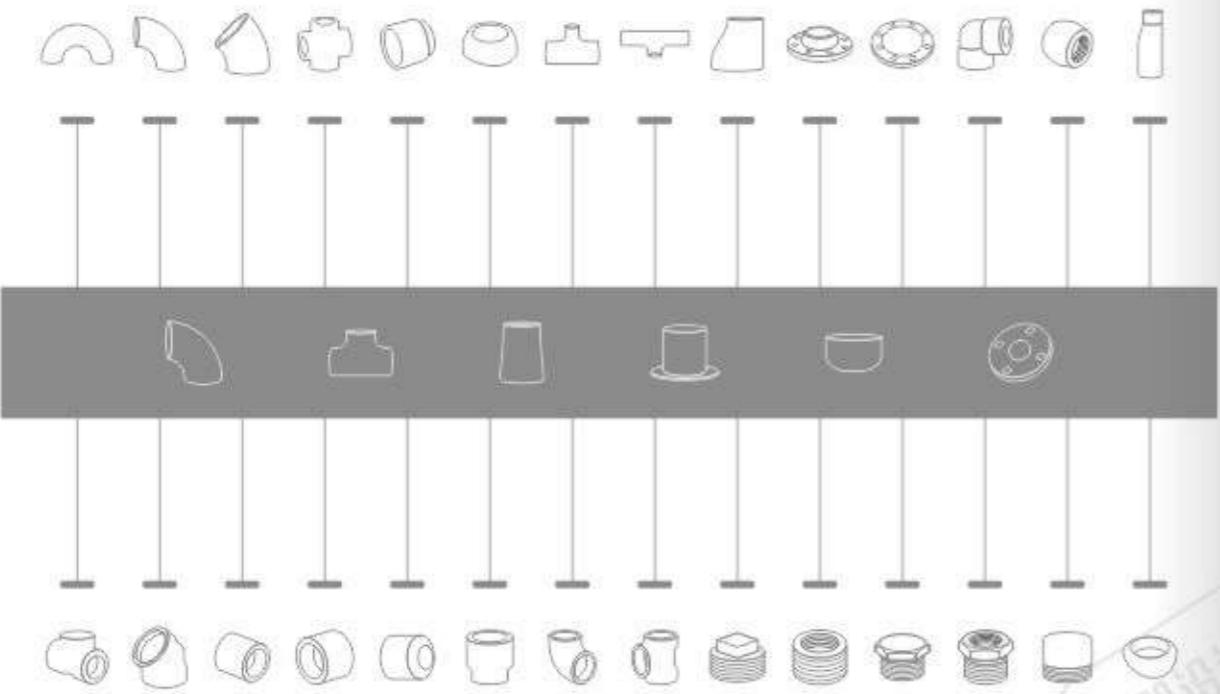




**SINOTEC**  
湖南格润德管业有限公司  
HUNAN GREAT STEEL PIPE CO.,LTD

One-stop Procurement



Sole Agent: Essential Trading Co.,Ltd  
Address: 15/F., Toi Shan Centre,  
128 Johnston Road, Wanchai,  
Hong Kong  
Tel: 28339906  
Fax: 28385587  
E-mail: essenthk@essential.imsbiz.com.hk  
Website: <http://essential-hk.com/>

Address:  
No.9 Xiangfu Rd, Yuhua District, Changsha, Hunan, China



BASED IN CHINA, SERVING THE WORLD

## CONTENTS

|  |    |                      |
|--|----|----------------------|
|  | 01 | PROFILE              |
|  | 03 | EQUIPMENTS           |
|  | 05 | QUALITY              |
|  | 07 | PROCESS              |
|  | 09 | PRODUCTS             |
|  | 20 | TECHNICAL PARAMETERS |

# PROFILE



## Pipe Fittings Manufacture

SHINESTAR STEEL GROUP is specialized in manufacturing superior quality steel products, and providing outstanding service for valued clients all over the world. Founded in 1993, our business covers from steel pipe and fittings manufacturing, stocking and one-stop purchasing.

Hunan Great Steel Pipe Co., Ltd is THE LONGEST ESTABLISHED and THE LARGEST OPERATED subsidiary under the group. Starting from the selling of carbon steel pipes, after years of developing, now we have a complete product matrix for meeting the needs of different clients in piping system area. Pipe fittings is used for piping connection, control, change of direction, diversion, sealing, supporting, etc. Stainless steel is relatively durable and have a strong resistance to various chemicals. Therefore stainless steel pipe fittings play a very important role in the whole steel piping system. Hunan Great Steel Pipe Co., Ltd is dedicated in offering one-stop procurement service for the steel piping system area.



With strong technical force, advanced equipment and skilled craftsmanship, we can supply various type of fittings with quality guaranteed. The production of industrial pipe fittings Outside Diameter ranges from 12mm to 508mm, and the Wall Thickness ranges from 1mm to 40mm, covering type such as 45 degree, 80 degree and 180 degree stainless steel elbow, equal tee, reducing tee, cross, concentric reducer, eccentric reducer, cap stub end and flanges. The production of industrial pipe fittings is strictly in accordance with the international and domestic standard, such as GB standard, ASTM B16.9/16.5, ASTM A403, DIN 2605, EN 10253, BS 1965, JISB2312, with material TP304L, TP304H, TP316L, TP321H, TP317L, TP310, Duplex stainless SS31803/2205 and special materials as 904L, TP347H, TP316Ti etc. We use high quality raw materials and technical advanced equipment to ensure the quality of pipe fittings. There are three branches and 12 advanced production lines for pipe fittings and flanges, including forging machine, intermediate frequency pushing machine, cold forming machine, hot extrusion machine, heat treatment machine and other craftsmanship. The Production capacity is over 20,000 tons.

**20,000<sup>+</sup>  
tons**



Our industrial pipe fittings are widely applied to paper making, shipping line, petroleum transporting, chemical industrial, machinery, electric power, pharmacy line, construction industry, food line etc. Based on the principle of **QUALITY FIRST CUSTOMER FOREMOST**, we sincerely hope to be your reliable and long term partner. Thanks to the unwavering dedication of our team, we are proud to be a designated supplier for PetroChina and a qualified supplier for esteemed organizations such as China General Nuclear Power, Three Gorges Group, Datang Power, and Water Supplies Department and Drainage Services Department in Hong Kong SAR.

# EQUIPMENTS



5T Forging machine



2000t Hydraulic press



Workshop



Ring rolling machine



Machining center



CNC lathe

# QUALITY



In order to ensure the quality of pipe fittings, we established an independent laboratories to make kinds of testing. Under the strict control system - ISO 9001 certified, we demonstrate our ability to consistently provide products and service that meet customer and applicable statutory and

regulatory requirements. We aim to enhance customer satisfaction through the effective application of the system, including processes for improvement of the system and the assurance of the conformity to customer and applicable statutory and regulatory requirements.

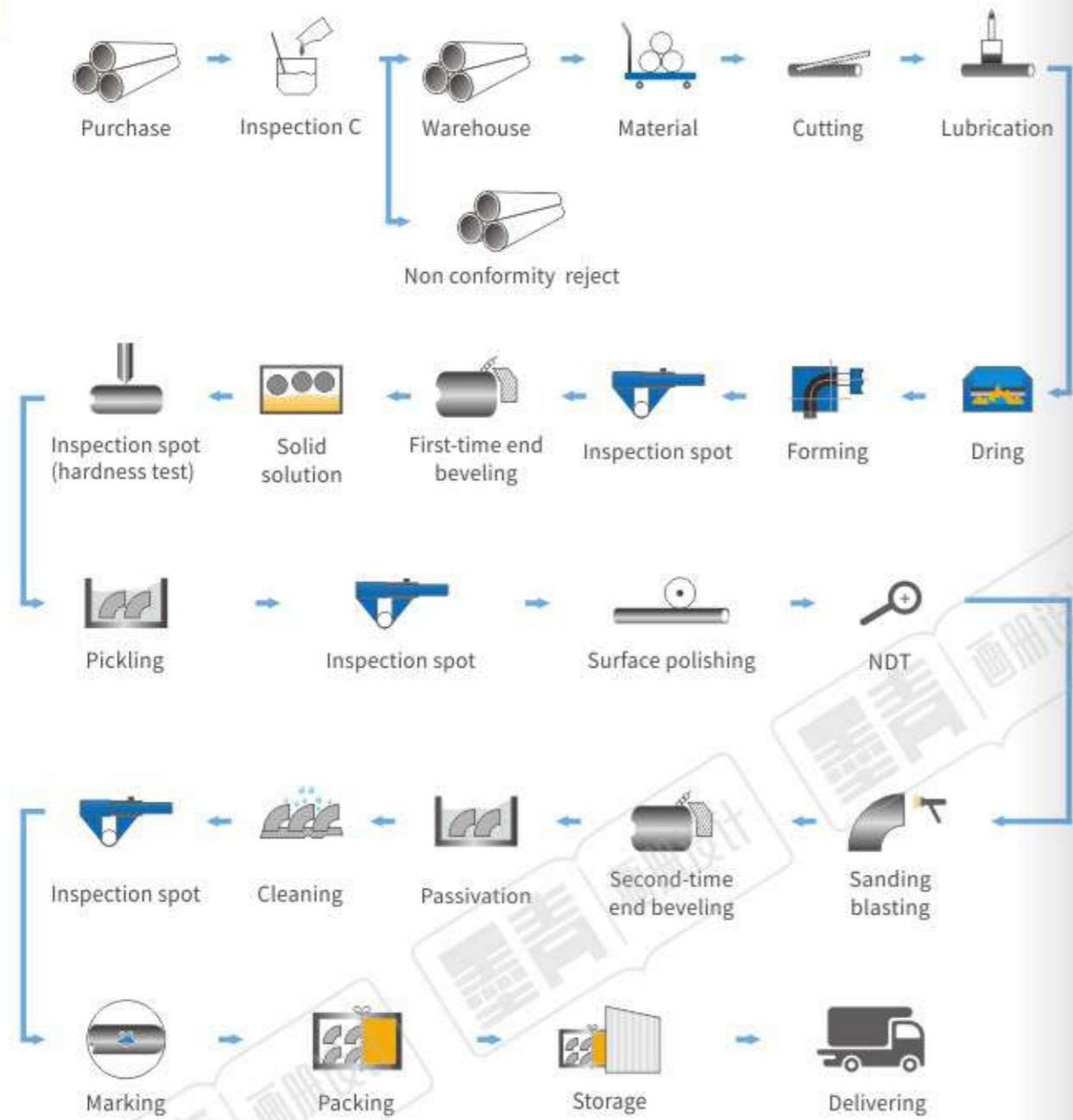


We have a full set of testing equipment and methods, such as Hydraulic Universal Testing, Bend Tests, Eddy-Current Testing, Tensile Test, Weld Decay Test, Weld Decay Test, Ultrasonic Test, Rockwell Hardness Test, Ultrasonic Testing etc.

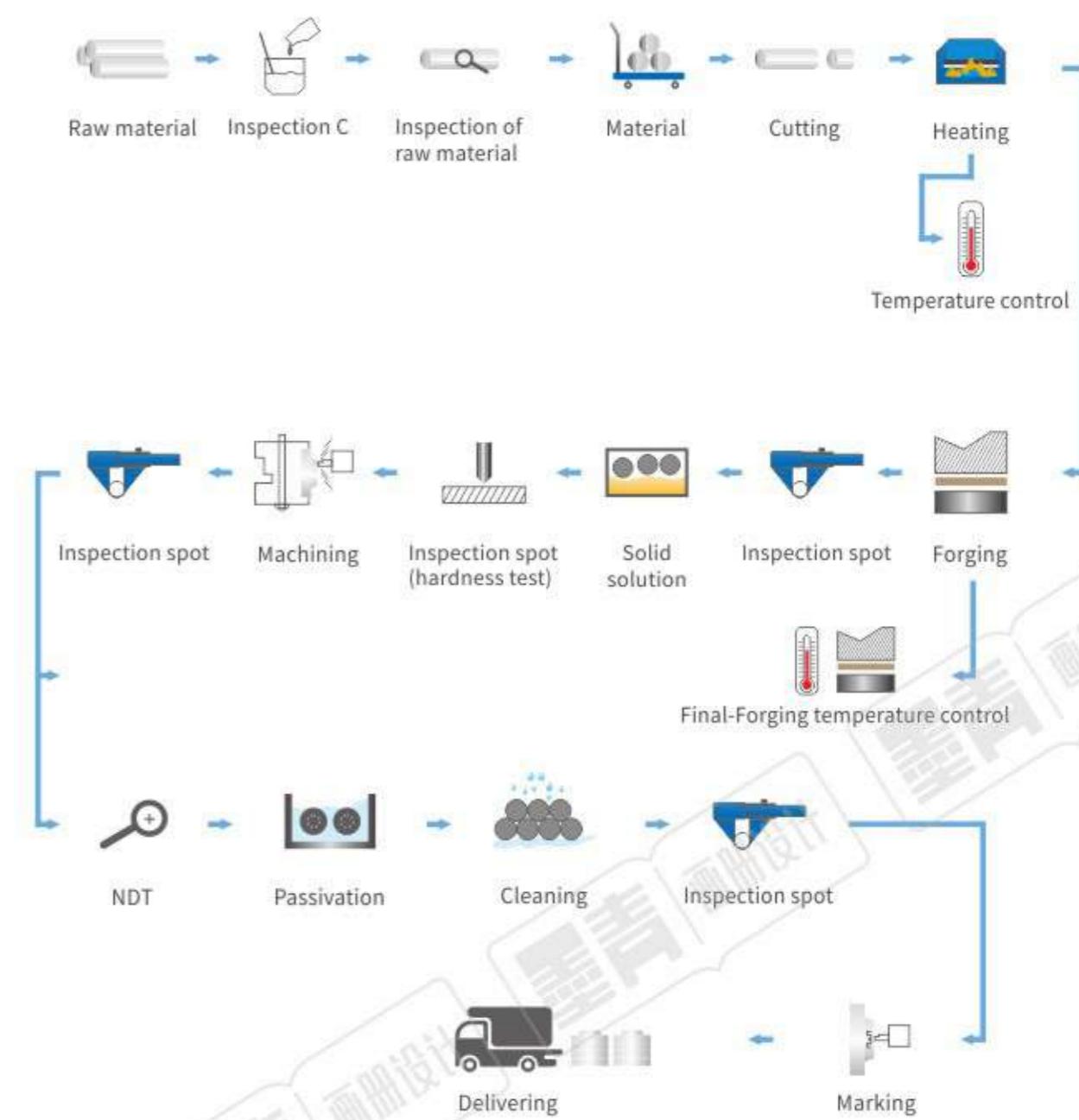


# PROCESS

## Production Process Flow Chart of Steel Pipe Fittings



## Production Process Flow Chart of Forged Flange



# PRODUCTS



## 45° Long Radius Elbow

|                       |  |
|-----------------------|--|
| <b>workmanship</b>    | Mandrel forming  |
| <b>size</b>           | seamless 1/2"-24"(DN15-DN600)<br>Welded 1/2"-48"(DN15-DN1200)  |
| <b>standard</b>       | ASME B16.9,DIN 2605,JIS B2313,GB/T 12459,GB/T 13401,SH3408,SH3409, HG/T21635,HG/T21631,MSS SP-43         |
| <b>wall thickness</b> | SCH5S-SCH160   |
| <b>material</b>       | 317/L,304/L,316/L,310S,309/S, 347/H,321/321H,904/L,S32750/ F53/SAF2507,S32205/F60 S31803/ F51,S32760/F55 |



