

SLIP-ON

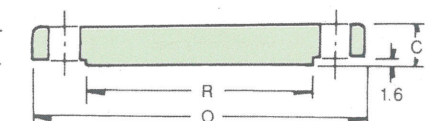
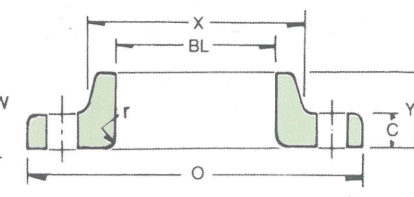
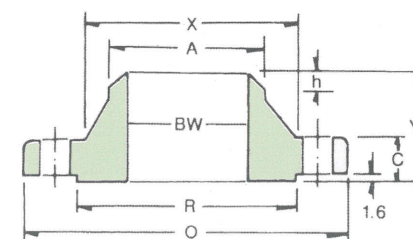
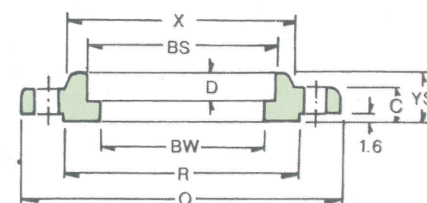
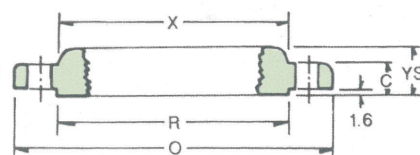
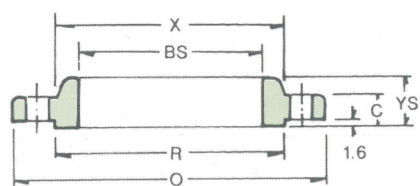
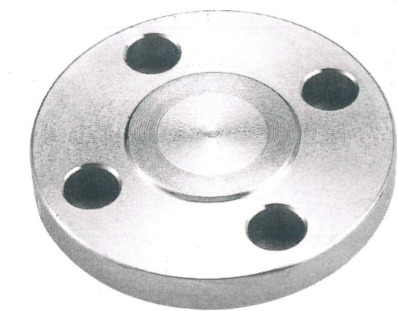
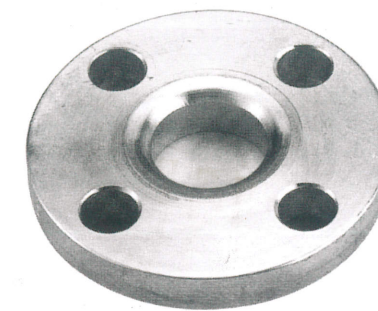
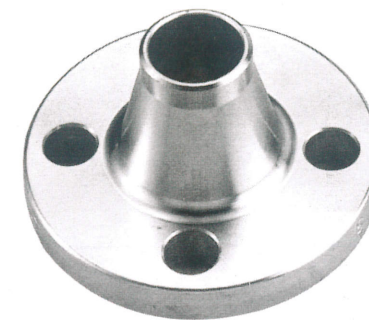
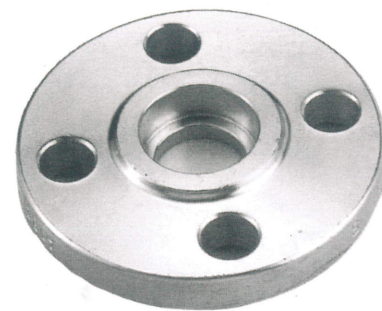
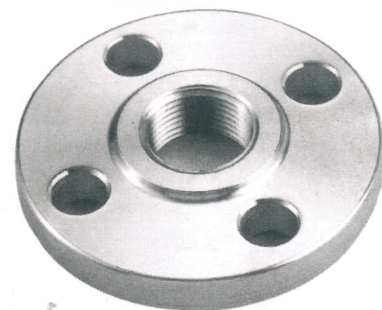
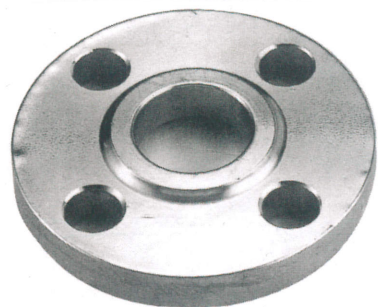
SCREWED

SOCKET WELDING

WELDING NECK

LAP JOINT

BLIND



DIMENSIONS IN MM

| NOMINAL PIPE SIZE | COMMON DIMENSIONS | | | | DIA. OF HUB AT BEVEL A | LENGTH THRU HUB | | | DIA. OF BORE | | |
|-------------------|--------------------------|--------------------|-----------------------|-----------------------|------------------------|-----------------------------|-----------------|--------------|--------------------|-------------------------|--------------|
| | OUTSIDE DIA. OF FLANGE O | THICK. OF FLANGE C | DIA. OF HUB AT BASE X | DIA. OF RAISED FACE R | | SLIP-ON, SCREWED, SOCKET Ys | WELDING NECK Yw | LAP JOINT YL | SLIP-ON, SOCKET Bs | WELDING NECK, SOCKET Bw | LAP JOINT BL |
| 1/2 | 88.9 | 11.2 | 30.2 | 34.9 | 21.3 | 15.9 | 47.6 | 15.9 | 22.4 | 15.7 | 22.9 |
| 3/4 | 98.4 | 12.7 | 38.1 | 42.9 | 26.7 | 15.9 | 52.4 | 15.9 | 27.7 | 20.8 | 28.2 |
| 1 | 108.0 | 14.3 | 49.2 | 50.8 | 33.5 | 17.5 | 55.6 | 17.5 | 34.5 | 26.7 | 35.1 |
| 1 1/4 | 117.5 | 15.9 | 58.7 | 63.5 | 42.2 | 20.6 | 57.2 | 20.6 | 43.2 | 35.1 | 43.7 |
| 1 1/2 | 127.0 | 17.5 | 65.1 | 73.0 | 48.3 | 22.2 | 61.9 | 22.2 | 49.5 | 40.9 | 50.0 |
| 2 | 152.4 | 19.1 | 77.8 | 92.1 | 60.5 | 25.4 | 63.5 | 25.4 | 62.0 | 52.6 | 62.5 |
| 2 1/2 | 177.8 | 22.3 | 90.5 | 104.8 | 73.2 | 28.6 | 69.9 | 28.6 | 74.7 | 62.7 | 75.4 |
| 3 | 190.5 | 23.9 | 108.0 | 127.0 | 88.9 | 30.2 | 69.9 | 30.2 | 90.7 | 78.0 | 91.4 |
| 3 1/2 | 215.9 | 23.9 | 122.2 | 139.7 | 101.6 | 31.8 | 71.4 | 31.8 | 103.4 | 90.2 | 104.1 |
| 4 | 228.6 | 23.9 | 134.9 | 157.2 | 114.3 | 33.3 | 76.2 | 33.3 | 116.1 | 102.4 | 116.8 |
| 5 | 254.0 | 23.9 | 163.5 | 185.7 | 141.2 | 36.5 | 88.9 | 36.5 | 143.8 | 128.3 | 144.5 |
| 6 | 279.4 | 25.4 | 192.1 | 215.9 | 168.4 | 39.7 | 88.9 | 39.7 | 170.7 | 154.2 | 171.5 |
| 8 | 342.9 | 28.6 | 246.1 | 269.9 | 219.2 | 44.5 | 101.6 | 44.5 | 221.5 | 202.7 | 222.3 |
| 10 | 406.4 | 30.2 | 304.8 | 323.9 | 273.1 | 49.2 | 101.6 | 49.2 | 276.4 | 254.5 | 277.4 |
| 12 | 482.6 | 31.8 | 365.1 | 381.0 | 323.9 | 55.6 | 114.3 | 55.6 | 327.2 | 304.8 | 328.2 |
| 14 | 533.4 | 35.0 | 400.1 | 412.8 | 355.6 | 57.2 | 127.0 | 79.4 | 359.2 | 336.6 | 360.2 |
| 16 | 596.9 | 36.6 | 457.2 | 469.9 | 406.4 | 63.5 | 127.0 | 87.3 | 410.5 | 387.4 | 411.2 |
| 18 | 635.0 | 39.7 | 504.8 | 533.4 | 457.2 | 68.3 | 139.7 | 96.8 | 461.8 | 438.2 | 462.3 |
| 20 | 698.5 | 42.9 | 558.8 | 584.2 | 508.0 | 73.0 | 144.5 | 103.2 | 513.1 | 489.0 | 514.4 |
| 24 | 812.8 | 47.7 | 663.6 | 692.2 | 609.6 | 82.6 | 152.4 | 111.1 | 616.0 | 590.6 | 616.0 |

DIMENSIONS IN MM

| RADIUS OF FILLET r | MINIMUM THREAD LENGTH T | DEPTH OF SOCKET D | DRILLING | | | | LENGTH OF SYUD BOLTS | | | NOMINAL PIPE SIZE |
|--------------------|-------------------------|-------------------|---------------------|-----------------|---------------|--------------------|----------------------|------------|--------------------------|-------------------|
| | | | DIA. OF BOLT CIRCLE | NUMBER OF BOLTS | DIA. OF BOLTS | DIA. OF BOLT HOLES | STUD BOLTS | | MACHINE BOLTS 1/16" R.F. | |
| | | | | | | | 1/16" RAISED FACE | RING JOINT | | |
| 3.2 | 15.9 | 9.5 | 60.3 | 4 | 1/2 | 15.9 | 2 1/4 | - | 1 3/4 | 1/2 |
| 3.2 | 15.9 | 11.1 | 69.9 | 4 | 1/2 | 15.9 | 2 1/4 | - | 2 | 3/4 |
| 3.2 | 17.5 | 12.7 | 79.4 | 4 | 1/2 | 15.9 | 2 1/2 | 3 | 2 | 1 |
| 4.8 | 20.6 | 14.3 | 88.9 | 4 | 1/2 | 15.9 | 2 1/2 | 3 | 2 1/4 | 1 1/4 |
| 6.4 | 22.2 | 15.9 | 98.4 | 4 | 1/2 | 15.9 | 2 3/4 | 3 1/4 | 2 1/4 | 1 1/2 |
| 7.9 | 25.4 | 17.5 | 120.7 | 4 | 5/8 | 19.1 | 3 | 3 1/2 | 2 3/4 | 2 |
| 7.9 | 28.6 | 19.1 | 139.7 | 4 | 5/8 | 19.1 | 3 1/4 | 3 3/4 | 3 | 2 1/2 |
| 9.5 | 30.1 | 20.6 | 152.4 | 4 | 5/8 | 19.1 | 3 1/2 | 4 | 3 | 3 |
| 9.5 | 31.8 | 22.2 | 177.8 | 8 | 5/8 | 19.1 | 3 1/2 | 4 | 3 | 3 1/2 |
| 11.1 | 33.3 | 23.8 | 190.5 | 8 | 5/8 | 19.1 | 3 1/2 | 4 | 3 | 4 |
| 11.1 | 36.5 | 23.8 | 215.9 | 8 | 3/4 | 22.2 | 3 3/4 | 4 1/4 | 3 1/4 | 5 |
| 12.7 | 39.7 | 27.0 | 241.3 | 8 | 3/4 | 22.2 | 3 3/4 | 4 1/4 | 3 1/4 | 6 |
| 12.7 | 44.5 | 31.8 | 298.5 | 8 | 3/4 | 22.2 | 4 | 4 1/2 | 3 1/2 | 8 |
| 12.7 | 49.2 | 33.3 | 362.0 | 12 | 7/8 | 25.4 | 4 1/2 | 5 | 3 3/4 | 10 |
| 12.7 | 55.6 | 39.7 | 431.8 | 12 | 7/8 | 25.4 | 4 1/2 | 5 | 4 | 12 |
| 12.7 | 57.1 | 41.3 | 476.3 | 12 | 1 | 28.6 | 5 | 5 1/2 | 4 1/4 | 14 |
| 12.7 | 63.5 | 44.5 | 539.9 | 16 | 1 | 28.6 | 5 1/4 | 5 3/4 | 4 1/2 | 16 |
| 12.7 | 68.3 | 49.2 | 577.9 | 16 | 1 1/8 | 31.8 | 5 3/4 | 6 1/4 | 4 3/4 | 18 |
| 12.7 | 73.0 | 54.0 | 635.0 | 20 | 1 1/8 | 31.8 | 6 | 6 1/2 | 5 1/4 | 20 |
| 12.7 | 82.5 | 63.5 | 749.3 | 20 | 1 1/4 | 34.9 | 6 3/4 | 7 1/4 | 5 3/4 | 24 |

SLIP-ON

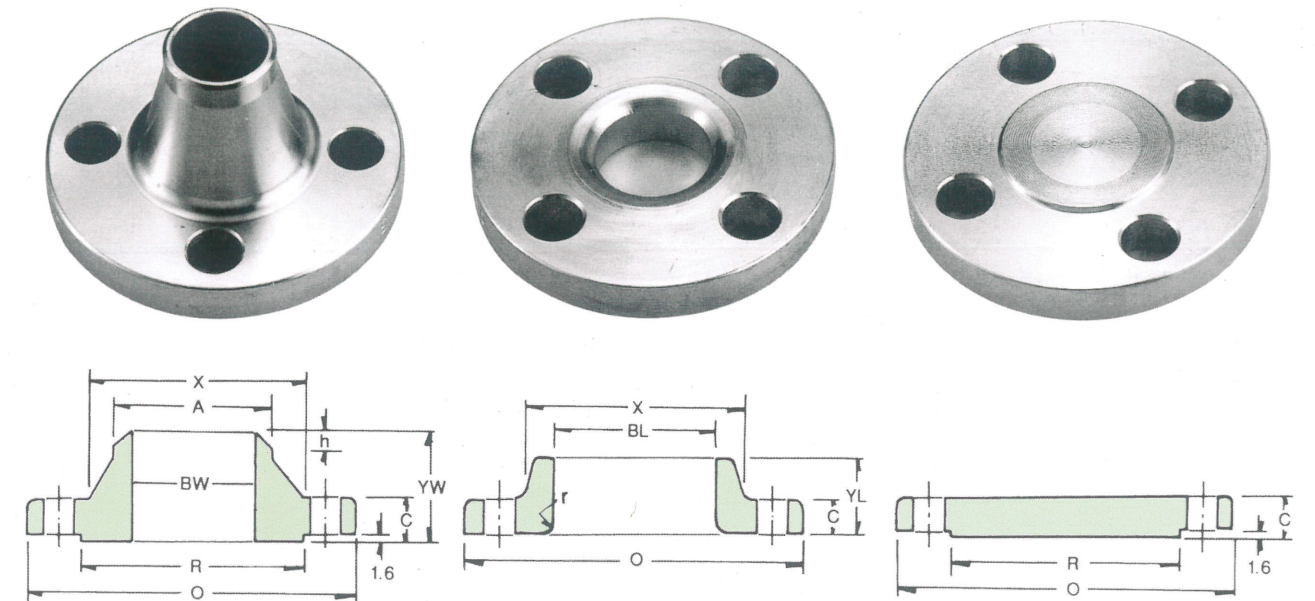
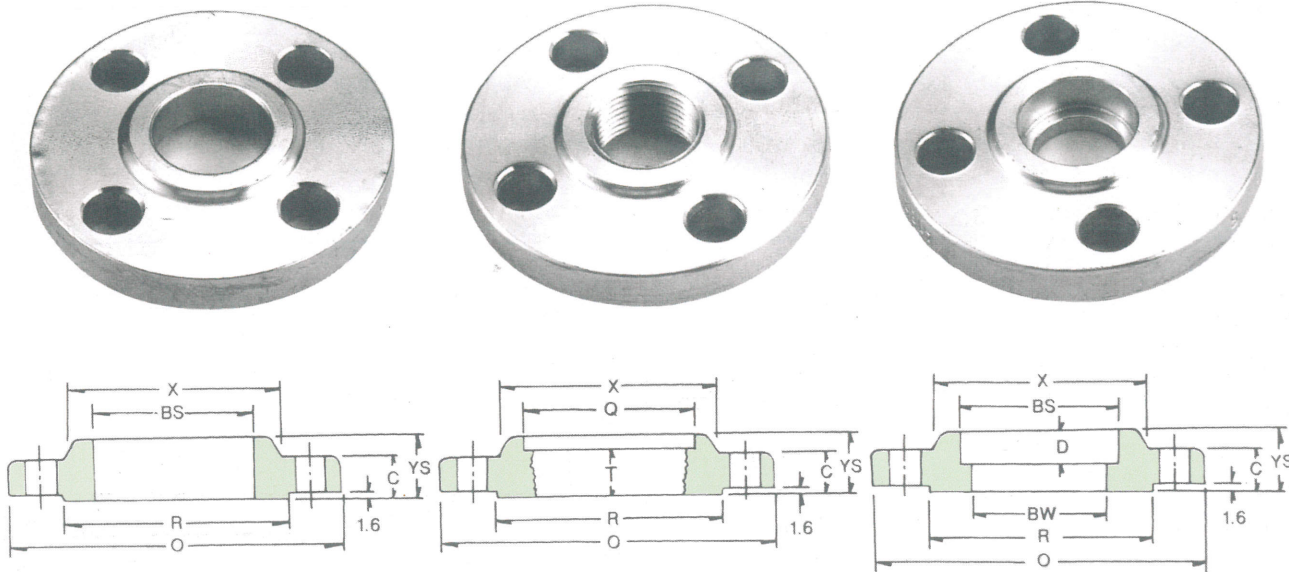
SCREWED

SOCKET WELDING

WELDING NECK

LAP JOINT

BLIND



DIMENSIONS IN MM

| NOMINAL PIPE SIZE | COMMON DIMENSIONS | | | | DIA. OF HUB AT BEVEL A | LENGTH THRU HUB | | | DIA. OF BORE | | |
|-------------------|--------------------------|--------------------|-----------------------|-----------------------|------------------------|-----------------------------|-----------------|--------------|--------------------|-------------------------|--------------|
| | OUTSIDE DIA. OF FLANGE O | THICK. OF FLANGE C | DIA. OF HUB AT BASE X | DIA. OF RAISED FACE R | | SLIP-ON, SCREWED, SOCKET Ys | WELDING NECK Yw | LAP JOINT YL | SLIP-ON, SOCKET Bs | WELDING NECK, SOCKET Bw | LAP JOINT BL |
| | | | | | | | | | | | |
| 1/2 | 95.3 | 14.3 | 38.1 | 34.9 | 21.3 | 22.2 | 52.4 | 22.2 | 22.4 | 15.7 | 22.9 |
| 3/4 | 117.5 | 15.9 | 47.6 | 42.9 | 26.7 | 25.4 | 57.2 | 25.4 | 27.7 | 20.8 | 28.2 |
| 1 | 123.8 | 17.5 | 54.0 | 50.8 | 33.5 | 27.0 | 61.9 | 27.0 | 34.5 | 26.7 | 35.1 |
| 1 1/4 | 133.4 | 19.1 | 63.5 | 63.5 | 42.2 | 27.0 | 65.1 | 27.0 | 43.2 | 35.1 | 43.7 |
| 1 1/2 | 155.6 | 20.7 | 69.9 | 73.0 | 48.3 | 30.2 | 68.3 | 30.2 | 49.5 | 40.9 | 50.0 |
| 2 | 165.1 | 22.3 | 84.1 | 92.1 | 60.5 | 33.3 | 69.9 | 33.3 | 62.0 | 52.6 | 62.5 |
| 2 1/2 | 190.5 | 25.4 | 100.0 | 104.8 | 73.2 | 38.1 | 76.2 | 38.1 | 74.7 | 62.7 | 75.4 |
| 3 | 209.6 | 28.6 | 117.5 | 127.0 | 88.9 | 42.9 | 79.4 | 42.9 | 90.7 | 78.0 | 91.4 |
| 3 1/2 | 228.6 | 30.2 | 133.4 | 139.7 | 101.6 | 44.5 | 81.0 | 44.5 | 103.4 | 90.2 | 104.1 |
| 4 | 254.0 | 31.8 | 146.1 | 157.2 | 114.3 | 47.6 | 85.7 | 47.6 | 116.1 | 102.4 | 116.8 |
| 5 | 279.4 | 35.0 | 177.8 | 185.7 | 141.2 | 50.8 | 98.4 | 50.8 | 143.8 | 128.3 | 144.5 |
| 6 | 317.5 | 36.6 | 206.4 | 215.9 | 168.4 | 52.4 | 98.4 | 52.4 | 170.7 | 154.2 | 171.5 |
| 8 | 381.0 | 41.3 | 260.4 | 269.9 | 219.2 | 61.9 | 111.1 | 61.9 | 221.5 | 202.7 | 222.3 |
| 10 | 444.5 | 47.7 | 320.7 | 323.9 | 273.1 | 66.7 | 117.5 | 95.3 | 276.4 | 254.5 | 277.4 |
| 12 | 520.7 | 50.8 | 374.7 | 381.0 | 323.9 | 73.0 | 130.2 | 101.6 | 327.2 | 304.8 | 328.2 |
| 14 | 584.2 | 54.0 | 425.5 | 412.8 | 355.6 | 76.2 | 142.9 | 111.0 | 359.2 | 336.6 | 360.2 |
| 16 | 647.7 | 57.2 | 482.6 | 469.9 | 406.4 | 82.6 | 146.1 | 120.7 | 410.5 | 387.4 | 411.2 |
| 18 | 711.2 | 60.4 | 533.4 | 533.4 | 457.2 | 88.9 | 158.8 | 130.2 | 461.8 | 438.2 | 462.3 |
| 20 | 774.7 | 63.5 | 587.4 | 584.2 | 508.0 | 95.3 | 161.9 | 139.7 | 513.1 | 489.0 | 514.4 |
| 24 | 914.4 | 69.9 | 701.7 | 692.2 | 609.6 | 106.4 | 168.3 | 152.4 | 616.0 | 590.6 | 616.0 |

