar, whereas the latest standard specifies that forging or plate are to be used, which can be significantly more expensive. There are minor differences in dimensions between the two versions. The following tables are based on the later version.

### Summary of flanges covered by BS 4504 : Section 3.1

| Code No.         | Description   | PN Range             | DN Range                      |
|------------------|---|----------------------|-------------------------------|
| 101              | Plate flange for welding<br>(see page 8-65)   | PN 2.5               | DN 10 to DN 2000              |
|                  |   | PN 6, 10, 16, 25, 40 | DN 10 to DN 600               |
| 102 <sup>1</sup> | Loose plate flange with weld-on plate collar or for lapped pipe end<br>(Weld-on plate collar = Code 132 <sup>1</sup><br>Lapped pipe end = Code 133 <sup>1</sup> ) | PN 6, 10, 16, 25, 40 | DN 10 to DN 600               |
| 104 <sup>1</sup> | Loose plate flange with weld-neck collar (Weld-neck collar = Code 134 <sup>1</sup> )  | PN 6, 10, 16, 25, 40 | DN 10 to DN 600               |
| 105              | Blank flange (see page 8-70)  | PN 2.5, 6            | DN 10 to DN 2000              |
|                  |   | PN 10, 16            | DN 10 to DN 1200              |
|                  |   | PN 25, 40            | DN 10 to DN 600               |
| 111              | Weld-neck flange (see page 8-66)  | PN 2.5, 6, 10, 16    | DN 10 to DN 2000 <sup>2</sup> |
|                  |   | PN 25                | DN 10 to DN 1000              |
|                  |   | PN 40                | DN 10 to DN 600               |
| 112              | Hubbed slip-on flange for welding<br>(see page 8-68)  | PN 6                 | DN 10 to DN 300               |
|                  |   | PN 10, 16, 25, 40    | DN 10 to DN 600               |
| 113              | Hubbed threaded flange (see page 8-69)  | PN 6, 10, 16, 25, 40 | DN 10 to DN 150               |
| 121 <sup>1</sup> | Integral flange   | PN 6, 10, 16, 25     | DN 10 to DN 2000              |
|                  |   | PN 40                | DN 10 to DN 600               |

#### Notes

- Flanges > DN 2000, are not covered in this summary.
- Dimensions: Nominal sizes, DN followed by a numerical designation of size (a convenient round number for reference purposes), are used as defined in ISO 6708.
- Pressure Ratings: Nominal pressures, i.e. PN followed by a numerical designation of size (a convenient round number for reference purposes), are used as defined in ISO 7268.

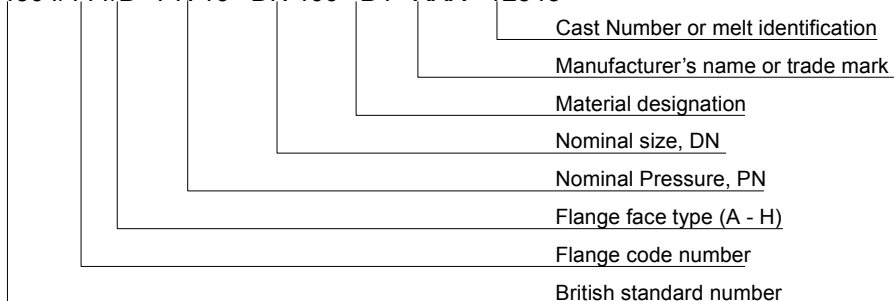
1 Dimensions for these flanges are not covered in this summary.

2 The DN range for weld neck flanges extends to DN 4000 for PN 2.5, to DN 3600 for PN 6, and to DN 3000 for PN 10.

## Designations/Marking

**Marking.** All flanges are marked with BS number, code number, PN, DN, material designation, manufacturers name or trade mark, cast number or melt identification, thread identification, An example follows:

BS 4504/111/B - PN 16 - DN 400 - B4 - XXX - 12345



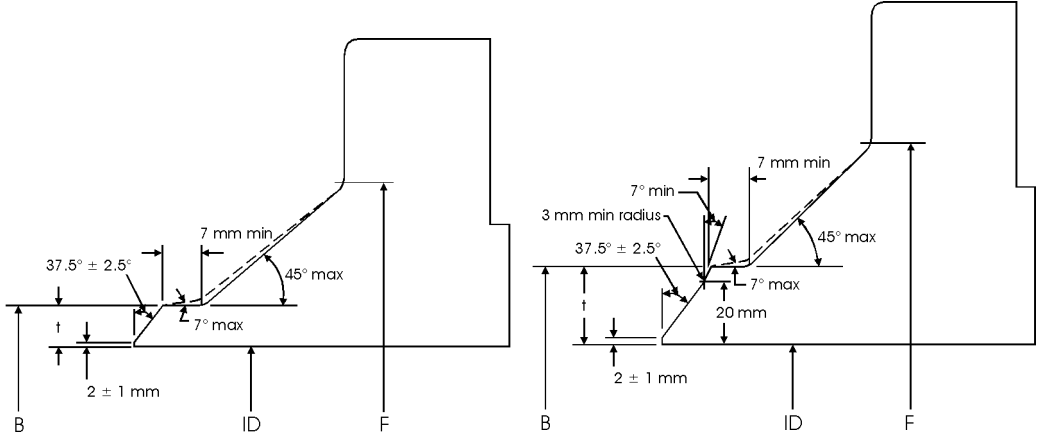
## BS 4504 Circular Flanges - General

## Dimensions and Tolerances

| Dimension   | Range   | Tolerance  |   |
|---|---|--|---|
|   |   | mm   |   |
| Flange Facings<br>(see page 8-63)   | Eccentricity of machined facing diameters                           | ≤ DN 100<br>> DN 100                                 | 1.0<br>2.0  |
|   | a (type B facing height)  | 2 mm   | +0, -1.0  |
|   |   | 3 mm   | +0, -2.0  |
|   |   | 4 mm   | +0, -3.0  |
|   |   | 5 mm   | +0, -4.0  |
|   |   | 6 mm   | +0, -5.0  |
|   | b (type C and E facing height)                                      | All  | +0.5, -0  |
|   | b (type G facing height)  | All  | +0, -0.5  |
|   | b (type H facing height, outer)                                     | All  | +0.2, -0  |
|   | c (type D and F facing height)                                      | All  | +0, -0.5  |
|   | d (type H facing height, inner)                                     | All  | +0.5, -0  |
| B and E (facing diameters)  | All   | +0, -0.5   |   |
| C and D (facing diameters)  | All   | +0.5, -0   |   |
| Surface Finish  | Facing types A, B, E and F  | All, turning<br>All, other than turning              | Ra = 3.2 µm min<br>12.5 µm max<br>Ra = 3.2 µm min<br>6.3 µm max |
|   | Facing types C, D, G and H  | All  | Ra = 0.8 µm min<br>3.2 µm max                                   |
| Flange Drilling<br>Details<br>(see page 8-64)   | B (diameter of bolt circle)   | Bolt sizes M10 to M24<br>Bolt sizes M27 to M45       | ±0.9<br>±1.4  |
|   | Centre to centre of adjacent bolt holes                             | Bolt sizes M10 to M24<br>Bolt sizes M27 to M45       | ±0.45<br>±0.7   |
| All   | A (outside diameter)  | ≤ DN 150   | ±2.0  |
|   |   | > DN 150 ≤ DN 500                                    | ±3.0  |
|   |   | > DN 500 ≤ DN 1200                                   | ±5.0  |
|   |   | > DN 1200 ≤ DN 1800                                  | ±7.0  |
|   |   | > DN 1800  | ±10.0   |
|   | C (flange thickness, machined on both faces)                        | ≤ 18 mm thickness                                    | ±1.0  |
|   |   | > 18 mm < 50 mm thickness                            | ±1.0  |
|   | C (flange thickness, machined on front face)                        | ≤ 18 mm thickness                                    | +2.0, -1.0  |
| > 18 mm < 50 mm thickness   |   | +4.0, -1.5   |   |
| > 50 mm thickness   |   | +7.0, -2.0   |   |
| Weld Neck<br>Flanges, Code 111<br>(see page 8-66)   | B (outside diameter of hub at welding end)                          | ≤ DN 125   | +3.0, -0  |
|   |   | > DN 125 ≤ DN 1200                                   | +4.5, -0  |
|   |   | > DN 1200  | +6.0, -0  |
|   | F (hub diameter)  | ≤ DN 50  | +0, -2.0  |
|   |   | > DN 50 ≤ DN 150                                     | +0, -4.0  |
|   |   | > DN 150 ≤ DN 300                                    | +0, -6.0  |
|   |   | > DN 300 ≤ DN 600                                    | +0, -8.0  |
|   |   | > DN 600 ≤ DN 1200                                   | +0, -10.0   |
| D (length through hub)  | ≤ DN 80   | ±1.5   |   |
|   | > DN 80 ≤ DN 250  | ±2.0   |   |
|   | > DN 250  | ±3.0   |   |
| Slip on, Code 112<br>(see page 8-68)<br>and Threaded,<br>Code 113<br>(see page 8-69)<br>Flanges | E (slip on flange hub diameter)<br>B (threaded flange hub diameter) | ≤ DN 50  | +1.0, -0  |
|   |   | > DN 50 ≤ DN 150                                     | +2.0, -0  |
|   |   | > DN 150 ≤ DN 300                                    | +4.0, -0  |
|   |   | > DN 300 ≤ DN 600                                    | +8.0, -0  |
|   |   | > DN 600 ≤ DN 1200                                   | +12.0, -0   |
|   |   | > DN 1200 ≤ DN 1800                                  | +16.0, -0   |
|   |   | > DN 1800  | +20.0, -0   |
|   | B (slip on bore diameter)   | ≤ DN 100   | +0.5, -0  |
|   |   | > DN 100 ≤ DN 400                                    | +1.0, .0  |
|   |   | > DN 400 ≤ DN 600                                    | +1.5, .0  |
| D (length through hub)  | > DN 600  | +3.0, -0   |   |
| Blank Flanges,<br>Code 105<br>(see page 8-70)   | B (flange thickness)  | Same as Weld Neck D                                  |   |
|   | C (unmachined centre portion)                                       | Same as C for all other flanges<br>Maximum specified |   |

# BS 4504 Circular Flanges - General

## Weld Neck Flange - Welding Ends

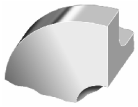


Welding end for Wall Thickness (t) from 5 mm to 22.2 mm

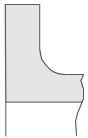
Welding end for Wall Thickness (t) > 22.2 mm

## Flange Facings - BS 4504

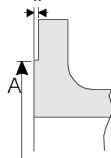
BS 4504 flange facing types A to H are defined below. The dimensions vary with pipe size (DN) and pressure rating (PN) as detailed in the following table.



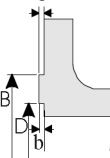
Type A  
Flat face



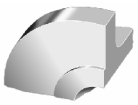
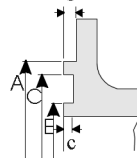
Type B  
Raised face