## 90° Short Radius Elbow

|                       |  |
|-----------------------|--|
| <b>workmanship</b>    | Mandrel forming  |
| <b>size</b>           | seamless 1/2"-24"(DN15-DN600)<br>Welded 1/2"-48"(DN15-DN1200)  |
| <b>standard</b>       | ASME B16.9,DIN 2605,JIS B2313,GB/T 12459,GB/T 13401,SH3408,SH3409, HG/T21635,HG/T21631,MSS SP-43         |
| <b>wall thickness</b> | SCH5S-SCH160   |
| <b>material</b>       | 317/L,304/L,316/L,310S,309/S, 347/H,321/321H,904/L,S32750/ F53/SAF2507,S32205/F60 S31803/ F51,S32760/F55 |



## Equal Tee

|                       |  |
|-----------------------|--|
| <b>workmanship</b>    | Bulge forming  |
| <b>size</b>           | seamless 1/2"-24"(DN15-DN600)<br>Welded 1/2"-48"(DN15-DN1200)  |
| <b>standard</b>       | ASME B16.9,DIN 2605,JIS B2313,GB/T 12459,GB/T 13401,SH3408,SH3409, HG/T21635,HG/T21631,MSS SP-43         |
| <b>wall thickness</b> | SCH5S-SCH160   |
| <b>material</b>       | 317/L,304/L,316/L,310S,309/S, 347/H,321/321H,904/L,S32750/ F53/SAF2507,S32205/F60 S31803/ F51,S32760/F55 |



## Reducing Tee

|                       |  |
|-----------------------|--|
| <b>workmanship</b>    | Bulge forming  |
| <b>size</b>           | seamless 1/2"-24"(DN15-DN600)<br>Welded 1/2"-48"(DN15-DN1200)  |
| <b>standard</b>       | ASME B16.9,DIN 2605,JIS B2313,GB/T 12459,GB/T 13401,SH3408,SH3409, HG/T21635,HG/T21631,MSS SP-43         |
| <b>wall thickness</b> | SCH5S-SCH160   |
| <b>material</b>       | 317/L,304/L,316/L,310S,309/S, 347/H,321/321H,904/L,S32750/ F53/SAF2507,S32205/F60 S31803/ F51,S32760/F55 |



## 90° Long Radius Elbow

|                       |  |
|-----------------------|--|
| <b>workmanship</b>    | Mandrel forming  |
| <b>size</b>           | seamless 1/2"-24"(DN15-DN600)<br>Welded 1/2"-48"(DN15-DN1200)  |
| <b>standard</b>       | ASME B16.9,DIN 2605,JIS B2313,GB/T 12459,GB/T 13401,SH3408,SH3409, HG/T21635,HG/T21631,MSS SP-43         |
| <b>wall thickness</b> | SCH5S-SCH160   |
| <b>material</b>       | 317/L,304/L,316/L,310S,309/S, 347/H,321/321H,904/L,S32750/ F53/SAF2507,S32205/F60 S31803/ F51,S32760/F55 |

## 180° Elbow

|                       |  |
|-----------------------|--|
| <b>workmanship</b>    | Ball forming/Hot forming   |
| <b>size</b>           | seamless 1/2"-12"(DN15-DN300)<br>Welded 1/2"-12"(DN15-DN300)   |
| <b>standard</b>       | ASME B16.9,DIN 2605,JIS B2313,GB/T 12459,GB/T 13401,SH3408,SH3409, HG/T21635,HG/T21631,MSS SP-43         |
| <b>wall thickness</b> | SCH5S-SCH160   |
| <b>material</b>       | 317/L,304/L,316/L,310S,309/S, 347/H,321/321H,904/L,S32750/ F53/SAF2507,S32205/F60 S31803/ F51,S32760/F55 |



## Non-standard Tee

|                       |  |
|-----------------------|--|
| <b>workmanship</b>    | Bulge forming  |
| <b>size</b>           | seamless 1/2"-24"(DN15-DN600)<br>Welded 1/2"-48"(DN15-DN1200)  |
| <b>standard</b>       | ASME B16.9,DIN 2605,JIS B2313,GB/T 12459,GB/T 13401,SH3408,SH3409, HG/T21635,HG/T21631,MSS SP-43         |
| <b>wall thickness</b> | SCH5S-SCH160   |
| <b>material</b>       | 317/L,304/L,316/L,310S,309/S, 347/H,321/321H,904/L,S32750/ F53/SAF2507,S32205/F60 S31803/ F51,S32760/F55 |



## Cross

|                       |  |
|-----------------------|--|
| <b>workmanship</b>    | Bulge forming  |
| <b>size</b>           | seamless 1/2"-24"(DN15-DN600)<br>Welded 1/2"-48"(DN15-DN1200)  |
| <b>standard</b>       | ASME B16.9,DIN 2605,JIS B2313,GB/T 12459,GB/T 13401,SH3408,SH3409, HG/T21635,HG/T21631,MSS SP-43         |
| <b>wall thickness</b> | SCH5S-SCH160   |
| <b>material</b>       | 317/L,304/L,316/L,310S,309/S, 347/H,321/321H,904/L,S32750/ F53/SAF2507,S32205/F60 S31803/ F51,S32760/F55 |



### Concentric Reducer

|                       |  |
|-----------------------|--|
| <b>workmanship</b>    | Cold extrusion   |
| <b>size</b>           | seamless 1/2"-24"(DN15-DN600)<br>Welded 1/2"-48"(DN15-DN1200)  |
| <b>standard</b>       | ASME B16.9,DIN 2605,JIS B2313,GB/T 12459,GB/T 13401,H3408,SH3409, HG/T21635,HG/T21631,MSS SP-43        |
| <b>wall thickness</b> | SCH5S-SCH160   |
| <b>material</b>       | 317/L,304/L,316/L,310S,309/S, 347/H,321/321H,904/L,S32750/F53/SAF2507,S32205/F60 S31803/F51,S32760/F55 |



### Eccentric Reducer

|                       |  |
|-----------------------|--|
| <b>workmanship</b>    | Cold extrusion   |
| <b>size</b>           | seamless 1/2"-24"(DN15-DN600)<br>Welded 1/2"-48"(DN15-DN1200)  |
| <b>standard</b>       | ASME B16.9,DIN 2605,JIS B2313,GB/T 12459,GB/T 13401,H3408,SH3409, HG/T21635,HG/T21631,MSS SP-43        |
| <b>wall thickness</b> | SCH5S-SCH160   |
| <b>material</b>       | 317/L,304/L,316/L,310S,309/S, 347/H,321/321H,904/L,S32750/F53/SAF2507,S32205/F60 S31803/F51,S32760/F55 |



### Cap

|                       |  |
|-----------------------|--|
| <b>workmanship</b>    | Press forming  |
| <b>size</b>           | seamless 1/2"-48"(DN15-DN600)  |
| <b>standard</b>       | ASME B16.9,DIN 2605,JIS B2313,GB/T 12459,GB/T 13401,H3408,SH3409, HG/T21635,HG/T21631,MSS SP-43        |
| <b>wall thickness</b> | SCH5S-SCH160   |
| <b>material</b>       | 317/L,304/L,316/L,310S,309/S, 347/H,321/321H,904/L,S32750/F53/SAF2507,S32205/F60 S31803/F51,S32760/F55 |



### Stub Ends

|                       |  |
|-----------------------|--|
| <b>workmanship</b>    | Press forming  |
| <b>size</b>           | seamless 1/2"-24"(DN15-DN600)<br>Welded 1/2"-48"(DN15-DN1200)  |
| <b>standard</b>       | ASME B16.9,HG/T 205099,HG/T 20621,MSS SP-43  |
| <b>wall thickness</b> | SCH5S-SCH160   |
| <b>material</b>       | 317/L,304/L,316/L,310S,309/S, 347/H,321/321H,904/L,S32750/F53/SAF2507,S32205/F60 S31803/F51,S32760/F55 |



### Sockolet

|                    |   |
|--------------------|---|
| <b>workmanship</b> | Forging   |
| <b>size</b>        | DN6-DN600   |
| <b>standard</b>    | MSS SP 97   |
| <b>material</b>    | 317/L,304/L,316/L,310S,309/S, 347/H,321/321H,904/L,S32750/F53/SAF2507,S32205/F60, S31803/F51,S32760/F55 |



### Weldolet

|                    |   |
|--------------------|---|
| <b>workmanship</b> | Forging   |
| <b>size</b>        | DN6-DN600   |
| <b>standard</b>    | MSS SP 97   |
| <b>material</b>    | 317/L,304/L,316/L,310S,309/S, 347/H,321/321H,904/L,S32750/F53/SAF2507,S32205/F60, S31803/F51,S32760/F55 |



### Thread

|                    |   |
|--------------------|---|
| <b>workmanship</b> | Forging   |
| <b>size</b>        | DN6-DN600   |
| <b>standard</b>    | MSS SP 97   |
| <b>material</b>    | 317/L,304/L,316/L,310S,309/S, 347/H,321/321H,904/L,S32750/F53/SAF2507,S32205/F60, S31803/F51,S32760/F55 |



### Swaged Nipples

|                    |   |
|--------------------|---|
| <b>workmanship</b> | Press forming   |
| <b>size</b>        | DN6-DN300   |
| <b>standard</b>    | MSS SP 95   |
| <b>material</b>    | 317/L,304/L,316/L,310S,309/S, 347/H,321/321H,904/L,S32750/F53/SAF2507,S32205/F60, S31803/F51,S32760/F55 |





### Welding Neck Flange

|                    |  |
|--------------------|--|
| <b>workmanship</b> | Forging  |
| <b>size</b>        | DN10-DN4000  |
| <b>standard</b>    | ASME B16.47, ASME B16.5, GB9112-9131, SH3406, DIN2576/27/66, DIN2632-2638, EN 1092-1                               |
| <b>material</b>    | 317/L, 304/L, 316/L, 310/S, 309/S, 347/H, 321/321H, 904/L, S32750/F53, SAF2507, S32205/F60, S31803/F51, S32760/F55 |

### Slip-on Flange

|                    |  |
|--------------------|--|
| <b>workmanship</b> | Forging  |
| <b>size</b>        | DN10-DN800   |
| <b>standard</b>    | ASME B16.5 GB9112-9131, SH3406, DIN2576/27/66, DIN2632-2638  |
| <b>material</b>    | 317/L, 304/L, 316/L, 310/S, 309/S, 347/H, 321/321H, 904/L, S32750/F53, SAF2507, S32205/F60, S31803/F51, S32760/F55 |

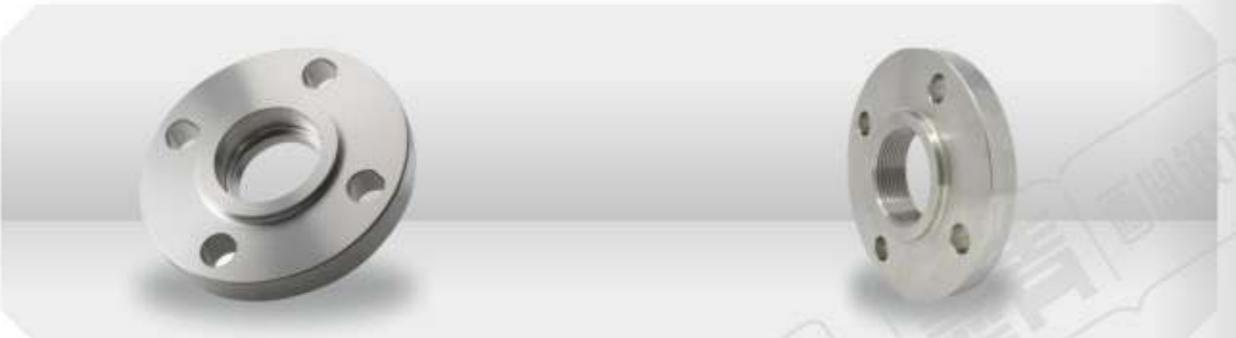


### Lap Joint Flange

|                    |  |
|--------------------|--|
| <b>workmanship</b> | Forging  |
| <b>size</b>        | DN15-DN600   |
| <b>standard</b>    | ASME B16.5, EN1092-1   |
| <b>material</b>    | 317/L, 304/L, 316/L, 310/S, 309/S, 347/H, 321/321H, 904/L, S32750/F53, SAF2507, S32205/F60, S31803/F51, S32760/F55 |