DIMENSIONS IN MM

| RADIUS OF FILLET r | MINIMUM THREAD LENGTH T | DEPTH OF SOCKET D | DRILLING | | | LENGTH OF STUD BOLTS | | COUNTER BORE SCREWED FLANGE MIN Q | NOMINAL PIPE SIZE | | |
|--------------------|-------------------------|-------------------|---------------------|-----------------|---------------|----------------------|-------------------|-----------------------------------|-------------------|------------|--------------------------|
| | | | DIA. OF BOLT CIRCLE | NUMBER OF BOLTS | DIA. OF BOLTS | DIA. OF BOLT HOLES | STUD BOLTS | | | | |
| | | | | | | | 1/16" RAISED FACE | | | RING JOINT | MACHINE BOLTS 1/16" R.F. |
| 3.2 | 15.9 | 9.5 | 66.7 | 4 | 1/2 | 15.9 | 2 1/2 | 3 | 2 | 23.6 | 1/2 |
| 3.2 | 15.9 | 11.1 | 82.6 | 4 | 5/8 | 19.1 | 2 3/4 | 3 1/4 | 2 1/2 | 29.0 | 3/4 |
| 3.2 | 17.5 | 12.7 | 88.9 | 4 | 5/8 | 19.1 | 3 | 3 1/2 | 2 1/2 | 35.8 | 1 |
| 4.8 | 20.6 | 14.3 | 98.4 | 4 | 5/8 | 19.1 | 3 | 3 1/2 | 2 3/4 | 44.5 | 1 1/4 |
| 6.4 | 22.2 | 15.9 | 114.3 | 4 | 3/4 | 22.2 | 3 1/2 | 4 | 3 | 50.5 | 1 1/2 |
| 7.9 | 28.6 | 17.5 | 127.0 | 8 | 5/8 | 19.1 | 3 1/4 | 4 | 3 | 63.5 | 2 |
| 7.9 | 31.8 | 19.1 | 149.2 | 8 | 3/4 | 22.2 | 3 3/4 | 4 1/2 | 3 1/4 | 76.2 | 2 1/2 |
| 9.5 | 31.8 | 20.6 | 168.3 | 8 | 3/4 | 22.2 | 4 | 4 3/4 | 3 1/2 | 92.2 | 3 |
| 9.5 | 36.5 | - | 184.2 | 8 | 3/4 | 22.2 | 4 1/4 | 5 | 3 3/4 | 104.9 | 3 1/2 |
| 11.1 | 36.5 | - | 200.0 | 8 | 3/4 | 22.2 | 4 1/4 | 5 | 3 3/4 | 117.6 | 4 |
| 11.1 | 42.9 | - | 235.0 | 8 | 3/4 | 22.2 | 4 1/2 | 5 1/4 | 4 | 144.5 | 5 |
| 12.7 | 46.0 | - | 269.9 | 12 | 3/4 | 22.2 | 4 3/4 | 5 1/2 | 4 1/4 | 171.5 | 6 |
| 12.7 | 50.8 | - | 330.2 | 12 | 7/8 | 25.4 | 5 1/4 | 6 | 4 3/4 | 222.3 | 8 |
| 12.7 | 55.6 | - | 387.4 | 16 | 1 | 28.6 | 6 | 6 3/4 | 5 1/4 | 276.4 | 10 |
| 12.7 | 60.3 | - | 450.9 | 16 | 1 1/8 | 31.8 | 6 1/2 | 7 1/4 | 5 3/4 | 328.7 | 12 |
| 12.7 | 63.5 | - | 514.4 | 20 | 1 1/8 | 31.8 | 6 3/4 | 7 1/2 | 6 | 360.4 | 14 |
| 12.7 | 68.3 | - | 571.5 | 20 | 1 1/4 | 34.9 | 7 1/4 | 8 | 6 1/2 | 411.2 | 16 |
| 12.7 | 69.9 | - | 628.7 | 24 | 1 1/4 | 34.9 | 7 1/2 | 8 1/4 | 6 3/4 | 462.0 | 18 |
| 12.7 | 73.0 | - | 685.8 | 24 | 1 1/4 | 34.9 | 8 | 8 3/4 | 7 | 512.8 | 20 |
| 12.7 | 82.6 | - | 812.8 | 24 | 1 1/2 | 41.3 | 9 | 10 | 7 3/4 | 614.4 | 24 |

SLIP-ON

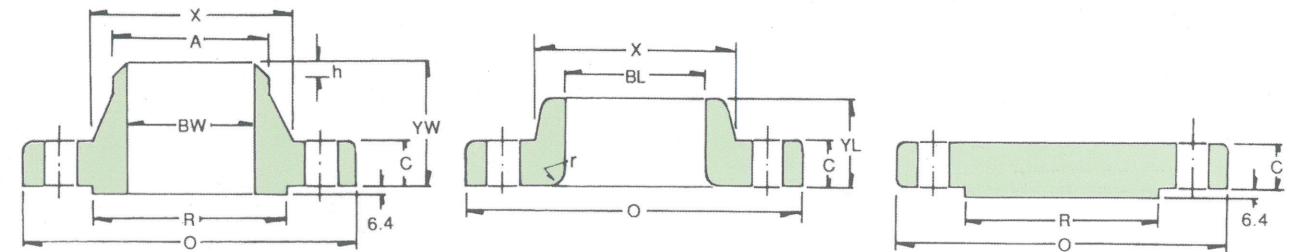
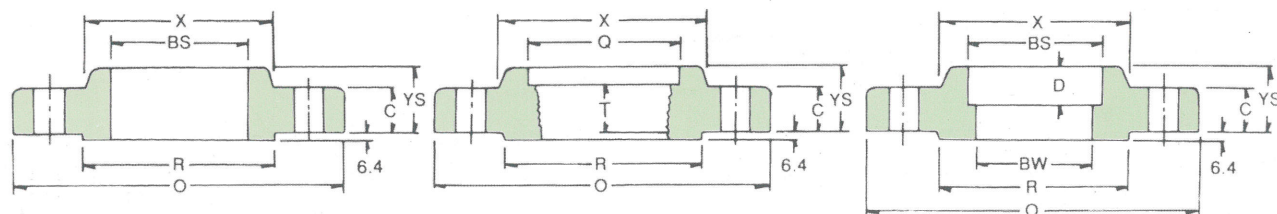
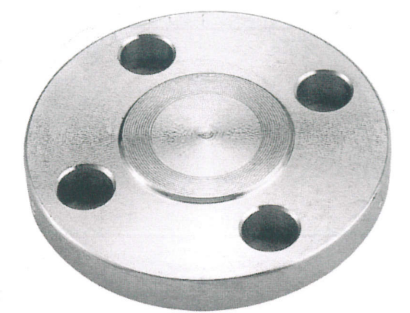
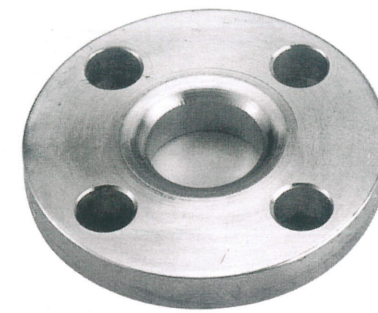
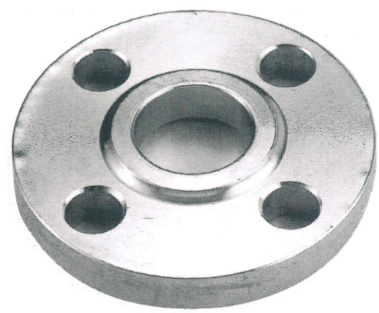
SCREWED

SOCKET WELDING

WELDING NECK

LAP JOINT

BLIND



DIMENSIONS IN MM

| NOMINAL PIPE SIZE | COMMON DIMENSIONS | | | | DIA. OF HUB AT BEVEL A | LENGTH THRU HUB | | | DIA. OF BORE | | |
|-------------------|--------------------------|--------------------|-----------------------|-----------------------|------------------------|-----------------------------|-----------------|--------------|--------------------|-------------------------|--------------|
| | OUTSIDE DIA. OF FLANGE O | THICK. OF FLANGE C | DIA. OF HUB AT BASE X | DIA. OF RAISED FACE R | | SLIP-ON, SCREWED, SOCKET Ys | WELDING NECK Yw | LAP JOINT YL | SLIP-ON, SOCKET Bs | WELDING NECK, SOCKET Bw | LAP JOINT BL |
| 1/2 | 95.3 | 14.3 | 38.1 | 34.9 | 21.3 | 22.2 | 52.4 | 22.2 | 22.4 | 14.0 | 22.9 |
| 3/4 | 117.5 | 15.9 | 47.6 | 42.9 | 26.7 | 25.4 | 57.2 | 25.4 | 27.7 | 18.8 | 28.2 |
| 1 | 123.8 | 17.5 | 54.0 | 50.8 | 33.5 | 27.0 | 61.9 | 27.0 | 34.5 | 24.4 | 35.1 |
| 1 1/4 | 133.4 | 20.7 | 63.5 | 63.5 | 42.2 | 28.6 | 66.7 | 28.6 | 43.2 | 32.5 | 43.7 |
| 1 1/2 | 155.6 | 22.3 | 69.9 | 73.0 | 48.3 | 31.8 | 69.9 | 31.8 | 49.5 | 38.1 | 50.0 |
| 2 | 165.1 | 25.4 | 84.1 | 92.1 | 60.5 | 36.5 | 73.0 | 36.5 | 62.0 | 49.3 | 62.5 |
| 2 1/2 | 190.5 | 28.6 | 100.0 | 104.8 | 73.2 | 41.3 | 79.4 | 41.3 | 74.7 | 58.9 | 75.4 |
| 3 | 209.6 | 31.8 | 117.5 | 127.0 | 88.9 | 46.0 | 82.6 | 46.0 | 90.7 | 73.7 | 91.4 |
| 3 1/2 | 228.6 | 35.0 | 133.4 | 139.7 | 101.6 | 49.2 | 85.7 | 49.2 | 103.4 | 85.3 | 104.1 |
| 4 | 254.0 | 35.0 | 146.1 | 157.2 | 114.3 | 50.8 | 88.9 | 50.8 | 116.1 | 97.3 | 116.8 |
| 5 | 279.4 | 38.1 | 177.8 | 185.7 | 141.2 | 54.0 | 101.6 | 54.0 | 143.8 | 122.2 | 144.5 |
| 6 | 317.5 | 41.3 | 206.4 | 215.9 | 168.4 | 57.2 | 103.2 | 57.2 | 170.7 | 146.3 | 171.5 |
| 8 | 381.0 | 47.7 | 260.4 | 269.9 | 219.2 | 68.3 | 117.5 | 68.3 | 221.5 | 193.8 | 222.3 |
| 10 | 444.5 | 54.0 | 320.7 | 323.9 | 273.1 | 73.0 | 123.8 | 101.6 | 276.4 | 247.7 | 277.4 |
| 12 | 520.7 | 57.2 | 374.7 | 381.0 | 323.9 | 79.4 | 136.5 | 108.0 | 327.2 | 298.5 | 328.2 |
| 14 | 584.2 | 60.4 | 425.5 | 412.8 | 355.6 | 84.1 | 149.2 | 117.5 | 359.2 | 330.2 | 360.2 |
| 16 | 647.7 | 63.5 | 482.6 | 469.9 | 406.4 | 93.7 | 152.4 | 127.0 | 410.5 | 381.0 | 411.2 |
| 18 | 711.2 | 66.7 | 533.4 | 533.4 | 457.2 | 98.4 | 165.1 | 136.5 | 461.8 | 431.8 | 462.3 |
| 20 | 774.7 | 69.9 | 587.4 | 584.2 | 508.0 | 101.6 | 168.3 | 146.1 | 513.1 | 482.6 | 514.4 |
| 24 | 914.4 | 76.2 | 701.7 | 692.2 | 609.6 | 114.3 | 174.6 | 158.8 | 616.0 | 584.2 | 616.0 |

DIMENSIONS IN MM

| RADIUS OF FILLET r | MINIMUM THREAD LENGTH T | DEPTH OF SOCKET D | DRILLING | | | | LENGTH OF STUD BOLTS | | | COUNTER BORE SCREWED FLANGE MIN Q | NOMINAL PIPE SIZE |
|--------------------|-------------------------|-------------------|---------------------|-----------------|---------------|--------------------|----------------------|------------------|------------------------------------|-----------------------------------|-------------------|
| | | | DIA. OF BOLT CIRCLE | NUMBER OF BOLTS | DIA. OF BOLTS | DIA. OF BOLT HOLES | STUD BOLTS | | MALE & FEMALE ALSO TONGUE & GROOVE | | |
| | | | | | | | | 1/4" RAISED FACE | | RING JOINT | |
| 3.2 | 15.9 | - | 66.7 | 4 | 1/2 | 15.9 | 3 | 3 | 2 3/4 | 23.6 | 1/2 |
| 3.2 | 15.9 | - | 82.6 | 4 | 5/8 | 19.1 | 3 1/4 | 3 1/4 | 3 | 29.0 | 3/4 |
| 3.2 | 17.5 | - | 88.9 | 4 | 5/8 | 19.1 | 3 1/2 | 3 1/2 | 3 1/4 | 35.8 | 1 |
| 4.8 | 20.6 | - | 98.4 | 4 | 5/8 | 19.1 | 3 3/4 | 3 3/4 | 3 1/2 | 44.5 | 1 1/4 |
| 6.4 | 22.2 | - | 114.3 | 4 | 3/4 | 22.2 | 4 | 4 | 3 3/4 | 50.5 | 1 1/2 |
| 7.9 | 28.6 | - | 127.0 | 8 | 5/8 | 19.1 | 4 | 4 1/4 | 3 3/4 | 63.5 | 2 |
| 7.9 | 31.8 | - | 149.2 | 8 | 3/4 | 22.2 | 4 1/2 | 4 3/4 | 4 1/4 | 76.2 | 2 1/2 |
| 9.5 | 34.9 | - | 168.3 | 8 | 3/4 | 22.2 | 4 3/4 | 5 | 4 1/2 | 92.2 | 3 |
| 9.5 | 39.7 | - | 184.2 | 8 | 7/8 | 25.4 | 5 1/4 | 5 1/2 | 5 | 104.9 | 3 1/2 |
| 11.1 | 36.5 | - | 200.0 | 8 | 7/8 | 25.4 | 5 1/4 | 5 1/2 | 5 | 117.6 | 4 |
| 11.1 | 42.9 | - | 235.0 | 8 | 7/8 | 25.4 | 5 1/2 | 5 3/4 | 5 1/4 | 144.5 | 5 |
| 12.7 | 46.0 | - | 269.9 | 12 | 7/8 | 25.4 | 5 3/4 | 6 | 5 1/2 | 171.5 | 6 |
| 12.7 | 50.8 | - | 330.2 | 12 | 1 | 28.6 | 6 1/2 | 6 3/4 | 6 1/4 | 222.3 | 8 |
| 12.7 | 55.6 | - | 387.4 | 16 | 1 1/8 | 31.8 | 7 1/4 | 7 1/2 | 7 | 276.4 | 10 |
| 12.7 | 60.3 | - | 450.9 | 16 | 1 1/4 | 34.9 | 7 3/4 | 8 | 7 1/2 | 328.7 | 12 |
| 12.7 | 63.5 | - | 514.4 | 20 | 1 1/4 | 34.9 | 8 | 8 1/4 | 7 3/4 | 360.4 | 14 |
| 12.7 | 68.3 | - | 571.5 | 20 | 1 3/8 | 38.1 | 8 1/2 | 8 3/4 | 8 1/4 | 411.2 | 16 |
| 12.7 | 69.9 | - | 628.7 | 24 | 1 3/8 | 38.1 | 8 3/4 | 9 | 8 1/2 | 462.0 | 18 |
| 12.7 | 73.0 | - | 685.8 | 24 | 1 1/2 | 41.3 | 9 1/2 | 9 3/4 | 9 1/4 | 512.8 | 20 |
| 12.7 | 82.6 | - | 812.8 | 24 | 1 3/4 | 47.6 | 10 1/2 | 11 | 10 1/4 | 614.4 | 24 |

SLIP-ON

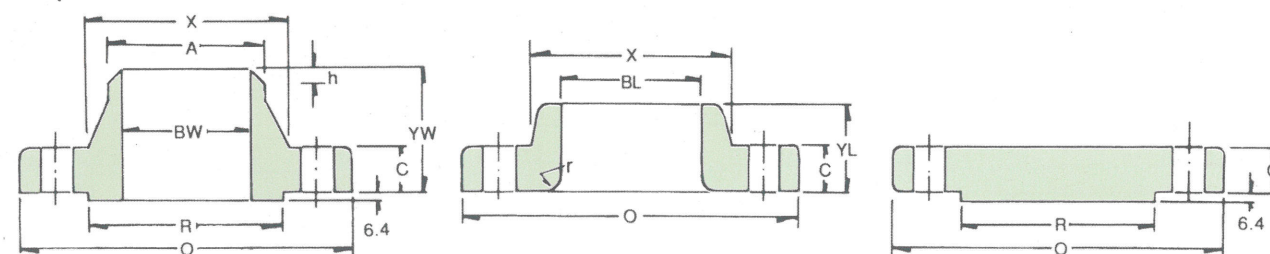
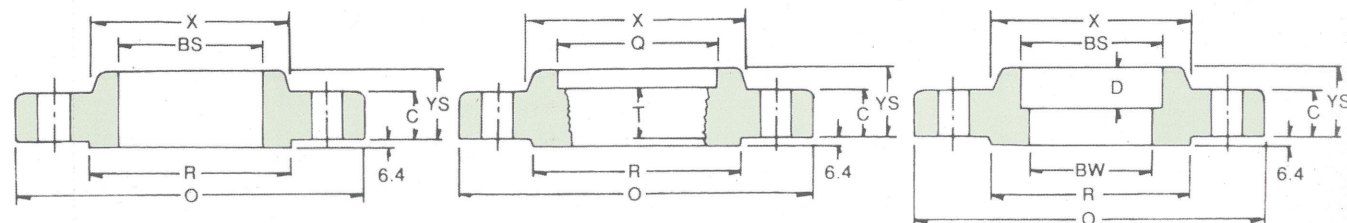
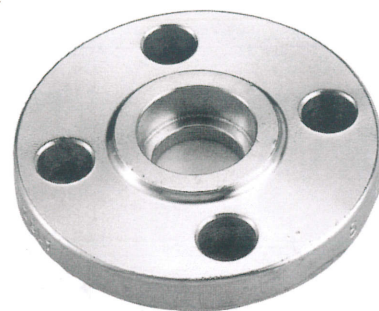
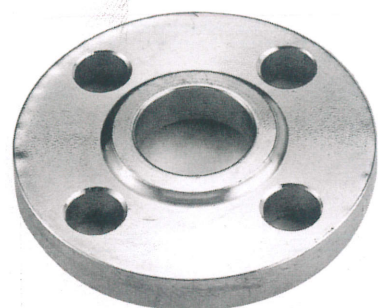
SCREWED

SOCKET WELDING

WELDING NECK

LAP JOINT

BLIND



DIMENSIONS IN MM

| NOMINAL PIPE SIZE | COMMON DIMENSIONS | | | | DIA. OF HUB AT BEVEL A | LENGTH THRU HUB | | | DIA. OF BORE | | |
|-------------------|--------------------------|--------------------|-----------------------|-----------------------|------------------------|-----------------------------|-----------------|--------------|--------------------|-------------------------|--------------|
| | OUTSIDE DIA. OF FLANGE O | THICK. OF FLANGE C | DIA. OF HUB AT BASE X | DIA. OF RAISED FACE R | | SLIP-ON, SCREWED, SOCKET Ys | WELDING NECK Yw | LAP JOINT YL | SLIP-ON, SOCKET Bs | WELDING NECK, SOCKET Bw | LAP JOINT BL |
| 1/2 | 95.3 | 14.3 | 38.1 | 34.9 | 21.3 | 22.2 | 52.4 | 22.2 | 22.4 | 14.0 | 22.9 |
| 3/4 | 117.5 | 15.9 | 47.6 | 42.9 | 26.7 | 25.4 | 57.2 | 25.4 | 27.7 | 18.8 | 28.2 |
| 1 | 123.8 | 17.5 | 54.0 | 50.8 | 33.5 | 27.0 | 61.9 | 27.0 | 34.5 | 24.4 | 35.1 |
| 1 1/4 | 133.4 | 20.7 | 63.5 | 63.5 | 42.2 | 28.6 | 66.7 | 28.6 | 43.2 | 32.5 | 43.7 |
| 1 1/2 | 155.6 | 22.3 | 69.9 | 73.0 | 48.3 | 31.8 | 69.9 | 31.8 | 49.5 | 38.1 | 50.0 |
| 2 | 165.1 | 25.4 | 84.1 | 92.1 | 60.5 | 36.5 | 73.0 | 36.5 | 62.0 | 49.3 | 62.5 |
| 2 1/2 | 190.5 | 28.6 | 100.0 | 104.8 | 73.2 | 41.3 | 79.4 | 41.3 | 74.7 | 58.9 | 75.4 |
| 3 | 209.6 | 31.8 | 117.5 | 127.0 | 88.9 | 46.0 | 82.6 | 46.0 | 90.7 | 73.7 | 91.4 |
| 3 1/2 | 228.6 | 35.0 | 133.4 | 139.7 | 101.6 | 49.2 | 85.7 | 49.2 | 103.4 | 85.3 | 104.1 |
| 4 | 273.1 | 38.1 | 152.4 | 157.2 | 114.3 | 54.0 | 101.6 | 54.0 | 116.1 | 97.3 | 116.8 |
| 5 | 330.2 | 44.5 | 188.9 | 185.7 | 141.2 | 60.3 | 114.3 | 60.3 | 143.8 | 122.2 | 144.5 |
| 6 | 355.6 | 47.7 | 222.3 | 215.9 | 168.4 | 66.7 | 117.5 | 66.7 | 170.7 | 146.3 | 171.5 |
| 8 | 419.1 | 55.6 | 273.1 | 269.9 | 219.2 | 76.2 | 133.4 | 76.2 | 221.5 | 193.8 | 222.3 |
| 10 | 508.0 | 63.5 | 342.9 | 323.9 | 273.1 | 85.7 | 152.4 | 111.1 | 276.4 | 247.7 | 277.4 |
| 12 | 558.8 | 66.7 | 400.1 | 381.0 | 323.9 | 92.1 | 155.6 | 117.5 | 327.2 | 298.5 | 328.2 |
| 14 | 603.3 | 69.9 | 431.8 | 412.8 | 355.6 | 93.7 | 165.1 | 127.0 | 359.2 | - | 360.2 |
| 16 | 685.8 | 76.2 | 495.3 | 469.9 | 406.4 | 106.4 | 177.8 | 139.7 | 410.5 | - | 411.2 |
| 18 | 743.0 | 82.6 | 546.1 | 533.4 | 457.2 | 117.5 | 184.2 | 152.4 | 461.8 | - | 462.3 |
| 20 | 812.8 | 88.9 | 609.6 | 584.2 | 508.0 | 127.0 | 190.5 | 165.1 | 513.1 | - | 514.4 |
| 24 | 939.8 | 101.6 | 717.6 | 692.2 | 609.6 | 139.7 | 203.2 | 184.2 | 616.0 | - | 616.0 |