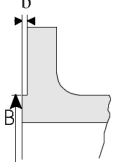
Type C  
Tongue face



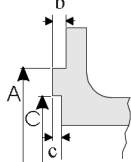
Type D  
Groove face



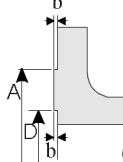
Type E  
Spigot



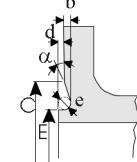
Type F  
Recess



Type G  
'O' Ring recess



Type H  
'O' Ring groove



## BS 4504 Circular Flanges - General

## Flange facing dimensions (BS 4504)

| DN   | A<br>mm |      |       |       |       |       | Face Dimensions |      |      |      |    |     |     |     |          |    |
|------|---------|------|-------|-------|-------|-------|-----------------|------|------|------|----|-----|-----|-----|----------|----|
|      | PN 2.5  | PN 6 | PN 10 | PN 16 | PN 25 | PN 40 | B               | C    | D    | E    | a  | b   | c   | d   | $\alpha$ | e  |
|      | mm      | mm   | mm    | mm    | mm    | mm    | mm              | mm   | mm   | mm   | mm | mm  | mm  | mm  | mm       | mm |
| 10   | 35      | 35   | 40    | 40    | 40    | 40    | 34              | 35   | 24   | 23   | 2  | 4   | 3   | 2   | -        | 5  |
| 15   | 40      | 40   | 45    | 45    | 45    | 45    | 39              | 40   | 29   | 28   | 2  | 4   | 3   | 2   | -        | 5  |
| 20   | 50      | 50   | 58    | 58    | 58    | 58    | 50              | 51   | 36   | 35   | 2  | 4   | 3   | 2   | 41°16'   | 5  |
| 25   | 60      | 60   | 68    | 68    | 68    | 68    | 57              | 58   | 43   | 42   | 2  | 4   | 3   | 2   | 41°16'   | 5  |
| 32   | 70      | 70   | 78    | 78    | 78    | 78    | 65              | 66   | 51   | 50   | 2  | 4   | 3   | 2   | 41°16'   | 5  |
| 40   | 80      | 80   | 88    | 88    | 88    | 88    | 75              | 76   | 61   | 60   | 3  | 4   | 3   | 2   | 41°16'   | 5  |
| 50   | 90      | 90   | 102   | 102   | 102   | 102   | 87              | 88   | 73   | 72   | 3  | 4   | 3   | 2   | 41°16'   | 5  |
| 65   | 110     | 110  | 122   | 122   | 122   | 122   | 109             | 110  | 95   | 94   | 3  | 4   | 3   | 2   | 41°16'   | 5  |
| 80   | 128     | 128  | 138   | 138   | 138   | 138   | 120             | 121  | 106  | 105  | 3  | 4   | 3   | 2   | 41°16'   | 5  |
| 100  | 148     | 148  | 158   | 158   | 162   | 162   | 149             | 150  | 129  | 128  | 3  | 4.5 | 3.5 | 2.5 | 32°15'   | 6  |
| 125  | 178     | 178  | 188   | 188   | 188   | 188   | 175             | 176  | 155  | 154  | 3  | 4.5 | 3.5 | 2.5 | 32°15'   | 6  |
| 150  | 202     | 202  | 212   | 212   | 218   | 218   | 203             | 204  | 183  | 182  | 3  | 4.5 | 3.5 | 2.5 | 32°15'   | 6  |
| 200  | 258     | 258  | 268   | 268   | 278   | 285   | 259             | 260  | 239  | 238  | 3  | 4.5 | 3.5 | 2.5 | 32°15'   | 6  |
| 250  | 312     | 312  | 320   | 320   | 335   | 345   | 312             | 313  | 292  | 291  | 3  | 4.5 | 3.5 | 2.5 | 32°15'   | 6  |
| 300  | 365     | 365  | 370   | 378   | 395   | 410   | 363             | 364  | 343  | 342  | 4  | 4.5 | 3.5 | 2.5 | 32°15'   | 6  |
| 350  | 415     | 415  | 430   | 438   | 450   | 465   | 421             | 422  | 395  | 394  | 4  | 5   | 4   | 3   | 27°24'   | 7  |
| 400  | 465     | 465  | 482   | 490   | 505   | 535   | 473             | 474  | 447  | 446  | 4  | 5   | 4   | 3   | 27°24'   | 7  |
| 450  | 520     | 520  | 532   | 550   | 555   | 560   | 523             | 524  | 497  | 496  | 4  | 5   | 4   | 3   | 27°24'   | 7  |
| 500  | 570     | 570  | 585   | 610   | 615   | 615   | 575             | 576  | 549  | 548  | 4  | 5   | 4   | 3   | 27°24'   | 7  |
| 600  | 670     | 670  | 685   | 725   | 720   | 735   | 675             | 676  | 649  | 648  | 5  | 5   | 4   | 3   | 27°24'   | 7  |
| 700  | 775     | 775  | 800   | 795   | 820   | -     | 777             | 778  | 751  | 750  | 5  | 5   | 4   | 3   | 27°24'   | 7  |
| 800  | 880     | 880  | 905   | 900   | 930   | -     | 882             | 883  | 856  | 855  | 5  | 5   | 4   | 3   | 27°24'   | 7  |
| 900  | 980     | 980  | 1005  | 1000  | 1030  | -     | 987             | 988  | 961  | 960  | 5  | 5   | 4   | 3   | 27°24'   | 7  |
| 1000 | 1080    | 1080 | 1110  | 1115  | 1140  | -     | 1092            | 1094 | 1062 | 1060 | 5  | 6   | 5   | 4   | 28°39'   | 8  |
| 1200 | 1280    | 1295 | 1330  | 1330  | 1350  | -     | 1292            | 1294 | 1262 | 1260 | 5  | 6   | 5   | 4   | 28°39'   | 8  |
| 1400 | 1480    | 1510 | 1535  | 1530  | 1560  | -     | 1492            | 1494 | 1462 | 1460 | 5  | 6   | 5   | 4   | 28°39'   | 8  |
| 1600 | 1690    | 1710 | 1760  | 1750  | 1780  | -     | 1692            | 1694 | 1662 | 1660 | 5  | 6   | 5   | 4   | 28°39'   | 8  |
| 1800 | 1890    | 1920 | 1960  | 1950  | 1985  | -     | 1982            | 1894 | 1862 | 1860 | 5  | 6   | 5   | 4   | 28°39'   | 8  |
| 2000 | 2090    | 2125 | 2170  | 2150  | 2210  | -     | 2092            | 2094 | 2062 | 2060 | 5  | 6   | 5   | 4   | 28°39'   | 8  |

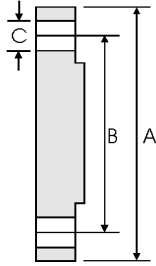
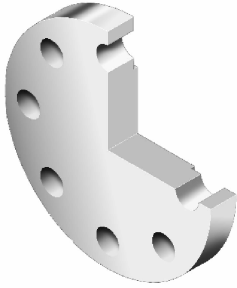
## Manufacture

- **Materials.** Flange codes 111 112 and 113 are manufactured from a forging or steel casting. Stainless steel forgings conforming to ASTM A 182, have an additional requirement for grade F304L and F316L that carbon content (by ladle analysis) shall be 0.030% max. Forgings to BS 1503 and comparable ASTM standard grades specified in BS 4504 are as listed in the following table.

## BS and ASTM forging grades in BS 4504

| BS 1503 Grade | ASTM A 182 Grade |
|---------------|------------------|
| 304S11        | F304L            |
| 304S31        | F304             |
| 304S51        | F304H            |
| 347S31        | F347             |
| 347S51        | F347H            |
| 321S31        | F321             |
| 321S51        | F321H            |
| 316S11        | F316L            |
| 316S31        | F316             |
| 316S51        | F316H            |
| 310S31        | F310             |

## Flange Drilling Details - BS 4504

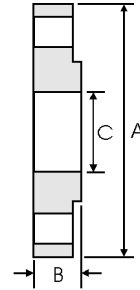
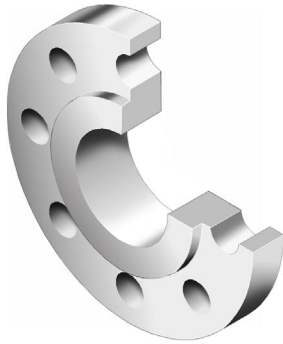


| DN  | PN       | A   | B   | C  | Bolt Holes |           |
|-----|----------|-----|-----|----|------------|-----------|
|     |          | mm  | mm  | mm | No.        | Bolt size |
| 10  | 2.5 & 6  | 75  | 50  | 11 | 4          | M10       |
|     | 10,16    | 90  | 60  | 14 | 4          | M12       |
| 15  | 2.5 & 6  | 80  | 55  | 11 | 4          | M10       |
|     | 10 & 16  | 95  | 65  | 14 | 4          | M12       |
| 20  | 2.5 & 40 | 95  | 65  | 14 | 4          | M12       |
|     | 2.5 & 6  | 90  | 65  | 11 | 4          | M10       |
| 25  | 10 & 16  | 105 | 75  | 14 | 4          | M12       |
|     | 25 & 40  | 105 | 75  | 14 | 4          | M12       |
| 32  | 2.5 & 6  | 100 | 75  | 11 | 4          | M10       |
|     | 10 & 16  | 115 | 85  | 14 | 4          | M12       |
| 40  | 25 & 40  | 115 | 85  | 14 | 4          | M12       |
|     | 2.5 & 6  | 120 | 90  | 14 | 4          | M12       |
| 50  | 10 & 16  | 140 | 100 | 18 | 4          | M16       |
|     | 25 & 40  | 140 | 100 | 18 | 4          | M16       |
| 65  | 2.5 & 6  | 130 | 100 | 14 | 4          | M12       |
|     | 10 & 16  | 150 | 110 | 18 | 4          | M16       |
| 80  | 25 & 40  | 150 | 110 | 18 | 4          | M16       |
|     | 2.5 & 6  | 140 | 110 | 14 | 4          | M12       |
| 100 | 10 & 16  | 165 | 125 | 18 | 4          | M16       |
|     | 25 & 40  | 165 | 125 | 18 | 4          | M16       |
| 125 | 2.5 & 6  | 160 | 130 | 14 | 4          | M12       |
|     | 10 & 16  | 185 | 145 | 18 | 4/8        | M16       |
| 150 | 25 & 40  | 185 | 145 | 18 | 8          | M16       |
|     | 2.5 & 6  | 190 | 150 | 18 | 4          | M16       |
| 200 | 10 & 16  | 200 | 160 | 18 | 8          | M16       |
|     | 25 & 40  | 200 | 160 | 18 | 8          | M16       |
| 250 | 2.5 & 6  | 210 | 170 | 18 | 4          | M16       |
|     | 10 & 16  | 220 | 180 | 18 | 8          | M16       |
| 300 | 25 & 40  | 235 | 190 | 22 | 8          | M20       |
|     | 2.5 & 6  | 240 | 200 | 18 | 8          | M16       |
| 350 | 10 & 16  | 250 | 210 | 18 | 8          | M16       |
|     | 25 & 40  | 270 | 220 | 26 | 8          | M24       |
| 400 | 2.5 & 6  | 265 | 225 | 18 | 8          | M16       |
|     | 10 & 16  | 285 | 240 | 22 | 8          | M20       |
| 450 | 25 & 40  | 300 | 250 | 26 | 8          | M24       |
|     | 2.5 & 6  | 320 | 280 | 18 | 8          | M16       |
| 500 | 10 & 16  | 340 | 295 | 22 | 8/12       | M20       |
|     | 25       | 360 | 310 | 26 | 12         | M24       |
| 550 | 40       | 375 | 320 | 30 | 12         | M27       |
|     | 2.5 & 6  | 375 | 335 | 18 | 12         | M16       |
| 600 | 10       | 395 | 350 | 22 | 12         | M20       |
|     | 16       | 405 | 355 | 26 | 12         | M24       |
| 650 | 25       | 425 | 370 | 30 | 12         | M27       |
|     | 40       | 450 | 385 | 33 | 12         | M30       |
| 700 | 2.5 & 6  | 440 | 395 | 22 | 12         | M20       |
|     | 10       | 445 | 400 | 22 | 12         | M20       |
| 750 | 16       | 460 | 410 | 26 | 12         | M24       |
|     | 25       | 485 | 430 | 30 | 16         | M27       |
| 800 | 40       | 515 | 450 | 33 | 16         | M30       |

| DN   | PN      | A       | B    | C    | Bolt Holes |           |
|------|---------|---------|------|------|------------|-----------|
|      |         | mm      | mm   | mm   | No.        | Bolt size |
| 350  | 2.5 & 6 | 490     | 445  | 22   | 12         | M20       |
|      | 10      | 505     | 460  | 22   | 16         | M20       |
|      | 16      | 520     | 470  | 26   | 16         | M24       |
|      | 25      | 555     | 490  | 33   | 16         | M30       |
|      | 40      | 580     | 510  | 36   | 16         | M33       |
| 400  | 2.5 & 6 | 540     | 495  | 22   | 16         | M20       |
|      | 10      | 565     | 515  | 26   | 16         | M24       |
|      | 16      | 580     | 525  | 30   | 16         | M27       |
|      | 25      | 620     | 550  | 36   | 16         | M33       |
|      | 40      | 660     | 585  | 39   | 16         | M36       |
| 450  | 2.5 & 6 | 595     | 550  | 22   | 16         | M20       |
|      | 10      | 615     | 565  | 26   | 20         | M24       |
|      | 16      | 640     | 585  | 30   | 20         | M27       |
|      | 25      | 670     | 600  | 36   | 20         | M33       |
|      | 40      | 685     | 610  | 39   | 20         | M36       |
| 500  | 2.5 & 6 | 645     | 610  | 22   | 20         | M20       |
|      | 10      | 670     | 620  | 26   | 20         | M24       |
|      | 16      | 715     | 650  | 33   | 20         | M30       |
|      | 25      | 730     | 660  | 36   | 20         | M33       |
|      | 40      | 755     | 670  | 42   | 20         | M39       |
| 600  | 2.5 & 6 | 755     | 705  | 26   | 20         | M24       |
|      | 10      | 780     | 725  | 30   | 20         | M27       |
|      | 16      | 840     | 770  | 36   | 20         | M33       |
|      | 25      | 845     | 770  | 39   | 20         | M36       |
|      | 40      | 890     | 795  | 48   | 20         | M45       |
| 700  | 2.5 & 6 | 860     | 810  | 26   | 24         | M24       |
|      | 10      | 895     | 840  | 30   | 24         | M27       |
|      | 16      | 910     | 840  | 36   | 24         | M33       |
|      | 25      | 960     | 875  | 42   | 24         | M39       |
|      | 800     | 2.5 & 6 | 975  | 920  | 30         | 24        |
| 10   |         | 1015    | 950  | 33   | 24         | M30       |
| 16   |         | 1025    | 950  | 39   | 24         | M36       |
| 25   |         | 1085    | 990  | 48   | 24         | M45       |
| 900  |         | 2.5 & 6 | 1075 | 1020 | 30         | 24        |
|      | 10      | 1115    | 1050 | 33   | 28         | M30       |
|      | 16      | 1125    | 1050 | 39   | 28         | M36       |
|      | 25      | 1185    | 1090 | 48   | 28         | M45       |
|      | 1000    | 2.5 & 6 | 1175 | 1120 | 30         | 28        |
| 10   |         | 1230    | 1160 | 36   | 28         | M33       |
| 16   |         | 1255    | 1170 | 42   | 28         | M39       |
| 25   |         | 1320    | 1210 | 56   | 28         | M52       |
| 1200 |         | 2.5     | 1375 | 1320 | 30         | 32        |
|      | 6       | 1405    | 1340 | 33   | 32         | M30       |
|      | 10      | 1455    | 1380 | 39   | 32         | M36       |
|      | 16      | 1485    | 1390 | 48   | 32         | M45       |
|      | 25      | 1530    | 1420 | 56   | 32         | M52       |
| 1400 | 2.5     | 1575    | 1520 | 30   | 36         | M27       |
|      | 6       | 1630    | 1560 | 36   | 36         | M33       |
|      | 10      | 1675    | 1590 | 42   | 36         | M39       |
|      | 16      | 1685    | 1590 | 48   | 36         | M45       |
|      | 25      | 1755    | 1640 | 62   | 36         | M56       |
| 1600 | 2.5     | 1790    | 1730 | 30   | 40         | M27       |
|      | 6       | 1830    | 1760 | 36   | 40         | M33       |
|      | 10      | 1915    | 1820 | 48   | 40         | M45       |
|      | 16      | 1930    | 1820 | 56   | 40         | M52       |
|      | 25      | 1975    | 1860 | 62   | 40         | M56       |
| 1800 | 2.5     | 1990    | 1930 | 30   | 44         | M27       |
|      | 6       | 2045    | 1970 | 39   | 44         | M36       |
|      | 10      | 2115    | 2020 | 48   | 44         | M45       |
|      | 16      | 2130    | 2020 | 56   | 44         | M52       |
|      | 25      | 2185    | 2070 | 70   | 44         | M64       |
| 2000 | 2.5     | 2190    | 2130 | 30   | 48         | M27       |
|      | 6       | 2265    | 2180 | 42   | 48         | M39       |
|      | 10      | 2325    | 2230 | 48   | 48         | M45       |
|      | 16      | 2345    | 2230 | 62   | 48         | M56       |
|      | 25      | 2425    | 2300 | 70   | 48         | M64       |