### Blind Flange

|                    |  |
|--------------------|--|
| <b>workmanship</b> | Forging  |
| <b>size</b>        | DN15-DN1500  |
| <b>standard</b>    | ASME B16.5, EN1092-1, ASME B16.47  |
| <b>material</b>    | 317/L, 304/L, 316/L, 310/S, 309/S, 347/H, 321/321H, 904/L, S32750/F53, SAF2507, S32205/F60, S31803/F51, S32760/F55 |



### Socket Welding Flange

|                    |  |
|--------------------|--|
| <b>workmanship</b> | Forging  |
| <b>size</b>        | DN15-DN600   |
| <b>standard</b>    | ASME B16.5   |
| <b>material</b>    | 317/L, 304/L, 316/L, 310/S, 309/S, 347/H, 321/321H, 904/L, S32750/F53, SAF2507, S32205/F60, S31803/F51, S32760/F55 |

### Threaded Flange

|                    |  |
|--------------------|--|
| <b>workmanship</b> | Forging  |
| <b>size</b>        | DN15-DN600   |
| <b>standard</b>    | ASME B16.5, EN1092-1   |
| <b>material</b>    | 317/L, 304/L, 316/L, 310/S, 309/S, 347/H, 321/321H, 904/L, S32750/F53, SAF2507, S32205/F60, S31803/F51, S32760/F55 |



### Bend

|                    |  |
|--------------------|--|
| <b>workmanship</b> | Hot expanding  |
| <b>size</b>        | DN6-DN650  |
| <b>standard</b>    | ASME B36.1M, API 5L, EN10210-1, DL/T515, SY5257, API 5L, ASTM A106, ASTM A53 EN10219-1 EN 10210-1                  |
| <b>material</b>    | 317/L, 304/L, 316/L, 310/S, 309/S, 347/H, 321/321H, 904/L, S32750/F53, SAF2507, S32205/F60, S31803/F51, S32760/F55 |

### Lateral

|                    |  |
|--------------------|--|
| <b>workmanship</b> | Bulge forming  |
| <b>size</b>        | DN15-DN1500  |
| <b>standard</b>    | ASME B16.9   |
| <b>material</b>    | 317/L, 304/L, 316/L, 310/S, 309/S, 347/H, 321/321H, 904/L, S32750/F53, SAF2507, S32205/F60, S31803/F51, S32760/F55 |



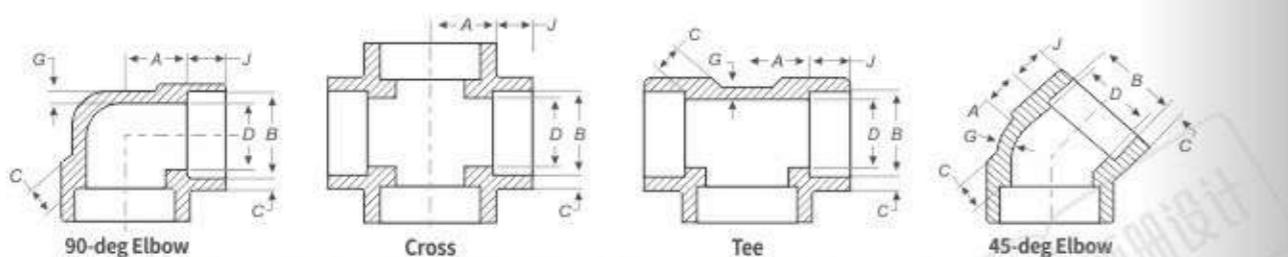
## Socket-Welding Elbows, Tees and Crosses

## workmanship Forging

size DN6-DN100

standard ASME B16.11

**material** 317/L, 304/L, 316/L, 310/S, 309/S, 347/H, 321/321H, 904/L, S32750/F53/SAF2507, S32205/F60, S31803/F51, S32760/F55



| Nominal<br>size | Socket Bore<br>Diam., <i>B</i> | Bore Diameter of fittings, <i>D</i> |                          |                          | Socket Wall Thickness, <i>C</i> [Note 1] |                     |                     | Body Wall, <i>G</i> |      |      | Socket<br>depth,<br>90EL, Cross, Tee | Center-to-Bottom of Socket, <i>A</i> |       |       |      |      |       |      |
|-----------------|--------------------------------|-------------------------------------|--------------------------|--------------------------|--|---------------------|---------------------|---------------------|------|------|--------------------------------------|--------------------------------------|-------|-------|------|------|-------|------|
|                 |                                | 3000                                | 6000                     | 9000                     | 3000                                     | 6000                | 9000                | 3000                | 6000 | 9000 |                                      | 3000                                 | 6000  | 9000  | 3000 | 6000 | 9000  |      |
|                 | Max. Min.                      | Max. Min. Max. Min. Max. Min.       | Max. Min. Max. Min. Avg. | Max. Min. Avg. Min. Avg. | Max. Min. Avg. Min. Avg.                 | Max. Min. Min. Min. | Max. Min. Min. Min. | Max. Min. Min. Min. | 3000 | 6000 | 9000                                 | 3000                                 | 6000  | 9000  | 3000 | 6000 | 9000  |      |
| 1/8             | 11.2                           | 10.8                                | 7.6                      | 6.1                      | 4.8                                      | 3.2                 | ...                 | 3.18                | 3.18 | 3.96 | 3.43                                 | ...                                  | 241   | 3.15  | ...  | 9.5  | 11.0  | 11.0 |
| 1/4             | 14.6                           | 14.2                                | 10.0                     | 8.5                      | 7.1                                      | 5.6                 | ...                 | 3.78                | 3.30 | 4.60 | 4.01                                 | ...                                  | 3.02  | 3.68  | ...  | 9.5  | 11.0  | 13.5 |
| 3/8             | 18.0                           | 17.6                                | 13.3                     | 11.8                     | 9.9                                      | 8.4                 | ...                 | 4.01                | 3.50 | 5.03 | 4.37                                 | ...                                  | 3.20  | 4.01  | ...  | 9.5  | 13.5  | 15.5 |
| 1/2             | 22.2                           | 21.8                                | 16.6                     | 15.0                     | 12.5                                     | 11.0                | 7.2                 | 5.6                 | 4.67 | 4.09 | 5.97                                 | 5.18                                 | 9.35  | 8.18  | 3.37 | 4.78 | 7.47  | 9.5  |
| 5/8             | 27.6                           | 27.2                                | 21.7                     | 20.2                     | 16.3                                     | 14.8                | 11.8                | 10.3                | 4.90 | 4.27 | 6.96                                 | 6.04                                 | 9.78  | 8.56  | 3.91 | 5.56 | 7.82  | 12.5 |
| 1               | 34.3                           | 33.9                                | 27.4                     | 25.9                     | 21.5                                     | 19.9                | 16.0                | 14.4                | 5.69 | 4.98 | 7.92                                 | 6.93                                 | 11.38 | 9.96  | 4.55 | 6.35 | 9.09  | 12.5 |
| 1 1/4           | 43.1                           | 42.7                                | 35.8                     | 34.3                     | 30.2                                     | 28.7                | 23.5                | 22.0                | 6.07 | 5.28 | 7.92                                 | 6.93                                 | 12.14 | 10.62 | 4.85 | 6.35 | 9.70  | 12.5 |
| 1 1/2           | 49.2                           | 48.8                                | 41.6                     | 40.1                     | 34.7                                     | 33.2                | 28.7                | 27.2                | 6.35 | 5.54 | 8.92                                 | 7.80                                 | 12.70 | 11.12 | 5.08 | 7.14 | 10.15 | 12.5 |
| 2               | 61.7                           | 61.2                                | 53.3                     | 51.7                     | 43.6                                     | 42.1                | 38.9                | 37.4                | 6.93 | 6.04 | 10.92                                | 9.50                                 | 13.84 | 12.12 | 5.54 | 8.74 | 11.07 | 16.0 |
| 2 1/2           | 74.4                           | 73.9                                | 64.2                     | 61.2                     | ...                                      | ...                 | 8.76                | 7.67                | ...  | ...  | ...                                  | ...                                  | 7.01  | ...   | 16.0 | 41.0 | ...   | 28.5 |
| 3               | 90.3                           | 89.8                                | 79.4                     | 76.4                     | ...                                      | ...                 | 9.52                | 8.30                | ...  | ...  | ...                                  | ...                                  | 7.62  | ...   | 16.0 | 57.0 | ...   | 32.0 |
| 4               | 115.7                          | 115.2                               | 103.8                    | 100.7                    | ...                                      | ...                 | 10.69               | 9.35                | ...  | ...  | ...                                  | ...                                  | 8.56  | ...   | 19.0 | 66.5 | ...   | 41.0 |

GENERAL NOTE: Dimensions are in millimeters.

NOTE: (1) Average of socket wall thickness around periphery shall not be less than listed values. The minimum values are permitted in localized areas.



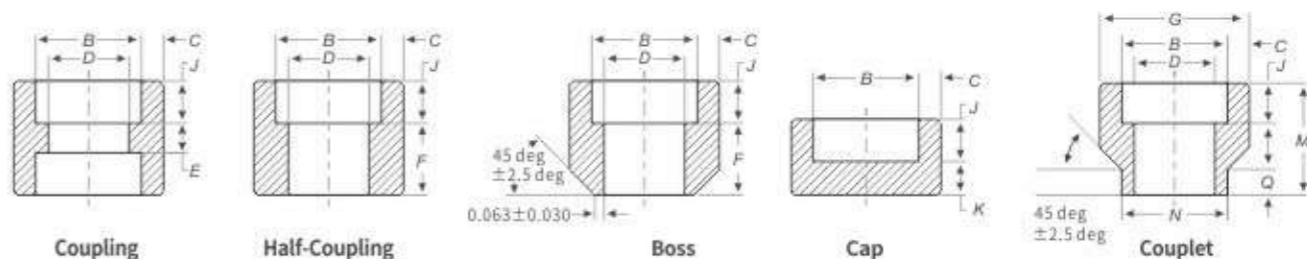
## Socket-Welding Couplings, Bosses, Caps and Couples

## workmanship Forging

size DN6-DN100

standard ASME B16.1

**material** 317/L, 304/L, 316/L, 310/S, 309/S, 347/H, 321/321H, 904/L, S32750/F53/SAF2507, S32205/F60, S31803/F51, S32760/F55



| Nominal pipe size | Socket Bore Dia., <i>B</i> | Bore Diameter of fittings, <i>D</i>                                   |       |       |      | Socket Wall Thickness, (Note 1) <i>C</i> |      |       | Outside Dia. Couplet, <i>G</i> | Tol. <i>J</i> | Socket Laying depth, Light, <i>E</i> Tol. <i>F</i> Tol. | Laying Light, <i>E</i> Tol. <i>F</i> Tol. | End Wall Thickness, <i>K</i> | End To End Couplet, <i>M</i> | End Ring Diameter, <i>N</i> | Weld Ring Length <i>Q</i> Tol. |        |
|-------------------|----------------------------|---|-------|-------|------|--|------|-------|--------------------------------|---------------|---|---|------------------------------|------------------------------|-----------------------------|--------------------------------|--------|
|                   |                            | 3000  | 6000  | 9000  | 3000 | 6000                                     | 9000 | 3000  |                                |               |   |   |                              |                              |                             |                                |        |
|                   | Max. Min.                  | Max. Min. Max. Min. Max. Min. Avg. Min. Avg. Min. Avg. Min. Avg. Min. |       |       |      |  |      |       |                                |               |   |   |                              |                              |                             |                                |        |
| 1/8               | 112                        | 10.8  | 7.6   | 6.1   | 4.8  | 3.2                                      | ...  | 3.18  | 3.18                           | 3.96          | 3.43  | ...                                       | ...                          | ...                          | ...                         | ...                            | ...    |
| 1/4               | 146                        | 14.2  | 10.0  | 8.5   | 7.1  | 5.6                                      | ...  | 3.78  | 3.30                           | 4.60          | 4.01  | ...                                       | 23.8                         | 25.4                         | ±15/-0                      | 9.5                            | 6.5    |
| 3/8               | 180                        | 17.6  | 13.3  | 11.8  | 9.9  | 8.4                                      | ...  | 4.01  | 3.50                           | 5.03          | 4.37  | ...                                       | 27.0                         | 31.8                         | ±15/-0                      | 9.5                            | 6.5    |
| 1/2               | 222                        | 21.8  | 16.6  | 15.0  | 12.5 | 11.0                                     | 7.2  | 5.6   | 4.67                           | 4.09          | 5.97  | 5.18                                      | 9.35                         | 8.18                         | 33.4                        | 38.1                           | ±15/-0 |
| 5/8               | 276                        | 27.2  | 21.7  | 20.2  | 16.3 | 14.8                                     | 11.8 | 10.3  | 4.90                           | 4.27          | 6.96  | 6.04                                      | 9.78                         | 8.56                         | 38.1                        | 44.5                           | ±15/-0 |
| 1                 | 343                        | 33.9  | 27.4  | 25.9  | 21.5 | 19.9                                     | 16.0 | 14.4  | 5.69                           | 4.98          | 7.92  | 6.93                                      | 11.38                        | 9.96                         | 46.1                        | 57.2                           | ±15/-0 |
| 1 1/4             | 431                        | 42.7  | 35.8  | 34.3  | 30.2 | 28.7                                     | 23.5 | 22.0  | 6.07                           | 5.28          | 7.92  | 6.93                                      | 12.14                        | 10.62                        | 55.6                        | 63.5                           | ±15/-0 |
| 1 1/2             | 492                        | 48.8  | 41.6  | 40.1  | 34.7 | 33.2                                     | 28.7 | 27.2  | 6.35                           | 5.54          | 8.92  | 7.80                                      | 12.70                        | 11.12                        | 63.5                        | 76.2                           | ±15/-0 |
| 2                 | 617                        | 61.2  | 53.3  | 51.7  | 43.6 | 42.1                                     | 38.9 | 37.4  | 6.93                           | 6.04          | 10.92   | 9.50                                      | 13.84                        | 12.12                        | 79.4                        | 92.1                           | ±15/-0 |
| 2 1/2             | 744                        | 73.9  | 64.2  | 61.2  | ...  | ...                                      | ...  | 8.76  | 7.67                           | ...           | ...   | ...                                       | 92.1                         | 108.0                        | ±15/-0                      | 16.0                           | 19.0   |
| 3                 | 903                        | 89.8  | 79.4  | 76.4  | ...  | ...                                      | ...  | 9.52  | 8.30                           | ...           | ...   | ...                                       | 111.1                        | 127.0                        | ±15/-0                      | 16.0                           | 19.0   |
| 4                 | 1157                       | 115.2   | 103.8 | 100.7 | ...  | ...                                      | ...  | 10.69 | 9.35                           | ...           | ...   | ...                                       | 141.3                        | 158.8                        | ±15/-0                      | 19.0                           | 19.0   |

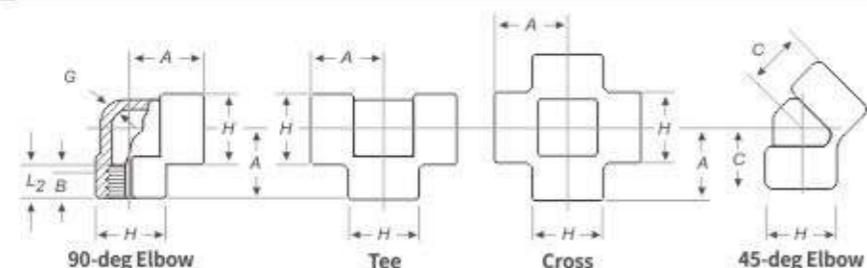
GENERAL NOTE: Dimensions are in millimeters.