DIMENSIONS IN MM

| RADIUS OF FILLET r | MINIMUM THREAD LENGTH T | DEPTH OF SOCKET D | DRILLING | | | LENGTH OF STUD BOLTS | | | COUNTER BORE SCREWED FLANGE MIN Q | NOMINAL PIPE SIZE | |
|--------------------|-------------------------|-------------------|---------------------|-----------------|---------------|----------------------|------------------|------------|-----------------------------------|-------------------|------------------------------------|
| | | | DIA. OF BOLT CIRCLE | NUMBER OF BOLTS | DIA. OF BOLTS | DIA. OF BOLT HOLES | 1/4" RAISED FACE | RING JOINT | | | MALE & FEMALE ALSO TONGUE & GROOVE |
| 3.2 | 15.9 | 9.5 | 66.7 | 4 | 1/2 | 15.9 | 3 | 3 | 2 3/4 | 23.6 | 1/2 |
| 3.2 | 15.9 | 11.1 | 82.6 | 4 | 5/8 | 19.1 | 3 1/4 | 3 1/4 | 3 | 29.0 | 3/4 |
| 3.2 | 17.5 | 12.7 | 88.9 | 4 | 5/8 | 19.1 | 3 1/2 | 3 1/2 | 3 1/4 | 35.8 | 1 |
| 4.8 | 20.6 | 14.3 | 98.4 | 4 | 5/8 | 19.1 | 3 3/4 | 3 3/4 | 3 1/2 | 44.5 | 1 1/4 |
| 6.4 | 22.2 | 15.9 | 114.3 | 4 | 3/4 | 22.2 | 4 | 4 | 3 3/4 | 50.5 | 1 1/2 |
| 7.9 | 28.6 | 17.5 | 127.0 | 8 | 5/8 | 19.1 | 4 | 4 1/4 | 3 3/4 | 63.5 | 2 |
| 7.9 | 31.8 | 19.1 | 149.2 | 8 | 3/4 | 22.2 | 4 1/2 | 4 3/4 | 4 1/4 | 76.2 | 2 1/2 |
| 9.5 | 34.9 | 20.6 | 168.3 | 8 | 3/4 | 22.2 | 4 3/4 | 5 | 4 1/2 | 92.2 | 3 |
| 9.5 | 39.7 | 22.2 | 184.2 | 8 | 7/8 | 25.4 | 5 1/4 | 5 1/2 | 5 | 104.9 | 3 1/2 |
| 11.1 | 41.3 | - | 215.9 | 8 | 7/8 | 25.4 | 5 1/2 | 5 3/4 | 5 1/4 | 117.6 | 4 |
| 11.1 | 47.6 | - | 266.7 | 8 | 1 | 28.6 | 6 1/4 | 6 1/2 | 6 | 144.5 | 5 |
| 12.7 | 50.8 | - | 292.1 | 12 | 1 | 28.6 | 6 1/2 | 6 3/4 | 6 1/4 | 171.5 | 6 |
| 12.7 | 57.2 | - | 349.3 | 12 | 1 1/8 | 31.8 | 7 1/2 | 7 3/4 | 7 1/4 | 222.3 | 8 |
| 12.7 | 65.1 | - | 431.8 | 16 | 1 1/4 | 34.9 | 8 1/4 | 8 1/2 | 8 | 276.4 | 10 |
| 12.7 | 69.9 | - | 489.0 | 20 | 1 1/4 | 34.9 | 8 1/2 | 8 3/4 | 8 1/4 | 328.7 | 12 |
| 12.7 | 73.0 | - | 527.1 | 20 | 1 3/8 | 38.1 | 9 | 9 1/4 | 8 3/4 | 360.4 | 14 |
| 12.7 | 77.8 | - | 603.3 | 20 | 1 1/2 | 41.3 | 9 3/4 | 10 | 9 1/2 | 411.2 | 16 |
| 12.7 | 79.4 | - | 654.1 | 20 | 1 5/8 | 44.5 | 10 1/2 | 10 3/4 | 10 1/4 | 462.0 | 18 |
| 12.7 | 82.6 | - | 723.9 | 24 | 1 5/8 | 44.5 | 11 1/4 | 11 1/2 | 11 | 512.8 | 20 |
| 12.7 | 92.1 | - | 838.2 | 24 | 1 7/8 | 50.8 | 12 3/4 | 13 1/4 | 12 1/2 | 614.4 | 24 |

SLIP-ON

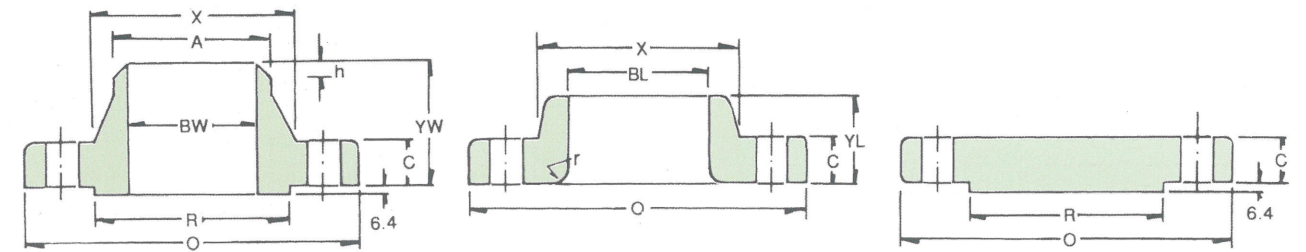
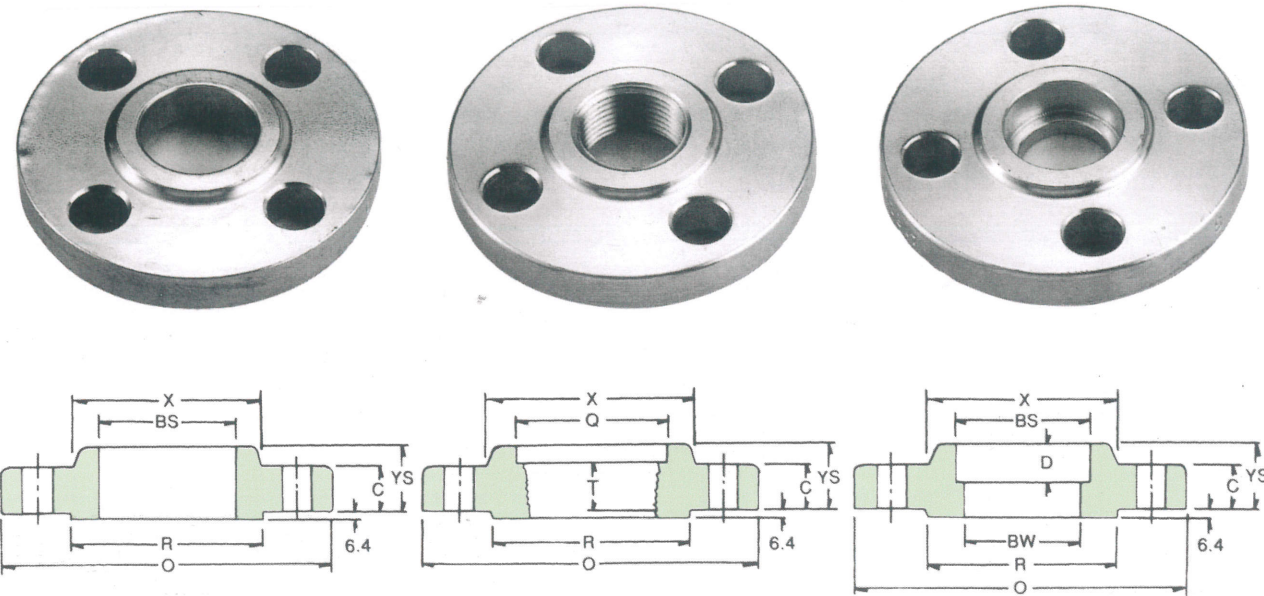
SCREWED

SOCKET WELDING

WELDING NECK

LAP JOINT

BLIND



DIMENSIONS IN MM

| NOMINAL PIPE SIZE | COMMON DIMENSIONS | | | | DIA. OF HUB AT BEVEL A | LENGTH THRU HUB | | | DIA. OF BORE | | |
|-------------------|--------------------------|--------------------|-----------------------|-----------------------|------------------------|-----------------------------|-----------------|--------------|--------------------|-------------------------|--------------|
| | OUTSIDE DIA. OF FLANGE O | THICK. OF FLANGE C | DIA. OF HUB AT BASE X | DIA. OF RAISED FACE R | | SLIP-ON, SCREWED, SOCKET Ys | WELDING NECK Yw | LAP JOINT YL | SLIP-ON, SOCKET Bs | WELDING NECK, SOCKET Bw | LAP JOINT BL |
| 1/2 | 120.7 | 22.3 | 38.1 | 34.9 | 21.3 | 31.8 | 60.3 | 31.8 | 22.4 | 22.9 | |
| 3/4 | 130.2 | 25.4 | 44.5 | 42.9 | 26.7 | 34.9 | 69.9 | 34.9 | 27.7 | 28.2 | |
| I | 149.2 | 28.6 | 52.4 | 50.8 | 33.5 | 41.3 | 73.0 | 41.3 | 34.5 | 35.1 | |
| I 1/4 | 158.8 | 28.6 | 63.5 | 63.5 | 42.2 | 41.3 | 73.0 | 41.3 | 43.2 | 43.7 | |
| I 1/2 | 177.8 | 31.8 | 69.9 | 73.0 | 48.3 | 44.5 | 82.6 | 44.5 | 49.5 | 50.0 | |
| 2 | 215.9 | 38.1 | 104.8 | 92.1 | 60.5 | 57.2 | 101.6 | 57.2 | 62.0 | 62.5 | |
| 2 1/2 | 244.5 | 41.3 | 123.8 | 104.8 | 73.2 | 63.5 | 104.8 | 63.5 | 74.7 | 75.4 | |
| 3 | 241.3 | 38.1 | 127.0 | 127.0 | 88.9 | 54.0 | 101.6 | 54.0 | 90.7 | 91.4 | |
| 4 | 292.1 | 44.5 | 158.8 | 157.2 | 114.3 | 69.9 | 114.3 | 69.9 | 116.1 | 116.8 | |
| 5 | 349.3 | 50.8 | 190.5 | 185.7 | 141.2 | 79.4 | 127.0 | 79.4 | 143.8 | 144.5 | |
| 6 | 381.0 | 55.6 | 235.0 | 215.9 | 168.4 | 85.7 | 139.7 | 85.7 | 170.7 | 171.5 | |
| 8 | 469.9 | 63.5 | 298.5 | 269.9 | 219.2 | 101.6 | 161.9 | 114.3 | 221.5 | 222.3 | |
| 10 | 546.1 | 69.9 | 368.3 | 323.9 | 273.1 | 108.0 | 184.2 | 127.0 | 276.4 | 277.4 | |
| 12 | 609.6 | 79.4 | 419.1 | 381.0 | 323.9 | 117.5 | 200.0 | 142.9 | 327.2 | 328.2 | |
| 14 | 641.4 | 85.8 | 450.9 | 412.8 | 355.6 | 130.2 | 212.7 | 155.6 | 359.2 | 360.2 | |
| 16 | 704.9 | 88.9 | 508.0 | 469.9 | 406.4 | 133.4 | 215.9 | 165.1 | 410.5 | 411.2 | |
| 18 | 787.4 | 101.6 | 565.2 | 533.4 | 457.2 | 152.4 | 228.6 | 190.5 | 461.8 | 462.3 | |
| 20 | 857.3 | 108.0 | 622.3 | 584.2 | 508.0 | 158.8 | 247.7 | 209.6 | 513.1 | 514.4 | |
| 24 | 1041.4 | 139.7 | 749.3 | 692.2 | 609.6 | 203.2 | 292.1 | 266.7 | 616.0 | 616.0 | |

To be specified by purchaser

DIMENSIONS IN MM

| RADIUS OF FILLET r | MINIMUM THREAD LENGTH T | DEPTH OF SOCKET D | DRILLING | | | | LENGTH OF STUD BOLTS | | | COUNTER BORE SCREWED FLANGE MIN Q | NOMINAL PIPE SIZE |
|--------------------|-------------------------|-------------------|---------------------|-----------------|---------------|--------------------|----------------------|------------|------------------------------------|-----------------------------------|-------------------|
| | | | DIA. OF BOLT CIRCLE | NUMBER OF BOLTS | DIA. OF BOLTS | DIA. OF BOLT HOLES | 1/14" RAISED FACE | RING JOINT | MALE & FEMALE ALSO TONGUE & GROOVE | | |
| 3.2 | 22.2 | - | 82.6 | 4 | 3/4 | 22.2 | 4 | 4 | 3 3/4 | 23.6 | 1/2 |
| 3.2 | 25.4 | - | 88.9 | 4 | 3/4 | 22.2 | 4 1/4 | 4 1/4 | 4 | 29.0 | 3/4 |
| 3.2 | 28.6 | - | 101.6 | 4 | 7/8 | 25.4 | 4 3/4 | 4 3/4 | 4 1/2 | 35.8 | I |
| 4.8 | 30.2 | - | 111.1 | 4 | 7/8 | 25.4 | 4 3/4 | 4 3/4 | 4 1/2 | 44.5 | I 1/4 |
| 6.4 | 31.8 | - | 123.8 | 4 | 1 | 28.6 | 5 1/4 | 5 1/4 | 5 | 50.5 | I 1/2 |
| 7.9 | 38.1 | - | 165.1 | 8 | 7/8 | 25.4 | 5 1/2 | 5 3/4 | 5 1/4 | 63.5 | 2 |
| 7.9 | 47.6 | - | 190.5 | 8 | 1 | 28.6 | 6 | 6 1/4 | 5 3/4 | 76.2 | 2 1/2 |
| 9.5 | 41.3 | - | 190.5 | 8 | 7/8 | 25.4 | 5 1/2 | 5 3/4 | 5 1/4 | 92.2 | 3 |
| 11.1 | 47.6 | - | 235.0 | 8 | 1 1/8 | 31.8 | 6 1/2 | 6 3/4 | 6 1/4 | 117.6 | 4 |
| 11.1 | 54.0 | - | 279.4 | 8 | 1 1/4 | 34.9 | 7 1/4 | 7 1/2 | 7 | 144.5 | 5 |
| 12.7 | 57.2 | - | 317.5 | 12 | 1 1/8 | 31.8 | 7 1/2 | 7 1/2 | 7 1/4 | 171.5 | 6 |
| 12.7 | 63.5 | - | 393.7 | 12 | 1 3/8 | 38.1 | 8 1/2 | 8 3/4 | 8 1/4 | 222.3 | 8 |
| 12.7 | 71.4 | - | 469.9 | 16 | 1 3/8 | 38.1 | 9 | 9 1/4 | 8 3/4 | 276.4 | 10 |
| 12.7 | 76.2 | - | 533.4 | 20 | 1 3/8 | 38.1 | 9 3/4 | 10 | 9 1/2 | 328.7 | 12 |
| 12.7 | 82.6 | - | 558.8 | 20 | 1 1/2 | 41.3 | 10 1/2 | 11 | 10 1/4 | 360.4 | 14 |
| 12.7 | 85.7 | - | 616.0 | 20 | 1 5/8 | 44.5 | 11 | 11 1/2 | 10 3/4 | 411.2 | 16 |
| 12.7 | 88.9 | - | 685.8 | 20 | 1 7/8 | 50.8 | 12 3/4 | 13 1/4 | 12 1/2 | 462.0 | 18 |
| 12.7 | 92.1 | - | 749.3 | 20 | 2 | 54.0 | 13 1/2 | 14 | 13 1/4 | 512.8 | 20 |
| 12.7 | 101.6 | - | 901.7 | 20 | 2 1/2 | 66.7 | 17 | 17 3/4 | 16 3/4 | 614.4 | 24 |

SLIP-ON

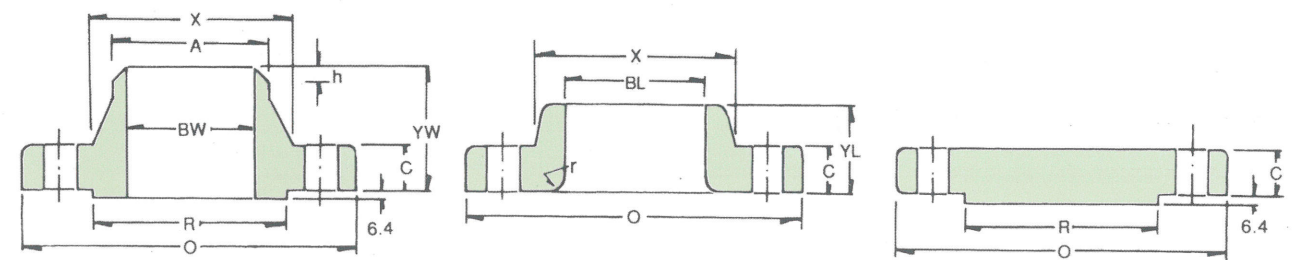
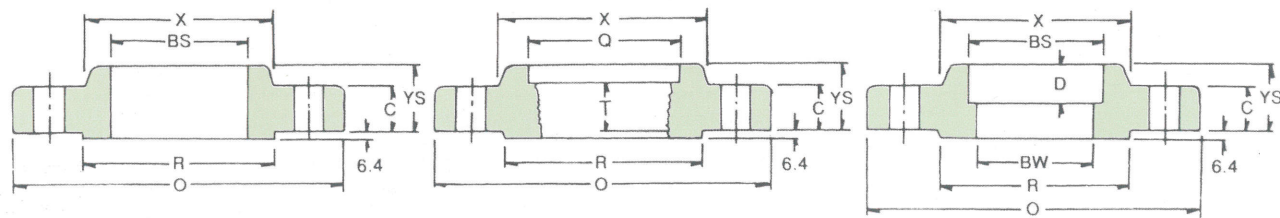
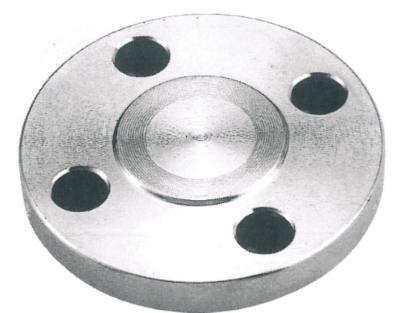
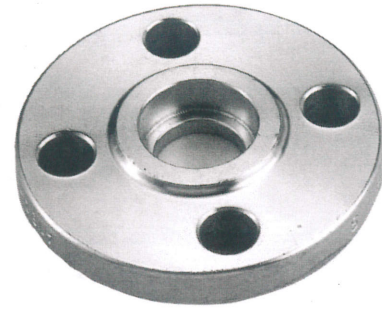
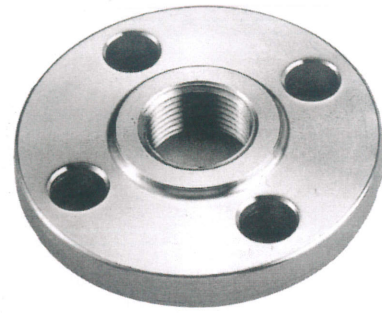
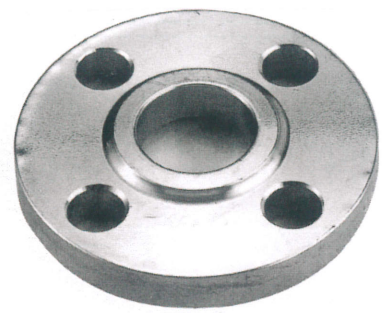
SCREWED