# Plate Flanges (Code 101) - BS 4504



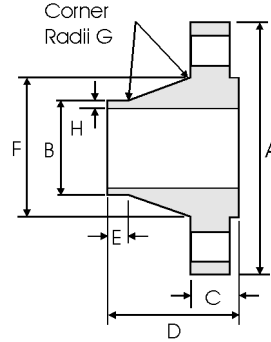
| DN  | PN      | A<br>mm | B<br>mm | C<br>mm |
|-----|---------|---------|---------|---------|
| 10  | 2.5 & 6 | 75      | 12      | 18.0    |
|     | 10 & 16 | 90      | 14      |         |
|     | 25 & 40 | 90      | 14      |         |
| 15  | 2.5 & 6 | 80      | 12      | 22      |
|     | 10 & 16 | 95      | 14      |         |
|     | 25 & 40 | 95      | 14      |         |
| 20  | 2.5 & 6 | 90      | 14      | 27.5    |
|     | 10 & 16 | 105     | 16      |         |
|     | 25 & 40 | 105     | 16      |         |
| 25  | 2.5 & 6 | 100     | 14      | 34.5    |
|     | 10 & 16 | 115     | 16      |         |
|     | 25 & 40 | 115     | 16      |         |
| 32  | 2.5 & 6 | 120     | 16      | 43.5    |
|     | 10 & 16 | 140     | 18      |         |
|     | 25 & 40 | 140     | 18      |         |
| 40  | 2.5 & 6 | 130     | 16      | 49.5    |
|     | 10 & 16 | 150     | 18      |         |
|     | 25 & 40 | 150     | 18      |         |
| 50  | 2.5 & 6 | 140     | 16      | 61.5    |
|     | 10 & 16 | 165     | 20      |         |
|     | 25 & 40 | 165     | 20      |         |
| 65  | 2.5 & 6 | 160     | 16      | 77.5    |
|     | 10 & 16 | 185     | 20      |         |
|     | 25 & 40 | 185     | 22      |         |
| 80  | 2.5 & 6 | 190     | 18      | 90.5    |
|     | 10 & 16 | 200     | 20      |         |
|     | 25 & 40 | 200     | 24      |         |
| 100 | 2.5 & 6 | 210     | 18      | 116.0   |
|     | 10 & 16 | 220     | 22      |         |
|     | 25 & 40 | 235     | 26      |         |
| 125 | 2.5 & 6 | 240     | 20      | 141.5   |
|     | 10 & 16 | 250     | 22      |         |
|     | 25 & 40 | 270     | 28      |         |
| 150 | 2.5 & 6 | 265     | 20      | 170.5   |
|     | 10 & 16 | 285     | 24      |         |
|     | 25 & 40 | 300     | 30      |         |
| 200 | 2.5 & 6 | 320     | 22      | 221.5   |
|     | 10 & 16 | 340     | 24      |         |
|     | 25      | 360     | 32      |         |
| 250 | 40      | 375     | 36      | 276.5   |
|     | 2.5 & 6 | 375     | 24      |         |
|     | 10      | 395     | 26      |         |
|     | 16      | 405     | 29      |         |
|     | 25      | 425     | 35      |         |
| 40  | 450     | 42      |         |         |

| DN   | PN      | A<br>mm | B<br>mm | C<br>mm                      |
|------|---------|---------|---------|------------------------------|
| 300  | 2.5 & 6 | 440     | 24      | 327.5                        |
|      | 10      | 445     | 26      |                              |
|      | 16      | 460     | 32      |                              |
|      | 25      | 485     | 38      |                              |
| 350  | 40      | 515     | 48      | 359.5                        |
|      | 2.5 & 6 | 490     | 26      |                              |
|      | 10      | 505     | 28      |                              |
|      | 16      | 520     | 35      |                              |
| 400  | 25      | 555     | 42      | 359.0                        |
|      | 40      | 580     | 54      |                              |
|      | 2.5 & 6 | 540     | 28      |                              |
|      | 10      | 565     | 32      |                              |
| 450  | 16      | 580     | 38      | 411.0                        |
|      | 25      | 620     | 46      |                              |
|      | 40      | 660     | 60      |                              |
|      | 2.5 & 6 | 595     | 30      |                              |
| 500  | 10      | 615     | 36      | 462.0                        |
|      | 16      | 640     | 42      |                              |
|      | 25      | 670     | 50      |                              |
|      | 40      | 685     | 66      |                              |
| 550  | 2.5 & 6 | 645     | 30      | 513.5                        |
|      | 10      | 670     | 38      |                              |
|      | 16      | 715     | 46      |                              |
|      | 25      | 730     | 56      |                              |
| 600  | 40      | 755     | 72      | 616.5                        |
|      | 2.5 & 6 | 755     | 32      |                              |
|      | 10      | 780     | 42      |                              |
|      | 16      | 840     | 52      |                              |
| 700  | 25      | 845     | 68      | To be specified by purchaser |
|      | 40      | 890     | 84      |                              |
|      | 2.5     | 860     | 36      |                              |
|      | 800     | 2.5     | 975     |                              |
| 900  | 2.5     | 1075    | 40      |                              |
|      | 1000    | 2.5     | 1175    | 42                           |
| 1200 | 2.5     | 1375    | 44      |                              |
|      | 1400    | 2.5     | 1575    | 48                           |
| 1600 | 2.5     | 1790    | 51      |                              |
|      | 1800    | 2.5     | 1990    | 54                           |
| 2000 | 2.5     | 2190    | 58      |                              |

Notes

- Dimension B is the flange thickness with or without a raised face.
- For drilling details see page 8-64.
- For tolerances see page 8-61.
- For facing types and dimensions see page 8-62.

## Weld Neck Flanges (Code 111) - BS 4504



| DN  | PN    | A<br>mm | B<br>mm | C<br>mm | D<br>mm | E<br>mm | F<br>mm | G<br>mm | H<br>mm |
|-----|-------|---------|---------|---------|---------|---------|---------|---------|---------|
| 10  | 2.5.6 | 75      | 17.2    | 12      | 28      | 6       | 26      | 3       | 1.8     |
|     | 10    | 90      |         | 14      | 35      |         | 28      |         | 1.8     |
|     | 16    | 90      |         | 14      | 35      |         | 28      |         | 1.8     |
|     | 25    | 90      |         | 16      | 35      |         | 28      |         | 1.8     |
|     | 40    | 90      |         | 16      | 35      |         | 28      |         | 1.8     |
| 15  | 2.5.6 | 80      | 21.3    | 12      | 30      | 6       | 30      | 3       | 2       |
|     | 10    | 95      |         | 14      | 35      |         | 32      |         | 2       |
|     | 16    | 95      |         | 14      | 35      |         | 32      |         | 2       |
|     | 25    | 95      |         | 16      | 38      |         | 32      |         | 2       |
|     | 40    | 95      |         | 16      | 38      |         | 32      |         | 2       |
| 20  | 2.5.6 | 90      | 26.9    | 14      | 32      | 6       | 38      | 4       | 2.3     |
|     | 10    | 105     |         | 16      | 38      |         | 39      |         | 2.3     |
|     | 16    | 105     |         | 16      | 38      |         | 39      |         | 2.3     |
|     | 25    | 105     |         | 18      | 40      |         | 40      |         | 2.3     |
|     | 40    | 105     |         | 18      | 40      |         | 40      |         | 2.3     |
| 25  | 2.5.6 | 100     | 33.7    | 14      | 35      | 6       | 42      | 4       | 2.6     |
|     | 10    | 115     |         | 16      | 38      |         | 46      |         | 2.6     |
|     | 16    | 115     |         | 16      | 38      |         | 46      |         | 2.6     |
|     | 25    | 115     |         | 18      | 40      |         | 46      |         | 2.6     |
|     | 40    | 115     |         | 18      | 40      |         | 46      |         | 2.6     |
| 32  | 2.5.6 | 120     | 42.4    | 14      | 35      | 6       | 55      | 5       | 2.6     |
|     | 10    | 140     |         | 16      | 40      |         | 56      |         | 2.6     |
|     | 16    | 140     |         | 16      | 40      |         | 56      |         | 2.6     |
|     | 25    | 140     |         | 18      | 42      |         | 56      |         | 2.6     |
|     | 40    | 140     |         | 18      | 42      |         | 56      |         | 2.6     |
| 40  | 2.5.6 | 130     | 48.3    | 14      | 38      | 7       | 62      | 5       | 2.6     |
|     | 10    | 150     |         | 16      | 42      |         | 64      |         | 2.6     |
|     | 16    | 150     |         | 16      | 42      |         | 64      |         | 2.6     |
|     | 25    | 150     |         | 18      | 45      |         | 64      |         | 2.6     |
|     | 40    | 150     |         | 18      | 45      |         | 64      |         | 2.6     |
| 50  | 2.5.6 | 140     | 60.3    | 14      | 38      | 8       | 74      | 5       | 2.9     |
|     | 10    | 165     |         | 18      | 45      |         | 74      |         | 2.9     |
|     | 16    | 165     |         | 18      | 45      |         | 74      |         | 2.9     |
|     | 25    | 165     |         | 20      | 48      |         | 74      |         | 2.9     |
|     | 40    | 165     |         | 20      | 48      |         | 74      |         | 2.9     |
| 65  | 2.5.6 | 160     | 76.1    | 14      | 38      | 9       | 88      | 6       | 2.9     |
|     | 10    | 185     |         | 18      | 45      |         | 92      |         | 2.9     |
|     | 16    | 185     |         | 18      | 45      |         | 92      |         | 2.9     |
|     | 25    | 185     |         | 22      | 52      |         | 92      |         | 2.9     |
|     | 40    | 185     |         | 22      | 52      |         | 92      |         | 2.9     |
| 80  | 2.5.6 | 190     | 88.9    | 16      | 42      | 10      | 102     | 6       | 3.2     |
|     | 10    | 200     |         | 20      | 50      |         | 110     |         | 3.2     |
|     | 16    | 200     |         | 20      | 50      |         | 110     |         | 3.2     |
|     | 25    | 200     |         | 24      | 58      |         | 110     |         | 3.2     |
|     | 40    | 200     |         | 24      | 58      |         | 110     |         | 3.2     |
| 100 | 2.5.6 | 210     | 114.3   | 16      | 45      | 12      | 130     | 6       | 3.6     |
|     | 10    | 220     |         | 20      | 52      |         | 130     |         | 3.6     |
|     | 16    | 220     |         | 20      | 52      |         | 130     |         | 3.6     |
|     | 25    | 235     |         | 24      | 65      |         | 134     |         | 3.6     |
|     | 40    | 235     |         | 24      | 65      |         | 134     |         | 3.6     |
| 125 | 2.5.6 | 240     | 139.7   | 18      | 48      | 12      | 155     | 6       | 4       |
|     | 10    | 250     |         | 22      | 55      |         | 158     |         | 4       |
|     | 16    | 250     |         | 22      | 55      |         | 158     |         | 4       |
|     | 25    | 270     |         | 26      | 68      |         | 162     |         | 4       |
|     | 40    | 270     |         | 26      | 68      |         | 162     |         | 4       |
| 150 | 2.5.6 | 265     | 168.3   | 18      | 48      | 12      | 184     | 8       | 4.5     |
|     | 10    | 285     |         | 22      | 55      |         | 184     |         | 4.5     |
|     | 16    | 285     |         | 22      | 55      |         | 184     |         | 4.5     |
|     | 25    | 300     |         | 28      | 75      |         | 190     |         | 4.5     |
|     | 40    | 300     |         | 28      | 75      |         | 190     |         | 4.5     |
| 200 | 2.5.6 | 320     | 219.1   | 20      | 55      | 15      | 236     | 8       | 5.6     |
|     | 10    | 340     |         | 24      | 62      |         | 234     |         | 5.6     |
|     | 16    | 340     |         | 24      | 62      |         | 234     |         | 5.6     |
|     | 25    | 360     |         | 30      | 80      |         | 244     |         | 6.3     |
|     | 40    | 375     |         | 34      | 88      |         | 244     |         | 6.3     |
| 250 | 2.5.6 | 375     | 273     | 22      | 60      | 16      | 290     | 10      | 6.3     |
|     | 10    | 395     |         | 26      | 68      |         | 288     |         | 6.3     |
|     | 16    | 405     |         | 26      | 70      |         | 288     |         | 6.3     |
|     | 25    | 425     |         | 32      | 88      |         | 296     |         | 7.1     |
|     | 40    | 450     |         | 38      | 105     |         | 306     |         | 7.1     |
| 300 | 2.5.6 | 440     | 323.9   | 22      | 62      | 16      | 342     | 10      | 7.1     |
|     | 10    | 445     |         | 26      | 68      |         | 342     |         | 7.1     |
|     | 16    | 460     |         | 28      | 78      |         | 342     |         | 7.1     |
|     | 25    | 485     |         | 34      | 92      |         | 350     |         | 8       |
|     | 40    | 515     |         | 42      | 115     |         | 362     |         | 8       |
| 350 | 2.5.6 | 490     | 355.6   | 22      | 62      | 16      | 385     | 10      | 7.1     |
|     | 10    | 505     |         | 26      | 68      |         | 390     |         | 7.1     |
|     | 16    | 520     |         | 30      | 82      |         | 390     |         | 8       |
|     | 25    | 555     |         | 38      | 100     |         | 398     |         | 8       |
|     | 40    | 580     |         | 46      | 125     |         | 408     |         | 8.8     |
| 400 | 2.5.6 | 540     | 406.4   | 22      | 65      | 16      | 438     | 10      | 7.1     |
|     | 10    | 565     |         | 26      | 72      |         | 440     |         | 7.1     |
|     | 16    | 580     |         | 32      | 85      |         | 444     |         | 8       |
|     | 25    | 620     |         | 40      | 110     |         | 452     |         | 8.8     |
|     | 40    | 660     |         | 50      | 135     |         | 462     |         | 11      |
| 450 | 2.5.6 | 595     | 457     | 24      | 65      | 16      | 492     | 12      | 7.1     |
|     | 10    | 615     |         | 28      | 72      |         | 488     |         | 7.1     |
|     | 16    | 640     |         | 34      | 87      |         | 490     |         | 8       |
|     | 25    | 670     |         | 42      | 110     |         | 500     |         | 8.8     |
|     | 40    | 685     |         | 50      | 135     |         | 500     |         | 12.5    |