NOTE: (1) Average of socket wall thickness around periphery shall not be less than listed values. The minimum values are permitted in localized areas.



## Threaded Elbows, Tees and Crosses

| workmanship | Forging   |  |  |  |  |  |  |  |  |  |  |  |
|-------------|---|--|--|--|--|--|--|--|--|--|--|--|
| size        | DN6-DN100   |  |  |  |  |  |  |  |  |  |  |  |
| standard    | ASME B16.11   |  |  |  |  |  |  |  |  |  |  |  |
| material    | 317/L, 304/L, 316/L, 310/S, 309/S, 347/H, 321/321H, 904/L, S32750/F53/SAF2507, S32205/F60, S31803/F51, S32760/F55 |  |  |  |  |  |  |  |  |  |  |  |



| Nominal pipe size | Center-to-End Elbows, Tees, and Crosses, A |      |      | Center-to-End 45-deg Elbow, C |      |      | Outside Diameter of Band, H |      |      | Minimum Wall Thickness, G |       |       | Minimum Length of Thread, [Note (1)] |                |
|-------------------|--|------|------|-------------------------------|------|------|-----------------------------|------|------|---------------------------|-------|-------|--------------------------------------|----------------|
|                   | 2000                                       | 3000 | 6000 | 2000                          | 3000 | 6000 | 2000                        | 3000 | 6000 | 2000                      | 3000  | 6000  | B                                    | L <sub>2</sub> |
| 1/8               | 21   | 21   | 25   | 17                            | 17   | 19   | 22                          | 22   | 25   | 3.18                      | 3.18  | 6.35  | 6.4                                  | 6.7            |
| 1/4               | 21   | 25   | 28   | 17                            | 19   | 22   | 22                          | 25   | 33   | 3.18                      | 3.30  | 6.60  | 8.1                                  | 10.2           |
| 3/8               | 25   | 28   | 33   | 19                            | 22   | 25   | 25                          | 33   | 38   | 3.18                      | 3.51  | 6.98  | 9.1                                  | 10.4           |
| 1/2               | 28   | 33   | 38   | 22                            | 25   | 28   | 33                          | 38   | 46   | 3.18                      | 4.09  | 8.15  | 10.9                                 | 13.6           |
| 5/8               | 33   | 38   | 44   | 25                            | 28   | 33   | 38                          | 46   | 56   | 3.18                      | 4.32  | 8.53  | 12.7                                 | 13.9           |
| 1                 | 38   | 44   | 51   | 28                            | 33   | 35   | 46                          | 56   | 62   | 3.68                      | 4.98  | 9.93  | 14.7                                 | 17.3           |
| 1 1/4             | 44   | 51   | 60   | 33                            | 35   | 43   | 56                          | 62   | 75   | 3.89                      | 5.28  | 10.59 | 17.0                                 | 18.0           |
| 1 1/2             | 51   | 60   | 64   | 35                            | 43   | 44   | 62                          | 75   | 84   | 4.01                      | 5.56  | 11.07 | 17.8                                 | 18.4           |
| 2                 | 60   | 64   | 83   | 43                            | 44   | 52   | 75                          | 84   | 102  | 4.27                      | 7.14  | 12.09 | 19.0                                 | 19.2           |
| 2 1/2             | 76   | 83   | 95   | 52                            | 52   | 64   | 92                          | 102  | 121  | 5.61                      | 7.65  | 15.29 | 23.6                                 | 28.9           |
| 3                 | 86   | 95   | 106  | 64                            | 64   | 79   | 109                         | 121  | 146  | 5.99                      | 8.84  | 16.64 | 25.9                                 | 30.5           |
| 4                 | 106  | 114  | 114  | 79                            | 79   | 146  | 152                         | 152  | 6.55 | 11.18                     | 18.67 | 27.7  | 33.0                                 |                |

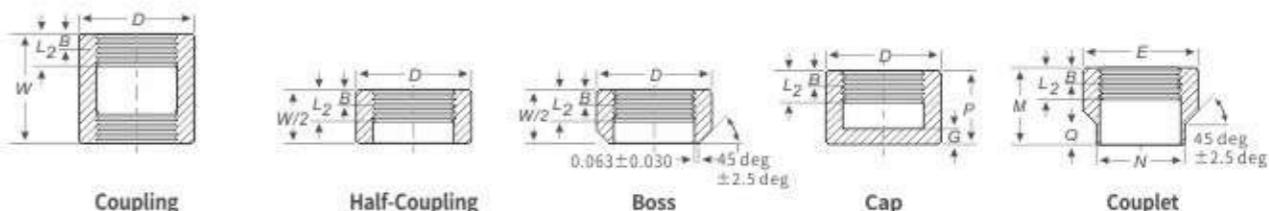
GENERAL NOTE: Dimensions are in millimeters.

NOTE: (1) Dimension B is minimum length of perfect thread. The length of useful thread (B plus threads with fully formed roots and flat crest) shall not be less than L<sub>2</sub> (effective length of external thread) required by American National Standard for Pipe Threads (ASME B1.20.1; see para. 6.3).



## Threaded Couplings, Bosses, Caps and Couplets

| workmanship | Forging   |  |  |  |  |  |  |  |  |  |  |  |
|-------------|---|--|--|--|--|--|--|--|--|--|--|--|
| size        | DN6-DN100   |  |  |  |  |  |  |  |  |  |  |  |
| standard    | ASME B16.11   |  |  |  |  |  |  |  |  |  |  |  |
| material    | 317/L, 304/L, 316/L, 310/S, 309/S, 347/H, 321/321H, 904/L, S32750/F53/SAF2507, S32205/F60, S31803/F51, S32760/F55 |  |  |  |  |  |  |  |  |  |  |  |



| Nominal pipe size | Outside Diameter, D |      | Outside Diameter Couplet, E |       | End-to-End Coupling, W | End-to-End Caps, P | End-to-End Caplings | Tol.      | Minimum End Wall Thickness, G |           | Weld Ring Length, Q | Weld Ring Diameter, N | Minimum Length of Thread, B | Tol. L |       |          |      |      |
|-------------------|---------------------|------|-----------------------------|-------|------------------------|--------------------|---------------------|-----------|-------------------------------|-----------|---------------------|-----------------------|-----------------------------|--------|-------|----------|------|------|
|                   | 3000                | 6000 | 3000                        | 6000  | 3000/6000              | 3000/6000          | 3000/6000           | 3000/6000 | 3000                          | 6000      | 3000/6000           | 3000/6000             | [Note (1)]                  |        |       |          |      |      |
| 1/8               | 16                  | 22   | ...                         | ...   | ...                    | 32                 | 19                  | 22        | ...                           | ...       | 4.8                 | 6.4                   | ...                         | ...    | 6.4   | 6.7      |      |      |
| 1/4               | 19                  | 25   | 23.8                        | 25.4  | ±15/-0.0               | 35                 | 25                  | 27        | 30.2                          | ±0.8/-0.0 | 4.8                 | 6.4                   | 9.5                         | 0.8    | 17.5  | ±15/-0.0 | 8.1  | 10.2 |
| 3/8               | 22                  | 32   | 27.0                        | 31.8  | ±15/-0.0               | 48                 | 32                  | 27        | 30.2                          | ±0.8/-0.0 | 4.8                 | 6.4                   | 9.5                         | 0.8    | 20.7  | ±15/-0.0 | 9.1  | 10.4 |
| 1/2               | 28                  | 38   | 33.4                        | 38.1  | ±15/-0.0               | 48                 | 32                  | 33        | 33.4                          | ±0.8/-0.0 | 6.4                 | 7.9                   | 9.5                         | 0.8    | 23.8  | ±15/-0.0 | 10.9 | 13.6 |
| 3/4               | 35                  | 44   | 38.1                        | 44.5  | ±15/-0.0               | 51                 | 37                  | 38        | 34.9                          | ±0.8/-0.0 | 6.4                 | 7.9                   | 9.5                         | 0.8    | 27.0  | ±15/-0.0 | 12.7 | 13.9 |
| 1                 | 44                  | 57   | 46.1                        | 57.2  | ±15/-0.0               | 60                 | 41                  | 43        | 42.9                          | ±0.8/-0.0 | 9.7                 | 11.2                  | 9.5                         | 0.8    | 33.4  | ±15/-0.0 | 14.7 | 17.3 |
| 1 1/4             | 57                  | 64   | 55.6                        | 63.5  | ±15/-0.0               | 67                 | 44                  | 46        | 47.6                          | ±0.8/-0.0 | 9.7                 | 11.2                  | 9.5                         | 0.8    | 42.9  | ±15/-0.0 | 17.0 | 18.4 |
| 1 1/2             | 64                  | 76   | 63.5                        | 76.2  | ±15/-0.0               | 79                 | 44                  | 48        | 50.8                          | ±0.8/-0.0 | 11.2                | 12.7                  | 9.5                         | 0.8    | 49.2  | ±15/-0.0 | 17.8 | 18.4 |
| 2                 | 76                  | 92   | 79.4                        | 92.4  | ±15/-0.0               | 86                 | 48                  | 51        | 57.2                          | ±15/-0.0  | 12.7                | 15.7                  | 9.5                         | 0.8    | 61.9  | ±15/-0.0 | 19.0 | 19.2 |
| 2 1/2             | 92                  | 108  | 92.1                        | 92.1  | ±15/-0.0               | 92                 | 60                  | 64        | 63.5                          | ±15/-0.0  | 15.7                | 19.0                  | 9.5                         | 0.8    | 73.0  | ±15/-0.0 | 23.6 | 28.9 |
| 3                 | 108                 | 127  | 111.1                       | 111.1 | ±15/-0.0               | 108                | 65                  | 68        | 69.9                          | ±15/-0.0  | 19.0                | 22.4                  | 9.5                         | 0.8    | 114.3 | ±15/-0.0 | 25.9 | 30.5 |
| 4                 | 140                 | 159  | 141.3                       | 141.3 | ±15/-0.0               | 121                | 68                  | 75        | 76.2                          | ±15/-0.0  | 22.4                | 28.4                  | 9.5                         | 0.8    | 114.3 | ±15/-0.0 | 27.7 | 33.0 |

GENERAL NOTES: (a) Dimensions are in millimeters.

(b) The wall thickness away from the threaded ends shall meet the minimum wall thickness requirements of Table 1-2 for the appropriate NPS and Class Designation fitting.

NOTE: (1) Dimension B is minimum length of perfect thread. The length of useful thread (B plus threads with fully formed roots and flat crests) shall not be less than L

# TECHNICAL PARAMETERS



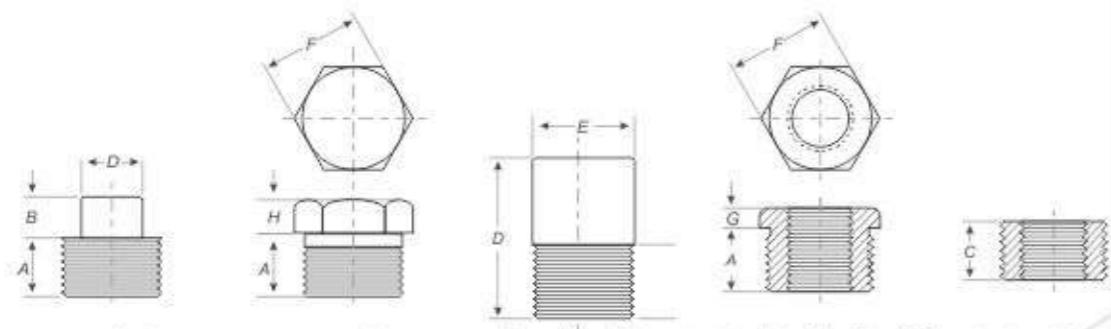
## Plugs and Bushings

workmanship Forging

size DN6-DN100

standard ASME B16.11

material 317/L, 304/L, 316/L, 310/S, 309/S, 347/H, 321/321H, 904/L, S32750/F53/SAF2507, S32205/F60, S31803/F51, S32760/F55



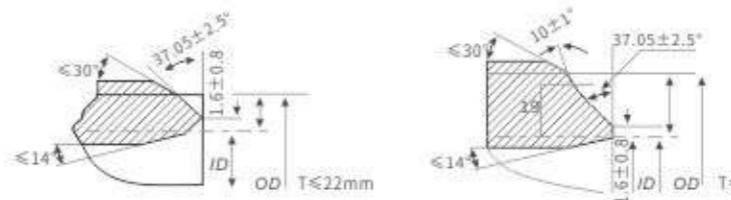
| Nominal pipe size | Square Head Plugs |                          |                                  | Round Head Plugs         |                   | Hex Plugs and Bushings           |            |                            |
|-------------------|-------------------|--------------------------|----------------------------------|--------------------------|-------------------|----------------------------------|------------|----------------------------|
|                   | Minimum Length, A | Minimum Square Height, B | Minimum Width Flats, C [Note(2)] | Nominal Head Diameter, E | Minimum Length, D | Nominal Width Flats, F [Note(2)] | Bushing, G | Minimum Hex Height Plug, G |
| 1/8               | 10                | 6                        | 7.15                             | 10                       | 35                | 11.11                            | ...        | 6                          |
| 1/4               | 11                | 6                        | 9.55                             | 14                       | 41                | 15.88                            | 3          | 6                          |
| 3/8               | 13                | 8                        | 11.11                            | 18                       | 41                | 17.46                            | 4          | 8                          |
| 1/2               | 14                | 10                       | 14.29                            | 21                       | 44                | 22.23                            | 5          | 8                          |
| 5/8               | 16                | 11                       | 15.88                            | 27                       | 44                | 26.99                            | 6          | 10                         |
| 1                 | 19                | 13                       | 20.64                            | 33                       | 51                | 34.93                            | 6          | 10                         |
| 1 1/4             | 21                | 14                       | 23.81                            | 43                       | 51                | 44.45                            | 7          | 14                         |
| 1 1/2             | 21                | 16                       | 28.58                            | 48                       | 51                | 50.80                            | 8          | 16                         |
| 2                 | 22                | 18                       | 33.27                            | 60                       | 64                | 63.50                            | 9          | 18                         |
| 2 1/2             | 27                | 19                       | 38.10                            | 73                       | 70                | 76.20                            | 10         | 19                         |
| 3                 | 28                | 21                       | 42.86                            | 89                       | 70                | 88.90                            | 10         | 21                         |
| 4                 | 32                | 25                       | 63.50                            | 114                      | 76                | 117.48                           | 13         | 25                         |

GENERAL NOTE: Dimensions are in millimeters

NOTES:(1) Cautionary Note Regarding Hex Bushings: Hex head bushings of one-size reduction should not be used in services where they might be subject to harmful loads and forces other than internal pressures.