SOCKET WELDING

WELDING NECK

LAP JOINT

BLIND



DIMENSIONS IN MM

DIMENSIONS IN MM

| NOMINAL PIPE SIZE | COMMON DIMENSIONS | | | | | LENGTH THRU HUB | | | DIA. OF BORE | | |
|-------------------|--------------------------|--------------------|-----------------------|-----------------------|------------------------|-----------------------------|-----------------|--------------|--------------------|-------------------------|--------------|
| | OUTSIDE DIA. OF FLANGE O | THICK. OF FLANGE C | DIA. OF HUB AT BASE X | DIA. OF RAISED FACE R | DIA. OF HUB AT BEVEL A | SLIP-ON, SCREWED, SOCKET Ys | WELDING NECK Yw | LAP JOINT YL | SLIP-ON, SOCKET Bs | WELDING NECK, SOCKET Bw | LAP JOINT BL |
| 1/2 | 120.7 | 22.3 | 38.1 | 34.9 | 21.3 | 31.8 | 60.3 | 31.8 | 22.4 | | 22.9 |
| 3/4 | 130.2 | 25.4 | 44.5 | 42.9 | 26.7 | 34.9 | 69.9 | 34.9 | 27.7 | | 28.2 |
| 1 | 149.2 | 28.6 | 52.4 | 50.8 | 33.5 | 41.3 | 73.0 | 41.3 | 34.5 | | 35.1 |
| 1 1/4 | 158.8 | 28.6 | 63.5 | 63.5 | 42.2 | 41.3 | 73.0 | 41.3 | 43.2 | | 43.7 |
| 1 1/2 | 177.8 | 31.8 | 69.9 | 73.0 | 48.3 | 44.5 | 82.6 | 44.5 | 49.5 | | 50.0 |
| 2 | 215.9 | 38.1 | 104.8 | 92.1 | 60.5 | 57.2 | 101.6 | 57.2 | 62.0 | | 62.5 |
| 2 1/2 | 244.5 | 41.3 | 123.8 | 104.8 | 73.2 | 63.5 | 104.8 | 63.5 | 74.7 | | 75.4 |
| 3 | 266.7 | 47.7 | 133.4 | 127.0 | 88.9 | 73.0 | 117.5 | 73.0 | 90.7 | | 91.4 |
| 4 | 311.2 | 54.0 | 161.9 | 157.2 | 114.3 | 90.5 | 123.8 | 90.5 | 116.1 | | 116.8 |
| 5 | 374.7 | 73.1 | 196.9 | 185.7 | 141.2 | 104.8 | 155.6 | 104.8 | 143.8 | | 144.5 |
| 6 | 393.7 | 82.6 | 228.6 | 215.9 | 168.4 | 119.1 | 171.5 | 119.1 | 170.7 | | 171.5 |
| 8 | 482.6 | 92.1 | 292.1 | 269.9 | 219.2 | 142.9 | 212.7 | 142.9 | 221.5 | | 222.3 |
| 10 | 584.2 | 108.0 | 368.3 | 323.9 | 273.1 | 158.8 | 254.0 | 177.8 | 276.4 | | 277.4 |
| 12 | 673.1 | 123.9 | 450.9 | 381.0 | 323.9 | 181.0 | 282.6 | 219.1 | 327.2 | | 328.2 |
| 14 | 749.3 | 133.4 | 495.3 | 412.8 | 355.6 | - | 298.5 | 241.3 | 359.2 | | 360.2 |
| 16 | 825.5 | 146.1 | 552.5 | 469.9 | 406.4 | - | 311.2 | 260.4 | 410.5 | | 411.2 |
| 18 | 914.4 | 162.0 | 596.9 | 533.4 | 457.2 | - | 327.0 | 276.2 | 461.8 | | 462.3 |
| 20 | 984.3 | 177.8 | 641.4 | 584.2 | 508.0 | - | 355.6 | 292.1 | 513.1 | | 514.4 |
| 24 | 1168.4 | 203.2 | 762.0 | 692.2 | 609.6 | - | 406.4 | 330.2 | 616.0 | | 616.0 |

To be specified by purchaser

| RADIUS OF FILLET r | MINIMUM THREAD LENGTH T | DEPTH OF SOCKET D | DRILLING | | | LENGTH OF BOLTS | | | COUNTER BORE SCREWED FLANGE MIN Q | NOMINAL PIPE SIZE | |
|--------------------|-------------------------|-------------------|---------------------|-----------------|---------------|--------------------|------------------|------------|-----------------------------------|-------------------|------------------------------------|
| | | | DIA. OF BOLT CIRCLE | NUMBER OF BOLTS | DIA. OF BOLTS | DIA. OF BOLT HOLES | 1/4" RAISED FACE | RING JOINT | | | MALE & FEMALE ALSO TONGUE & GROOVE |
| 3.2 | 22.2 | 9.5 | 82.6 | 4 | 3/4 | 22.2 | 4 | 4 | 3 3/4 | 23.6 | 1/2 |
| 3.2 | 25.4 | 11.1 | 88.9 | 4 | 3/4 | 22.2 | 4 1/4 | 4 1/4 | 4 | 29.0 | 3/4 |
| 3.2 | 28.6 | 12.7 | 101.6 | 4 | 7/8 | 25.4 | 4 3/4 | 4 3/4 | 4 1/2 | 35.8 | 1 |
| 4.8 | 30.2 | 14.3 | 111.1 | 4 | 7/8 | 25.4 | 4 3/4 | 4 3/4 | 4 1/2 | 44.5 | 1 1/4 |
| 6.4 | 31.8 | 15.9 | 123.8 | 4 | 1 | 28.6 | 5 1/4 | 5 1/4 | 5 | 50.5 | 1 1/2 |
| 7.9 | 38.1 | 17.5 | 165.1 | 8 | 7/8 | 25.4 | 5 1/2 | 5 3/4 | 5 1/4 | 63.5 | 2 |
| 7.9 | 47.6 | 19.1 | 190.5 | 8 | 1 | 28.6 | 6 | 6 1/4 | 5 3/4 | 76.2 | 2 1/2 |
| 9.5 | 50.8 | - | 203.2 | 8 | 1 1/8 | 31.8 | 6 3/4 | 7 | 6 1/2 | 92.2 | 3 |
| 11.1 | 57.2 | - | 241.3 | 8 | 1 1/4 | 34.9 | 7 1/2 | 7 3/4 | 7 1/4 | 117.6 | 4 |
| 11.1 | 63.5 | - | 292.1 | 8 | 1 1/2 | 41.3 | 9 1/2 | 9 3/4 | 9 1/4 | 144.5 | 5 |
| 12.7 | 69.9 | - | 317.5 | 12 | 1 3/8 | 38.1 | 10 | 10 1/4 | 9 3/4 | 171.5 | 6 |
| 12.7 | 76.2 | - | 393.7 | 12 | 1 5/8 | 44.5 | 11 1/4 | 11 3/4 | 11 | 222.3 | 8 |
| 12.7 | 84.1 | - | 482.6 | 12 | 1 7/8 | 50.8 | 13 1/4 | 13 1/2 | 13 | 276.4 | 10 |
| 12.7 | 92.1 | - | 571.5 | 16 | 2 | 54.0 | 14 3/4 | 15 1/4 | 14 1/2 | 328.7 | 12 |
| 12.7 | - | - | 635.0 | 16 | 2 1/4 | 60.3 | 16 | 16 3/4 | 15 3/4 | 360.4 | 14 |
| 12.7 | - | - | 704.9 | 16 | 2 1/2 | 66.7 | 17 1/2 | 18 1/2 | 17 1/4 | 411.2 | 16 |
| 12.7 | - | - | 774.7 | 16 | 2 3/4 | 73.0 | 19 1/4 | 20 1/4 | 19 | 462.0 | 18 |
| 12.7 | - | - | 831.9 | 16 | 3 | 79.4 | 21 | 22 1/4 | 20 3/4 | 512.8 | 20 |
| 12.7 | - | - | 990.6 | 16 | 3 1/2 | 92.1 | 24 | 25 1/2 | 23 3/4 | 614.4 | 24 |

SLIP-ON

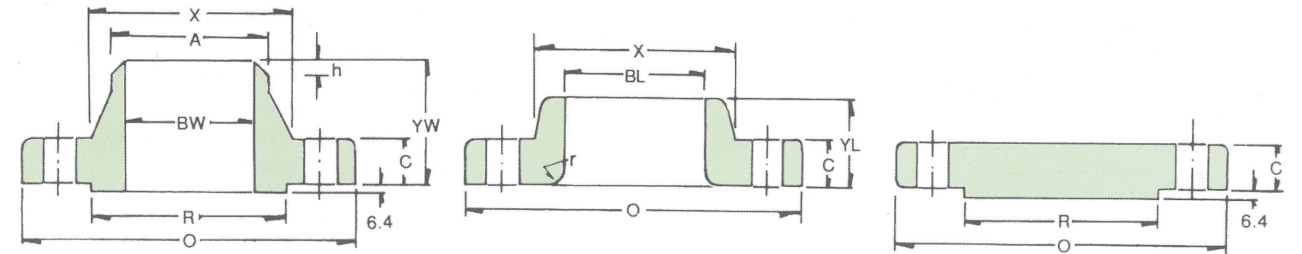
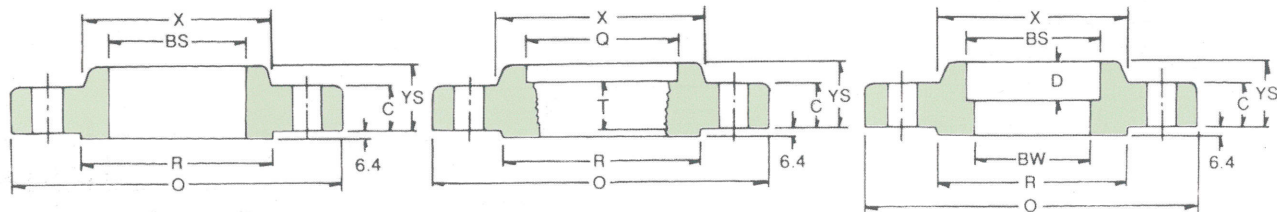
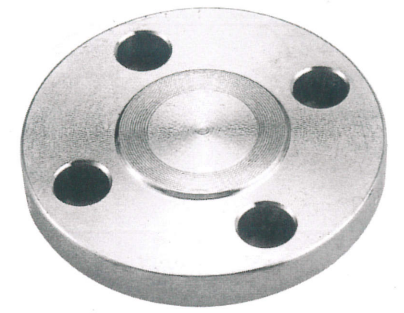
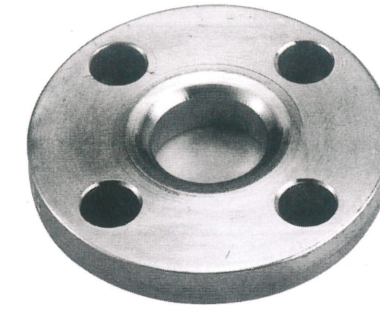
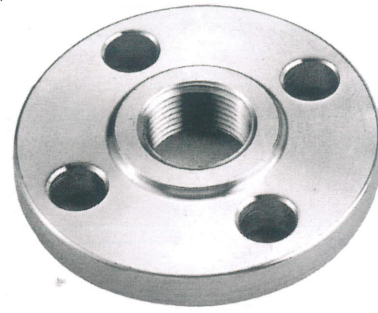
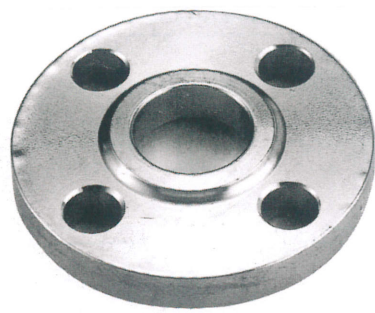
SCREWED

SOCKET WELDING

WELDING NECK

LAP JOINT

BLIND



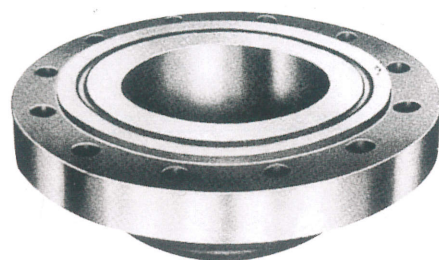
DIMENSIONS IN MM

| NOMINAL PIPE SIZE | COMMON DIMENSIONS | | | | DIA. OF HUB AT BEVEL A | LENGTH THRU HUB | | | DIA. OF BORE | | |
|-------------------|--------------------------|--------------------|-----------------------|-----------------------|------------------------|-----------------------------|-----------------|--------------|--------------------|------------------------------|--------------|
| | OUTSIDE DIA. OF FLANGE O | THICK. OF FLANGE C | DIA. OF HUB AT BASE X | DIA. OF RAISED FACE R | | SLIP-ON, SCREWED, SOCKET Ys | WELDING NECK Yw | LAP JOINT YL | SLIP-ON, SOCKET Bs | WELDING NECK, SOCKET Bw | LAP JOINT BL |
| 1/2 | 133.4 | 30.2 | 42.9 | 34.9 | 21.3 | 39.7 | 73.0 | 39.7 | 22.4 | To be specified by purchaser | 22.9 |
| 3/4 | 139.7 | 31.8 | 50.8 | 42.9 | 26.7 | 42.9 | 79.4 | 42.9 | 27.7 | | 28.2 |
| 1 | 158.8 | 35.0 | 57.2 | 50.8 | 33.5 | 47.6 | 88.9 | 47.6 | 34.5 | | 35.1 |
| 1 1/4 | 184.2 | 38.1 | 73.0 | 63.5 | 42.2 | 52.4 | 95.3 | 52.4 | 43.2 | | 43.7 |
| 1 1/2 | 203.2 | 44.5 | 79.4 | 73.0 | 48.3 | 60.3 | 111.1 | 60.3 | 49.5 | | 50.0 |
| 2 | 235.0 | 50.8 | 95.3 | 92.1 | 60.5 | 69.9 | 127.0 | 69.9 | 62.0 | | 62.5 |
| 2 1/2 | 266.7 | 57.2 | 114.3 | 104.8 | 73.2 | 79.4 | 142.9 | 79.4 | 74.7 | | 75.4 |
| 3 | 304.8 | 66.7 | 133.4 | 127.0 | 88.9 | 92.1 | 168.3 | 92.1 | 90.7 | | 91.4 |
| 4 | 355.6 | 76.2 | 165.1 | 157.2 | 114.3 | 108.0 | 190.5 | 108.0 | 116.1 | | 116.8 |
| 5 | 419.1 | 92.1 | 203.2 | 185.7 | 141.2 | 130.2 | 228.6 | 130.2 | 143.8 | | 144.5 |
| 6 | 482.6 | 108.0 | 235.0 | 215.9 | 168.4 | 152.4 | 273.1 | 152.4 | 170.7 | | 171.5 |
| 8 | 552.5 | 127.0 | 304.8 | 269.9 | 219.2 | 177.8 | 317.5 | 177.8 | 221.5 | | 222.3 |
| 10 | 673.1 | 165.1 | 374.7 | 323.9 | 273.1 | 228.6 | 419.1 | 228.6 | 276.4 | 227.4 | |
| 12 | 762.0 | 184.2 | 441.3 | 381.0 | 323.9 | 254.0 | 463.6 | 254.0 | 327.2 | 328.2 | |

DIMENSIONS IN MM

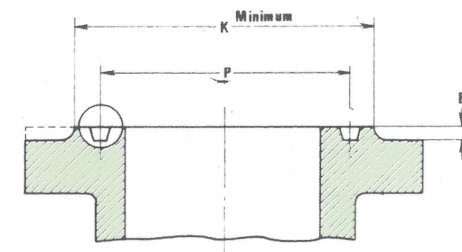
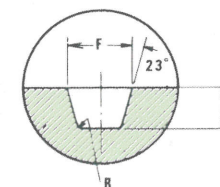
| RADIUS OF FILLET r | MINIMUM THREAD LENGTH T | DEPTH OF SOCKET D | DRILLING | | | LENGTH OF BOLTS STUD BOLTS | | | COUNTER BORE SCREWED FLANGE MIN Q | NOMINAL PIPE SIZE | |
|--------------------|-------------------------|-------------------|---------------------|-----------------|---------------|----------------------------|------------------|------------|-----------------------------------|-------------------|------------------------------------|
| | | | DIA. OF BOLT CIRCLE | NUMBER OF BOLTS | DIA. OF BOLTS | DIA. OF BOLT HOLES | 1/4" RAISED FACE | RING JOINT | | | MALE & FEMALE ALSO TONGUE & GROOVE |
| 3.2 | 28.6 | 9.6 | 88.9 | 4 | 3/4 | 22.2 | 4 3/4 | 4 3/4 | 4 1/2 | 23.6 | 1/2 |
| 3.2 | 31.8 | 11.1 | 95.3 | 4 | 3/4 | 22.2 | 4 3/4 | 4 3/4 | 4 1/2 | 29.0 | 3/4 |
| 3.2 | 34.9 | 12.7 | 108.0 | 4 | 7/8 | 25.4 | 5 1/4 | 5 1/4 | 5 | 35.8 | 1 |
| 4.8 | 38.1 | 14.3 | 130.2 | 4 | 1 | 28.6 | 5 3/4 | 6 | 5 1/2 | 44.5 | 1 1/4 |
| 6.4 | 44.5 | 16.0 | 146.1 | 4 | 1 1/8 | 31.8 | 6 1/2 | 6 3/4 | 6 1/4 | 50.5 | 1 1/2 |
| 7.9 | 50.8 | 17.5 | 171.5 | 8 | 1 | 28.6 | 6 3/4 | 7 | 6 1/2 | 63.5 | 2 |
| 7.9 | 57.2 | 19.0 | 196.9 | 8 | 1 1/8 | 31.8 | 7 1/2 | 7 3/4 | 7 1/4 | 76.2 | 2 1/2 |
| 9.5 | 63.5 | - | 228.6 | 8 | 1 1/4 | 34.9 | 8 1/2 | 8 3/4 | 8 1/4 | 92.2 | 3 |
| 11.1 | 69.9 | - | 273.1 | 8 | 1 1/2 | 41.3 | 9 3/4 | 10 1/4 | 9 1/2 | 117.6 | 4 |
| 11.1 | 76.2 | - | 323.9 | 8 | 1 3/4 | 47.6 | 11 1/2 | 12 1/4 | 11 1/4 | 144.5 | 5 |
| 12.7 | 82.6 | - | 368.3 | 8 | 2 | 54.0 | 13 1/2 | 14 | 13 1/4 | 171.5 | 6 |
| 12.7 | 95.3 | - | 438.2 | 12 | 2 | 54.0 | 15 | 15 1/2 | 14 3/4 | 222.3 | 8 |
| 12.7 | 108.0 | - | 539.8 | 12 | 2 1/2 | 66.7 | 19 | 20 | 18 3/4 | 276.4 | 10 |
| 12.7 | 120.7 | - | 619.1 | 12 | 2 3/4 | 73.0 | 21 | 22 | 20 3/4 | 328.7 | 12 |

DIMENSIONS OF RING-JOINT FACINGS



TOLERANCES

- E (depth) $+1/64$
 -0
- F (width) $\pm .008$
- P (pitch diam) $\pm .005$
- R (radius at bottom) Max
- 23° (angle) $\pm 1/2^\circ C$



DIMENSIONS IN INCHES

| NOMINAL PIPE SIZE | | | | | | | GROOVE NUMBER | GROOVE DIMENSIONS | | | | DIAMETER OF RAISED PORTION K | | | | |
|-------------------|---------|---------|---------|---------|----------|----------|---------------|-------------------|---------|---------|--------------------|------------------------------|-----------------|---------|----------|----------|
| 150 PSI | 300 PSI | 400 PSI | 600 PSI | 900 PSI | 1500 PSI | 2500 PSI | | PITCH DIAMETER P | DEPTH E | WIDTH F | RADIUS AT BOTTOM R | 150 PSI | 300 400 600 PSI | 900 PSI | 1500 PSI | 2500 PSI |
| - | 1/2 | - | 1/2 | - | - | - | R11 | 1 11/32 | 7/32 | 9/32 | 1/32 | - | 2 | - | - | - |
| - | - | - | - | - | 1/2 | - | 12 | 1 9/16 | 1/4 | 11/32 | 1/32 | - | 2 1/2 | 2 3/8 | 2 3/8 | - |
| - | 3/4 | - | 3/4 | - | - | 1/2 | 13 | 1 11/16 | 1/4 | 11/32 | 1/32 | - | - | - | - | 2 9/16 |
| 1 | - | - | - | - | 3/4 | - | 14 | 1 3/4 | 1/4 | 11/32 | 1/32 | - | - | 2 5/8 | 2 5/8 | - |
| - | - | - | - | - | - | - | 15 | 1 7/8 | 1/4 | 11/32 | 1/32 | 2 1/2 | - | - | - | - |
| - | 1 | - | 1 | - | 1 | 3/4 | 16 | 2 | 1/4 | 11/32 | 1/32 | - | 2 3/4 | 2 13/16 | 2 13/16 | 2 7/8 |
| 1 1/4 | - | - | - | - | - | - | 17 | 2 1/4 | 1/4 | 11/32 | 1/32 | 2 7/8 | - | - | - | - |
| - | 1 1/4 | - | 1 1/4 | - | 1 1/4 | 1 | 18 | 2 3/8 | 1/4 | 11/32 | 1/32 | - | 3 1/8 | 3 3/16 | 3 3/16 | 3 1/4 |
| 1 1/2 | - | - | - | - | - | - | 19 | 2 9/16 | 1/4 | 11/32 | 1/32 | 3 1/4 | - | - | - | - |
| - | 1 1/2 | - | 1 1/2 | - | 1 1/2 | - | 20 | 2 11/16 | 1/4 | 11/32 | 1/32 | - | 3 9/16 | 3 5/8 | 3 5/8 | - |
| - | - | - | - | - | - | 1 1/4 | 21 | 2 27/32 | 5/16 | 15/32 | 1/32 | - | - | - | - | 4 |
| 2 | - | - | - | - | - | - | 22 | 3 1/4 | 1/4 | 11/32 | 1/32 | - | - | - | - | - |
| - | 2 | - | 2 | - | - | 1 1/2 | 23 | 3 1/4 | 5/16 | 15/32 | 1/32 | 4 | 4 1/4 | - | - | 4 1/2 |
| - | - | - | - | - | 2 | - | 24 | 3 3/4 | 5/16 | 15/32 | 1/32 | - | - | 4 7/8 | 4 7/8 | - |
| 2 1/2 | - | - | - | - | - | - | 25 | 4 | 1/4 | 11/32 | 1/32 | 4 3/4 | - | - | - | - |
| - | 2 1/2 | - | 2 1/2 | - | - | 2 | 26 | 4 | 5/16 | 15/32 | 1/32 | - | 5 | - | - | 5 1/4 |
| - | - | - | - | - | 2 1/2 | - | 27 | 4 1/4 | 5/16 | 15/32 | 1/32 | - | - | - | 5 3/8 | - |
| - | - | - | - | - | - | 2 1/2 | 28 | 4 3/8 | 3/8 | 17/32 | 1/16 | - | - | - | - | 5 7/8 |
| 3 | - | - | - | - | - | - | 29 | 4 1/2 | 1/4 | 11/32 | 1/32 | 5 1/4 | - | - | - | - |
| - | - | - | - | - | - | - | 30 | 4 5/8 | 5/16 | 15/32 | 1/32 | - | - | - | - | - |
| - | 3 | - | 3 | 3 | - | 3 | 31 | 4 7/8 | 5/16 | 15/32 | 1/32 | - | 5 3/4 | 6 1/8 | - | - |
| - | - | - | - | - | - | - | 32 | 5 | 3/8 | 17/32 | 1/16 | - | - | - | - | 6 5/8 |
| 3 1/2 | - | - | - | - | - | - | 33 | 5 3/16 | 1/4 | 11/32 | 1/32 | 6 1/16 | - | - | - | - |
| - | 3 1/2 | - | 3 1/2 | - | - | - | 34 | 5 3/16 | 5/16 | 15/32 | 1/32 | - | 6 1/4 | - | - | - |
| - | - | - | - | - | 3 | - | 35 | 5 3/8 | 5/16 | 15/32 | 1/32 | - | - | 6 5/8 | - | - |
| 4 | - | - | - | - | - | - | 36 | 5 7/8 | 1/4 | 11/32 | 1/32 | 6 3/4 | - | - | - | - |
| - | 4 | - | 4 | 4 | - | 4 | 37 | 5 7/8 | 5/16 | 15/32 | 1/32 | - | 6 7/8 | - | - | - |
| - | - | - | - | - | - | - | 38 | 6 3/16 | 7/16 | 21/32 | 1/16 | - | - | 7 1/8 | - | 8 |
| - | - | - | - | - | 4 | - | 39 | 6 3/8 | 5/16 | 15/32 | 1/32 | - | - | - | 7 5/8 | - |
| 5 | - | - | - | - | - | - | 40 | 6 3/4 | 1/4 | 11/32 | 1/32 | 7 5/8 | - | - | - | - |
| - | 5 | 5 | 5 | 5 | - | - | 41 | 7 1/8 | 5/16 | 15/32 | 1/32 | - | 8 1/4 | 8 1/2 | - | - |
| - | - | - | - | - | - | 5 | 42 | 7 1/2 | 1/2 | 25/32 | 1/16 | - | - | - | - | 9 1/2 |
| - | - | - | - | - | - | - | 43 | 7 5/8 | 1/4 | 11/32 | 1/32 | 8 5/8 | - | - | - | - |
| - | - | - | - | - | 5 | - | 44 | 7 5/8 | 5/16 | 15/32 | 1/32 | - | - | 9 | - | - |
| - | 6 | 6 | 6 | 6 | - | - | 45 | 8 5/16 | 5/16 | 15/32 | 1/32 | - | 9 1/2 | 9 1/2 | - | - |