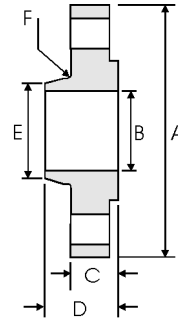
## Weld Neck Flanges (Code 111) - BS 4504

| DN   | PN    | A    | B    | C  | D   | E  | F    | G  | H    |
|------|-------|------|------|----|-----|----|------|----|------|
|      |       | mm   | mm   | mm | mm  | mm | mm   | mm | mm   |
| 500  | 2.5,6 | 645  | 508  | 24 | 68  | 15 | 538  | 12 | 7.1  |
|      | 10    | 670  |      | 28 | 75  | 16 | 540  |    | 7.1  |
|      | 16    | 715  |      | 34 | 90  |    | 546  |    | 8    |
|      | 25    | 730  |      | 44 | 125 | 20 | 558  |    | 10   |
|      | 40    | 755  |      | 52 | 140 |    | 562  |    | 14.2 |
| 600  | 2.5,6 | 755  | 610  | 24 | 70  | 16 | 640  | 12 | 7.1  |
|      | 10    | 780  |      | 28 | 80  | 18 | 640  |    | 7.1  |
|      | 16    | 840  |      | 36 | 95  |    | 650  |    | 8.8  |
|      | 25    | 845  |      | 46 | 125 | 20 | 660  |    | 11   |
|      | 40    | 890  |      | 60 | 150 |    | 666  |    | 16   |
| 700  | 2.5   | 860  | 711  | 24 | 70  | 16 | 740  | 12 | .1   |
|      | 6     | 860  |      | 24 | 70  |    | 740  |    | 7.1  |
|      | 10    | 895  |      | 30 | 80  | 18 | 746  |    | 8    |
|      | 16    | 910  |      | 36 | 100 |    | 750  |    | 8.8  |
|      | 25    | 960  |      | 46 | 125 | 20 | 760  |    | 12.5 |
| 800  | 2.5   | 975  | 813  | 26 | 70  | 16 | 842  | 12 | .1   |
|      | 6     | 975  |      | 24 | 70  |    | 842  |    | 7.1  |
|      | 10    | 1015 |      | 32 | 90  | 18 | 848  |    | 8    |
|      | 16    | 1025 |      | 38 | 105 | 20 | 848  |    | 10   |
|      | 25    | 1085 |      | 50 | 135 | 22 | 864  |    | 14.2 |
| 900  | 2.5   | 1075 | 914  | 26 | 70  | 16 | 942  | 12 | .1   |
|      | 6     | 1075 |      | 26 | 70  |    | 942  |    | 7.1  |
|      | 10    | 1115 |      | 34 | 95  | 20 | 948  |    | 10   |
|      | 16    | 1125 |      | 40 | 110 |    | 948  |    | 10   |
|      | 25    | 1185 |      | 54 | 145 | 24 | 968  |    | 16   |
| 1000 | 2.5   | 1175 | 1016 | 26 | 70  | 16 | 1045 | 12 | .1   |
|      | 6     | 1175 |      | 26 | 70  |    | 1045 |    | 7.1  |
|      | 10    | 1230 |      | 34 | 95  | 20 | 1050 |    | 10   |
|      | 16    | 1255 |      | 42 | 120 | 22 | 1056 |    | 10   |
|      | 25    | 1320 |      | 58 | 155 | 24 | 1070 |    | 17.5 |
| 1200 | 2.5   | 1375 | 1220 | 26 | 70  | 16 | 1245 | 16 | .1   |
|      | 6     | 1405 |      | 28 | 90  | 20 | 1248 |    | 8    |
|      | 10    | 1455 |      | 38 | 115 | 25 | 1256 |    | 11   |
|      | 16    | 1485 |      | 48 | 130 | 30 | 1260 |    | 12.5 |
|      | 25    | 1575 |      | 26 | 70  | 16 | 1445 |    | 16   |
| 1400 | 6     | 1630 | 1420 | 32 | 90  | 20 | 1452 | 12 | 8    |
|      | 10    | 1675 |      | 42 | 120 | 25 | 1460 |    | 12   |
|      | 16    | 1685 |      | 52 | 145 | 30 | 1465 |    | 14.2 |
|      | 25    | 1790 |      | 26 | 80  | 20 | 1645 |    | 16   |
| 1600 | 6     | 1830 | 1620 | 34 | 90  | 20 | 1655 | 12 | 9    |
|      | 10    | 1915 |      | 46 | 130 | 25 | 1666 |    | 14   |
|      | 16    | 1930 |      | 58 | 160 | 35 | 1668 |    | 16   |
|      | 25    | 1990 |      | 26 | 80  | 20 | 1845 |    | 16   |
| 1800 | 6     | 2045 | 1820 | 36 | 100 |    | 1855 | 15 | 10   |
|      | 10    | 2115 |      | 50 | 140 | 30 | 1866 |    | 15   |
|      | 16    | 2130 |      | 62 | 170 | 35 | 1870 |    | 17.5 |
|      | 25    | 2190 |      | 26 | 80  | 22 | 2045 |    | 16   |
| 2000 | 6     | 2265 | 2020 | 38 | 110 | 25 | 2058 | 15 | 11   |
|      | 10    | 2325 |      | 54 | 150 | 30 | 2070 |    | 16   |
|      | 16    | 2345 |      | 66 | 190 | 40 | 2072 |    | 20   |

## Notes

- For drilling details see page 8-64.
- For tolerances see page 8-61.
- For facing types and dimensions see page 8-62.
- 1 To be specified by the purchaser.

## Slip On Flanges (Code 112) - BS 4504



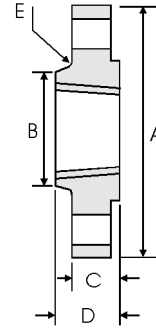
| DN  | PN      | A   | B     | C  | D  | E   | F  |
|-----|---------|-----|-------|----|----|-----|----|
|     |         | mm  | mm    | mm | mm | mm  | mm |
| 10  | 6       | 75  | 18.0  | 12 | 20 | 25  | 3  |
|     | 10 & 16 | 90  |       | 14 | 20 | 30  |    |
|     | 25 & 40 | 90  |       | 16 | 22 | 30  |    |
| 15  | 6       | 80  | 22    | 12 | 20 | 30  | 3  |
|     | 10 & 16 | 95  |       | 14 | 20 | 35  |    |
|     | 25 & 40 | 95  |       | 16 | 22 | 35  |    |
| 20  | 6       | 90  | 27.5  | 14 | 24 | 40  | 4  |
|     | 10 & 16 | 105 |       | 16 | 24 | 45  |    |
|     | 25 & 40 | 105 |       | 18 | 26 | 45  |    |
| 25  | 6       | 100 | 34.5  | 14 | 24 | 50  | 4  |
|     | 10 & 16 | 115 |       | 16 | 24 | 52  |    |
|     | 25 & 40 | 115 |       | 18 | 28 | 52  |    |
| 32  | 6       | 120 | 43.5  | 14 | 26 | 60  | 5  |
|     | 10 & 16 | 140 |       | 16 | 26 | 60  |    |
|     | 25 & 40 | 140 |       | 18 | 30 | 60  |    |
| 40  | 6       | 130 | 49.5  | 14 | 26 | 70  | 5  |
|     | 10 & 16 | 150 |       | 16 | 26 | 70  |    |
|     | 25 & 40 | 150 |       | 18 | 32 | 70  |    |
| 50  | 6       | 140 | 61.5  | 14 | 28 | 80  | 5  |
|     | 10 & 16 | 165 |       | 18 | 28 | 84  |    |
|     | 25 & 40 | 165 |       | 20 | 34 | 84  |    |
| 65  | 6       | 160 | 77.5  | 14 | 32 | 100 | 6  |
|     | 10 & 16 | 185 |       | 18 | 32 | 104 |    |
|     | 25 & 40 | 185 |       | 22 | 38 | 104 |    |
| 80  | 6       | 190 | 90.5  | 16 | 34 | 110 | 6  |
|     | 10 & 16 | 200 |       | 20 | 34 | 118 |    |
|     | 25 & 40 | 200 |       | 24 | 40 | 118 |    |
| 100 | 6       | 210 | 116.0 | 16 | 40 | 130 | 6  |
|     | 10 & 16 | 220 |       | 20 | 40 | 140 |    |
|     | 25 & 40 | 235 |       | 24 | 44 | 145 |    |
| 125 | 6       | 240 | 141.5 | 18 | 44 | 160 | 6  |
|     | 10 & 16 | 250 |       | 22 | 44 | 168 |    |
|     | 25 & 40 | 270 |       | 26 | 48 | 170 |    |
| 150 | 6       | 265 | 170.5 | 18 | 44 | 185 | 8  |
|     | 10 & 16 | 285 |       | 22 | 44 | 195 |    |
|     | 25 & 40 | 300 |       | 28 | 75 | 190 |    |

| DN  | PN      | A   | B     | C   | D   | E   | F  |
|-----|---------|-----|-------|-----|-----|-----|----|
|     |         | mm  | mm    | mm  | mm  | mm  | mm |
| 200 | 6       | 320 | 221.5 | 20  | 44  | 240 | 8  |
|     | 10 & 16 | 340 |       | 24  | 44  | 246 |    |
|     | 25      | 360 |       | 30  | 52  | 256 |    |
|     | 40      | 375 |       | 34  | 52  | 260 |    |
| 250 | 6       | 375 | 276.5 | 22  | 44  | 295 | 10 |
|     | 10      | 395 |       | 26  | 46  | 298 |    |
|     | 25      | 425 |       | 32  | 60  | 310 |    |
|     | 40      | 450 |       | 38  | 60  | 312 |    |
| 300 | 6       | 440 | 327.5 | 22  | 44  | 355 | 10 |
|     | 10      | 445 |       | 26  | 46  | 350 |    |
|     | 16      | 460 |       | 28  | 46  | 350 |    |
|     | 25      | 485 |       | 34  | 67  | 364 |    |
| 350 | 40      | 515 | 359.5 | 42  | 67  | 380 | 10 |
|     | 10      | 505 |       | 26  | 53  | 400 |    |
|     | 16      | 520 |       | 30  | 57  | 400 |    |
|     | 25      | 555 |       | 38  | 72  | 418 |    |
| 400 | 40      | 580 | 411.0 | 46  | 72  | 424 | 10 |
|     | 10      | 565 |       | 26  | 57  | 456 |    |
|     | 16      | 580 |       | 32  | 63  | 456 |    |
|     | 25      | 620 |       | 40  | 78  | 472 |    |
| 450 | 40      | 660 | 462.0 | 50  | 78  | 478 | 12 |
|     | 10      | 615 |       | 28  | 63  | 502 |    |
|     | 16      | 640 |       | 34  | 68  | 502 |    |
|     | 25      | 670 |       | 42  | 84  | 520 |    |
| 500 | 40      | 685 | 513.5 | 50  | 84  | 522 | 12 |
|     | 10      | 670 |       | 28  | 67  | 559 |    |
|     | 16      | 715 |       | 34  | 73  | 559 |    |
|     | 25      | 730 |       | 44  | 90  | 580 |    |
| 600 | 40      | 755 | 616.5 | 52  | 90  | 576 | 12 |
|     | 10      | 780 |       | 28  | 75  | 658 |    |
|     | 16      | 840 |       | 36  | 83  | 658 |    |
|     | 25      | 845 |       | 46  | 100 | 684 |    |
| 40  | 890     | 60  | 100   | 686 |     |     |    |
| -   | -       | -   | -     | -   | -   | -   | -  |
| -   | -       | -   | -     | -   | -   | -   | -  |

### Notes

- The hubs of slip on (code 112) flanges are parallel or have a draft <7 degrees.
- For drilling details see page 8-64.
- For tolerances see page 8-61.
- For facing types and dimensions see page 8-62.