(2) Manufacturer's applied tolerance shall ensure dimension will fit U.S. Customary tooling.

## Welding Bevel of Fittings



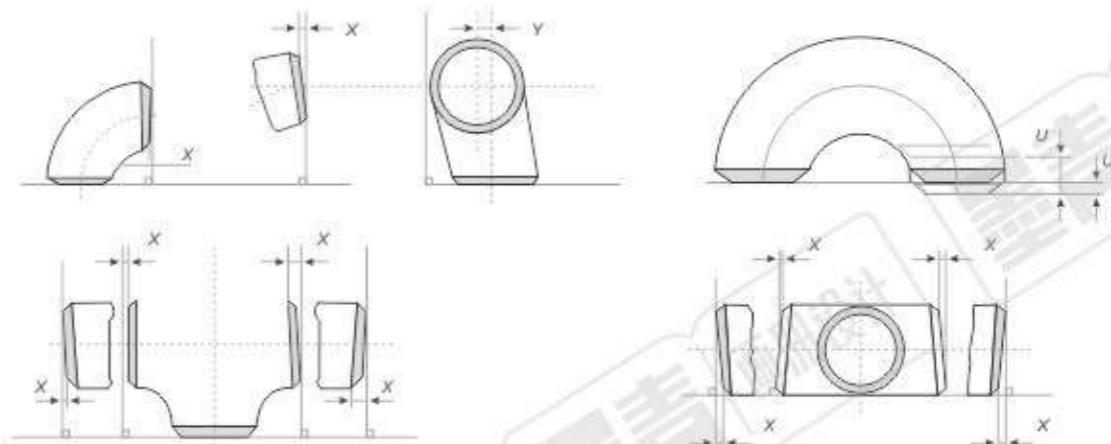
Limiting tolerances can be slightly different between the different standards and codes.

GB12459, GB/T 13401, ASME/ANSI B16.9, B16.28

## Tolerances for butt-welding fittings

| Item       | Types of pipe fittings | DN  |        |         |         |      |
|------------|------------------------|---|--------|---------|---------|------|
|            |                        | 15-65   | 80-100 | 125-200 | 250-450 | 500  |
| D1, D2, D3 | All pipe fittings      | ±1.6  | ±1.6   | ±2.4    | ±4.0    | ±6.4 |
|            |                        | -0.8  |        | -1.6    | -3.2    | -4.8 |
|            |                        | ±0.8  |        | ±1.6    | ±3.2    | ±4.8 |
| T, T1, T2  |                        | Not less than 87.5% of the nominal wall thickness |        |         |         |      |
|            |                        |   |        |         |         |      |
| B, A       | 45° elbow, 90° elbow   |   | ±2     |         |         | ±3   |
| P          | 180° elbow             |   | ±7     |         |         | ±7   |
| K          |                        |   |        |         | ±7      |      |
| L          | Reducer                |   | ±2     |         |         | ±3   |
| C, M       | Tee, Cross             |   | ±2     |         |         | ±3   |
| E, E1      | Caps                   |   | ±4     |         |         | ±7   |

## Angularity tolerance of butt-welding fittings GB12459



| Item | Types of pipe fittings     | DN     |         |         |         |         |
|------|----------------------------|--------|---------|---------|---------|---------|
|      |                            | 15-100 | 125-200 | 250-300 | 350-400 | 450-500 |
| X    | Elbow, Tee, Reducer, Cross | 1      | 2       | 3       | 4       |         |
| Y    | Elbow, Tee, Cross          | 2      | 4       | 5       | 7       | 10      |
| U    | 180° elbow                 |        | 1       |         | 2       |         |

## Angularity Tolerance of Butt-welding Fittings

GB/T 12459-90

| Item  | Types of pipe fittings | DN    |        |         |         |      |
|---|------------------------|-------|--------|---------|---------|------|
|   |                        | 15-65 | 80-100 | 125-200 | 250-450 | 500  |
| Limit deviation                                   |                        |       |        |         |         |      |
| End outer diameter                                | All pipe fittings      | ±1.6  | ±1.6   | ±2.4    | ±4.0    | ±6.4 |
| End inner diameter                                |                        | -0.8  |        | -1.6    | -3.2    | -4.8 |
| Wall thickness                                    |                        | ±0.8  |        | ±1.6    | ±3.2    | ±4.8 |
| Not less than 87.5% of the nominal wall thickness |                        |       |        |         |         |      |
| H, F  | 45° elbow, 90° elbow   |       | ±2     |         | ±3      |      |
| P   | 180° elbow             |       | ±7     |         | ±10     |      |
| K   |                        |       |        |         |         |      |
| L   | Reducer                |       | ±2     |         | ±3      |      |
| C, M  | Tee                    |       | ±2     |         | ±3      |      |
| E, E1   | Caps                   |       | ±4     |         | ±7      |      |

| Item      | Types of pipe fittings     | DN    |        |         |         |     |
|-----------|----------------------------|-------|--------|---------|---------|-----|
|           |                            | 15-65 | 80-100 | 125-200 | 250-450 | 500 |
| Tolerance |                            |       |        |         |         |     |
| X         | Elbow, Tee, Reducer, Cross | 1     | 4      | 3       | 4       |     |
| Y         | Elbow, Tee, Cross          | 2     |        | 5       | 7       | 10  |
| U         | 180° elbow                 | 1     |        | 2       |         |     |

GB/T 13401-92

| Item   | Types of pipe fittings | DN  |         |         |         |          |
|--|------------------------|---|---------|---------|---------|----------|
|  |                        | 150-200                                   | 250-450 | 500-600 | 650-750 | 800-1200 |
| Limit deviation  |                        |   |         |         |         |          |
| End outer diameter   | All pipe fittings      | ±2.4                                      | ±4.0    |         | ±4.0    |          |
| End inner diameter ①   |                        | -1.6                                      | -3.2    |         | -3.2    |          |
| Wall thickness   |                        | ±1.6                                      | ±3.2    |         | ±3.2    |          |
| Not less than 87.5% of the nominal wall thickness            |                        |   |         |         |         |          |
| H, F   | 45° elbow, 90° elbow   | -   |         | ±3      |         | ±5       |
| L  | Reducer                | -   |         | ±3      |         | ±5       |
| C, M   | Tee, Cross             | -   |         | ±3      |         | ±5       |
| E  | Caps                   |   | ±7      |         | ±10     |          |
| The minimum and maximum outer diameter difference of the end | All pipe fittings      | Not more than 0.01DN, and not more than 5 |         |         |         |          |

| Item      | Types of pipe fittings   | DN      |         |         |          |           |
|-----------|--------------------------|---------|---------|---------|----------|-----------|
|           |                          | 350-400 | 400-600 | 650-750 | 800-1050 | 1100-1200 |
| Tolerance |                          |         |         |         |          |           |
| X         | Elbow, Reducing tee, Tee | 3       | 4       | 5       |          |           |
| Y         | Elbow, Tee, Cross        | 7       | 10      | 13      | 19       |           |

NOTES: (1) Unless the customer has special requirements, priority should be given to the limit deviation of the end outer diameter and the nominal wall thickness.

(2) For reducing pipe fittings, the dimensional deviation is given according to the nominal cut of the large diameter end.

## Angularity Tolerance of Butt-welding Fittings

ASME/ANSI B16.9, B16.28

| Item                  | Types of pipe fittings                            | DN         |          |       |       |       |       |       |
|-----------------------|---|------------|----------|-------|-------|-------|-------|-------|
|                       |   | 1/5-2(1/2) | 3-3(1/2) | 4     | 5-8   | 10-18 | 20-24 | 26-30 |
| Limit deviation       |   |            |          |       |       |       |       |       |
| D, D1, D2             | All pipe fittings                                 | ±1.52      | ±1.52    | ±2.29 | ±4.06 | ±6.35 |       |       |
| End inner diameter ①② |   | -0.76      |          | -1.52 | -3.05 | -4.83 |       |       |
|                       |   | ±0.76      |          | ±3.05 | ±4.83 |       |       |       |
| T, T1, T2             | Not less than 87.5% of the nominal wall thickness |            |          |       |       |       |       |       |
| H, F, C, M            | 45° elbow, 90° elbow, Tee, Cross                  |            |          | ±1.52 |       | ±2.29 | ±3.05 | ±4.83 |
| P                     | 180° elbow  |            |          | ±6.35 |       | ±9.65 | -     | -     |
| K                     |   |            |          | ±6.35 |       | -     | -     | -     |
| U                     | Reducer, Stub                                     |            |          | ±0.76 |       | ±1.52 | -     | -     |
| L                     |   |            |          | ±1.52 |       | ±2.29 | ±4.83 |       |
| E, E1                 | Caps  | ±3.05      |          | ±6.35 |       | ±9.65 |       |       |
| G                     | Stub  |            |          | -0.76 |       | -1.25 |       |       |
| t                     |   |            |          | 0     | ±1.52 | 0     |       |       |
| R                     |   |            |          | -0.76 |       | -1.25 |       |       |

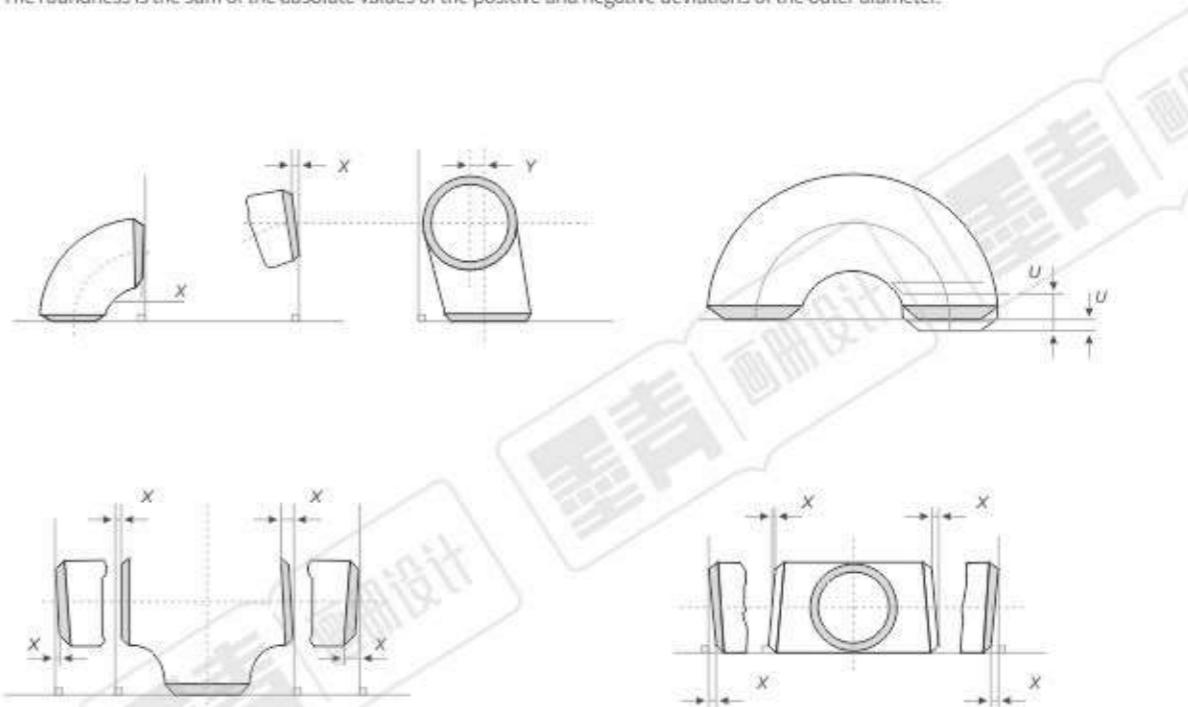
  

| DN         | 1/2-4 | 5-8  | 10-12 | 14-16 | 18-24 | 26-30 | 32-42 | 44-48 |
|------------|-------|------|-------|-------|-------|-------|-------|-------|
| Elbow, Tee | X     | 0.76 | 1.52  | 2.29  | 2.29  | 3.05  | 4.83  |       |
| Cross      | Y     | 1.52 | 3.05  | 4.83  | 6.35  | 9.65  | 9.65  | 12.70 |

NOTES: (1) Unless the customer has special requirements, priority should be given to the limit deviation of the end outer diameter and the nominal wall thickness.