DIMENSIONS IN INCHES

| NOMINAL PIPE SIZE | | | | | | | GROOVE NUMBER | GROOVE DIMENSIONS | | | | DIAMETER OF RAISED PORTION K | | | | |
|-------------------|---------|---------|---------|---------|----------|----------|---------------|-------------------|---------|---------|--------------------|------------------------------|-----------------|---------|----------|----------|
| 150 PSI | 300 PSI | 400 PSI | 600 PSI | 900 PSI | 1500 PSI | 2500 PSI | | PITCH DIAMETER P | DEPTH E | WIDTH F | RADIUS AT BOTTOM R | 150 PSI | 300 400 600 PSI | 900 PSI | 1500 PSI | 2500 PSI |
| - | - | - | - | - | 6 | - | R46 | 8 5/16 | 3/8 | 17/32 | 1/16 | - | - | - | 9 3/4 | - |
| - | - | - | - | - | - | 6 | 47 | 9 | 1/2 | 25/32 | 1/16 | - | - | - | - | 11 |
| 8 | - | - | - | - | - | - | 48 | 9 3/4 | 1/4 | 11/32 | 1/32 | 10 3/4 | - | - | - | - |
| - | 8 | 8 | 8 | 8 | - | - | 49 | 10 5/8 | 5/16 | 15/32 | 1/32 | - | 11 7/8 | 12 1/8 | - | - |
| - | - | - | - | - | 8 | - | 50 | 10 5/8 | 7/16 | 21/32 | 1/16 | - | - | - | 12 1/2 | - |
| - | - | - | - | - | - | 8 | 51 | 11 | 9/16 | 29/32 | 1/16 | - | - | - | - | 13 3/8 |
| 10 | - | - | - | - | - | - | 52 | 12 | 1/4 | 11/32 | 1/32 | 13 | - | - | - | - |
| - | 10 | 10 | 10 | 10 | 10 | - | 53 | 12 3/4 | 5/16 | 15/32 | 1/32 | - | 14 | 14 1/4 | - | - |
| - | - | - | - | - | 10 | - | 54 | 12 3/4 | 7/16 | 21/32 | 1/16 | - | - | - | 14 5/8 | - |
| - | - | - | - | - | - | - | 55 | 13 1/2 | 11/16 | 1 3/16 | 3/32 | - | - | - | - | 16 3/4 |
| 12 | - | - | - | - | - | - | 56 | 15 | 1/4 | 11/32 | 1/32 | 16 | - | - | - | - |
| - | 12 | 12 | 12 | 12 | 12 | - | 57 | 15 | 5/16 | 15/32 | 1/32 | - | 16 1/4 | 16 1/2 | - | - |
| - | - | - | - | - | 12 | - | 58 | 15 | 9/16 | 29/32 | 1/16 | - | - | - | 17 1/4 | - |
| 14 | - | - | - | - | - | - | 59 | 15 5/8 | 1/4 | 11/32 | 1/32 | 16 3/4 | - | - | - | - |
| - | - | - | - | - | - | 12 | 60 | 16 | 11/16 | 1 5/16 | 3/32 | - | - | - | - | 19 1/2 |
| - | 14 | 14 | 14 | - | - | - | 61 | 16 1/2 | 5/16 | 15/32 | 1/32 | - | 18 | - | - | - |
| - | - | - | - | 14 | - | - | 62 | 16 1/2 | 7/16 | 21/32 | 1/16 | - | - | 18 3/8 | - | - |
| - | - | - | - | - | 14 | - | 63 | 16 1/2 | 5/8 | 1 1/16 | 3/32 | - | - | - | 19 1/4 | - |
| 16 | - | - | - | - | - | - | 64 | 17 7/8 | 1/4 | 11/32 | 1/32 | 19 | - | - | - | - |
| - | 16 | 16 | 16 | - | - | - | 65 | 18 1/2 | 5/16 | 15/32 | 1/32 | - | 20 | - | - | - |
| - | - | - | - | 16 | - | - | 66 | 18 1/2 | 7/16 | 21/32 | 1/16 | - | - | 20 5/8 | - | - |
| 18 | - | - | - | - | 16 | - | 67 | 18 1/2 | 11/16 | 1 3/16 | 3/32 | - | - | - | 21 1/2 | - |
| - | - | - | - | - | - | - | 68 | 20 | 3/8 | 1/4 | 11/32 | 1/32 | 21 1/2 | - | - | - |
| - | 18 | 18 | 18 | - | - | - | 69 | 21 | 5/16 | 15/32 | 1/32 | - | 22 5/8 | - | - | - |
| - | - | - | - | 18 | - | - | 70 | 21 | 1/2 | 25/32 | 1/16 | - | - | 23 3/8 | - | - |
| - | - | - | - | - | 18 | - | 71 | 21 | 11/16 | 1 3/16 | 3/32 | - | - | - | 24 1/8 | - |
| - | - | - | - | - | - | - | 72 | 22 | 1/4 | 11/33 | 1/32 | 23 1/2 | - | - | - | - |
| - | 20 | 20 | 20 | - | - | - | 73 | 23 | 3/8 | 17/32 | 1/16 | - | 25 | - | - | - |
| - | - | - | 20 | 20 | - | - | 74 | 23 | 1/2 | 25/32 | 1/16 | - | - | 25 1/2 | - | - |
| - | - | - | - | - | 20 | - | 75 | 23 | 11/16 | 1 5/16 | 3/32 | - | - | - | 26 1/2 | - |
| 24 | - | - | - | - | - | - | 76 | 26 1/2 | 1/4 | 11/32 | 1/32 | 28 | - | - | - | - |
| - | 24 | 24 | 24 | - | - | - | 77 | 27 1/4 | 7/16 | 21/32 | 1/16 | - | - | 29 1/2 | - | - |
| - | - | - | - | 24 | - | - | 78 | 27 1/4 | 5/8 | 1 1/16 | 3/32 | - | - | 30 3/8 | - | - |
| - | - | - | - | - | 24 | - | 79 | 27 1/4 | 13/16 | 1 1/16 | 3/32 | - | - | - | 31 1/4 | - |

OUTSIDE DIAMETER

When O.D. is 24" or less..... $\pm 1/16"$
 When O.D. IS over 24"..... $\pm 1/8"$

INSIDE DIAMETER

Threaded
 To Standard Gauge Limits
 Slip-On,Lap Joint
 10" and smaller..... $+1/32" - 0"$
 12" and Larger..... $+1/16" - 0"$
 Welding Neck, Long Welding Neck
 10" and smaller..... $\pm 1/32"$
 12" to 18"..... $\pm 1/16"$
 20" and larger..... $+1/8" - 1/16"$

DIAMETER OF CONTACT FACE

1/16" Raised Face..... $\pm 1/32"$
 1/4" Raised Face, Tongue and Groove,
 Male or Female..... $\pm 1/64"$

DIAMETER OF COUNTERBORE

Threaded
 10" and smaller..... $+1/32" - 0"$
 12" and larger..... $+1/16" - 0"$

FLANGE THICKNESS

18" and smaller..... $+1/8" - 0"$
 Over 18"..... $+3/16" - 0"$

HUB

Welding Neck
 Outside Diameter of Hub at Point of Weld
 5" and smaller..... $+3/32" - 1/32"$
 6" and larger..... $+5/32" - 1/32"$
 Thickness of Hub at Point of Weld
 Not less than 87.5% of the nominal
 thickness of the pipe to which the
 flange is to be attached.
 Long Welding Neck
 Outside Diameter of Neck
 10" and smaller..... $+3/32" - 1/32"$
 12" and larger..... $+3/32" - 1/16"$

DRILLING

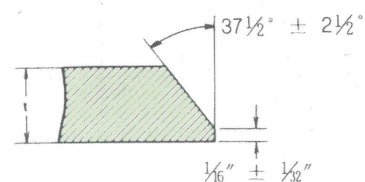
Bolt circle..... $\pm 1/16"$
 Bolt Hole Spacing..... $\pm 1/32"$
 Eccentricity of Bolt Circle and Facing
 With respect to bore..... $1/32"$ Max

OVERALL HEIGHT

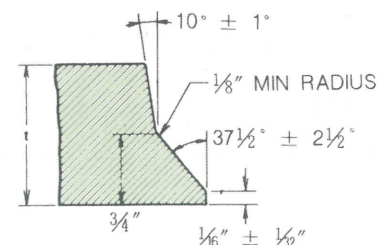
Threaded, Slip-On,Lap Joint,Blind
 All sizes..... $\pm 1/16"$
 Welding Neck,Long Welding Neck
 10" and smaller..... $\pm 1/16"$
 12 "and larger..... $\pm 1/8"$

WELDING BEVEL STANDARDS

For wall thickness "t" 3/16" to 3/4" inch



For wall thickness "t" greater than 3/4"



ANSI-B36.10 and B36.19

DIMENSIONS IN INCHES

| NOMINAL PIPE SIZE | OUT SIDE DIA. | NOMINAL WALL THICKNESS FOR | | | | | | | | | | | | | | |
|-------------------|---------------|----------------------------|------------|-----------|-----------|-----------|------------------|-----------|-----------|------------|-----------|------------|------------|------------|------------|-----------------|
| | | SCHED. 5S | SCHED. 10S | SCHED. 10 | SCHED. 20 | SCHED. 30 | STAND. ARD (STD) | SCHED. 40 | SCHED. 60 | EXTRA (XH) | SCHED. 80 | SCHED. 100 | SCHED. 120 | SCHED. 140 | SCHED. 160 | XX STRONG (XXH) |
| 1/8 | 0.405 | - | 0.049 | - | - | - | 0.068 | 0.068 | - | 0.095 | 0.095 | - | - | - | - | - |
| 1/4 | 0.540 | - | 0.065 | - | - | - | 0.088 | 0.088 | - | 0.119 | 0.119 | - | - | - | - | - |
| 3/8 | 0.675 | - | 0.065 | - | - | - | 0.091 | 0.091 | - | 0.126 | 0.126 | - | - | - | - | - |
| 1/2 | 0.840 | 0.065 | 0.083 | - | - | - | 0.109 | 0.109 | - | 0.147 | 0.147 | - | - | - | 0.187 | 0.294 |
| 3/4 | 1.050 | 0.065 | 0.083 | - | - | - | 0.113 | 0.113 | - | 0.154 | 0.154 | - | - | - | 0.218 | 0.308 |
| 1 | 1.315 | 0.065 | 0.109 | - | - | - | 0.133 | 0.133 | - | 0.179 | 0.179 | - | - | - | 0.250 | 0.358 |
| 1 1/4 | 1.660 | 0.065 | 0.109 | - | - | - | 0.140 | 0.140 | - | 0.191 | 0.191 | - | - | - | 0.250 | 0.382 |
| 1 1/2 | 1.900 | 0.065 | 0.109 | - | - | - | 0.145 | 0.145 | - | 0.200 | 0.200 | - | - | - | 0.281 | 0.400 |
| 2 | 2.375 | 0.065 | 0.109 | - | - | - | 0.154 | 0.154 | - | 0.218 | 0.218 | - | - | - | 0.343 | 0.436 |
| 2 1/2 | 2.875 | 0.083 | 0.120 | - | - | - | 0.203 | 0.203 | - | 0.276 | 0.276 | - | - | - | 0.375 | 0.552 |
| 3 | 3.500 | 0.083 | 0.120 | - | - | - | 0.216 | 0.216 | - | 0.300 | 0.300 | - | - | - | 0.438 | 0.600 |
| 3 1/2 | 4.000 | 0.083 | 0.120 | - | - | - | 0.226 | 0.226 | - | 0.318 | 0.318 | - | - | - | - | - |
| 4 | 4.500 | 0.083 | 0.120 | - | - | - | 0.237 | 0.237 | - | 0.337 | 0.337 | - | 0.438 | - | 0.531 | 0.674 |
| 5 | 5.563 | 0.109 | 0.134 | - | - | - | 0.258 | 0.258 | - | 0.375 | 0.375 | - | 0.500 | - | 0.625 | 0.750 |
| 6 | 6.625 | 0.109 | 0.134 | - | - | - | 0.280 | 0.280 | - | 0.432 | 0.432 | - | 0.562 | - | 0.718 | 0.864 |
| 8 | 8.625 | 0.109 | 0.148 | - | 0.250 | 0.277 | 0.322 | 0.322 | 0.406 | 0.500 | 0.500 | 0.593 | 0.718 | 0.812 | 0.906 | 0.875 |
| 10 | 10.750 | 0.134 | 0.165 | - | 0.250 | 0.307 | 0.365 | 0.365 | 0.500 | 0.500 | 0.593 | 0.718 | 0.843 | 1.000 | 1.125 | 1.000 |
| 12 | 12.750 | 0.156 | 0.180 | - | 0.250 | 0.330 | 0.375 | 0.406 | 0.562 | 0.500 | 0.687 | 0.843 | 1.000 | 1.125 | 1.312 | 1.000 |
| 140.D. | 14.0 | 0.156 | 0.188 | 0.250 | 0.312 | 0.375 | 0.375 | 0.438 | 0.593 | 0.500 | 0.750 | 0.937 | 1.093 | 1.250 | 1.406 | - |
| 160.D. | 16.0 | 0.165 | 0.188 | 0.250 | 0.312 | 0.375 | 0.375 | 0.500 | 0.656 | 0.500 | 0.843 | 1.031 | 1.218 | 1.438 | 1.593 | - |
| 180.D. | 18.0 | 0.165 | 0.188 | 0.250 | 0.312 | 0.438 | 0.375 | 0.562 | 0.750 | 0.500 | 0.937 | 1.156 | 1.375 | 1.562 | 1.781 | - |
| 200.D. | 20.0 | 0.188 | 0.218 | 0.250 | 0.375 | 0.500 | 0.375 | 0.593 | 0.812 | 0.500 | 1.031 | 1.281 | 1.500 | 1.750 | 1.968 | - |
| 220.D. | 22.0 | 0.188 | 0.218 | 0.250 | 0.375 | 0.500 | 0.375 | - | 0.875 | 0.500 | 1.125 | 1.375 | 1.625 | 1.875 | 2.125 | - |
| 240.D. | 24.0 | 0.218 | 0.250 | 0.250 | 0.375 | 0.562 | 0.375 | 0.687 | 0.968 | 0.500 | 1.128 | 1.531 | 1.812 | 2.062 | 2.343 | - |
| 260.D. | 26.0 | - | - | 0.312 | 0.500 | - | 0.375 | - | - | 0.500 | - | - | - | - | - | - |
| 280.D. | 28.0 | - | - | 0.312 | 0.500 | 0.625 | 0.375 | - | - | 0.500 | - | - | - | - | - | - |
| 300.D. | 30.0 | 0.250 | 0.312 | 0.312 | 0.500 | 0.625 | 0.375 | - | - | 0.500 | - | - | - | - | - | - |
| 320.D. | 32.0 | - | - | 0.312 | 0.500 | 0.625 | 0.375 | 0.688 | - | 0.500 | - | - | - | - | - | - |
| 340.D. | 34.0 | - | - | 0.312 | 0.500 | 0.625 | 0.375 | 0.688 | - | 0.500 | - | - | - | - | - | - |
| 360.D. | 36.0 | - | - | 0.312 | 0.500 | 0.625 | 0.375 | 0.750 | - | 0.500 | - | - | - | - | - | - |
| 420.D. | 42.0 | - | - | - | - | - | 0.375 | - | - | 0.500 | - | - | - | - | - | - |

MATERIAL SPECIFICATIONS (ASTM)