# Threaded Flanges (Code 113) - BS 4504



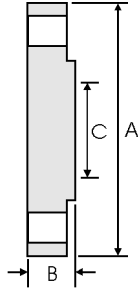
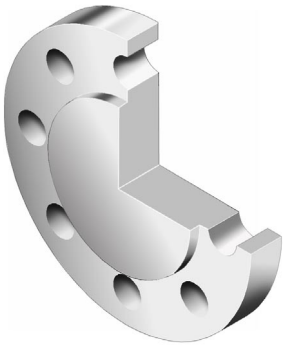
| DN  | PN | A<br>mm | B<br>mm | C<br>mm | D<br>mm | E<br>mm |
|-----|----|---------|---------|---------|---------|---------|
| 10  | 6  | 75      | 25      | 12      | 20      | 3       |
|     | 16 | 90      | 30      | 14      | 20      |         |
|     | 40 | 90      | 30      | 16      | 22      |         |
| 15  | 6  | 80      | 30      | 12      | 20      | 3       |
|     | 16 | 95      | 35      | 14      | 20      |         |
|     | 40 | 95      | 35      | 16      | 22      |         |
| 20  | 6  | 90      | 40      | 14      | 24      | 4       |
|     | 16 | 105     | 45      | 16      | 24      |         |
|     | 40 | 105     | 45      | 18      | 26      |         |
| 25  | 6  | 100     | 50      | 14      | 24      | 4       |
|     | 16 | 115     | 52      | 16      | 24      |         |
|     | 40 | 115     | 52      | 18      | 28      |         |
| 32  | 6  | 120     | 60      | 14      | 26      | 5       |
|     | 16 | 140     | 60      | 16      | 26      |         |
|     | 40 | 140     | 60      | 18      | 30      |         |
| 40  | 6  | 130     | 70      | 14      | 26      | 5       |
|     | 16 | 150     | 70      | 16      | 26      |         |
|     | 40 | 150     | 70      | 18      | 32      |         |
| 50  | 6  | 140     | 80      | 14      | 28      | 5       |
|     | 16 | 165     | 84      | 18      | 28      |         |
|     | 40 | 165     | 84      | 20      | 34      |         |
| 65  | 6  | 160     | 100     | 14      | 32      | 6       |
|     | 16 | 185     | 104     | 18      | 32      |         |
|     | 40 | 185     | 104     | 22      | 38      |         |
| 80  | 6  | 190     | 110     | 16      | 34      | 6       |
|     | 16 | 200     | 118     | 20      | 34      |         |
|     | 40 | 200     | 118     | 24      | 40      |         |
| 100 | 6  | 210     | 130     | 16      | 40      | 6       |
|     | 16 | 220     | 140     | 20      | 40      |         |
|     | 40 | 235     | 145     | 24      | 44      |         |

| DN  | PN | A<br>mm | B<br>mm | C<br>mm | D<br>mm | E<br>mm |
|-----|----|---------|---------|---------|---------|---------|
| 125 | 6  | 240     | 160     | 18      | 44      | 6       |
|     | 16 | 250     | 168     | 22      | 44      |         |
|     | 40 | 270     | 170     | 26      | 48      |         |
| 150 | 6  | 265     | 185     | 18      | 44      | 8       |
|     | 16 | 285     | 195     | 22      | 44      |         |
|     | 40 | 300     | 200     | 28      | 52      |         |
| 200 | 6  | 320     | 240     | 20      | 44      | 8       |
|     | 16 | 340     | 246     | 24      | 44      |         |
|     | 40 | 375     | 260     | 34      | 52      |         |
| 250 | 6  | 375     | 295     | 22      | 44      | 10      |
|     | 16 | 405     | 298     | 26      | 46      |         |
|     | 40 | 450     | 312     | 38      | 60      |         |
| 300 | 6  | 440     | 355     | 22      | 44      | 10      |
|     | 16 | 460     | 350     | 28      | 46      |         |
|     | 40 | 515     | 380     | 42      | 67      |         |
| 350 | 16 | 520     | 400     | 30      | 57      | 10      |
|     | 40 | 580     | 424     | 46      | 72      |         |
|     | 16 | 580     | 456     | 32      | 63      |         |
| 400 | 40 | 660     | 478     | 50      | 78      | 10      |
|     | 16 | 640     | 502     | 34      | 68      |         |
|     | 40 | 685     | 522     | 50      | 84      |         |
| 450 | 16 | 715     | 559     | 34      | 73      | 12      |
|     | 40 | 755     | 576     | 52      | 90      |         |
|     | 16 | 840     | 658     | 36      | 83      |         |
| 600 | 40 | 890     | 686     | 60      | 100     | 12      |
|     | 16 | 910     | 760     | 36      | 83      |         |
|     | 16 | 1025    | 864     | 38      | 90      |         |
| 800 | 16 | 1125    | 968     | 40      | 94      | 12      |
| 900 | 16 | 1255    | 1072    | 42      | 100     | 12      |
| -   | -  | -       | -       | -       | -       | -       |

Notes

- Threaded flange (code 113) threads are tapered or parallel. BS 21 or ANSI/ASME B1.20.1 threads may be specified (see Section 10).
- The hubs of threaded (code 113) flanges are parallel or have a draft <7 degrees.
- For drilling details see page 8-64.
- For tolerances see page 8-61.
- For facing types and dimensions see page 8-62.

## Blank Flanges (Code 105) - BS 4504



| DN  | PN      | A<br>mm | B<br>mm | C<br>mm |
|-----|---------|---------|---------|---------|
| 10  | 2.5 & 6 | 75      | 12      | -       |
|     | 10 & 16 | 90      | 14      | -       |
|     | 25 & 40 | 90      | 16      | -       |
| 15  | 2.5 & 6 | 80      | 12      | -       |
|     | 10 & 16 | 95      | 14      | -       |
|     | 25 & 40 | 95      | 16      | -       |
| 20  | 2.5 & 6 | 90      | 14      | -       |
|     | 10 & 16 | 105     | 16      | -       |
|     | 25 & 40 | 105     | 18      | -       |
| 25  | 2.5 & 6 | 100     | 14      | -       |
|     | 10 & 16 | 115     | 16      | -       |
|     | 25 & 40 | 115     | 18      | -       |
| 32  | 2.5 & 6 | 120     | 14      | -       |
|     | 10 & 16 | 140     | 16      | -       |
|     | 25 & 40 | 140     | 18      | -       |
| 40  | 2.5 & 6 | 130     | 14      | -       |
|     | 10 & 16 | 150     | 16      | -       |
|     | 25 & 40 | 150     | 18      | -       |
| 50  | 2.5 & 6 | 140     | 14      | -       |
|     | 10 & 16 | 165     | 18      | -       |
|     | 25 & 40 | 165     | 20      | -       |
| 65  | 2.5 & 6 | 160     | 14      | 55      |
|     | 10 & 16 | 185     | 18      | 55      |
|     | 25 & 40 | 185     | 22      | 55      |
| 80  | 2.5 & 6 | 190     | 16      | 70      |
|     | 10 & 16 | 200     | 20      | 70      |
|     | 25 & 40 | 200     | 24      | 70      |
|     | 2.5 & 6 | 210     | 16      | 90      |
| 100 | 10 & 16 | 220     | 20      | 90      |
|     | 25 & 40 | 235     | 24      | 90      |
|     | 2.5 & 6 | 240     | 18      | 115     |
|     | 10 & 16 | 250     | 22      | 115     |
| 125 | 25 & 40 | 270     | 26      | 115     |
|     | 2.5 & 6 | 265     | 18      | 140     |
|     | 10 & 16 | 285     | 22      | 140     |
| 150 | 25 & 40 | 300     | 28      | 140     |
|     | 2.5 & 6 | 320     | 20      | 190     |
|     | 10 & 16 | 340     | 24      | 190     |
| 200 | 25      | 360     | 30      | 190     |
|     | 40      | 375     | 34      | 190     |
|     | 2.5 & 6 | 375     | 22      | 235     |
| 250 | 10      | 395     | 26      | 235     |
|     | 16      | 405     | 26      | 235     |
|     | 25      | 425     | 32      | 235     |
|     | 40      | 450     | 38      | 235     |

| DN   | PN      | A<br>mm | B<br>mm | C<br>mm |
|------|---------|---------|---------|---------|
| 300  | 2.5 & 6 | 440     | 22      | 285     |
|      | 10      | 445     | 26      | 285     |
|      | 16      | 460     | 28      | 285     |
|      | 25      | 485     | 34      | 285     |
|      | 40      | 515     | 42      | 285     |
| 350  | 2.5 & 6 | 490     | 22      | 325     |
|      | 10      | 505     | 26      | 325     |
|      | 16      | 520     | 30      | 325     |
|      | 25      | 555     | 38      | 325     |
|      | 40      | 580     | 46      | 325     |
| 400  | 2.5 & 6 | 540     | 22      | 375     |
|      | 10      | 565     | 26      | 375     |
|      | 16      | 580     | 32      | 375     |
|      | 25      | 620     | 40      | 375     |
|      | 40      | 660     | 50      | 375     |
| 450  | 2.5 & 6 | 595     | 24      | 425     |
|      | 10      | 615     | 28      | 425     |
|      | 16      | 640     | 34      | 425     |
|      | 25      | 670     | 42      | 425     |
|      | 40      | 685     | 54      | 425     |
| 500  | 2.5 & 6 | 645     | 24      | 475     |
|      | 10      | 670     | 28      | 475     |
|      | 16      | 715     | 36      | 475     |
|      | 25      | 730     | 45      | 475     |
|      | 40      | 755     | 56      | 475     |
| 600  | 2.5 & 6 | 755     | 34      | 575     |
|      | 10      | 780     | 34      | 575     |
|      | 16      | 840     | 44      | 575     |
|      | 25      | 845     | 54      | 575     |
|      | 40      | 890     | 70      | 575     |
| 700  | 2.5     | 860     | 36      | -       |
|      | 6       | 860     | 38      | -       |
|      | 10      | 895     | 38      | 670     |
|      | 16      | 910     | 48      | 670     |
| 800  | 2.5     | 975     | 38      | -       |
|      | 6       | 975     | 42      | -       |
|      | 10      | 1015    | 42      | 770     |
|      | 16      | 1025    | 52      | 770     |
| 900  | 2.5     | 1075    | 40      | -       |
|      | 6       | 1075    | 46      | -       |
|      | 10      | 1115    | 46      | 860     |
|      | 16      | 1125    | 58      | 860     |
| 1000 | 2.5     | 1175    | 42      | -       |
|      | 6       | 1175    | 52      | -       |
|      | 10      | 1230    | 52      | 960     |
|      | 16      | 1255    | 64      | 960     |
| 1200 | 2.5     | 1375    | 44      | -       |
|      | 6       | 1405    | 60      | -       |
|      | 10      | 1455    | 60      | 1160    |
|      | 16      | 1485    | 76      | 1160    |
| 1400 | 2.5     | 1575    | 48      | -       |
|      | 6       | 1630    | 68      | -       |
| 1600 | 2.5     | 1790    | 51      | -       |
|      | 6       | 1830    | 76      | -       |
| 1800 | 2.5     | 1990    | 54      | -       |
|      | 6       | 2045    | 84      | -       |
| 2000 | 2.5     | 2190    | 58      | -       |
|      | 6       | 2265    | 92      | -       |

### Notes

- Dimension B is the range thickness with or without a raised face.
- Dimension C is the maximum diameter of the centre portion of a blank flange face which need not be machined.
- For drilling details see page 8-64.
- For tolerances see page 8-61.
- For facing types and dimensions see page 8-62.

## BS 10 : 1962

British Standard BS 10 : 1962 - Specification for Flanges and Bolting for Pipes, Valves, and Fittings. This covers plain, boss, integrally cast or forged, and welding neck type flanges, in ten tables. Although BS 10 is obsolescent, it remains in use for the dimensions of light duty, economy stainless steel flanges in applications where corrosion resistance and/or hygiene, rather than high pressures and temperatures, are the primary considerations. The following tables detail the applicable standard dimensions from Tables D, E, F and H of BS 10.