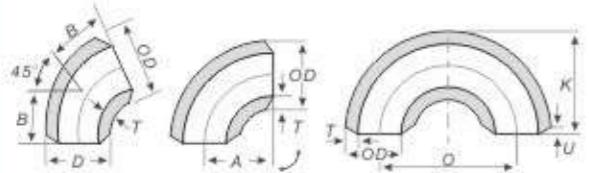
(2) The difference between the inner diameter of the end and the nominal wall thickness twice the outer diameter of the end.

(3) The roundness is the sum of the absolute values of the positive and negative deviations of the outer diameter.



## Long Radius Elbows

45° 90° 180°



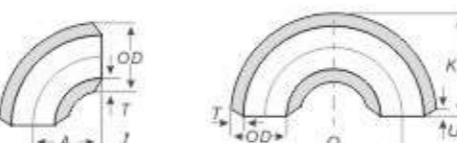
Above dimensions acc. to GB/T 12459, GB/T 13401, SH3408, SH 3409, HG/T 21635, HG/T 21631, SY/T 05010, ASME B16.9.

Weights are approximate and based on manufacturer's data, according to ASME B36.10M, B36.19M, (sch20S/LG, weights are approximate and based on manufacturer's data, according to GB/T 12459, GB/T13401.)

| Nominal diameter |        | Outside diameter | Center to end |      | Center to center | 90°L/R elbow approx weight (kg/pc) |        |           |            |           |        |
|------------------|--------|------------------|---------------|------|------------------|------------------------------------|--------|-----------|------------|-----------|--------|
| DN               | NPS    | OD               | B             | A    | O                | sch5S                              | sch10S | sch20S/LG | sch40S/STD | sch80S/XS | sch80  |
| 15               | 1/2    | 18               | 16            | 38   | 76               | 0.04                               | 0.05   | 0.06      | 0.06       | 0.08      | 0.10   |
| 20               | 3/4    | 25               | 19            | 38   | 76               | 0.06                               | 0.07   | 0.09      | 0.09       | 0.12      | 0.12   |
| 25               | 1      | 32               | 22            | 38   | 76               | 0.07                               | 0.12   | 0.14      | 0.14       | 0.19      | 0.19   |
| 32               | 1(1/4) | 38               | 25            | 48   | 96               | 0.11                               | 0.18   | 0.21      | 0.23       | 0.30      | 0.30   |
| 40               | 1(1/2) | 45               | 29            | 57   | 114              | 0.13                               | 0.20   | 0.23      | 0.26       | 0.34      | 0.34   |
| 50               | 2      | 57               | 35            | 76   | 152              | 0.27                               | 0.45   | 0.57      | 0.62       | 0.85      | 0.85   |
| 65               | 2(1/2) | 76               | 44            | 95   | 190              | 0.58                               | 0.82   | 0.97      | 1.35       | 1.79      | 1.79   |
| 80               | 3      | 89               | 51            | 114  | 228              | 0.82                               | 1.17   | 1.51      | 2.04       | 2.76      | 2.76   |
| 90               | 3(1/2) | 101.6            | 57            | 133  | 266              | 1.09                               | 1.56   | 2.03      | 2.85       | 3.92      | 3.92   |
| 100              | 4      | 108              | 64            | 152  | 304              | 1.32                               | 1.90   | 2.47      | 3.64       | 5.05      | 5.05   |
| 125              | 5      | 113              | 79            | 190  | 380              | 2.67                               | 3.27   | 4.74      | 6.14       | 8.72      | 8.72   |
| 139.7            |        |                  |               |      |                  | 2.84                               | 3.47   | 5.05      | 6.54       | 9.31      | 9.31   |
| 168.3            |        |                  |               |      |                  | 2.81                               | 3.43   | 4.99      | 6.46       | 9.19      | 9.19   |
| 150              | 6      | 159              | 95            | 229  | 458              | 3.86                               | 4.72   | 6.88      | 9.64       | 14.50     | 14.50  |
|                  |        | 165              |               |      |                  | 4.01                               | 4.91   | 7.14      | 10.03      | 15.09     | 15.09  |
| 200              | 8      | 219              | 127           | 305  | 610              | 7.12                               | 9.63   | 15.94     | 20.51      | 31.17     | 31.17  |
|                  |        | 216              |               |      |                  | 7.03                               | 9.49   | 15.71     | 20.22      | 30.71     | 30.71  |
| 250              | 10     | 273              | 159           | 381  | 762              | 13.62                              | 16.74  | 24.97     | 36.33      | 49.12     | 57.83  |
|                  |        | 325              |               |      |                  | 13.34                              | 16.39  | 24.44     | 35.56      | 48.06     | 56.57  |
| 300              | 12     | 323.9            | 190           | 457  | 914              | 22.58                              | 26.01  | 35.66     | 53.40      | 70.44     | 95.46  |
|                  |        | 318              |               |      |                  | 22.16                              | 25.53  | 35.00     | 52.39      | 49.11     | 93.63  |
| 350              | 14     | 377              | 222           | 533  | 1066             | 30.71                              | 36.98  | 61.36     | 72.80      | 96.17     | 141.75 |
|                  |        | 355.6            |               |      |                  | 28.95                              | 34.86  | 57.80     | 68.56      | 90.52     | 133.27 |
| 400              | 16     | 426              | 254           | 610  | 1220             | 42.05                              | 47.90  | 79.55     | 94.42      | 124.87    | 206.35 |
|                  |        | 406.4            |               |      |                  | 40.09                              | 45.67  | 75.82     | 89.98      | 118.95    | 196.35 |
| 450              | 18     | 478              | 286           | 686  | 1372             | 53.11                              | 60.52  | 100.60    | 199.44     | 158.10    | 298.56 |
|                  |        | 457.2            |               |      |                  | 50.78                              | 57.86  | 96.14     | 114.14     | 151.03    | 276.29 |
| 500              | 20     | 529              | 318           | 762  | 1524             | 74.47                              | 86.18  | 123.86    | 147.12     | 194.86    | 391.34 |
|                  |        | 508              |               |      |                  | 71.48                              | 82.72  | 118.87    | 141.17     | 186.94    | 375.00 |
| 550              | 22     | 559              | 343           | 838  | 1676             | 86.58                              | 100.21 | 144.06    | 171.14     | 226.75    | 495.44 |
|                  |        | 630              |               |      |                  | 123.32                             | 141.21 | 177.37    | 210.78     | 279.45    | 661.10 |
| 600              | 24     | 610              | 381           | 914  | 1828             | 119.37                             | 136.64 | 171.67    | 203.98     | 270.40    | -      |
|                  |        | 660              | 406           | 991  | 1982             | -                                  | -      | 201.59    | 239.58     | 317.72    | -      |
| 700              | 28     | 720              | 438           | 1067 | 2134             | -                                  | -      | 237.03    | 281.75     | 373.80    | -      |
|                  |        | 711              |               |      |                  | -                                  | -      | 234.03    | 278.18     | 369.04    | -      |
| 750              | 30     | 762              | 470           | 1143 | 2286             | 213.9                              | 266.23 | 268.89    | 319.66     | 424.20    | -      |
|                  |        | 820              | 502           | 1219 | 2438             | -                                  | -      | 308.83    | 367.20     | 487.42    | □      |
| 800              | 32     | 813              | 533           | 1295 | 2590             | -                                  | -      | 306.16    | 364.02     | 483.20    | -      |
|                  |        | 864              |               |      |                  | -                                  | -      | 345.86    | 411.27     | 546.04    | -      |
| 850              | 34     | 864              |               |      |                  | -                                  | -      | -         | -          | -         | -      |
|                  |        | 920              |               |      |                  | -                                  | -      | -         | -          | -         | -      |
| 900              | 36     | 920              | 565           | 1372 | 2744             | -                                  | -      | 390.39    | 464.28     | 616.56    | -      |
|                  |        | 914              |               |      |                  | -                                  | -      | 387.83    | 461.22     | 612.48    | -      |
| 950              | 38     | 965              | 600           | 1448 | 2896             | -                                  | -      | 432.25    | 514.21     | 682.98    | -      |
|                  |        | 1016             |               |      |                  | -                                  | -      | 479.29    | 570.09     | 757.33    | -      |
| 1000             | 40     | 1020             | 632           | 1524 | 3048             | -                                  | -      | 481.19    | 572.36     | 760.35    | □      |
|                  |        | 1168             | 660           | 1600 | 3200             | -                                  | -      | 528.65    | 628.85     | 835.51    | -      |
| 1050             | 42     | 1118             |               |      |                  | -                                  | -      | 580.43    | 690.49     | 917.53    | -      |
|                  |        | 1120             | 695           | 1676 | 3352             | -                                  | -      | 581.48    | 491.73     | 919.19    | -      |
| 1100             | 44     | 1168             |               |      |                  | -                                  | -      | 634.45    | 754.79     | 1003.10   | □      |
| 1150             | 46     | 1168             | 727           | 1753 | 3506             | -                                  | -      | -         | -          | -         | -      |
| 1200             | 48     | 1220             | 759           | 1829 | 3658             | -                                  | -      | 691.63    | 822.86     | 1093.70   | -      |

## Long Radius Elbows

90° 180°



Above dimensions acc. to GB/T 12459, GB/T 13401, SH3408, SH 3409, HG/T 21635, HG/T 21631, SY/T 05010, ASME B16.9.

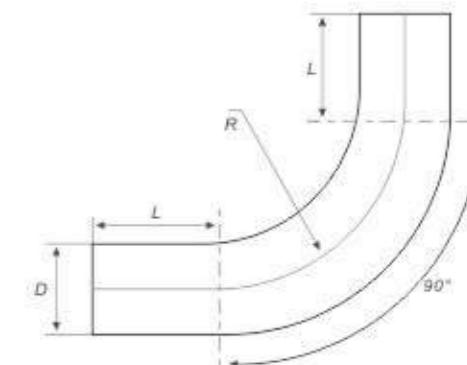
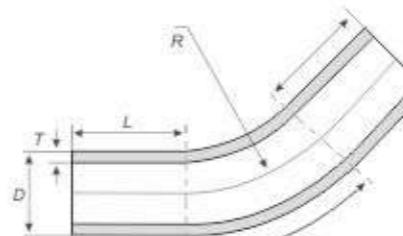
Weights are approximate and based on manufacturer's data, according to ASME B36.10M, B36.19M, (sch20S/LG, weights are approximate and based on manufacturer's data, according to GB/T 12459, GB/T13401.)

| Nominal diameter |        | Outside diameter | Center to end |     | Center to center | 90°L/R elbow approx weight (kg/pc) |        |           |            |           |       |
|------------------|--------|------------------|---------------|-----|------------------|------------------------------------|--------|-----------|------------|-----------|-------|
| DN               | NPS    | OD               | B             | A   | O                | sch5S                              | sch10S | sch20S/LG | sch40S/STD | sch80S/XS | sch80 |
| 25               | 1      | 32               | 25            | 50  | 50               | 0.05                               | 0.08   | 0.09      | 0.09       | 0.12      | 0.12  |
| 32               | 1(1/4) | 38               | 32            | 64  | 64               | 0.07                               | 0.12   | 0.14      | 0.15       | 0.20      | 0.20  |
| 40               | 1      | 45               | 38            | 76  | 76               | 0.11                               | 0.17   | 0.20      | 0.23       | 0.30      | 0.30  |
| 50               | 2      | 57               | 51            | 102 | 102              | 0.18                               | 0.30   | 0.38      | 0.41       | 0.57      | 0.57  |
| 65               | 2(1/2) | 76               | 64            | 128 | 128              | 0.39                               | 0.56   | 0.65      | 0.71       | 1.21      | 1.21  |
| 80               | 3      | 89               | 76            | 152 | 152              | 0.54                               |        |           |            |           |       |