| ASTM | GRADE | CLASSIFICATION | CHEMISTRY | | | | | | | | | | | | |
|----------|-------|-------------------|-----------|-----------|-------------|-----------|-----------|-------------|-------------|-----------|----------------------|----------------------|----------|------------|---------|
| | | | C % | Mn % | P % | S % | SI % | NI % | Cr % | Mo % | T.S. Min psi (kg/mm) | Y.S. Min psi (kg/mm) | EL Min % | RED. Min % | HB MAX |
| A-105 | | Carbon Steel | MAX 0.35 | MAX 1.05 | MAX 0.040 | MAX 0.050 | MAX 0.35 | MAX 0.40 | MAX 0.30 | MAX 0.12 | 70.000 (49.2) | 36.000 (25.3) | 22 | 30 | 137~187 |
| A-181 | I | " | " 0.35 | " 1.10 | " 0.050 | " 0.050 | 0.10~0.35 | | | | 60.000 (49.2) | 30.000 (21.1) | 22 | 35 | |
| " | II | " | " 0.35 | " 1.10 | " 0.050 | " 0.050 | 0.10~0.35 | | | | 70.000 (49.2) | 36.000 (25.3) | 18 | 24 | |
| A-182 | F1 | Carbon Molybdenum | " 0.28 | 0.6~0.90 | " 0.045 | " 0.045 | 0.15~0.35 | | | 0.44~0.65 | 70.000 (42.2) | 40.000 (28.1) | 25 | 35 | 143~192 |
| " | F5 | 4To.6%cr | " 0.15 | 0.30~0.60 | 0.030 | " 0.030 | MAX 0.50 | MAX 0.50 | 4.0~6.0 | 0.44~0.65 | 60.000 (49.2) | 30.000 (21.1) | 22 | 50 | 143~217 |
| " | F5a | 4To.6%cr | " 0.25 | MAX 0.6 | " 0.040 | " 0.030 | " 0.50 | " 0.50 | 4.0~6.0 | 0.44~0.65 | 90.000 (63.3) | 65.000 (45.7) | 22 | 50 | 187~248 |
| " | F6 | 13.cr | " 0.12 | " 1.00 | " 0.040 | " 0.030 | " 1.00 | " 0.50 | 11.5~13.5 | | 85.000 (59.76) | 55.000 (38.7) | 25 | 60 | 241 |
| " | F7 | 7cr.1/2Mo | " 0.15 | 0.30~0.60 | " 0.030 | " 0.030 | 0.5~1.00 | | 6.0~8.0 | 0.44~0.65 | 60.000 (42.2) | 36.000 (42.2) | 22 | 50 | 201 |
| " | F9 | 9cr.1/2Mo | " 0.15 | 0.30~0.60 | " 0.030 | " 0.030 | 0.5~1.00 | | 8.0~10.0 | 0.90~1.10 | 100.000 (70.3) | 70.000 (49.2) | 20 | 40 | 262 |
| " | F11 | 11/4cr.1/2Mo | 0.10~0.20 | 0.30~0.80 | " 0.040 | " 0.040 | 0.5~1.00 | | 1.00~1.50 | 0.44~0.65 | 70.000 (49.2) | 40.000 (28.1) | 20 | 30 | 143~207 |
| " | F12 | 1cr.1/2Mo | 0.10~0.20 | 0.30~0.80 | " 0.040 | " 0.040 | 0.1~0.6 | | 0.8~1.25 | 0.44~0.65 | 70.000 (49.2) | 40.000 (28.1) | 20 | 30 | 143~207 |
| " | F22 | 21/4cr.1Mo | 0.05~0.15 | 0.30~0.60 | " 0.040 | " 0.040 | MAX 0.50 | | 2.00~2.50 | 0.87~1.13 | 70.000 (49.2) | 40.000 (28.1) | 20 | 30 | 156~207 |
| " | F304 | 18cr-8Ni | " 0.08 | MAX 2.00 | " 0.040 | " 0.030 | " 1.00 | 8.00~11.00 | 18.00~20.00 | | 75.000 (52.7) | 30.000 (21.1) | 45 | 50 | |
| " | F304L | 18cr-8Ni Low | " 0.035 | " 2.00 | " 0.040 | " 0.030 | " 1.00 | 8.00~13.00 | 18.00~20.00 | | 65.000 (45.7) | 25.000 (17.6) | 30 | 50 | |
| " | F316 | 18cr-8Ni Mo | " 0.08 | " 2.00 | " 0.040 | " 0.030 | " 1.00 | 10.00~14.00 | 16.00~18.00 | 2.00~3.00 | 75.000 (52.7) | 30.000 (21.1) | 45 | 50 | |
| " | F316L | 18cr-8Ni | MAX 0.035 | MAX 2.00 | MAX 0.040 | MAX 0.030 | MAX 1.00 | 10.0~15.0 | 16.00~18.00 | 2.00~3.00 | 70374 (49.5) | 24667 (17.3) | 30 | 50 | |
| " | F317L | 19cr-13Ni-3.5Mo | MAX 0.03 | MAX 2.00 | MAX 0.045 | MAX 0.030 | MAX 1.00 | 11.0~15.0 | 18.00~20.00 | 3.0~4.0 | 74727 (52.5) | 29746 (17.3) | 30 | 50 | |
| " | F317 | 19cr-13Ni-3.5Mo | MAX 0.08 | MAX 2.00 | MAX 0.045 | MAX 0.030 | MAX 1.00 | 11.0~15.0 | 18.00~20.00 | 3.0~4.0 | 70374 (49.5) | 24667 (17.3) | 30 | 50 | |
| " | F321 | 18cr-8Ni Ti | " 0.08 | " 2.00 | " 0.040 | " 0.030 | " 1.00 | 9.00~12.00 | Min 17.00 | | 75.000 (52.7) | 30.000 (21.1) | 45 | 50 | |
| " | F347 | 18cr-8Ni Cb | " 0.08 | " 2.00 | " 0.040 | " 0.030 | " 1.00 | 9.00~13.00 | 17.00~20.00 | | 75.000 (52.7) | 30.000 (21.1) | 45 | 50 | |
| A-350 | LF1 | Carbon Steel | " 0.30 | 0.60~1.35 | " 0.035 | " 0.040 | 0.15~0.30 | 0.40 | 0.30 | 0.12 | 60.000 (42.2) | 30.000 (21.1) | 25 | 38 | 197 |
| " | LF2 | " | " 0.30 | 0.60~1.35 | 0.035~0.040 | " 0.040 | 0.15~0.30 | 0.40 | 0.30 | 0.12 | 70.000 (49.2) | 36.000 (25.3) | 22 | 30 | 197 |
| " | LF3 | 31/2Ni | " 0.20 | " 0.90 | " 0.035 | " 0.040 | 0.20~0.35 | 3.3~3.7 | 0.30 | 0.12 | 70.000 (49.2) | 40.000 (28.1) | 25 | 50 | 197 |
| MSS SP44 | F52 | Carbon Steel | " 0.30 | " 1.35 | " 0.040 | " 0.050 | | | | | 52.000 (36.6) | 66.000 (46.4) | 20 | | 197 |
| A-694 | F52 | Carbon Steel | " 0.30 | " 1.5 | " 0.030 | " 0.030 | 0.13~0.37 | | | | 52.000 (36.6) | 66.000 (46.4) | 20 | | 197 |

ANSI B 16.5 FORGED FLANGES APPROX. WEIGHT LIST



| CLASS | NOMINAL PIPE SIZE | SLIP ON TYPE | | | | UNIT POUND AND(KG) | |
|-------|-------------------|----------------|---------------|--------------|--------------|--------------------|---------------|
| | | SLIP ON | SCREWED | SOCKET | LAP JOINT | BLIND | WELDING NECK |
| | | | | | | | |
| 150lb | 1/2 | 1 (0.45) | 1 (0.45) | 2 (0.91) | 2 (0.91) | 2 (0.91) | 2 (0.91) |
| | 3/4 | 1 1/2 (0.68) | 1 1/2 (0.68) | 2 (0.91) | 2 1/2(0.91) | 2 (0.91) | 2 (0.91) |
| | I | 2 (0.91) | 2 (0.91) | 2 (0.91) | 2 (0.91) | 2 (0.91) | 2 1/2(1.14) |
| | I 1/4 | 2 1/2(1.14) | 2 1/2(1.14) | 3 (1.36) | 3 1/2(1.36) | 3 (1.36) | 2 1/2(1.14) |
| | I 1/2 | 3 (1.36) | 3 (1.36) | 3 (1.36) | 3 (1.36) | 3 (1.36) | 4 (1.81) |
| | 2 | 5 (2.18) | 5 (2.27) | 5 (2.27) | 5 (2.27) | 4 (1.82) | 6 (2.72) |
| | 2 1/2 | 8 (3.45) | 8 (3.63) | 7 (3.18) | 8 (3.63) | 7 (3.18) | 10 (4.45) |
| | 3 | 9 (4.01) | 10 (4.54) | 8 (3.63) | 9 (4.09) | 9 (4.09) | 11 1/2(5.22) |
| | 3 1/2 | 11 (4.99) | 12 (5.45) | 11 (4.99) | 11 (4.99) | 13 (5.90) | 12 (5.45) |
| | 4 | 13 (5.63) | 13 (5.90) | 13 (5.90) | 13 (5.90) | 17 (7.72) | 16 1/2 (7.49) |
| | 5 | 15 (6.74) | 15 (6.81) | 15 (6.81) | 15 (6.81) | 20 (9.08) | 21 (9.53) |
| | 6 | 17 (7.90) | 19 1/2 (8.85) | 19 (8.63) | 19 (8.63) | 27 (12.26) | 26 (11.80) |
| | 8 | 28 (12.90) | 30 (13.62) | 30 (13.62) | 30 (13.62) | 47 (21.34) | 42 (19.07) |
| | 10 | 40 (17.60) | 41 (18.61) | 43 (19.52) | 43 (19.52) | 67 (30.42) | 54 (24.52) |
| | 12 | 61 (27.69) | 65 (29.51) | 64 (29.06) | 64 (29.06) | 123 (45.00) | 88 (39.95) |
| | 14 | 83 (37.68) | 85 (38.59) | 85 (38.59) | 99 (44.95) | 139 (63.11) | 114 (51.76) |
| | 16 | 106 (48.12) | 93 (42.22) | 93 (42.22) | 128 (58.11) | 187 (84.90) | 142 (64.47) |
| | 18 | 109 (49.49) | 120 (54.48) | 120 (54.48) | 146 (66.28) | 217 (98.52) | 165 (74.90) |
| 20 | 148 (67.19) | 155 (70.37) | 155 (70.37) | 185 (83.99) | 283 (128.48) | 197 (89.44) | |
| 24 | 204 (92.62) | 210 (95.34) | 210 (95.34) | 260 (118.04) | 415 (188.41) | 268 (121.67) | |
| 300lb | 1/2 | 1 1/2 (0.68) | 1 1/2 (0.68) | 3 (1.36) | 3 (1.36) | 2 (0.91) | 2 (0.91) |
| | 3/4 | 2 1/2 (1.14) | 2 1/2 (1.14) | 3 (1.36) | 3 (1.36) | 3 (1.36) | 3 (1.36) |
| | I | 3 (1.36) | 3 (1.36) | 3 (1.36) | 3 (1.36) | 4 (1.82) | 4 (1.82) |
| | I 1/4 | 4 1/2 (2.04) | 4 1/2 (2.04) | 4 (1.82) | 4 1/2(2.04) | 6 (2.72) | 5 (2.27) |
| | I 1/2 | 6 1/2 (2.95) | 6 1/2 (2.95) | 6 (2.72) | 6 1/2(2.95) | 7 (3.18) | 7 (3.18) |
| | 2 | 7 (3.18) | 7 (3.18) | 7 (3.18) | 7 (3.18) | 8 (3.63) | 8 (3.63) |
| | 2 1/2 | 10 (4.54) | 10 (4.54) | 10 (4.54) | 10 (4.54) | 12 (5.45) | 12 (5.45) |
| | 3 | 13 (5.90) | 14 (6.36) | 13 (5.90) | 14 1/2(6.58) | 16 (7.26) | 18 (8.17) |
| | 3 1/2 | 16 (7.26) | 16 (7.26) | 17 (7.72) | 17 (7.72) | 21 (9.53) | 20 (9.1) |
| | 4 | 23 1/2 (10.67) | 24 (10.90) | 22 (9.99) | 24 (10.90) | 28 (12.71) | 26 1/2(12.03) |
| | 5 | 29 (13.17) | 31 (14.07) | - | 28 (12.71) | 37 (16.80) | 36 (16.34) |
| | 6 | 36 (16.34) | 36 (16.34) | - | 39 (17.71) | 48 (21.79) | 45 (20.43) |
| | 8 | 56 (25.42) | 56 (25.42) | - | 58 (26.33) | 79 (35.87) | 69 (31.33) |
| | 10 | 77 (34.96) | 80 (36.32) | - | 91 (41.31) | 122 (55.39) | 100 (45.4) |
| | 12 | 113 (51.30) | 110 (49.94) | - | 139 (63.11) | 183 (83.08) | 142 (64.47) |
| | 14 | 159 (72.19) | 164 (74.46) | - | 189 (85.81) | 241 (109.41) | 206 (93.52) |
| | 16 | 210 (95.34) | 220 (99.88) | - | 240 (108.96) | 315 (143.01) | 249 (113.05) |
| | 18 | 253 (114.86) | 280 (127.12) | - | 305 (138.47) | 414 (187.96) | 306 (138.92) |
| 20 | 307 (139.38) | 325 (147.55) | - | 375 (170.25) | 515 (233.81) | 369 (167.53) | |
| 24 | 490 (222.46) | 490 (222.46) | - | 530 (240.62) | 800 (363.2) | 519 (235.63) | |

ANSI B 16.5 FORGED FLANGES APPROX. WEIGHT LIST



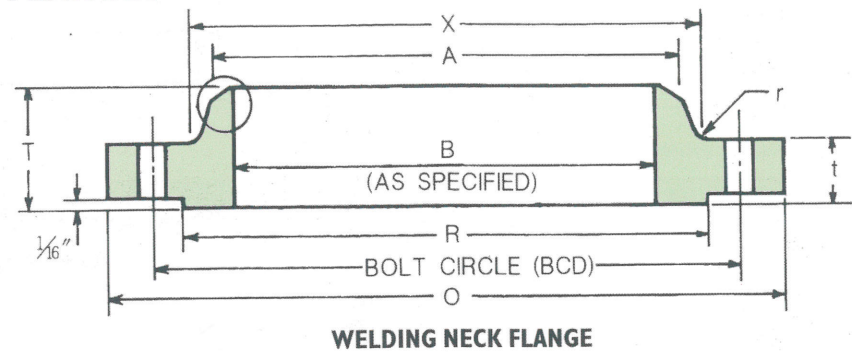
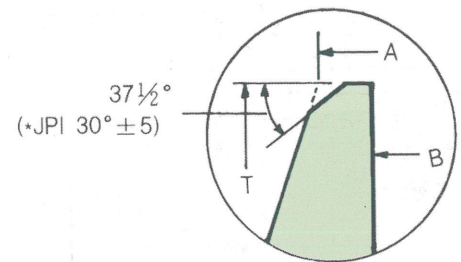
UNIT POUND AND(KG)

| CLASS | NOMINAL PIPE SIZE | SLIP ON TYPE | | | BLIND | WELDING NECK |
|-----------|-------------------|--------------|--------------|---------------|--------------|--------------|
| | | SLIP ON | SCREWED | LAP JOINT | | |
| 400lb | 1/2 | 2 (0.91) | 2 (0.91) | 3 (1.36) | 2 (0.91) | 3 (1.36) |
| | 3/4 | 3 (1.36) | 3 (1.36) | 3 (1.36) | 3 (1.36) | 3 1/2 (1.59) |
| | 1 | 3 1/2 (1.59) | 3 1/2 (1.59) | 4 (1.82) | 4 (1.82) | 4 (1.82) |
| | 1 1/4 | 4 1/2 (2.04) | 4 1/2 (2.04) | 6 (2.72) | 6 (2.72) | 5 1/2 (2.50) |
| | 1 1/2 | 6 1/2 (2.95) | 6 1/2 (2.95) | 7 (3.18) | 8 (3.63) | 8 (3.63) |
| | 2 | 8 (3.63) | 8 (3.63) | 9 (4.09) | 10 (4.54) | 10 (4.54) |
| | 2 1/2 | 12 (5.45) | 12 (5.45) | 12 (5.45) | 15 (6.81) | 14 (6.36) |
| | 3 | 15 (6.81) | 15 (6.81) | 15 (6.81) | 20 (9.08) | 18 (8.17) |
| | 3 1/2 | 21 (9.53) | 21 (9.53) | 20 (9.08) | 29 (13.17) | 26 (11.80) |
| | 4 | 24 (10.9) | 24 (10.9) | 25 (11.35) | 33 (14.98) | 30 (13.62) |
| | 5 | 31 (14.07) | 31 (14.07) | 29 (13.17) | 44 (19.98) | 39 (17.71) |
| | 6 | 39 (17.71) | 39 (17.71) | 42 (19.07) | 61 (27.69) | 49 (22.45) |
| | 8 | 63 (28.60) | 63 (28.60) | 64 (29.06) | 100 (45.4) | 78 (35.41) |
| | 10 | 91 (41.31) | 91 (41.31) | 112 (50.85) | 155 (70.37) | 110 (49.94) |
| | 12 | 129 (58.57) | 129 (58.57) | 152 (69.01) | 226 (102.60) | 160 (72.64) |
| | 14 | 191 (86.71) | 191 (86.71) | 210 (95.34) | 310 (140.74) | 233 (105.78) |
| | 16 | 253 (114.86) | 253 (114.86) | 280 (127.12) | 398 (180.69) | 194 (133.78) |
| | 18 | 310 (140.74) | 310 (140.74) | 345 (156.63) | 502 (227.91) | 360 (163.44) |
| 20 | 378 (171.61) | 378 (171.61) | 420 (190.68) | 621 (281.93) | 445 (202.03) | |
| 24 | 539 (244.71) | 539 (244.71) | 615 (279.21) | 936 (424.94) | 640 (290.56) | |
| 600lb | 1/2 | 2 (0.91) | 2 (0.91) | 3 (1.36) | 2 (0.91) | 3 (1.36) |
| | 3/4 | 3 (1.36) | 3 (1.36) | 3 (1.36) | 3 (1.36) | 3 1/2 (1.59) |
| | 1 | 3 1/2 (1.59) | 3 1/2 (1.59) | 4 (1.82) | 4 (1.82) | 4 (1.82) |
| | 1 1/4 | 4 1/2 (2.04) | 4 1/2 (2.04) | 6 (2.72) | 6 (2.72) | 5 1/2 (2.50) |
| | 1 1/2 | 6 1/2 (2.95) | 6 1/2 (2.95) | 7 (3.18) | 8 (3.63) | 8 (3.63) |
| | 2 | 8 (3.63) | 8 (3.63) | 9 (4.09) | 10 (4.54) | 10 (4.54) |
| | 2 1/2 | 12 (5.45) | 12 (5.45) | 12 (5.45) | 15 (6.81) | 14 (6.36) |
| | 3 | 15 (6.81) | 15 (6.81) | 15 (6.81) | 20 (9.08) | 18 (8.17) |
| | 3 1/2 | 21 (9.53) | 21 (9.53) | 20 (9.08) | 29 (13.17) | 26 (11.80) |
| | 4 | 33 (14.98) | 33 (14.98) | 36 (16.34) | 41 (18.61) | 37 (16.80) |
| | 5 | 63 (28.60) | 63 (28.60) | 63 (28.60) | 68 (30.87) | 68 (30.87) |
| | 6 | 80 (36.32) | 80 (36.32) | 78 (35.41) | 86 (39.04) | 73 (33.14) |
| | 8 | 97 (44.04) | 97 (44.04) | 112 (50.85) | 139 (63.11) | 112 (50.85) |
| | 10 | 177 (80.36) | 177 (80.36) | 195 (88.53) | 231 (104.87) | 189 (85.81) |
| | 12 | 215 (97.61) | 215 (97.61) | 240 (108.96) | 295 (133.93) | 226 (102.60) |
| | 14 | 259 (117.59) | 259 (117.59) | 290 (131.66) | 378 (171.61) | 347 (157.54) |
| | 16 | 366 (166.16) | 366 (166.16) | 400 (181.6) | 527 (239.26) | 481 (218.37) |
| | 18 | 476 (216.10) | 476 (216.10) | 469 (212.93) | 665 (301.91) | 555 (251.97) |
| 20 | 612 (277.85) | 612 (277.85) | 604 (274.22) | 855 (388.17) | 690 (313.26) | |
| 24 | 876 (397.70) | 876 (397.70) | 866 (393.16) | 1175 (533.45) | 977 (443.56) | |

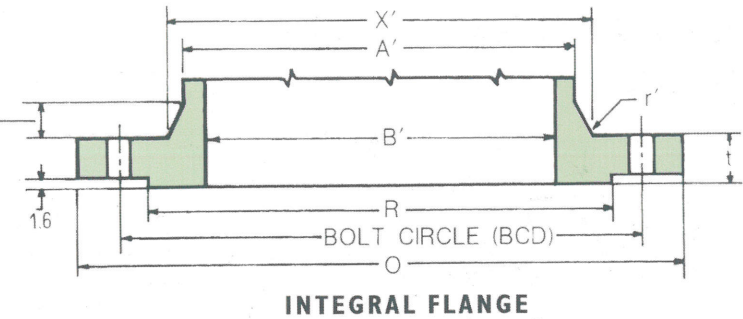
UNIT POUNDS AND (KG)

| CLASS | NOMINAL PIPE SIZE | SLIP ON TYPE | | | BLIND | WELDING NECK | |
|-----------|-------------------|---------------|---------------|---------------|---------------|---------------|-----------|
| | | SLIP ON | THREADED | LAP JOINT | | | |
| 900lb | 1/2 | 6 (2.72) | 6 (2.72) | 9 (4.09) | 4 (1.82) | 7 (3.18) | |
| | 3/4 | 6 (2.72) | 6 (2.72) | 9 (4.09) | 6 (2.72) | 7 (3.18) | |
| | 1 | 7 1/2 (3.41) | 7 1/2 (3.41) | 9 (4.09) | 9 (4.09) | 8 1/2 (3.86) | |
| | 1 1/4 | 10 (4.54) | 10 (4.54) | 10 (4.54) | 10 (4.54) | 10 (4.54) | |
| | 1 1/2 | 14 (6.36) | 14 (6.36) | 14 (6.36) | 14 (6.36) | 14 (6.36) | |
| | 2 | 22 (9.99) | 22 (9.99) | 25 (11.35) | 25 (11.35) | 24 (10.90) | |
| | 2 1/2 | 36 (16.34) | 36 (16.34) | 35 (15.9) | 35 (15.89) | 36 (16.34) | |
| | 3 | 31 (14.07) | 31 (14.07) | 20 (13.62) | 32 (14.53) | 29 (13.17) | |
| | 4 | 53 (24.06) | 53 (24.06) | 51 (23.15) | 54 (24.52) | 51 (23.15) | |
| | 5 | 83 (37.68) | 83 (37.68) | 81 (36.77) | 87 (39.50) | 86 (39.04) | |
| | 6 | 108 (49.03) | 108 (49.03) | 105 (47.67) | 113 (51.30) | 110 (49.94) | |
| | 8 | 172 (78.09) | 172 (78.09) | 188 (85.35) | 197 (89.44) | 187 (84.90) | |
| | 10 | 245 (111.23) | 245 (111.23) | 277 (125.76) | 290 (131.66) | 268 (121.67) | |
| | 12 | 326 (148.00) | 326 (148.00) | 371 (168.43) | 413 (187.50) | 372 (168.89) | |
| | 14 | 380 (172.52) | 380 (172.52) | 397 (180.24) | 494 (224.28) | 562 (255.15) | |
| | 16 | 459 (208.39) | 459 (208.39) | 488 (221.55) | 619 (281.03) | 685 (310.99) | |
| | 18 | 647 (293.74) | 647 (293.74) | 670 (304.18) | 880 (399.52) | 924 (419.50) | |
| | 20 | 792 (359.57) | 792 (359.57) | 868 (394.07) | 1107 (502.58) | 1164 (528.46) | |
| 24 | 1480 (671.92) | 1480 (671.92) | 1659 (753.19) | 2099 (952.95) | 2107 (956.58) | | |
| 1500lb | 1/2 | 6 (2.72) | 6 (2.72) | 9 (4.09) | 4 (1.82) | 7 (3.18) | |
| | 3/4 | 6 (2.72) | 6 (2.72) | 9 (4.09) | 6 (2.72) | 7 (3.18) | |
| | 1 | 7 1/2 (3.41) | 7 1/2 (3.41) | 9 (4.09) | 9 (4.09) | 8 1/2 (3.86) | |
| | 1 1/4 | 10 (4.54) | 10 (4.54) | 10 (4.54) | 10 (4.54) | 10 (4.54) | |
| | 1 1/2 | 14 (6.36) | 14 (6.36) | 14 (6.36) | 14 (6.36) | 14 (6.36) | |
| | 2 | 22 (9.99) | 22 (9.99) | 25 (11.35) | 25 (11.35) | 24 (10.90) | |
| | 2 1/2 | 36 (16.34) | 36 (16.34) | 35 (15.9) | 35 (15.89) | 36 (16.34) | |
| | 3 | 48 (21.79) | 48 (21.79) | 47 (21.3) | 48 (21.79) | 48 (21.79) | |
| | 4 | 73 (33.14) | 73 (33.14) | 75 (34.05) | 73 (33.14) | 69 (31.33) | |
| | 5 | 132 (59.93) | 132 (59.93) | 138 (62.65) | 142 (64.47) | 132 (59.93) | |
| | 6 | 164 (74.46) | 164 (74.46) | 170 (77.18) | 159 (72.19) | 164 (74.46) | |
| | 8 | 258 (117.13) | 258 (117.13) | 286 (129.84) | 302 (137.11) | 273 (123.94) | |
| | 10 | 436 (197.94) | 436 (197.94) | 485 (220.19) | 507 (230.18) | 454 (206.12) | |
| | 12 | 667 (302.82) | 667 (302.82) | 749 (340.05) | 775 (351.85) | 690 (313.26) | |
| | 2500lb | 1/2 | 7 (3.18) | 7 (3.18) | 7 (3.18) | 7 (13.18) | 8 (3.63) |
| | | 3/4 | 9 (4.09) | 9 (4.09) | 8 (3.63) | 10 (4.54) | 9 (4.09) |
| | | 1 | 12 (5.45) | 12 (5.45) | 12 (5.45) | 12 (5.45) | 13 (5.90) |
| | | 1 1/4 | 18 (8.17) | 18 (8.17) | 17 (7.72) | 18 (8.17) | 20 (9.08) |
| 1 1/2 | | 25 (11.35) | 25 (11.35) | 24 (10.90) | 25 (11.35) | 28 (12.71) | |
| 2 | | 38 (17.25) | 38 (17.25) | 37 (16.80) | 39 (17.71) | 42 (19.07) | |
| 2 1/2 | | 55 (24.97) | 55 (24.97) | 53 (24.06) | 56 (25.42) | 52 (23.61) | |
| 3 | | 83 (37.68) | 83 (37.68) | 80 (36.32) | 86 (39.04) | 94 (42.68) | |
| 4 | | 127 (57.66) | 127 (57.66) | 122 (55.39) | 133 (60.38) | 146 (66.28) | |
| 5 | | 210 (95.34) | 210 (95.34) | 204 (92.62) | 223 (101.24) | 244 (110.78) | |
| 6 | | 323 (146.64) | 323 (146.64) | 314 (142.56) | 345 (156.63) | 378 (171.61) | |
| 8 | | 485 (220.19) | 485 (220.19) | 471 (213.83) | 533 (241.98) | 576 (261.50) | |
| 10 | | 925 (419.95) | 925 (419.95) | 897 (407.24) | 1025 (465.35) | 1068 (484.87) | |
| 12 | | 1300 (590.2) | 1300 (590.2) | 1262 (572.95) | 1464 (664.66) | 1608 (730.03) | |