### Flange Dimensions Based on Tables D and E of BS 10 : 1962

| Common<br>Flange Size<br>Designation<br>(Nominal<br>Bore of<br>Pipe) | BS 10 Table D Dimensions         |                                |                                |                       |                         | BS 10 Table E Dimensions         |                                |                                |                       |                               |
|--|----------------------------------|--------------------------------|--------------------------------|-----------------------|-------------------------|----------------------------------|--------------------------------|--------------------------------|-----------------------|-------------------------------|
|  | Overall<br>Diameter<br>of Flange | Flange<br>Thickness            | Bolt<br>Circle<br>Diameter     | Number<br>of<br>Bolts | Diameter<br>of<br>Bolts | Overall<br>Diameter<br>of Flange | Flange<br>Thickness            | Bolt<br>Circle<br>Diameter     | Number<br>of<br>Bolts | Diameter<br>of<br>Bolts       |
|  | in                               | in                             | in                             |                       | in                      | in                               | in                             | in                             |                       | in                            |
| 1/2  | 3 <sup>3</sup> / <sub>4</sub>    | 3 <sup>1</sup> / <sub>16</sub> | 2 <sup>5</sup> / <sub>8</sub>  | 4                     | 1/2                     | 3 <sup>3</sup> / <sub>4</sub>    | 1/4                            | 2 <sup>5</sup> / <sub>8</sub>  | 4                     | 1/2                           |
| 3/4  | 4                                | 3 <sup>1</sup> / <sub>16</sub> | 2 <sup>7</sup> / <sub>8</sub>  | 4                     | 1/2                     | 4                                | 1/4                            | 2 <sup>7</sup> / <sub>8</sub>  | 4                     | 1/2                           |
| 1  | 4 <sup>1</sup> / <sub>2</sub>    | 3 <sup>1</sup> / <sub>16</sub> | 3 <sup>1</sup> / <sub>4</sub>  | 4                     | 1/2                     | 4 <sup>1</sup> / <sub>2</sub>    | 9/32                           | 3 <sup>1</sup> / <sub>4</sub>  | 4                     | 1/2                           |
| 1 <sup>1</sup> / <sub>4</sub>  | 4 <sup>3</sup> / <sub>4</sub>    | 1/4                            | 3 <sup>7</sup> / <sub>16</sub> | 4                     | 1/2                     | 4 <sup>3</sup> / <sub>4</sub>    | 5 <sup>1</sup> / <sub>16</sub> | 3 <sup>7</sup> / <sub>16</sub> | 4                     | 1/2                           |
| 1 <sup>1</sup> / <sub>2</sub>  | 5 <sup>1</sup> / <sub>4</sub>    | 1/4                            | 3 <sup>7</sup> / <sub>8</sub>  | 4                     | 1/2                     | 5 <sup>1</sup> / <sub>4</sub>    | 1 <sup>1</sup> / <sub>32</sub> | 3 <sup>7</sup> / <sub>8</sub>  | 4                     | 1/2                           |
| 2  | 6                                | 5 <sup>1</sup> / <sub>16</sub> | 4 <sup>1</sup> / <sub>2</sub>  | 4                     | 5/8                     | 6                                | 3/8                            | 4 <sup>1</sup> / <sub>2</sub>  | 4                     | 5/8                           |
| 2 <sup>1</sup> / <sub>2</sub>  | 6 <sup>1</sup> / <sub>2</sub>    | 5 <sup>1</sup> / <sub>16</sub> | 5                              | 4                     | 5/8                     | 6 <sup>1</sup> / <sub>2</sub>    | 1 <sup>3</sup> / <sub>32</sub> | 5                              | 4                     | 5/8                           |
| 3  | 7 <sup>1</sup> / <sub>4</sub>    | 3/8                            | 5 <sup>3</sup> / <sub>4</sub>  | 4                     | 5/8                     | 7 <sup>1</sup> / <sub>4</sub>    | 7/16                           | 5 <sup>3</sup> / <sub>4</sub>  | 4                     | 5/8                           |
| 3 <sup>1</sup> / <sub>2</sub>  | 8                                | 3/8                            | 6 <sup>1</sup> / <sub>2</sub>  | 4                     | 5/8                     | 8                                | 1 <sup>5</sup> / <sub>32</sub> | 6 <sup>1</sup> / <sub>2</sub>  | 8                     | 5/8                           |
| 4  | 8 <sup>1</sup> / <sub>2</sub>    | 3/8                            | 7                              | 4                     | 5/8                     | 8 <sup>1</sup> / <sub>2</sub>    | 1/2                            | 7                              | 8                     | 5/8                           |
| 5  | 10                               | 1/2                            | 8 <sup>1</sup> / <sub>4</sub>  | 8                     | 5/8                     | 10                               | 9/16                           | 8 <sup>1</sup> / <sub>4</sub>  | 8                     | 5/8                           |
| 6  | 11                               | 1/2                            | 9 <sup>1</sup> / <sub>4</sub>  | 8                     | 5/8                     | 11                               | 1 <sup>1</sup> / <sub>16</sub> | 9 <sup>1</sup> / <sub>4</sub>  | 8                     | 3/4                           |
| 7  | 12                               | 1/2                            | 10 <sup>1</sup> / <sub>4</sub> | 8                     | 5/8                     | 12                               | 3/4                            | 10 <sup>1</sup> / <sub>4</sub> | 8                     | 3/4                           |
| 8  | 13 <sup>1</sup> / <sub>4</sub>   | 1/2                            | 11 <sup>1</sup> / <sub>2</sub> | 8                     | 5/8                     | 13 <sup>1</sup> / <sub>4</sub>   | 3/4                            | 11 <sup>1</sup> / <sub>2</sub> | 8                     | 3/4                           |
| 9  | 14 <sup>1</sup> / <sub>2</sub>   | 5/8                            | 12 <sup>3</sup> / <sub>4</sub> | 8                     | 5/8                     | 14 <sup>1</sup> / <sub>2</sub>   | 1 <sup>3</sup> / <sub>16</sub> | 12 <sup>3</sup> / <sub>4</sub> | 12                    | 3/4                           |
| 10   | 16                               | 5/8                            | 14                             | 8                     | 3/4                     | 16                               | 7/8                            | 14                             | 12                    | 3/4                           |
| 12   | 18                               | 3/4                            | 16                             | 12                    | 3/4                     | 18                               | 1                              | 16                             | 12                    | 7/8                           |
| 13   | 19 <sup>1</sup> / <sub>4</sub>   | 3/4                            | 17 <sup>1</sup> / <sub>4</sub> | 12                    | 3/4                     | 19 <sup>1</sup> / <sub>4</sub>   | 1                              | 17 <sup>1</sup> / <sub>4</sub> | 12                    | 7/8                           |
| 14   | 20 <sup>3</sup> / <sub>4</sub>   | 7/8                            | 18 <sup>1</sup> / <sub>2</sub> | 12                    | 7/8                     | 20 <sup>3</sup> / <sub>4</sub>   | 1 <sup>1</sup> / <sub>8</sub>  | 18 <sup>1</sup> / <sub>2</sub> | 12                    | 7/8                           |
| 15   | 21 <sup>3</sup> / <sub>4</sub>   | 7/8                            | 19 <sup>1</sup> / <sub>2</sub> | 12                    | 7/8                     | 21 <sup>3</sup> / <sub>4</sub>   | 1 <sup>1</sup> / <sub>4</sub>  | 19 <sup>1</sup> / <sub>2</sub> | 12                    | 7/8                           |
| 16   | 22 <sup>3</sup> / <sub>4</sub>   | 7/8                            | 20 <sup>1</sup> / <sub>2</sub> | 12                    | 7/8                     | 22 <sup>3</sup> / <sub>4</sub>   | 1 <sup>1</sup> / <sub>4</sub>  | 20 <sup>1</sup> / <sub>2</sub> | 12                    | 7/8                           |
| 17   | 24                               | 1                              | 21 <sup>3</sup> / <sub>4</sub> | 12                    | 7/8                     | 24                               | 1 <sup>3</sup> / <sub>8</sub>  | 21 <sup>3</sup> / <sub>4</sub> | 12                    | 7/8                           |
| 18   | 25 <sup>1</sup> / <sub>4</sub>   | 1                              | 23                             | 12                    | 7/8                     | 25 <sup>1</sup> / <sub>4</sub>   | 1 <sup>3</sup> / <sub>8</sub>  | 23                             | 16                    | 7/8                           |
| 19   | 26 <sup>1</sup> / <sub>2</sub>   | 1                              | 24                             | 12                    | 7/8                     | 26 <sup>1</sup> / <sub>2</sub>   | 1 <sup>1</sup> / <sub>2</sub>  | 24                             | 16                    | 7/8                           |
| 20   | 27 <sup>3</sup> / <sub>4</sub>   | 1 <sup>1</sup> / <sub>8</sub>  | 25 <sup>1</sup> / <sub>4</sub> | 16                    | 7/8                     | 27 <sup>3</sup> / <sub>4</sub>   | 1 <sup>1</sup> / <sub>2</sub>  | 25 <sup>1</sup> / <sub>4</sub> | 16                    | 7/8                           |
| 21   | 29                               | 1 <sup>1</sup> / <sub>8</sub>  | 26 <sup>1</sup> / <sub>2</sub> | 16                    | 7/8                     | 29                               | 1 <sup>5</sup> / <sub>8</sub>  | 26 <sup>1</sup> / <sub>2</sub> | 16                    | 1                             |
| 22   | 30                               | 1 <sup>1</sup> / <sub>8</sub>  | 27 <sup>1</sup> / <sub>2</sub> | 16                    | 1                       | 30                               | 1 <sup>3</sup> / <sub>4</sub>  | 27 <sup>1</sup> / <sub>2</sub> | 16                    | 1                             |
| 23   | 31                               | 1 <sup>1</sup> / <sub>8</sub>  | 28 <sup>1</sup> / <sub>2</sub> | 16                    | 1                       | 31                               | 1 <sup>3</sup> / <sub>4</sub>  | 28 <sup>1</sup> / <sub>2</sub> | 16                    | 1                             |
| 24   | 32 <sup>1</sup> / <sub>2</sub>   | 1 <sup>1</sup> / <sub>4</sub>  | 29 <sup>3</sup> / <sub>4</sub> | 16                    | 1                       | 32 <sup>1</sup> / <sub>2</sub>   | 1 <sup>7</sup> / <sub>8</sub>  | 29 <sup>3</sup> / <sub>4</sub> | 16                    | 1 <sup>1</sup> / <sub>8</sub> |

#### Note

- Bolt hole diameters are as follows:

For 1/2 in and 5/8 in bolts, the bolt hole shall be 1/16 in larger than the bolt diameter.

For 3/4 in bolts and larger, the bolt hole shall be not more than 1/8 in larger than the bolt diameter.