## Long Radius Elbows

| Nominal diameter | Outside diameter | Center to end | Center to center | Approx weight (kg/pc) |     |       |     |   |       |        |            |
|------------------|------------------|---------------|------------------|-----------------------|-----|-------|-----|---|-------|--------|------------|
|                  |                  |               |                  | DN                    | NPS | D1xD2 | C   | M | sch5S | sch10S | sch40S/STD |
| 750×350          | 30×14            | 732×355.6     | 559              | 483                   | 141 | 166   | 211 | - | 285   | -      | -          |
| 750×300          | 30×12            | 762×323.9     | 559              | 473                   | 137 | 156   | 206 | - | 275   | -      | -          |
| 750×250          | 33×10            | 762×273       | 559              | 460                   | 132 | 150   | 198 | - | 264   | -      | -          |
| 800×800          | 32×32            | 820×820       | 597              | 597                   | -   | -     | 303 | - | 405   | -      | -          |
|                  |                  | 813×813       |                  |                       | -   | -     | 302 | - | 402   | -      | -          |
| 800×750          | 32×30            | 813×762       | 597              | 584                   | -   | -     | 290 | - | 386   | -      | -          |
| 800×700          | 32×28            | 820×720       | 597              | 572                   | -   | -     | 291 | - | 388   | -      | -          |
|                  |                  | 713×711       |                  |                       | -   | -     | 277 | - | 370   | -      | -          |
| 800×650          | 32×26            | 813×660       | 597              | 572                   | -   | -     | 271 | - | 362   | -      | -          |
| 800×600          | 32×24            | 820×630       | 597              | 559                   | -   | -     | 279 | - | 356   | -      | -          |
|                  |                  | 813×610       |                  |                       | -   | -     | 268 | - | 358   | -      | -          |
| 800×550          | 32×22            | 813×559       | 597              | 546                   | -   | -     | 262 | - | 350   | -      | -          |
| 800×500          | 32×20            | 820×529       | 597              | 533                   | -   | -     | 273 | - | 364   | -      | -          |
|                  |                  | 813×508       |                  |                       | -   | -     | 256 | - | 342   | -      | -          |
| 800×450          | 32×18            | 820×478       | 597              | 521                   | -   | -     | 270 | - | 360   | -      | -          |
|                  |                  | 813×457       |                  |                       | -   | -     | 250 | - | 334   | -      | -          |
| 800×400          | 32×16            | 820×426       | 597              | 508                   | -   | -     | 264 | - | 352   | -      | -          |
|                  |                  | 813×406.4     |                  |                       | -   | -     | 241 | - | 322   | -      | -          |
| 800×350          | 32×14            | 820×377       | 597              | 508                   | -   | -     | 258 | - | 344   | -      | -          |
|                  |                  | 813×355.6     |                  |                       | -   | -     | 235 | - | 314   | -      | -          |
| 850×850          | 34×34            | 864×864       | 635              | 635                   | -   | -     | 341 | - | 415   | -      | -          |
| 850×800          | 34×32            | 864×813       | 635              | 622                   | -   | -     | 328 | - | 437   | -      | -          |
| 850×750          | 34×30            | 864×762       | 635              | 610                   | -   | -     | 314 | - | 419   | -      | -          |
| 850×700          | 34×28            | 864×711       | 635              | 597                   | -   | -     | 307 | - | 409   | -      | -          |
| 850×650          | 34×26            | 864×660       | 635              | 597                   | -   | -     | 304 | - | 405   | -      | -          |
| 850×600          | 34×24            | 864×610       | 635              | 584                   | -   | -     | 297 | - | 396   | -      | -          |
| 850×550          | 34×22            | 864×599       | 635              | 572                   | -   | -     | 290 | - | 387   | -      | -          |
| 850×500          | 34×20            | 864×508       | 635              | 559                   | -   | -     | 283 | - | 378   | -      | -          |
| 850×450          | 34×18            | 864×457       | 635              | 546                   | -   | -     | 273 | - | 364   | -      | -          |
| 850×400          | 34×16            | 864×406.7     | 635              | 533                   | -   | -     | 266 | - | 355   | -      | -          |
| 900×900          | 36×36            | 920×920       | 673              | 673                   | -   | -     | 648 | - | 543   | -      | -          |
|                  |                  | 914×914       |                  |                       | -   | -     | 639 | - | 511   | -      | -          |
| 900×850          | 36×34            | 914×864       | 673              | 660                   | -   | -     | 619 | - | 511   | -      | -          |
| 900×800          | 36×32            | 920×820       | 673              | 648                   | -   | -     | 370 | - | 594   | -      | -          |
|                  |                  | 914×813       |                  |                       | -   | -     | 353 | - | 470   | -      | -          |
| 900×750          | 36×30            | 914×762       | 673              | 635                   | -   | -     | 345 | - | 460   | -      | -          |
| 900×700          | 36×28            | 920×720       | 673              | 622                   | -   | -     | 355 | - | 473   | -      | -          |
|                  |                  | 914×711       |                  |                       | -   | -     | 341 | - | 455   | -      | -          |
| 900×650          | 36×26            | 914×660       | 673              | 622                   | -   | -     | 333 | - | 447   | -      | -          |
| 900×600          | 36×24            | 914×610       | 673              | 610                   | -   | -     | 326 | - | 434   | -      | -          |
| 900×550          | 36×22            | 914×599       | 673              | 597                   | -   | -     | 318 | - | 424   | -      | -          |
| 900×500          | 36×20            | 920×529       | 673              | 584                   | -   | -     | 347 | - | 462   | -      | -          |
|                  |                  | 914×508       |                  |                       | -   | -     | 306 | - | 409   | -      | -          |
| 900×450          | 36×18            | 920×478       | 673              | 572                   | -   | -     | 343 | - | 457   | -      | -          |
|                  |                  | 914×457       |                  |                       | -   | -     | 299 | - | 398   | -      | -          |
| 900×400          | 36×16            | 920×426       | 673              | 559                   | -   | -     | 335 | - | 447   | -      | -          |
|                  |                  | 914×406.4     |                  |                       | -   | -     | 287 | - | 383   | -      | -          |

## Bend

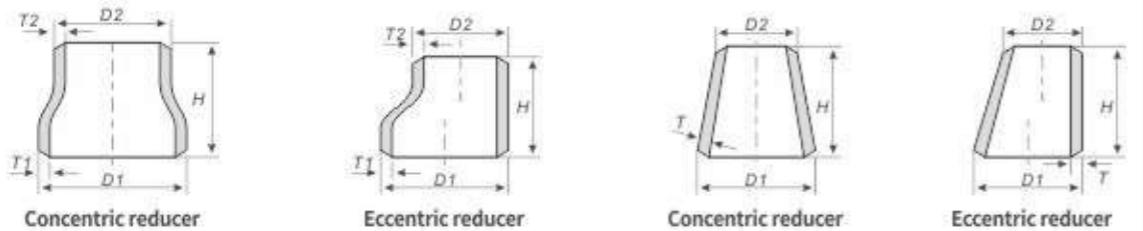


| Item                 | Description   |
|----------------------|---|
| standard             | according to DL/T515《power station bend》, Sy5257《steel bend》, or customer's technical drawing               |
| material             | carbon steel, alloy steel, stainless steel  |
| bend radius          | $R \leq 6000\text{mm}$ , $R \geq 3D$ , ( $R=3D, 4D, 5D, 6D, 7D, 8D, 9D, 10D$ ), $D$ : outside diameter      |
| bend angle $\theta$  | normally $15^\circ, 30^\circ, 45^\circ, 60^\circ, 90^\circ, 135^\circ, 180^\circ$ , or at customer's option |
| length of straight L | normally between 300mm and 1500mm in length of straight, it is at customer's option                         |
| outside diameter D   | $D \leq 1220\text{mm}$  |
| wall thickness T     | $T \leq 120\text{mm}$   |
| end bevel            | according to welding bevel of butt welding fitting  |
| weight               | $\text{weight/kg} = \frac{0.043(D-T)TR\theta}{100000} + L \text{ (weight of double side straight length)}$  |

## Tees(Straight and Reducing)

| Nominal diameter |       | Outside diameter | Center to end | Center to center | Approx weight (kg/pc) |        |            |       |           |       |
|------------------|-------|------------------|---------------|------------------|-----------------------|--------|------------|-------|-----------|-------|
| DN               | NPS   | DixD2            | C             | M                | sch5S                 | sch10S | sch40S/STD | sch40 | sch80S/XS | sch80 |
| 400×150          | 16×6  | 426×159          | 305           | 264              | 29.2                  | 33.5   | 67.6       | 217   | 89.2      | 90.1  |
|                  |       | 406.4×168.3      |               |                  | 27.7                  | 31.8   | 64.4       | 206   | 84.8      | 85.8  |
| 450×450          | 18×18 | 478×476          | 343           | 343              | 41.9                  | 47.8   | 95.3       | 349   | 127       | 142   |
|                  |       | 457×457          |               |                  | 39.8                  | 45.5   | 90.7       | 332   | 120       | 136   |
| 450×400          | 18×16 | 457×406.4        | 343           | 330              | 41.0                  | 46.8   | 93.3       | 342   | 144       | 140   |
|                  |       | 478×426          |               |                  | 39.0                  | 44.5   | 88.9       | 325   | 118       | 133   |
| 450×350          | 18×14 | 478×377          | 343           | 330              | 40.4                  | 46.1   | 91.9       | 336   | 142       | 137   |
|                  |       | 406.4×355.6      |               |                  | 38.3                  | 43.8   | 87.3       | 320   | 135       | 130   |
| 450×300          | 18×12 | 478×325          | 343           | 321              | 39.0                  | 45.4   | 90.6       | 331   | 140       | 135   |
|                  |       | 406.4×323.9      |               |                  | 37.3                  | 42.6   | 85.0       | 216   | 131       | 127   |
| 450×250          | 18×10 | 478×273          | 343           | 308              | 39.3                  | 44.9   | 89.6       | 228   | 138       | 134   |
|                  |       | 457×273.1        |               |                  | 37.3                  | 42.6   | 85.0       | 216   | 131       | 127   |
| 450×200          | 18×18 | 478×219          | 343           | 298              | 38.8                  | 44.3   | 89.1       | 225   | 137       | 132   |
|                  |       | 457×219.1        |               |                  | 36.9                  | 42.1   | 84.7       | 213   | 130       | 120   |
| 500×500          | 20×20 | 529×529          | 381           | 381              | 58.9                  | 68.2   | 117        | 469   | 156       | 186   |
|                  |       | 508×508          |               |                  | 56.3                  | 65.3   | 112        | 449   | 149       | 178   |
| 500×450          | 20×18 | 529×478          | 381           | 368              | 57.9                  | 67.1   | 115        | 462   | 154       | 183   |
|                  |       | 508×457          |               |                  | 55.4                  | 64.2   | 110        | 441   | 147       | 175   |
| 500×400          | 20×16 | 529×426          | 381           | 356              | 57.0                  | 66.0   | 113        | 454   | 151       | 180   |
|                  |       | 507×406.4        |               |                  | 54.7                  | 63.4   | 109        | 436   | 145       | 173   |
| 500×350          | 20×14 | 529×377          | 381           | 356              | 56.0                  | 64.9   | 111        | 446   | 148       | 177   |
|                  |       | 508×355.6        |               |                  | 53.7                  | 62.3   | 107        | 428   | 142       | 170   |
| 500×300          | 20×12 | 529×325          | 381           | 346              | 55.0                  | 63.8   | 109        | 438   | 146       | 174   |
|                  |       | 508×323.9        |               |                  | 52.8                  | 61.2   | 105        | 421   | 140       | 167   |
| 500×250          | 20×10 | 529×273          | 381           | 333              | 54.4                  | 63.0   | 108        | 433   | 144       | 172   |
|                  |       | 508×273.1        |               |                  | 52.2                  | 60.5   | 104        | 416   | 138       | 165   |
| 500×200          | 20×8  | 529×219          | 381           | 324              | 53.7                  | 62.3   | 107        | 428   | 142       | 170   |
|                  |       | 508×219.1        |               |                  | 51.5                  | 59.7   | 102        | 410   | 137       | 163   |
| 550×550          | 22×22 | 559×559          | 419           | 419              | 73.5                  | 85.2   | 146        | 635   | 195       | -     |
| 550×500          | 22×20 | 559×508          | 419           | 406              | 70.7                  | 81.9   | 141        | 610   | 187       | -     |
| 550×450          | 22×18 | 559×457          | 419           | 394              | 67.7                  | 78.5   | 135        | 584   | 180       | -     |
| 550×400          | 22×16 | 559×406.4        | 419           | 381              | 66.2                  | 76.7   | 132        | 571   | 179       | -     |
| 550×350          | 22×14 | 559×355.6        | 419           | 381              | 65.5                  | 75.9   | 130        | 565   | 174       | -     |
| 550×300          | 22×12 | 559×323.9        | 419           | 371              | 64.0                  | 74.2   | 127        | 552   | 170       | -     |
| 550×250          | 22×10 | 559×273.1        | 419           | 359              | 62.5                  | 72.5   | 124        | 540   | 166       | -     |
| 600×600          | 24×24 | 630×630          | 432           | 432              | 96.0                  | 110    | 165        | 797   | 220       | 303   |
|                  |       | 610×610          |               |                  | 93.9                  | 107    | 161        | 779   | 215       | 296   |
| 600×550          | 24×22 | 610×559          | 432           | 432              | 90.1                  | 103    | 155        | 748   | 206       | -     |
|                  |       | 630×529          |               |                  | 92.2                  | 105    | 157        | 765   | 211       | 291   |
| 600×500          | 24×20 | 610×508          | 432           | 432              | 86.4                  | 99.4   | 148        | 701   | 198       | 272   |
|                  |       | 630×478          |               |                  | 88.4                  | 101    | 152        | 734   | 202       | 278   |
| 600×450          | 24×18 | 610×457          | 432           | 419              | 84.5                  | 96.9   | 145        | 694   | 193       | 266   |
|                  |       | 630×426          |               |                  | 86.4                  | 99.1   | 148        | 718   | 198       | 272   |
| 600×400          | 24×16 | 610×404          | 432           | 406              | 83.2                  | 95.7   | 143        | 690   | 191       | 263   |
|                  |       | 630×377          |               |                  | 85.5                  | 98.0   | 147        | 710   | 195       | 269   |
| 600×350          | 24×14 | 610×355.6        | 432           | 406              | 81.7                  | 93.5   | 140        | 678   | 187       | 257   |
|                  |       | 630×325          |               |                  | 83.5                  | 95.8   | 143        | 678   | 191       | 263   |
| 600×300          | 24×12 | 610×323.9        | 432           | 397              | 79.8                  | 91.5   | 137        | 662   | 182       | 251   |
|                  |       | 630×273          |               |                  | 81.6                  | 93.6   | 140        | 662   | 187       | 267   |
| 600×250          | 24×10 | 610×273.1        | 432           | 384              | 77.9                  | 89.3   | 134        | 647   | 178       | 245   |
| 650×650          | 26×26 | 660×660          | 495           | 495              | -                     | -      | 206        | -     | 274       | -     |
|                  |       | 660×610          |               |                  | 495                   | -      | -          | 263   | -         | -     |
| 650×550          | 26×22 | 660×559          | 495           | 470              | -                     | -      | 189        | -     | 252       | -     |
|                  |       | 660×508          |               |                  | 495                   | -      | -          | 185   | -         | 246   |
| 650×500          | 26×20 | 660×508.0        | 495           | 457              | -                     | -      | 183        | -     | 244       | -     |
|                  |       | 660×457.2        |               | 444              | -                     | -      | 183        | -     | 238       | -     |
| 650×450          | 26×18 | 660×457.2        | 495           | 444              | -                     | -      | 179        | -     | 233       | -     |
|                  |       | 660×406.4        |               | 432              | -                     | -      | 175        | -     | 227       | -     |
| 650×350          | 26×14 | 660×355.6        | 495           | 432              | -                     | -      | 171        | -     | 227       | -     |
|                  |       | 660×323.9        |               | 422              | -                     | -      | 171        | -     | 227       | -     |
| 700×700          | 28×28 | 720×720          | 521           | 521              | -                     | -      | 232        | -     | 300       | -     |
|                  |       | 711×711          |               |                  | -                     | -      | 229        | -     | 305       | -     |
| 700×650          | 28×26 | 711×660          | 521           | 521              | -                     | -      | 222        | -     | 293       | -     |
|                  |       | 720×630          |               |                  | -                     | -      | 222        | -     | 296       | -     |
| 700×600          | 28×24 | 711×610          | 510           | 508              | -                     | -      | 211        | -     | 275       | -     |
|                  |       | 720×599          |               |                  | -                     | -      | 204        | -     | 272       | -     |
| 700×550          | 28×22 | 711×559          | 521           | 495              | -                     | -      | 222        | -     | 296       | -     |
|                  |       | 720×529          |               |                  | -                     | -      | 199        | -     | 265       | -     |
| 700×500          | 28×20 | 711×508          | 521           | 483              | -                     | -      | 195        | -     | 263       | -     |
|                  |       | 720×478          |               |                  | -                     | -      | 208        | -     | 268       | -     |
| 700×450          | 28×18 | 711×457          | 521           | 470              | -                     | -      | 195        | -     | 263       | -     |
|                  |       | 720×426          |               |                  | -                     | -      | 190        | -     | 259       | -     |
| 700×400          | 28×16 | 711×406.4        | 521           | 457              | -                     | -      | 201        | -     | 260       | -     |
|                  |       | 720×377          |               |                  | -                     | -      | 183        | -     | 253       | -     |
| 700×350          | 28×14 | 711×355.6        | 521           | 457              | -                     | -      | 197        | -     | 256       | -     |
|                  |       | 720×325          |               |                  | -                     | -      | 179        | -     | 244       | -     |
| 750×750          | 30×30 | 762×762          | 559           | 559              | 176                   | 200    | 264        | -     | 352       | -     |
|                  |       | 762×711          |               |                  | 546                   | -      | 254        | -     | 338       | -     |
|                  |       |                  |               |                  |                       |        |            |       |           |       |