**API 605
WELDING NECK & INTEGRAL FLANGES
(Large Diameter)**



57.2 FOR 300 PSI
28.6 FOR 150 PSI
0 FOR 75PSI



75lbs. Nominal Rating

DIMENSIONS IN MM

| NOMINAL SIZE | WELDING NECK AND INTEGRAL FLANGES | | | | | | | | |
|--------------|-----------------------------------|------------------|----------------------|----------------------------|-----------------|------------------------|--------------------|----------------|-------------|
| | FLANGE OUTSIDE DIAMETER | FLANGE THICKNESS | RAISED-FACE DIAMETER | DRILLING | | | BOLT LENGTH | | |
| | | | | BOLT-CIRCLE DIAMETER (BCD) | NUMBER OF BOLTS | BOLT DIAMETER (INCHES) | BOLT-HOLE DIAMETER | MACHINE BOLT L | STUD BOLT L |
| O | C | R | | | | | | | |
| 26 | 762 | 33.3 | 704.8 | 723.9 | 36 | 5/8 | 19.0 | 102 | 114 |
| 28 | 813 | 33.3 | 755.6 | 774.7 | 40 | 5/8 | 19.0 | 102 | 114 |
| 30 | 864 | 33.3 | 806.4 | 825.5 | 44 | 5/8 | 19.0 | 102 | 114 |
| 32 | 914 | 34.9 | 857.2 | 876.3 | 48 | 5/8 | 19.0 | 108 | 121 |
| 34 | 965 | 34.9 | 908.0 | 927.1 | 52 | 5/8 | 19.0 | 108 | 121 |
| 36 | 1033 | 36.5 | 965.2 | 992.2 | 40 | 3/4 | 22.2 | 114 | 127 |
| 38 | 1084 | 38.1 | 1016.0 | 1043.0 | 40 | 3/4 | 22.2 | 114 | 133 |
| 42 | 1186 | 39.7 | 1117.6 | 1144.6 | 48 | 3/4 | 22.2 | 121 | 133 |
| 48 | 1353 | 46.0 | 1276.4 | 1304.9 | 44 | 7/8 | 25.4 | 140 | 152 |
| 54 | 1508 | 49.2 | 1428.8 | 1460.5 | 48 | 7/8 | 25.4 | 146 | 159 |
| 60 | 1676 | 55.6 | 1587.5 | 1622.4 | 44 | 1 | 28.6 | 159 | 178 |

150lbs. Nominal Rating

| | | | | | | | | | |
|----|------|------|--------|--------|----|-------|------|-----|-----|
| 26 | 786 | 41.3 | 711.2 | 744.5 | 36 | 3/4 | 22.2 | 121 | 140 |
| 28 | 837 | 44.4 | 762.0 | 795.3 | 40 | 3/4 | 22.2 | 127 | 146 |
| 30 | 887 | 44.4 | 812.8 | 846.1 | 44 | 3/4 | 22.2 | 127 | 146 |
| 32 | 941 | 46.0 | 863.6 | 900.1 | 48 | 3/4 | 22.2 | 133 | 146 |
| 34 | 1005 | 49.2 | 920.8 | 957.3 | 40 | 7/8 | 25.4 | 146 | 159 |
| 36 | 1057 | 52.4 | 971.6 | 1009.6 | 44 | 7/8 | 25.4 | 152 | 165 |
| 42 | 1226 | 58.7 | 1130.3 | 1171.6 | 48 | 1 | 28.6 | 165 | 184 |
| 48 | 1392 | 65.1 | 1289.0 | 1335.1 | 44 | 1 1/8 | 31.8 | 184 | 203 |
| 54 | 1549 | 71.4 | 1441.4 | 1492.2 | 56 | 1 1/8 | 31.8 | 197 | 216 |
| 60 | 1726 | 76.2 | 1600.2 | 1662.1 | 52 | 1 1/4 | 34.9 | 210 | 235 |

300lbs. Nominal Rating

| | | | | | | | | | |
|----|------|-------|--------|--------|----|-------|------|-----|-----|
| 26 | 867 | 88.9 | 736.6 | 803.3 | 32 | 1 1/4 | 34.9 | 235 | 260 |
| 28 | 921 | 88.9 | 787.4 | 857.2 | 36 | 1 1/4 | 34.9 | 235 | 260 |
| 30 | 991 | 93.7 | 844.6 | 920.8 | 36 | 1 3/8 | 38.1 | 248 | 273 |
| 32 | 1054 | 103.2 | 901.7 | 977.9 | 32 | 1 1/2 | 41.3 | 273 | 298 |
| 34 | 1108 | 103.2 | 952.5 | 1031.9 | 36 | 1 1/2 | 41.3 | 273 | 298 |
| 36 | 1172 | 103.2 | 1009.6 | 1089.0 | 32 | 1 5/8 | 44.4 | 273 | 305 |
| 42 | 1334 | 119.1 | 1168.4 | 1244.6 | 36 | 1 3/4 | 47.6 | 311 | 343 |
| 48 | 1511 | 128.6 | 1327.2 | 1416.0 | 40 | 1 7/8 | 50.8 | 330 | 368 |
| 54 | 1673 | 136.5 | 1479.6 | 1578.0 | 48 | 1 7/8 | 50.8 | 349 | 387 |
| 60 | 1878 | 150.8 | 1651.0 | 1763.7 | 40 | 2 1/4 | 60.3 | 387 | 432 |

TOLERANCE

| Dimension | Tolerance millimeters |
|---|-----------------------|
| Outside diameter of raised face (R) | ± 0.8 |
| Flange thickness (C) ^a | + 4.8,-0 |
| Overall hub length (Y) | ± 3.2 |
| Inside diameter of welding-neck flange (B) | ± 0.8 |
| Back-to-face parallelism of flange ^a | + 3.2,-16 |

I.GENERAL

*The 3/16-in. tolerance on flange thickness applies, either with or without back-facing or spot-facing, to the thickness at any point on the nut bearing surface

75lbs. Nominal Rating

DIMENSIONS IN MM

| NOMINAL SIZE | WELDING NECK FLANGES | | | | INTEGRAL FLANGES | | | |
|--------------|------------------------------|------------------------------|----------------|---------------|-------------------------------|-------------------------------|-----------------|----------------|
| | DIAMETER OF LARGE END OF HUB | DIAMETER OF SMALL END OF HUB | OVERALL LENGTH | FILLET RADIUS | DIAMETER OF LARGE END OF NECK | DIAMETER OF SMALL END OF NECK | INSIDE DIAMETER | FILLET RADIUS |
| | X | A | T | R | X' | A' | B ^c | r ^c |
| 26 | 676.3 | 662.0 | 58.7 | 7.9 | 676.3 | 676.3 | 644.5 | 9.5 |
| 28 | 727.1 | 712.8 | 61.9 | 7.9 | 727.1 | 727.1 | 695.3 | 9.5 |
| 30 | 777.9 | 763.6 | 65.1 | 7.9 | 777.9 | 777.9 | 746.1 | 9.5 |
| 32 | 828.7 | 814.4 | 69.8 | 7.9 | 828.7 | 828.7 | 795.3 | 9.5 |
| 34 | 879.5 | 865.2 | 73.0 | 7.9 | 879.5 | 879.5 | 844.6 | 12.7 |
| 36 | 935.0 | 916.0 | 85.7 | 9.5 | 935.0 | 935.0 | 895.4 | 12.7 |
| 42 | 1087.4 | 1068.4 | 95.2 | 9.5 | 1087.4 | 1087.4 | 1046.2 | 12.7 |
| 48 | 1241.4 | 1220.8 | 111.1 | 9.5 | 1241.4 | 1241.4 | 1195.4 | 12.7 |
| 54 | 1397.0 | 1373.2 | 125.4 | 9.5 | 1397.0 | 1397.0 | 1347.8 | 15.9 |
| 60 | 1552.6 | 1525.6 | 144.5 | 11.1 | 1552.6 | 1552.6 | 1498.6 | 15.9 |

150lbs. Nominal Rating

| | | | | | | | | |
|----|--------|--------|-------|------|--------|--------|--------|------|
| 26 | 684.2 | 662.0 | 88.9 | 9.5 | 687.4 | 676.3 | 642.9 | 12.7 |
| 28 | 735.0 | 712.8 | 95.2 | 9.5 | 738.2 | 727.1 | 690.6 | 12.7 |
| 30 | 787.4 | 763.6 | 100.0 | 9.5 | 789.0 | 777.9 | 739.8 | 12.7 |
| 32 | 839.8 | 814.4 | 108.0 | 9.5 | 843.0 | 831.8 | 792.2 | 12.7 |
| 34 | 892.2 | 865.2 | 110.3 | 9.5 | 893.8 | 882.6 | 839.8 | 12.7 |
| 36 | 944.6 | 916.0 | 117.5 | 9.5 | 946.2 | 935.0 | 890.6 | 12.7 |
| 42 | 1101.7 | 1070.0 | 133.4 | 11.1 | 1101.7 | 1090.6 | 1038.2 | 15.9 |
| 48 | 1257.3 | 1222.4 | 149.2 | 11.1 | 1258.9 | 1247.8 | 1187.4 | 15.9 |
| 54 | 1412.9 | 1374.8 | 161.9 | 11.1 | 1416.0 | 1404.9 | 1339.8 | 15.9 |
| 60 | 1570.0 | 1527.2 | 179.4 | 14.3 | 1573.2 | 1562.1 | 1485.9 | 19.0 |

300lbs. Nominal Rating

| | | | | | | | | |
|----|--------|--------|-------|------|--------|--------|--------|------|
| 26 | 701.7 | 665.2 | 144.5 | 14.3 | 714.4 | 689.0 | 635.0 | 15.9 |
| 28 | 755.6 | 716.0 | 149.2 | 14.3 | 768.4 | 743.0 | 685.8 | 15.9 |
| 30 | 812.8 | 768.4 | 158.0 | 14.3 | 825.5 | 800.1 | 736.6 | 15.9 |
| 32 | 863.6 | 819.2 | 168.3 | 15.9 | 876.3 | 850.9 | 781.0 | 19.0 |
| 34 | 917.6 | 870.0 | 173.0 | 15.9 | 930.3 | 904.9 | 831.8 | 19.0 |
| 36 | 965.2 | 920.8 | 181.0 | 15.9 | 981.1 | 955.7 | 876.3 | 19.0 |
| 42 | 1117.6 | 1074.7 | 204.8 | 15.9 | 1130.3 | 1101.7 | 1022.4 | 19.0 |
| 48 | 1277.9 | 1227.1 | 223.8 | 15.9 | 1295.4 | 1266.8 | 1168.4 | 19.0 |
| 54 | 1435.1 | 1379.5 | 239.7 | 15.9 | 1457.3 | 1428.8 | 1314.4 | 22.2 |
| 60 | 1598.6 | 1531.9 | 271.5 | 17.5 | 1624.0 | 1692.3 | 1460.5 | 22.2 |

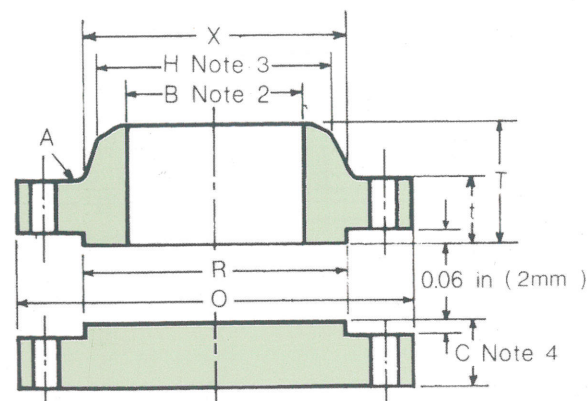
The 0.03-in. Tolerance applies, either with or without back-facing or spot-facing, to the parallelism between the flange face and nut bearing surface on back of flange.

I.GENERAL

Tolerances for the welding end of a welding neck flange shall be in conformance with ANSI B16.5

150lb.

MSS SP-44 MSS LARGE DIAMETER FLANGES



Class 150

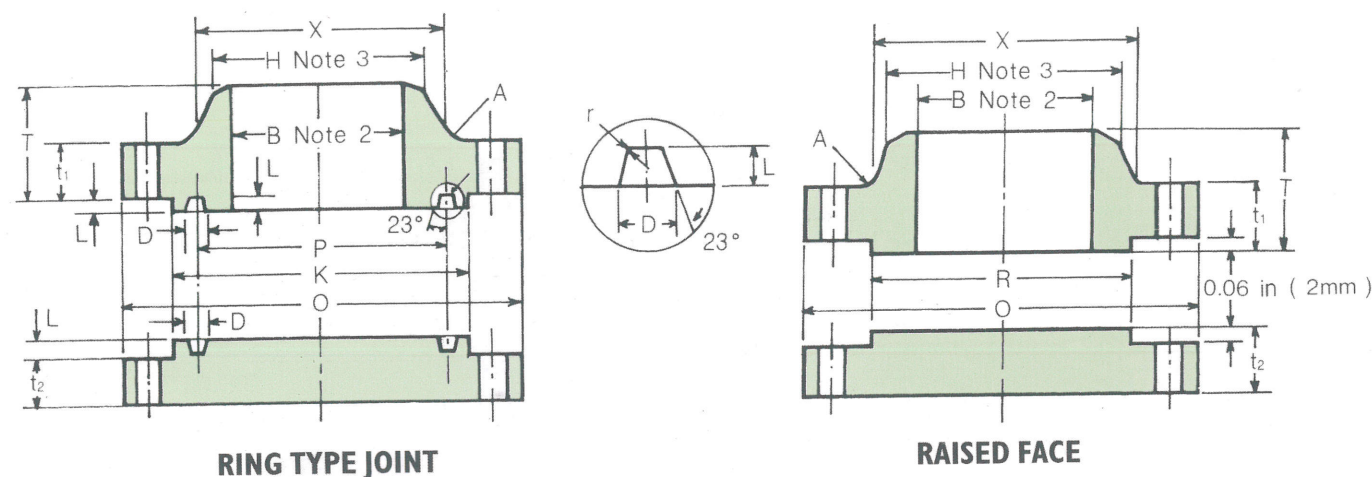
DIMENSIONS IN MM

| PIPE SIZE | FLANGE DIMENSIONS | | | HUB DIMENSIONS | | | | FILLET RADIUS (MIN) | |
|-----------|-------------------|-----------------------|-----------------|------------------|------------------|--------------------|---------------------|---------------------|------------------|
| | OD OF FLANGE | THICK OF FLANGE (MIN) | LENGTH THRU HUB | OD LARGE END HUB | NO OF BOLT HOLES | DIA. OF BOLT HOLES | DIA. OF BOLT CIRCLE | | RAISED FACE DIA. |
| | | | | | | | | | |
| 12 | 483 | 32.0 | 114 | 365 | 12 | 25 | 432 | 381 | 10 |
| 14 | 535 | 35.0 | 127 | 400 | 12 | 29 | 476 | 413 | 10 |
| 16 | 595 | 36.5 | 127 | 457 | 16 | 29 | 540 | 470 | 10 |
| 18 | 635 | 39.5 | 140 | 505 | 16 | 32 | 578 | 533 | 10 |
| 20 | 700 | 43.0 | 144 | 560 | 20 | 32 | 635 | 584 | 10 |
| 22 | 750 | 46.0 | 149 | 610 | 20 | 35 | 692 | 641 | 10 |
| 24 | 815 | 47.5 | 152 | 665 | 20 | 35 | 749 | 692 | 10 |
| 26 | 870 | 68.5 | 121 | 675 | 24 | 35 | 806 | 749 | 10 |
| 28 | 925 | 71.5 | 125 | 725 | 28 | 35 | 863 | 800 | 11 |
| 30 | 985 | 74.5 | 137 | 780 | 28 | 35 | 914 | 857 | 11 |
| 32 | 1060 | 81.0 | 144 | 830 | 28 | 41 | 978 | 914 | 11 |
| 34 | 1110 | 82.5 | 149 | 880 | 32 | 41 | 1029 | 965 | 13 |
| 36 | 1170 | 90.5 | 157 | 935 | 32 | 41 | 1086 | 1022 | 13 |
| 38 | 1240 | 87.5 | 157 | 990 | 32 | 41 | 1150 | 1073 | 13 |
| 40 | 1290 | 90.5 | 164 | 1040 | 36 | 41 | 1200 | 1124 | 13 |
| 42 | 1345 | 97.5 | 171 | 1090 | 36 | 41 | 1257 | 1194 | 13 |
| 44 | 1405 | 102.0 | 178 | 1145 | 40 | 41 | 1314 | 1245 | 13 |
| 46 | 1455 | 103.0 | 186 | 1195 | 40 | 41 | 1365 | 1295 | 13 |
| 48 | 1510 | 108.0 | 192 | 1250 | 44 | 41 | 1422 | 1359 | 13 |
| 50 | 1570 | 111.0 | 203 | 1300 | 44 | 48 | 1480 | 1410 | 13 |
| 52 | 1625 | 116.0 | 210 | 1355 | 44 | 48 | 1537 | 1460 | 13 |
| 54 | 1685 | 121.0 | 216 | 1405 | 44 | 48 | 1594 | 1511 | 13 |
| 56 | 1745 | 124.0 | 229 | 1455 | 48 | 48 | 1651 | 1575 | 13 |
| 58 | 1805 | 129.0 | 235 | 1510 | 48 | 48 | 1708 | 1626 | 13 |
| 60 | 1855 | 132.0 | 240 | 1560 | 52 | 48 | 1759 | 1676 | 13 |

1.For machining tolerances see ANSI Standard B16.5
2.Dimensions to be specified by customer.
3.Thickness of Blind Flange and ring of Weld Neck Flange are equal.

300lb.

