

BS 10 : 1962

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

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

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

Note

- Bolt hole diameters are as follows:

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

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

BS 10 : 1962

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

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

Note

Bolt hole diameters are as follows:

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

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

Pressure/Temperature Ratings

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

Materials: 304, 304H

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

Note

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

Pressure/temperature ratings

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

Note

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

Materials: 316, 316H, 317

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

Note

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

Pressure/temperature ratings

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

Note

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

Pressure/Temperature Ratings

Materials: 316L, 304L

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

Note

1 Not to be used over 800°F.

Pressure/temperature ratings

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

Note

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

Materials: 321, 321H

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

Notes

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

2 Not to be used over 1000°F.

Pressure/temperature ratings

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

Note

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

Pressure/Temperature Ratings

Materials: 347, 347H, 348, 348H

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

Notes

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

Pressure/temperature ratings

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

Note

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

Materials: 309S, 309H

| Nominal Designation | Forgings | Plates |
|---------------------|----------|---|
| 23Cr-12Ni | - | A 240 Gr. 309S ^{1,2,3} A 240 Gr. 309H |

Notes

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

Pressure/temperature ratings

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

Note

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

Pressure/Temperature Ratings

Materials: 310, 310S, 310H

| Nominal Designation | Forgings | Plates |
|---------------------|-------------------------------|---|
| 25Cr-20Ni | A 182 Gr. F310 ^{1,3} | A 240 Gr. 310S ^{1,2,3} A 240 Gr. 310H |

Notes

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

Pressure/temperature ratings

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

Note

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

Materials: F44, F51, F53

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

Note

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

Pressure/temperature ratings

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

Note

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