## BS 10 : 1962

### Flange Dimensions Based on Tables F and H of BS 10 : 1962

| Common<br>Flange Size<br>Designation<br>(Nominal<br>Bore of<br>Pipe) | BS 10 Table F Dimensions         |                               |                                |                       |                               | BS 10 Table H Dimensions         |                               |                                |                       |                               |
|--|----------------------------------|-------------------------------|--------------------------------|-----------------------|-------------------------------|----------------------------------|-------------------------------|--------------------------------|-----------------------|-------------------------------|
|  | Overall<br>Diameter<br>of Flange | Flange<br>Thickness           | Bolt<br>Circle<br>Diameter     | Number<br>of<br>Bolts | Diameter<br>of<br>Bolts       | Overall<br>Diameter<br>of Flange | Flange<br>Thickness           | Bolt<br>Circle<br>Diameter     | Number<br>of<br>Bolts | Diameter<br>of<br>Bolts       |
| 1/2  | 3 <sup>3</sup> / <sub>4</sub>    | <sup>3</sup> / <sub>8</sub>   | 2 <sup>5</sup> / <sub>8</sub>  | 4                     | 1/2                           | 4 <sup>1</sup> / <sub>2</sub>    | 1/2                           | 3 <sup>1</sup> / <sub>4</sub>  | 4                     | <sup>5</sup> / <sub>8</sub>   |
| 3/4  | 4                                | <sup>3</sup> / <sub>8</sub>   | 2 <sup>7</sup> / <sub>8</sub>  | 4                     | 1/2                           | 4 <sup>1</sup> / <sub>2</sub>    | 1/2                           | 3 <sup>1</sup> / <sub>4</sub>  | 4                     | <sup>5</sup> / <sub>8</sub>   |
| 1  | 4 <sup>3</sup> / <sub>4</sub>    | <sup>3</sup> / <sub>8</sub>   | 3 <sup>7</sup> / <sub>16</sub> | 4                     | <sup>5</sup> / <sub>8</sub>   | 4 <sup>3</sup> / <sub>4</sub>    | <sup>9</sup> / <sub>16</sub>  | 3 <sup>7</sup> / <sub>16</sub> | 4                     | <sup>5</sup> / <sub>8</sub>   |
| 1 <sup>1</sup> / <sub>4</sub>  | 5 <sup>1</sup> / <sub>4</sub>    | 1/2                           | 3 <sup>7</sup> / <sub>8</sub>  | 4                     | <sup>5</sup> / <sub>8</sub>   | 5 <sup>1</sup> / <sub>4</sub>    | <sup>11</sup> / <sub>16</sub> | 3 <sup>7</sup> / <sub>8</sub>  | 4                     | <sup>5</sup> / <sub>8</sub>   |
| 1 <sup>1</sup> / <sub>2</sub>  | 5 <sup>1</sup> / <sub>2</sub>    | 1/2                           | 4 <sup>1</sup> / <sub>8</sub>  | 4                     | <sup>5</sup> / <sub>8</sub>   | 5 <sup>1</sup> / <sub>2</sub>    | <sup>11</sup> / <sub>16</sub> | 4 <sup>1</sup> / <sub>8</sub>  | 4                     | <sup>5</sup> / <sub>8</sub>   |
| 2  | 6 <sup>1</sup> / <sub>2</sub>    | <sup>5</sup> / <sub>8</sub>   | 5                              | 4                     | <sup>5</sup> / <sub>8</sub>   | 6 <sup>1</sup> / <sub>2</sub>    | <sup>3</sup> / <sub>4</sub>   | 5                              | 4                     | <sup>5</sup> / <sub>8</sub>   |
| 2 <sup>1</sup> / <sub>2</sub>  | 7 <sup>1</sup> / <sub>4</sub>    | <sup>5</sup> / <sub>8</sub>   | 5 <sup>3</sup> / <sub>4</sub>  | 8                     | <sup>5</sup> / <sub>8</sub>   | 7 <sup>1</sup> / <sub>4</sub>    | <sup>3</sup> / <sub>4</sub>   | 5 <sup>3</sup> / <sub>4</sub>  | 8                     | <sup>5</sup> / <sub>8</sub>   |
| 3  | 8                                | <sup>5</sup> / <sub>8</sub>   | 6 <sup>1</sup> / <sub>2</sub>  | 8                     | <sup>5</sup> / <sub>8</sub>   | 8                                | <sup>7</sup> / <sub>8</sub>   | 6 <sup>1</sup> / <sub>2</sub>  | 8                     | <sup>5</sup> / <sub>8</sub>   |
| 3 <sup>1</sup> / <sub>2</sub>  | 8 <sup>1</sup> / <sub>2</sub>    | <sup>3</sup> / <sub>4</sub>   | 7                              | 8                     | <sup>5</sup> / <sub>8</sub>   | 8 <sup>1</sup> / <sub>2</sub>    | <sup>7</sup> / <sub>8</sub>   | 7                              | 8                     | <sup>5</sup> / <sub>8</sub>   |
| 4  | 9                                | <sup>3</sup> / <sub>4</sub>   | 7 <sup>1</sup> / <sub>2</sub>  | 8                     | <sup>5</sup> / <sub>8</sub>   | 9                                | 1                             | 7 <sup>1</sup> / <sub>2</sub>  | 8                     | <sup>5</sup> / <sub>8</sub>   |
| 5  | 11                               | <sup>7</sup> / <sub>8</sub>   | 9 <sup>1</sup> / <sub>4</sub>  | 8                     | <sup>3</sup> / <sub>4</sub>   | 11                               | 1 <sup>1</sup> / <sub>8</sub> | 9 <sup>1</sup> / <sub>4</sub>  | 8                     | <sup>3</sup> / <sub>4</sub>   |
| 6  | 12                               | <sup>7</sup> / <sub>8</sub>   | 10 <sup>1</sup> / <sub>4</sub> | 12                    | <sup>3</sup> / <sub>4</sub>   | 12                               | 1 <sup>1</sup> / <sub>8</sub> | 10 <sup>1</sup> / <sub>4</sub> | 12                    | <sup>3</sup> / <sub>4</sub>   |
| 7  | 13 <sup>1</sup> / <sub>4</sub>   | <sup>7</sup> / <sub>8</sub>   | 11 <sup>1</sup> / <sub>2</sub> | 12                    | <sup>3</sup> / <sub>4</sub>   | 13 <sup>1</sup> / <sub>4</sub>   | 1 <sup>1</sup> / <sub>4</sub> | 11 <sup>1</sup> / <sub>2</sub> | 12                    | <sup>3</sup> / <sub>4</sub>   |
| 8  | 14 <sup>1</sup> / <sub>2</sub>   | 1                             | 12 <sup>3</sup> / <sub>4</sub> | 12                    | <sup>3</sup> / <sub>4</sub>   | 14 <sup>1</sup> / <sub>2</sub>   | 1 <sup>1</sup> / <sub>4</sub> | 12 <sup>3</sup> / <sub>4</sub> | 12                    | <sup>3</sup> / <sub>4</sub>   |
| 9  | 16                               | 1 <sup>1</sup> / <sub>8</sub> | 14                             | 12                    | <sup>7</sup> / <sub>8</sub>   | 16                               | 1 <sup>3</sup> / <sub>8</sub> | 14                             | 12                    | <sup>7</sup> / <sub>8</sub>   |
| 10   | 17                               | 1 <sup>1</sup> / <sub>8</sub> | 15                             | 12                    | <sup>7</sup> / <sub>8</sub>   | 17                               | 1 <sup>3</sup> / <sub>8</sub> | 15                             | 12                    | <sup>7</sup> / <sub>8</sub>   |
| 12   | 19 <sup>1</sup> / <sub>4</sub>   | 1 <sup>1</sup> / <sub>4</sub> | 17 <sup>1</sup> / <sub>4</sub> | 16                    | <sup>7</sup> / <sub>8</sub>   | 19 <sup>1</sup> / <sub>4</sub>   | 1 <sup>5</sup> / <sub>8</sub> | 17 <sup>1</sup> / <sub>4</sub> | 16                    | <sup>7</sup> / <sub>8</sub>   |
| 13   | 20 <sup>3</sup> / <sub>4</sub>   | 1 <sup>3</sup> / <sub>8</sub> | 18 <sup>1</sup> / <sub>2</sub> | 16                    | 1                             | 20 <sup>3</sup> / <sub>4</sub>   | 1 <sup>3</sup> / <sub>4</sub> | 18 <sup>1</sup> / <sub>2</sub> | 16                    | 1                             |
| 14   | 21 <sup>3</sup> / <sub>4</sub>   | 1 <sup>3</sup> / <sub>8</sub> | 19 <sup>1</sup> / <sub>2</sub> | 16                    | 1                             | 21 <sup>3</sup> / <sub>4</sub>   | 1 <sup>7</sup> / <sub>8</sub> | 19 <sup>1</sup> / <sub>2</sub> | 16                    | 1                             |
| 15   | 22 <sup>3</sup> / <sub>4</sub>   | 1 <sup>1</sup> / <sub>2</sub> | 20 <sup>1</sup> / <sub>2</sub> | 16                    | 1                             | 22 <sup>3</sup> / <sub>4</sub>   | 2                             | 20 <sup>1</sup> / <sub>2</sub> | 16                    | 1                             |
| 16   | 24                               | 1 <sup>5</sup> / <sub>8</sub> | 21 <sup>3</sup> / <sub>4</sub> | 20                    | 1                             | 24                               | 2 <sup>1</sup> / <sub>8</sub> | 21 <sup>3</sup> / <sub>4</sub> | 20                    | 1                             |
| 17   | 25 <sup>1</sup> / <sub>4</sub>   | 1 <sup>3</sup> / <sub>4</sub> | 23                             | 20                    | 1                             | 25 <sup>1</sup> / <sub>4</sub>   | 2 <sup>1</sup> / <sub>4</sub> | 23                             | 20                    | 1                             |
| 18   | 26 <sup>1</sup> / <sub>2</sub>   | 1 <sup>3</sup> / <sub>4</sub> | 24                             | 20                    | 1 <sup>1</sup> / <sub>8</sub> | 26 <sup>1</sup> / <sub>2</sub>   | 2 <sup>3</sup> / <sub>8</sub> | 24                             | 20                    | 1 <sup>1</sup> / <sub>8</sub> |
| 19   | 27 <sup>3</sup> / <sub>4</sub>   | 1 <sup>3</sup> / <sub>4</sub> | 25 <sup>1</sup> / <sub>4</sub> | 20                    | 1 <sup>1</sup> / <sub>8</sub> | 27 <sup>3</sup> / <sub>4</sub>   | 2 <sup>1</sup> / <sub>2</sub> | 25 <sup>1</sup> / <sub>4</sub> | 20                    | 1 <sup>1</sup> / <sub>8</sub> |
| 20   | 29                               | 2                             | 26 <sup>1</sup> / <sub>2</sub> | 24                    | 1 <sup>1</sup> / <sub>8</sub> | 29                               | 2 <sup>5</sup> / <sub>8</sub> | 26 <sup>1</sup> / <sub>2</sub> | 24                    | 1 <sup>1</sup> / <sub>8</sub> |
| 21   | 30                               | 2                             | 27 <sup>1</sup> / <sub>2</sub> | 24                    | 1 <sup>1</sup> / <sub>8</sub> | 30                               | 2 <sup>3</sup> / <sub>4</sub> | 27 <sup>1</sup> / <sub>2</sub> | 24                    | 1 <sup>1</sup> / <sub>8</sub> |
| 22   | 31                               | 2 <sup>1</sup> / <sub>8</sub> | 28 <sup>1</sup> / <sub>2</sub> | 24                    | 1 <sup>1</sup> / <sub>8</sub> | 31                               | 2 <sup>3</sup> / <sub>4</sub> | 28 <sup>1</sup> / <sub>2</sub> | 24                    | 1 <sup>1</sup> / <sub>8</sub> |
| 23   | 32 <sup>1</sup> / <sub>2</sub>   | 2 <sup>1</sup> / <sub>4</sub> | 29 <sup>3</sup> / <sub>4</sub> | 24                    | 1 <sup>1</sup> / <sub>4</sub> | 32 <sup>1</sup> / <sub>2</sub>   | 3                             | 29 <sup>3</sup> / <sub>4</sub> | 24                    | 1 <sup>1</sup> / <sub>4</sub> |
| 24   | 33 <sup>1</sup> / <sub>2</sub>   | 2 <sup>1</sup> / <sub>4</sub> | 30 <sup>3</sup> / <sub>4</sub> | 24                    | 1 <sup>1</sup> / <sub>4</sub> | 33 <sup>1</sup> / <sub>2</sub>   | 3                             | 30 <sup>3</sup> / <sub>4</sub> | 24                    | 1 <sup>1</sup> / <sub>4</sub> |

Note

- Bolt hole diameters are as follows:

For <sup>1</sup>/<sub>2</sub> in and <sup>5</sup>/<sub>8</sub> in bolts, the bolt hole shall be <sup>1</sup>/<sub>16</sub> in larger than the bolt diameter.

For <sup>3</sup>/<sub>4</sub> in bolts and larger, the bolt hole shall be not more than <sup>1</sup>/<sub>8</sub> in larger than the bolt diameter.



# Pressure/Temperature Ratings

The following tables (based on ANSI B16.5-1996 and B16.47-1996) provide pressure/temperature ratings for stainless steel materials used for flanges. Refer to Section 4 for further details regarding ASTM A 182. Also, the chemical analyses of ASTM A 240 grades are included in Section 1.

## Materials: 304, 304H

| Nominal Designation | Forgings                                       | Plates                                       |
|---------------------|--|--|
| 18Cr-8Ni            | A 182 Gr. F304 <sup>1</sup><br>A 182 Gr. F304H | A 240 Gr. 304 <sup>1</sup><br>A 240 Gr. 304H |

Note

<sup>1</sup> At temperatures over 1000°F, use only when the carbon content is 0.04% or higher.

## Pressure/temperature ratings

| Temperature |             | Working Pressures by Classes, psig |        |        |        |        |         |         |
|-------------|-------------|------------------------------------|--------|--------|--------|--------|---------|---------|
| °F          | °C          | 150 lb                             | 300 lb | 400 lb | 600 lb | 900 lb | 1500 lb | 2500 lb |
| -20 to 100  | -29 to 37.8 | 275                                | 720    | 960    | 1440   | 2160   | 3600    | 6000    |
| 300         | 149         | 205                                | 540    | 720    | 1080   | 1620   | 2700    | 4500    |
| 500         | 260         | 170                                | 465    | 620    | 930    | 1395   | 2330    | 3880    |
| 700         | 371         | 110                                | 425    | 565    | 850    | 1275   | 2125    | 3540    |
| 850         | 454         | 65                                 | 395    | 530    | 790    | 1190   | 1980    | 3300    |
| 1000        | 538         | 20                                 | 320    | 430    | 640    | 965    | 1605    | 2675    |
| 1150        | 566         | -                                  | 200    | 265    | 400    | 595    | 995     | 1655    |
| 1300        | 704         | -                                  | 85     | 115    | 170    | 255    | 430     | 715     |
| 1400        | 760         | -                                  | 50     | 65     | 95     | 145    | 240     | 400     |
| 1500        | 816         | -                                  | 25     | 35     | 55     | 80     | 135     | 230     |

Note

- psig = pounds per square inch gauge (0 psig = 14.7 psi absolute)

## Materials: 316, 316H, 317

| Nominal Designation | Forgings                                       | Plates                                       |
|---------------------|--|--|
| 16Cr-12Ni-2Mo       | A 182 Gr. F316 <sup>1</sup><br>A 182 Gr. F316H | A 240 Gr. 316 <sup>1</sup><br>A 240 Gr. 316H |
| 18Cr-13Ni-3Mo       | -  | A 240 Gr. 317 <sup>1</sup>                   |

Note

<sup>1</sup> At temperatures over 1000°F, use only when the carbon content is 0.04% or higher.