MSS SP-44 MSS LARGE DIAMETER FLANGES



Class 300

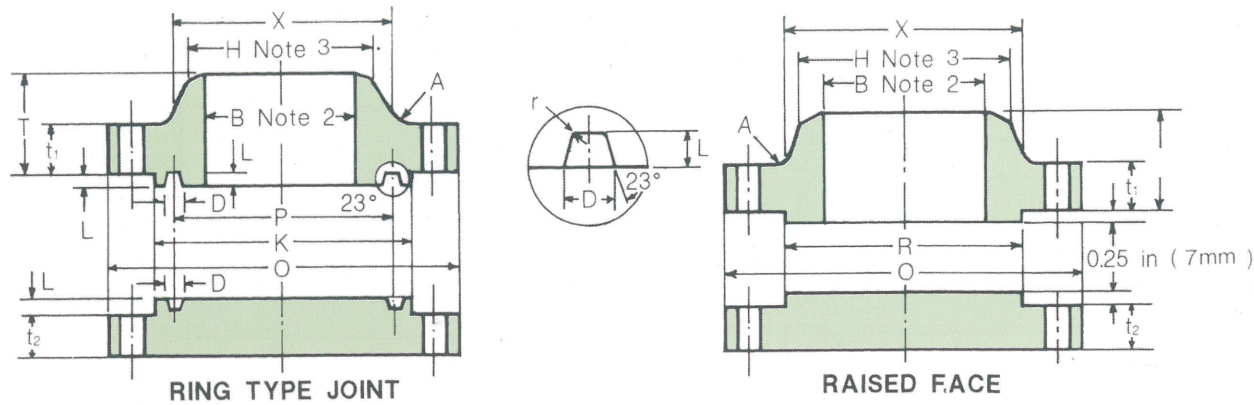
DIMENSIONS IN MM

| PIPE SIZE | FLANGE DIMENSIONS | | | | HUB DIM | DRILLING | | | FACING DRILLING | | | | | FILLET RADIUS (MIN) | GROOVE FILLET RADIUS | | |
|-----------|-------------------|-----------------|------|-----------------|---------|------------------|-------------------|--------------------|---------------------|------------------|-----------------|-----------------|------------|---------------------|----------------------|-----------------|----------|
| | OD OF FLANGE | THICK OF FLANGE | | | | OD LARGE END HUB | NO. OF BOLT HOLES | DIA. OF BOLT HOLES | DIA. OF BOLT CIRCLE | RAISED FACE DIA. | RING-TYPE JOINT | | | | | | |
| | | WELD-NECK | BLD. | LENGTH THRU HUB | | | | | | | FACING DIA. | DEPTH OF GROOVE | PITCH DIA. | | | WIDTH OF GROOVE | RING NO. |
| | | O | T1 | T2 | | | | | | | T | X | R | | | K | L |
| 12 | 520 | 51.0 | 51.0 | 130 | 375 | 16 | 32 | 451 | 381 | 413 | 7.95 | 381.00 | 11.90 | R57 | 10 | 1 | |
| 14 | 585 | 54.0 | 54.0 | 143 | 425 | 20 | 32 | 514 | 413 | 457 | 7.95 | 419.10 | 11.90 | R61 | 10 | 1 | |
| 16 | 650 | 57.0 | 57.0 | 146 | 483 | 20 | 35 | 572 | 470 | 508 | 7.95 | 469.90 | 11.90 | R65 | 10 | 1 | |
| 18 | 710 | 60.5 | 60.5 | 159 | 535 | 24 | 35 | 629 | 533 | 575 | 7.95 | 533.40 | 11.90 | R69 | 10 | 1 | |
| 20 | 775 | 63.5 | 63.5 | 162 | 585 | 24 | 35 | 686 | 584 | 635 | 9.52 | 584.20 | 13.50 | R73 | 10 | 2 | |
| 22 | 840 | 66.5 | 66.5 | 165 | 640 | 24 | 41 | 743 | 641 | 686 | 11.10 | 635.00 | 15.10 | R81 | 10 | 2 | |
| 24 | 915 | 70.0 | 70.0 | 168 | 700 | 24 | 41 | 813 | 692 | 749 | 11.10 | 692.15 | 16.66 | R77 | 10 | 2 | |
| 26 | 970 | 79.5 | 84.0 | 184 | 725 | 28 | 44 | 876 | 749 | 810 | 12.70 | 749.30 | 19.85 | R93 | 10 | 2 | |
| 28 | 1035 | 82.5 | 90.5 | 197 | 775 | 28 | 44 | 940 | 800 | 860 | 12.70 | 800.10 | 19.85 | R94 | 11 | 2 | |
| 30 | 1090 | 92.0 | 90.5 | 210 | 825 | 28 | 48 | 997 | 857 | 918 | 12.70 | 857.25 | 19.85 | R95 | 11 | 2 | |
| 32 | 1150 | 98.5 | 100 | 222 | 880 | 28 | 51 | 1054 | 914 | 984 | 14.30 | 914.40 | 23.00 | R96 | 11 | 2 | |
| 34 | 1205 | 102 | 105 | 232 | 935 | 28 | 51 | 1105 | 965 | 1035 | 14.30 | 965.20 | 23.00 | R97 | 13 | 2 | |
| 36 | 1270 | 105 | 111 | 241 | 990 | 32 | 54 | 1168 | 1022 | 1092 | 14.30 | 1022.35 | 23.00 | R98 | 13 | 2 | |
| 38 | 1170 | 108 | 108 | 181 | 995 | 32 | 41 | 1092 | 1029 | | | | | | 13 | | |
| 40 | 1240 | 114 | 114 | 194 | 1050 | 32 | 44 | 1156 | 1086 | | | | | | 13 | | |
| 42 | 1290 | 119 | 119 | 200 | 1100 | 32 | 44 | 1206 | 1137 | | | | | | 13 | | |
| 44 | 1355 | 124 | 124 | 206 | 1150 | 32 | 48 | 1264 | 1194 | | | | | | 13 | | |
| 46 | 1415 | 129 | 129 | 216 | 1205 | 28 | 51 | 1321 | 1245 | | | | | | 13 | | |
| 48 | 1465 | 133 | 133 | 224 | 1255 | 32 | 51 | 1372 | 1308 | | | | | | 13 | | |
| 50 | 1530 | 140 | 140 | 232 | 1305 | 32 | 54 | 1429 | 1359 | | | | | | 13 | | |
| 52 | 1580 | 144 | 144 | 238 | 1355 | 32 | 54 | 1480 | 1410 | | | | | | 13 | | |
| 54 | 1660 | 152 | 152 | 252 | 1410 | 28 | 60 | 1549 | 1467 | | | | | | 13 | | |
| 56 | 1710 | 154 | 154 | 260 | 1465 | 28 | 60 | 1600 | 1518 | | | | | | 13 | | |
| 58 | 1760 | 159 | 159 | 267 | 1515 | 32 | 60 | 1651 | 1575 | | | | | | 13 | | |
| 60 | 1810 | 164 | 164 | 273 | 1565 | 32 | 60 | 1702 | 1626 | | | | | | 13 | | |

1.For machining tolerances see ANSI Standard B16.5
2.Dimensions to be specified by customer

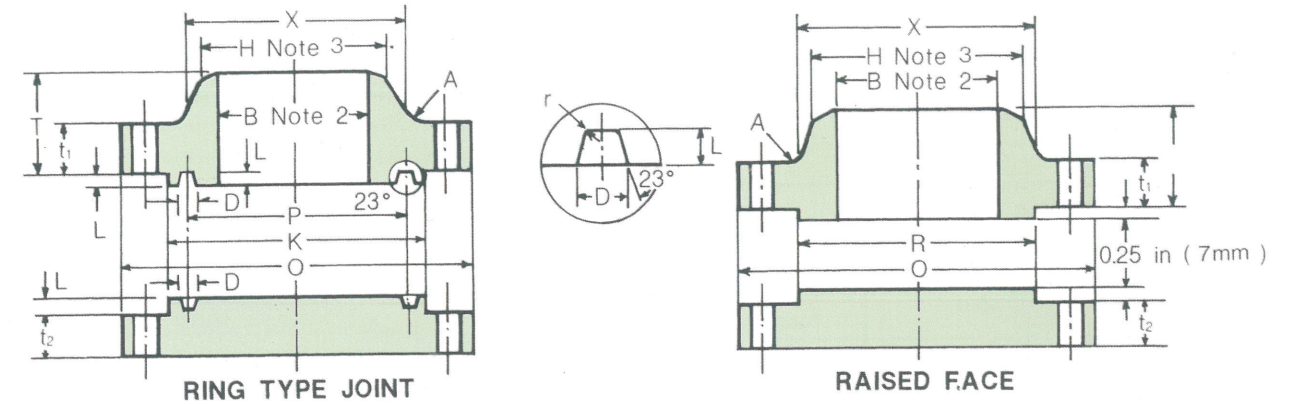
400lb.

MSS SP-44
MSS LARGE DIAMETER FLANGES



600lb.

MSS SP-44
MSS LARGE DIAMETER FLANGES



Class 400

DIMENSIONS IN MM

| PIPE SIZE | FLANGE DIMENSIONS | | | | HUB DIM OD LARGE END HUB X | DRILLING | | | FACING DRILLING | | | | | FILLET RADIUS (MIN) A | GROOVE FILLET RADIUS R | |
|-----------|-------------------|-----------------|------------|----------------------|----------------------------------|-------------------|--------------------|---------------------|-----------------------|------------------|----------------------|-----------------|----------------------|--------------------------|---------------------------|----------|
| | OD OF FLANGE O | THICK OF FLANGE | | | | NO. OF BOLT HOLES | DIA. OF BOLT HOLES | DIA. OF BOLT CIRCLE | RING-TYPE JOINT | | | | | | | |
| | | WELD-NECK T1 | BLD. T2 | LENGTH THRU HUB T | | | | | RAISED FACE DIA. R | FACING DIA. K | DEPTH OF GROOVE L | PITCH DIA. P | WIDTH OF GROOVE D | | | RING NO. |
| | | | | | | | | | | | | | | | | |
| 12 | 520 | 57.0 | 57.0 | 136 | 375 | 16 | 35 | 451 | 381 | 413 | 7.95 | 381.00 | 11.90 | R57 | 11 | 1 |
| 14 | 585 | 60.5 | 60.5 | 149 | 425 | 20 | 35 | 514 | 413 | 457 | 7.95 | 419.10 | 11.90 | R61 | 11 | 1 |
| 16 | 650 | 63.5 | 63.5 | 152 | 483 | 20 | 38 | 572 | 470 | 508 | 7.95 | 469.90 | 11.90 | R65 | 11 | 1 |
| 18 | 710 | 66.5 | 66.5 | 165 | 535 | 24 | 38 | 629 | 533 | 575 | 7.95 | 533.40 | 11.90 | R69 | 11 | 1 |
| 20 | 775 | 70.0 | 70.0 | 168 | 585 | 24 | 41 | 686 | 584 | 635 | 9.52 | 584.20 | 13.50 | R73 | 11 | 2 |
| 22 | 840 | 73.0 | 73.0 | 171 | 640 | 24 | 44 | 743 | 641 | 686 | 11.10 | 635.00 | 15.10 | R81 | 11 | 2 |
| 24 | 915 | 76.0 | 76.0 | 175 | 700 | 24 | 48 | 813 | 692 | 749 | 11.10 | 692.15 | 16.66 | R77 | 11 | 2 |
| 26 | 970 | 89.0 | 98.5 | 194 | 725 | 28 | 48 | 876 | 749 | 810 | 12.70 | 749.30 | 19.85 | R93 | 11 | 2 |
| 28 | 1035 | 95.0 | 105 | 206 | 785 | 28 | 51 | 940 | 800 | 860 | 12.70 | 800.10 | 19.85 | R94 | 13 | 2 |
| 30 | 1090 | 102 | 111 | 219 | 835 | 28 | 54 | 997 | 857 | 918 | 12.70 | 857.25 | 19.85 | R95 | 13 | 2 |
| 32 | 1150 | 108 | 116 | 232 | 890 | 28 | 54 | 1054 | 914 | 984 | 14.30 | 914.40 | 23.00 | R96 | 13 | 2 |
| 34 | 1205 | 111 | 122 | 241 | 945 | 28 | 54 | 1105 | 965 | 1035 | 14.30 | 965.20 | 23.00 | R97 | 14 | 2 |
| 36 | 1270 | 114 | 129 | 251 | 1000 | 32 | 54 | 1168 | 1022 | 1092 | 14.30 | 1022.35 | 23.00 | R98 | 14 | 2 |
| 38 | 1205 | 124 | 124 | 206 | 1005 | 32 | 48 | 1118 | 1035 | | | | | | 14 | |
| 40 | 1270 | 130 | 130 | 216 | 1055 | 32 | 51 | 1175 | 1092 | | | | | | 14 | |
| 42 | 1320 | 133 | 133 | 224 | 1110 | 32 | 51 | 1226 | 1143 | | | | | | 14 | |
| 44 | 1385 | 140 | 140 | 233 | 1160 | 32 | 54 | 1283 | 1200 | | | | | | 14 | |
| 46 | 1440 | 146 | 146 | 244 | 1215 | 36 | 54 | 1340 | 1257 | | | | | | 14 | |
| 48 | 1510 | 152 | 152 | 257 | 1265 | 28 | 60 | 1403 | 1308 | | | | | | 14 | |
| 50 | 1570 | 157 | 159 | 268 | 1320 | 32 | 60 | 1460 | 1362 | | | | | | 14 | |
| 52 | 1620 | 162 | 164 | 276 | 1370 | 32 | 60 | 1511 | 1413 | | | | | | 14 | |
| 54 | 1700 | 170 | 171 | 289 | 1425 | 28 | 67 | 1581 | 1470 | | | | | | 14 | |
| 56 | 1755 | 175 | 176 | 298 | 1480 | 32 | 67 | 1632 | 1527 | | | | | | 14 | |
| 58 | 1705 | 178 | 181 | 306 | 1530 | 32 | 67 | 1683 | 1578 | | | | | | 14 | |
| 60 | 1885 | 186 | 189 | 319 | 1585 | 32 | 73 | 1753 | 1635 | | | | | | 14 | |

1.For machining tolerances see ANSI Standard B16.5
2.Dimensions to be specified by customer

Class 600

DIMENSIONS IN MM

| PIPE SIZE | FLANGE DIMENSIONS | | | | HUB DIM OD LARGE END HUB X | DRILLING | | | FACING DRILLING | | | | | FILLET RADIUS (MIN) A | GROOVE FILLET RADIUS R | |
|-----------|-------------------|-----------------|------------|----------------------|----------------------------------|-------------------|--------------------|---------------------|-----------------------|------------------|----------------------|-----------------|----------------------|--------------------------|---------------------------|----------|
| | OD OF FLANGE O | THICK OF FLANGE | | | | NO. OF BOLT HOLES | DIA. OF BOLT HOLES | DIA. OF BOLT CIRCLE | RAISED FACE DIA. R | RING-TYPE JOINT | | | | | | |
| | | WELD-NECK T1 | BLD. T2 | LENGTH THRU HUB T | | | | | | FACING DIA. K | DEPTH OF GROOVE L | PITCH DIA. P | WIDTH OF GROOVE D | | | RING NO. |
| | | | | | | | | | | | | | | | | |
| 12 | 560 | 66.5 | 66.5 | 156 | 387 | 20 | 35 | 489 | 381 | 413 | 7.95 | 381.00 | 11.90 | R57 | 11 | 1 |
| 14 | 605 | 70.0 | 70.0 | 165 | 432 | 20 | 38 | 527 | 413 | 457 | 7.95 | 419.10 | 11.90 | R61 | 11 | 1 |
| 16 | 685 | 76.0 | 76.0 | 178 | 495 | 20 | 41 | 603 | 470 | 508 | 7.95 | 469.90 | 11.90 | R65 | 11 | 1 |
| 18 | 740 | 82.5 | 82.5 | 184 | 545 | 20 | 44 | 654 | 533 | 575 | 7.95 | 533.40 | 11.90 | R69 | 11 | 1 |
| 20 | 815 | 89.0 | 89.0 | 190 | 610 | 24 | 44 | 724 | 584 | 635 | 9.52 | 584.20 | 13.50 | R73 | 11 | 2 |
| 22 | 870 | 95.0 | 95.0 | 197 | 665 | 24 | 47 | 778 | 641 | 686 | 11.10 | 635.00 | 15.10 | R81 | 11 | 2 |
| 24 | 940 | 102 | 102 | 203 | 720 | 24 | 51 | 838 | 692 | 749 | 11.10 | 692.15 | 16.66 | R77 | 11 | 2 |
| 26 | 1015 | 108 | 125 | 222 | 750 | 28 | 51 | 914 | 749 | 810 | 12.70 | 749.30 | 19.85 | R93 | 11 | 2 |
| 28 | 1075 | 111 | 132 | 235 | 805 | 28 | 54 | 965 | 800 | 860 | 12.70 | 800.10 | 19.85 | R94 | 13 | 2 |
| 30 | 1130 | 114 | 140 | 248 | 860 | 28 | 54 | 1022 | 857 | 918 | 12.70 | 857.25 | 19.85 | R95 | 13 | 2 |
| 32 | 1195 | 117 | 148 | 260 | 920 | 28 | 60 | 1980 | 914 | 984 | 14.30 | 914.40 | 23.00 | R96 | 13 | 2 |
| 34 | 1245 | 121 | 154 | 270 | 975 | 28 | 60 | 1130 | 965 | 1035 | 14.30 | 965.20 | 23.00 | R97 | 14 | 2 |
| 36 | 1315 | 124 | 162 | 283 | 1030 | 28 | 67 | 1194 | 1022 | 1092 | 14.30 | 1022.35 | 23.00 | R98 | 14 | 2 |
| 38 | 1270 | 152 | 156 | 254 | 1020 | 28 | 60 | 1162 | 1054 | | | | | | 14 | |
| 40 | 1320 | 159 | 162 | 264 | 1075 | 32 | 60 | 1213 | 1111 | | | | | | 14 | |
| 42 | 1405 | 168 | 171 | 279 | 1125 | 28 | 67 | 1283 | 1168 | | | | | | 14 | |
| 44 | 1455 | 173 | 178 | 289 | 1180 | 32 | 67 | 1334 | 1226 | | | | | | 14 | |
| 46 | 1510 | 179 | 186 | 300 | 1235 | 32 | 67 | 1391 | 1276 | | | | | | 14 | |
| 48 | 1595 | 189 | 195 | 316 | 1290 | 32 | 73 | 1460 | 1334 | | | | | | 14 | |
| 50 | 1670 | 197 | 203 | 329 | 1345 | 28 | 79 | 1524 | 1384 | | | | | | 14 | |
| 52 | 1720 | 203 | 210 | 337 | 1395 | 32 | 79 | 1575 | 1435 | | | | | | 14 | |
| 54 | 1780 | 210 | 217 | 349 | 1450 | 32 | 79 | 1632 | 1492 | | | | | | 14 | |
| 56 | 1855 | 217 | 225 | 362 | 1500 | 32 | 86 | 1695 | 1543 | | | | | | 16 | |
| 58 | 1905 | 222 | 232 | 370 | 1555 | 32 | 86 | 1746 | 1600 | | | | | | 16 | |
| 60 | 1995 | 233 | 243 | 389 | 1610 | 28 | 92 | 1822 | 1657 | | | | | | 17 | |

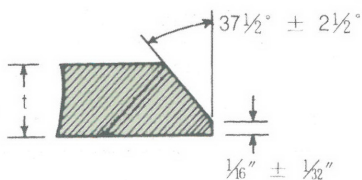
1.For machining tolerances see ANSI Standard B16.5
2.Dimensions to be specified by customer

DIMENSIONAL TOLERANCES ANSI B16.5-1992a

| THREAD, SOCKET-WELDING, SLIP-ON, LAP JOINT AND BLIND | | | WELDING NECK | | |
|--|--|---|--|--|---|
| OUTSIDE DIAMETER | When O.D. is 24" or less | $\pm 1/16"$ (1.6mm) | OUTSIDE DIAMETER | When O.D. is 24" or Less | $\pm 1/16"$ (1.6mm) |
| | When O.D. is Over 24" | $\pm 1/8"$ (3.2mm) | | When O.D. is Over 24" | $\pm 1/8"$ (3.2mm) |
| INSIDE DIAMETER | Threaded | Within limits on boring gauge | INSIDE DIAMETER | 10" and Small | $\pm 1/32"$ (0.8mm) |
| | Socket-Welding. Slip-on and Lap joint | 10" & Smaller $+1/32"$ (0.8mm), -0" 12" & Larger $+1/16"$ (1.6mm), -0" | | 12" thru 18" | $\pm 1/16"$ (1.6mm) |
| 20" and Larger | | | | $+1/8"$ (3.2mm) $-1/16"$ (1.6mm) | |
| OUTSIDE DIAMETER OF HUB | 12" and Small | $+3/32"$ (2.4mm) $-1/16"$ (1.6mm) | DIAMETER OF CONTACT FACE | 1/16" Raised Face | $\pm 1/32"$ (0.8mm) |
| | 14" and Larger | $\pm 1/8"$ (3.2mm) | | 1/4"/raised Face Tongue & Groove Male, Female | $\pm 1/64"$ (0.4mm) |
| DIAMETER OF CONTACT FACE | 1/16" Raised Face | $\pm 1/32"$ (0.8mm) | DIAMETER OF HUB AT BASE | When Hub Base is 24" or Smaller | $\pm 1/16"$ (1.6mm) |
| | 1/4"/raused Face Tongue & Groove Male, Female | $\pm 1/64"$ (0.4mm) | | When Hub Base is Over 24" | $\pm 1/8"$ (3.2mm) |
| DIAMETER OF COUNTERBORE | Same as for Inside Diameter | | DIAMETER OF HUB AT POINT OF WELDING | 5" and Smaller | $+3/32"$ (2.4mm) $-1/32"$ (0.8mm) |
| | | | | 6" and Larger | $+5/32"$ (4.0mm) $-1/32"$ (0.8mm) |
| DRILLING | Bolt Circle | $\pm 1/16"$ (1.6mm) | DRILLING | Bolt Circle | $\pm 1/16"$ (1.6mm) |
| | Bolt hole spacing | $\pm 1/32"$ (0.8mm) | | Bolt hole spacing | $\pm 1/32"$ (0.8mm) |
| | Eccentricity of Bolt Circle with Respect to Facing | 2 1/2" & Smaller $1/32"$ (0.8mm) max 3" & Larger $1/16"$ (1.6mm) max | | Eccentricity of Bolt Circle with Respect to Facing | 2 1/2" & Smaller $1/32"$ (0.8mm) max 3" & Larger $1/16"$ (1.6mm) max |
| THICKNESS | 18" and Smaller | $+1/8"$ (3.2mm), -0" | THICKNESS | 18" and Smaller | $+1/8"$ (3.2mm), -0" |
| | 20" and Larger | $+3/16"$ (4.8mm), -0" | | 20" and Larger | $+3/16"$ (4.8mm), -0" |
| LINGTH THRR HUB | 18" and Smaller | $+1/8"$ (3.2mm), -1/32(0.8mm) | LINGTH THRR HUB | 10" and Smaller | $\pm 1/16"$ (1.6mm) |
| | 20" and Larger | $+3/16"$ (4.8mm), -1/16"(1.6mm) | | 12" and Larger | $\pm 1/8"$ (3.2mm) |

WELDING BEVEL STANDARDS

For wall thickness "t" 3/16" to 3/4" incl



For wall thickness "t" greater than 3/4"