## Pressure/temperature ratings

| Temperature |             | Working Pressures by Classes, psig |        |        |        |        |         |         |
|-------------|-------------|------------------------------------|--------|--------|--------|--------|---------|---------|
| °F          | °C          | 150 lb                             | 300 lb | 400 lb | 600 lb | 900 lb | 1500 lb | 2500 lb |
| -20 to 100  | -29 to 37.8 | 275                                | 720    | 960    | 1440   | 2160   | 3600    | 6000    |
| 300         | 149         | 215                                | 560    | 745    | 1120   | 1680   | 2795    | 4660    |
| 500         | 260         | 170                                | 480    | 635    | 955    | 1435   | 2390    | 3980    |
| 700         | 371         | 110                                | 430    | 580    | 870    | 1305   | 2170    | 3620    |
| 850         | 454         | 65                                 | 420    | 555    | 835    | 1255   | 2090    | 3480    |
| 1000        | 538         | 20                                 | 350    | 465    | 700    | 1050   | 1750    | 2915    |
| 1150        | 566         | -                                  | 235    | 315    | 475    | 710    | 1185    | 1970    |
| 1300        | 704         | -                                  | 115    | 155    | 235    | 350    | 585     | 970     |
| 1400        | 760         | -                                  | 75     | 100    | 150    | 225    | 380     | 630     |
| 1500        | 816         | -                                  | 40     | 55     | 85     | 125    | 205     | 345     |

Note

- psig = pounds per square inch gauge (0 psig = 14.7 psi absolute)

## Pressure/Temperature Ratings

### Materials: 316L, 304L

| Nominal Designation       | Forgings  | Plates  |
|---------------------------|---|---|
| 16Cr-12Ni-2Mo<br>18Cr-8Ni | A 182 Gr. F316L<br>A 182 Gr. F304L <sup>1</sup> | A 240 Gr. 316L<br>A 240 Gr. 304L <sup>1</sup> |

Note

1 Not to be used over 800°F.

### Pressure/temperature ratings

| Temperature |             | Working Pressures by Classes, psig |        |        |        |        |         |         |
|-------------|-------------|------------------------------------|--------|--------|--------|--------|---------|---------|
| °F          | °C          | 150 lb                             | 300 lb | 400 lb | 600 lb | 900 lb | 1500 lb | 2500 lb |
| -20 to 100  | -29 to 37.8 | 230                                | 600    | 800    | 1200   | 1800   | 3000    | 5000    |
| 300         | 149         | 175                                | 455    | 605    | 910    | 1360   | 2270    | 3780    |
| 500         | 260         | 145                                | 380    | 510    | 765    | 1145   | 1910    | 3180    |
| 700         | 371         | 110                                | 345    | 460    | 685    | 1030   | 1715    | 2860    |
| 850         | 454         | 65                                 | 320    | 430    | 645    | 965    | 1610    | 2680    |

Note

- psig = pounds per square inch gauge (0 psig = 14.7 psi absolute)

### Materials: 321, 321H

| Nominal Designation | Forgings  | Plates  |
|---------------------|---|---|
| 18Cr-10Ni-Ti        | A 182 Gr. F321 <sup>2</sup><br>A 182 Gr. F321H <sup>1</sup> | A 240 Gr. 321 <sup>2</sup><br>A 240 Gr. 321H <sup>1</sup> |

Notes

1 At temperatures over 1000°F, use only if the material is heat treated by heating to a minimum temperature of 2000°F.

2 Not to be used over 1000°F.

### Pressure/temperature ratings

| Temperature |             | Working Pressures by Classes, psig |        |        |        |        |         |         |
|-------------|-------------|------------------------------------|--------|--------|--------|--------|---------|---------|
| °F          | °C          | 150 lb                             | 300 lb | 400 lb | 600 lb | 900 lb | 1500 lb | 2500 lb |
| -20 to 100  | -29 to 37.8 | 275                                | 720    | 960    | 1440   | 2160   | 3600    | 6000    |
| 300         | 149         | 230                                | 595    | 795    | 1190   | 1785   | 2975    | 4960    |
| 500         | 260         | 170                                | 515    | 685    | 1030   | 1545   | 2570    | 4285    |
| 700         | 371         | 110                                | 465    | 620    | 930    | 1395   | 2330    | 3880    |
| 850         | 454         | 65                                 | 445    | 595    | 895    | 1340   | 2230    | 3720    |
| 1000        | 538         | 20                                 | 355    | 475    | 715    | 1070   | 1785    | 2970    |
| 1150        | 566         | -                                  | 235    | 315    | 465    | 710    | 1185    | 1970    |
| 1300        | 704         | -                                  | 110    | 145    | 220    | 330    | 550     | 915     |
| 1400        | 760         | -                                  | 65     | 85     | 130    | 195    | 325     | 545     |
| 1500        | 816         | -                                  | 40     | 50     | 75     | 115    | 190     | 315     |

Note

- psig = pounds per square inch gauge (0 psig = 14.7 psi absolute)

# Pressure/Temperature Ratings

## Materials: 347, 347H, 348, 348H

| Nominal Designation | Forgings   | Plates   |
|---------------------|--|--|
| 18Cr-10Ni-Cb        | A 182 Gr. F347 <sup>2</sup><br>A 182 Gr. F347H <sup>1</sup><br>A 182 Gr. F348 <sup>2</sup><br>A 182 Gr. F348H <sup>1</sup> | A 240 Gr. 347 <sup>2</sup><br>A 240 Gr. 347H <sup>1</sup><br>A 240 Gr. 348 <sup>2</sup><br>A 240 Gr. 348H <sup>1</sup> |

### Notes

- At temperatures over 1000°F, use only if the material is heat treated by heating to a minimum temperature of 2000°F.
- Not to be used over 1000°F.

### Pressure/temperature ratings

| Temperature |             | Working Pressures by Classes, psig |        |        |        |        |         |         |
|-------------|-------------|------------------------------------|--------|--------|--------|--------|---------|---------|
| °F          | °C          | 150 lb                             | 300 lb | 400 lb | 600 lb | 900 lb | 1500 lb | 2500 lb |
| -20 to 100  | -29 to 37.8 | 275                                | 720    | 960    | 1440   | 2160   | 3600    | 6000    |
| 300         | 149         | 230                                | 615    | 820    | 1230   | 1845   | 3070    | 5120    |
| 500         | 260         | 170                                | 540    | 720    | 1080   | 1620   | 2700    | 4500    |
| 700         | 371         | 110                                | 495    | 660    | 990    | 1485   | 2470    | 4120    |
| 850         | 454         | 65                                 | 485    | 645    | 970    | 1455   | 2425    | 4040    |
| 1000        | 538         | 20                                 | 365    | 485    | 725    | 1090   | 1820    | 3030    |
| 1150        | 566         | -                                  | 275    | 365    | 550    | 825    | 1370    | 2285    |
| 1300        | 704         | -                                  | 95     | 125    | 185    | 280    | 465     | 770     |
| 1400        | 760         | -                                  | 55     | 75     | 110    | 165    | 275     | 455     |
| 1500        | 816         | -                                  | 35     | 45     | 70     | 105    | 170     | 285     |

### Note

- psig = pounds per square inch gauge (0 psig = 14.7 psi absolute)

## Materials: 309S, 309H

| Nominal Designation | Forgings | Plates  |
|---------------------|----------|---|
| 23Cr-12Ni           | -        | A 240 Gr. 309S <sup>1,2,3</sup><br>A 240 Gr. 309H |

### Notes

- At temperatures over 1000°F, use only when the carbon content is 0.04% or higher.
- For temperatures above 1000°F, use only if the material solution is heat treated to the minimum temperature specified in the specification but not lower than 1900°F, and quenching in water or rapidly cooling by other means.
- This material should be used for service temperatures 1050°F and above only when assurance is provided that grain size is not finer than ASTM 6.

### Pressure/temperature ratings

| Temperature |             | Working Pressures by Classes, psig |        |        |        |        |         |         |
|-------------|-------------|------------------------------------|--------|--------|--------|--------|---------|---------|
| °F          | °C          | 150 lb                             | 300 lb | 400 lb | 600 lb | 900 lb | 1500 lb | 2500 lb |
| -20 to 100  | -29 to 37.8 | 260                                | 670    | 895    | 1345   | 2015   | 3360    | 5600    |
| 300         | 149         | 220                                | 570    | 760    | 1140   | 1705   | 2875    | 4740    |
| 500         | 260         | 170                                | 505    | 670    | 1010   | 1510   | 2520    | 4200    |
| 700         | 371         | 110                                | 455    | 610    | 910    | 1370   | 2280    | 3800    |
| 850         | 454         | 65                                 | 425    | 565    | 850    | 1275   | 2125    | 3540    |
| 1000        | 538         | 20                                 | 335    | 450    | 670    | 1010   | 1680    | 2800    |
| 1150        | 566         | -                                  | 170    | 230    | 345    | 515    | 860     | 1430    |
| 1300        | 704         | -                                  | 80     | 105    | 160    | 235    | 395     | 660     |
| 1400        | 760         | -                                  | 45     | 60     | 90     | 135    | 225     | 370     |
| 1500        | 816         | -                                  | 25     | 30     | 50     | 70     | 120     | 200     |

### Note

- psig = pounds per square inch gauge (0 psig = 14.7 psi absolute)

# Pressure/Temperature Ratings

## Materials: 310, 310S, 310H

| Nominal Designation | Forgings                      | Plates  |
|---------------------|-------------------------------|---|
| 25Cr-20Ni           | A 182 Gr. F310 <sup>1,3</sup> | A 240 Gr. 310S <sup>1,2,3</sup><br>A 240 Gr. 310H |

Notes

- 1 At temperatures over 1000°F, use only when the carbon content is 0.04% or higher.
- 2 For temperatures above 1000°F, use only if the material is heat treated by heating it to a temperature of at least 1900°F and quenching in water or rapidly cooling by other means.
- 3 Service temperatures of 1050°F and above should only be used when assurance is provided that grain size is not finer than ASTM 6.

### Pressure/temperature ratings

| Temperature |             | Working Pressures by Classes, psig |        |        |        |        |         |         |
|-------------|-------------|------------------------------------|--------|--------|--------|--------|---------|---------|
| °F          | °C          | 150 lb                             | 300 lb | 400 lb | 600 lb | 900 lb | 1500 lb | 2500 lb |
| -20 to 100  | -29 to 37.8 | 260                                | 670    | 895    | 1345   | 2015   | 3360    | 5600    |
| 300         | 149         | 220                                | 570    | 760    | 1140   | 1705   | 2845    | 4740    |
| 500         | 260         | 170                                | 505    | 675    | 1015   | 1520   | 2530    | 4220    |
| 700         | 371         | 110                                | 455    | 610    | 910    | 1370   | 2280    | 3800    |
| 850         | 454         | 65                                 | 425    | 575    | 855    | 1280   | 2135    | 3560    |
| 1000        | 538         | 20                                 | 345    | 460    | 685    | 1030   | 1720    | 2865    |
| 1150        | 566         | -                                  | 190    | 250    | 375    | 565    | 945     | 1570    |
| 1300        | 704         | -                                  | 75     | 100    | 150    | 225    | 375     | 630     |
| 1400        | 760         | -                                  | 45     | 60     | 90     | 135    | 225     | 370     |
| 1500        | 816         | -                                  | 25     | 35     | 50     | 75     | 130     | 215     |

Note

- psig = pounds per square inch gauge (0 psig = 14.7 psi absolute)

## Materials: F44, F51, F53

| Nominal Designation | Forgings                   | Plates                        |
|---------------------|----------------------------|-------------------------------|
| 20Cr-18Ni-6Mo       | A 182 Gr. F44              | A 240 Gr. S31254              |
| 22Cr-5Ni-3Mo-N      | A 182 Gr. F51 <sup>1</sup> | A 240 Gr. S31803 <sup>1</sup> |
| 25Cr-7Ni-4Mo-N      | A 182 Gr. F53 <sup>1</sup> | A 240 Gr. S32750 <sup>1</sup> |

Note

- 1 This steel may become brittle after service at moderately elevated temperatures. Not to be used over 600°F.

### Pressure/temperature ratings

| Temperature |             | Working Pressures by Classes, psig |        |        |        |        |         |         |
|-------------|-------------|------------------------------------|--------|--------|--------|--------|---------|---------|
| °F          | °C          | 150 lb                             | 300 lb | 400 lb | 600 lb | 900 lb | 1500 lb | 2500 lb |
| -20 to 100  | -29 to 37.8 | 290                                | 750    | 1000   | 1500   | 2250   | 3750    | 6250    |
| 300         | 149         | 230                                | 665    | 885    | 1330   | 1995   | 3325    | 5540    |
| 500         | 260         | 170                                | 575    | 770    | 1150   | 1730   | 2880    | 4800    |
| 700         | 371         | 110                                | 540    | 725    | 1085   | 1625   | 2710    | 4520    |
| 750         | 399         | 95                                 | 530    | 710    | 1065   | 1595   | 2660    | 4430    |

Note

- psig = pounds per square inch gauge (0 psig = 14.7 psi absolute)