## Reducers(Concentric and Eccentric)

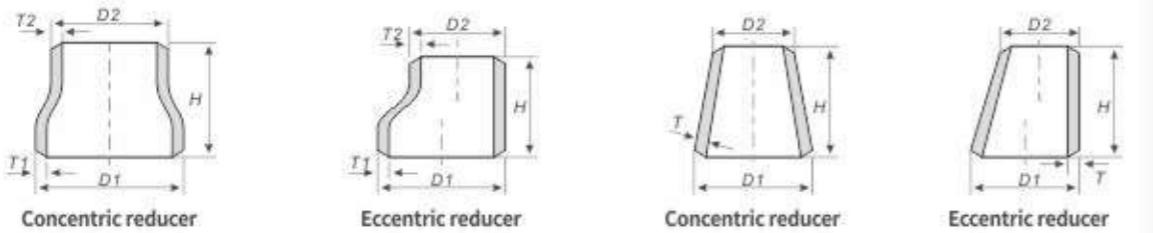


Above dimensions acc. to GB/T 12459, GB/T 13401, SH3408, SH 3409, HG/T 21635, HG/T 21631, SY/T 05010, ASME B16.9.

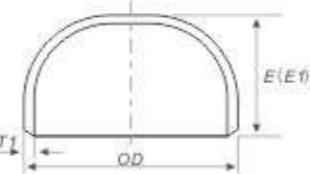
Weights are approximate and based on manufacturer's data, according to ASME B36.10M, B36.19M, (sch20S/LG, weights are approximate and based on manufacturer's data, according to GB/T 12459, GB/T13401.)

| Nominal diameter |             | Outside diameter | End to end | Approx weight (kg/pc) |        |            |       |           |       |  |
|------------------|-------------|------------------|------------|-----------------------|--------|------------|-------|-----------|-------|--|
| DN               | NPS         | D1xD2            | H          | sch5S                 | sch10S | sch40S/STD | sch40 | sch80S/XS | sch80 |  |
| 20×15            | 3/4×1/2     | 25×18            | 38         | 0.03                  | 0.04   | 0.05       | 0.05  | 0.07      | 0.07  |  |
|                  |             | 26.7×213         |            | 0.04                  | 0.04   | 0.06       | 0.06  | 0.07      | 0.07  |  |
| 25×20            | 1×3/4       | 32×25            | 51         | 0.06                  | 0.09   | 0.11       | 0.11  | 0.14      | 0.14  |  |
|                  |             | 334×26.7         |            | 0.06                  | 0.10   | 0.11       | 0.11  | 0.15      | 0.15  |  |
| 25×15            | 1×1/2       | 32×8             | 51         | 0.05                  | 0.08   | 0.09       | 0.09  | 0.12      | 0.12  |  |
|                  |             | 33.4×213         |            | 0.06                  | 0.09   | 0.10       | 0.10  | 0.13      | 0.13  |  |
| 32×25            | 1.1/4×1     | 38×32            | 51         | 0.07                  | 0.11   | 0.14       | 0.14  | 0.18      | 0.18  |  |
|                  |             | 42.2×33.4        |            | 0.08                  | 0.12   | 0.15       | 0.15  | 0.20      | 0.20  |  |
| 32×20            | 1.1/4×3/4   | 38×25            | 51         | 0.06                  | 0.10   | 0.13       | 0.13  | 0.16      | 0.16  |  |
|                  |             | 42.2×26.7        |            | 0.07                  | 0.11   | 0.14       | 0.14  | 0.18      | 0.18  |  |
| 32×15            | 1.1/4×1/2   | 38×18            | 51         | 0.06                  | 0.09   | 0.11       | 0.11  | 0.14      | 0.14  |  |
|                  |             | 42.2×21.3        |            | 0.07                  | 0.11   | 0.13       | 0.13  | 0.17      | 0.17  |  |
| 40×32            | 1.1/2×1.1/4 | 45×38            | 64         | 0.11                  | 0.17   | 0.22       | 0.22  | 0.29      | 0.29  |  |
|                  |             | 48.3×33.4        |            | 0.11                  | 0.19   | 0.24       | 0.24  | 0.32      | 0.32  |  |
| 40×25            | 1.1/2×1     | 45×32            | 64         | 0.10                  | 0.16   | 0.20       | 0.20  | 0.27      | 0.27  |  |
|                  |             | 48.3×33.4        |            | 0.10                  | 0.17   | 0.22       | 0.22  | 0.29      | 0.29  |  |
| 40×20            | 1.1/2×3/4   | 45×25            | 64         | 0.09                  | 0.15   | 0.18       | 0.18  | 0.24      | 0.24  |  |
|                  |             | 48.3×26.7        |            | 0.10                  | 0.16   | 0.20       | 0.20  | 0.26      | 0.26  |  |
| 40×15            | 1.1/2×1/2   | 45×18            | 64         | 0.08                  | 0.13   | 0.16       | 0.16  | 0.21      | 0.21  |  |
|                  |             | 48.3×21.3        |            | 0.09                  | 0.15   | 0.19       | 0.19  | 0.24      | 0.24  |  |
| 50×40            | 2×11/2      | 57×45            | 76         | 0.16                  | 0.26   | 0.35       | 0.35  | 0.47      | 0.47  |  |
|                  |             | 60.3×48.3        |            | 0.17                  | 0.27   | 0.37       | 0.37  | 0.51      | 0.51  |  |
| 50×32            | 2×1.1/4     | 57×38            | 76         | 0.15                  | 0.24   | 0.32       | 0.32  | 0.44      | 0.44  |  |
|                  |             | 60.3×42.2        |            | 0.16                  | 0.26   | 0.35       | 0.35  | 0.48      | 0.48  |  |
| 50×25            | 2×1         | 57×32            | 76         | 0.14                  | 0.22   | 0.30       | 0.30  | 0.41      | 0.41  |  |
|                  |             | 60.3×33.4        |            | 0.14                  | 0.24   | 0.32       | 0.32  | 0.44      | 0.44  |  |
| 65×50            | 2.1/2×2     | 76×57            | 89         | 0.30                  | 0.43   | 0.70       | 0.70  | 0.92      | 0.92  |  |
|                  |             | 73.0×60.3        |            | 0.30                  | 0.43   | 0.70       | 0.70  | 0.92      | 0.92  |  |
| 65×40            | 2.1/2×1.1/2 | 76×45            | 89         | 0.28                  | 0.40   | 0.64       | 0.64  | 0.84      | 0.84  |  |
|                  |             | 73.0×48.3        |            | 0.28                  | 0.40   | 0.63       | 0.63  | 0.83      | 0.83  |  |
| 65×32            | 2.1/2×11/4  | 76×38            | 89         | 0.26                  | 0.38   | 0.60       | 0.60  | 0.79      | 0.79  |  |
|                  |             | 73.0×42.2        |            | 0.27                  | 0.38   | 0.60       | 0.60  | 0.79      | 0.79  |  |
| 65×25            | 2.1/2×1     | 76×32            | 89         | 0.25                  | 0.36   | 0.57       | 0.57  | 0.75      | 0.75  |  |
|                  |             | 73.0×33.4        |            | 0.25                  | 0.35   | 0.56       | 0.56  | 0.73      | 0.73  |  |
| 80×65            | 3×2.1/2     | 89×76            | 89         | 0.38                  | 0.54   | 0.93       | 0.93  | 1.26      | 1.26  |  |
|                  |             | 88.9×73.0        |            | 0.37                  | 0.53   | 0.91       | 0.91  | 1.23      | 1.23  |  |
| 80×50            | 3×2         | 89×57            | 89         | 0.34                  | 0.48   | 0.83       | 0.83  | 1.11      | 1.11  |  |
|                  |             | 88.9×60.3        |            | 0.35                  | 0.49   | 0.84       | 0.84  | 1.13      | 1.13  |  |
| 80×40            | 3×1.1/2     | 89×45            | 89         | 0.31                  | 0.45   | 0.76       | 0.76  | 1.02      | 1.02  |  |
|                  |             | 88.9×48.3        |            | 0.32                  | 0.45   | 0.78       | 0.78  | 1.05      | 1.05  |  |
| 90×80            | 3.1/2×3     | 101.6×88.9       | 102        | 0.50                  | 0.72   | 1.29       | 1.29  | 1.77      | 1.77  |  |
|                  |             | 101.6×73.0       |            | 0.46                  | 0.66   | 1.12       | 1.12  | 1.63      | 1.63  |  |
| 90×65            | 3.1/2×2.1/2 | 101.6×60.3       | 102        | 0.43                  | 0.62   | 1.10       | 1.10  | 1.51      | 1.51  |  |
|                  |             | 101.6×8.3        |            | 0.41                  | 0.58   | 1.03       | 1.03  | 1.40      | 1.40  |  |
| 100×90           | 3.1/2×11/2  | 114.3×101.6      | 102        | 0.57                  | 0.82   | 1.55       | 1.55  | 2.41      | 2.41  |  |
|                  |             | 108×89           |            | 0.52                  | 0.75   | 1.41       | 1.41  | 1.94      | 1.94  |  |
| 100×80           | 4×3         | 114.3×88.9       | 102        | 0.54                  | 0.77   | 1.46       | 1.46  | 2.02      | 2.02  |  |
|                  |             | 108×76           |            | 0.49                  | 0.70   | 1.32       | 1.32  | 1.82      | 1.82  |  |
| 100×65           | 4×2.1/2     | 114.3×73.0       | 102        | 0.50                  | 0.72   | 1.35       | 1.35  | 1.87      | 1.87  |  |
|                  |             | 108×57           |            | 0.44                  | 0.64   | 1.19       | 1.19  | 1.64      | 1.64  |  |
| 100×50           | 4×2         | 114.3×60.3       | 102        | 0.48                  | 0.68   | 1.27       | 1.27  | 1.75      | 1.75  |  |
|                  |             | 133×108          |            | 1.04                  | 1.27   | 2.35       | 2.35  | 3.33      | 3.33  |  |
| 125×100          | 5×4         | 141.3×114.3      | 127        | 1.11                  | 1.35   | 2.50       | 2.50  | 3.55      | 3.55  |  |
|                  |             | 133×89           |            | 0.97                  | 1.18   | 2.17       | 2.17  | 3.07      | 3.07  |  |
| 125×90           | 5×3.1/2     | 141.3×101.6      | 127        | 1.06                  | 1.29   | 2.38       | 2.38  | 3.38      | 3.38  |  |
|                  |             | 133×89           |            | 1.01                  | 1.23   | 2.27       | 2.27  | 3.22      | 3.22  |  |
| 125×80           | 5×3         | 141.3×88.9       | 127        | 0.92                  | 1.12   | 2.06       | 2.06  | 2.91      | 2.91  |  |
|                  |             | 133×76           |            | 0.95                  | 1.16   | 2.14       | 2.14  | 3.02      | 3.02  |  |

## Reducers(Concentric and Eccentric)



## Caps



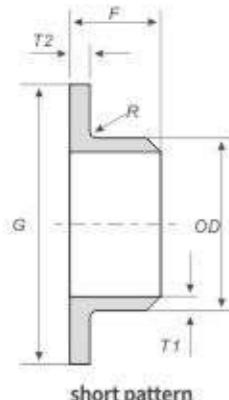
Above dimensions acc. to GB/T 12459, GB/T 13401, SH3408, SH 3409, HG/T 21635, HG/T 21631, SY/T 05010, ASME B16.9.

Weights are approximate and based on manufacture's data, according to ASME B36.10M, B36.19M, (sch20S/LG, weights are approximate and based on manufacture's data, according to GB/T 12459, GB/T13401.)

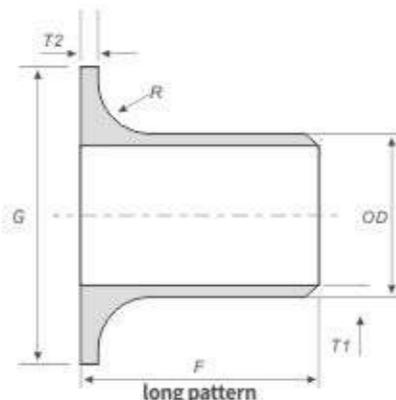
| Nominal diameter | Outside diameter | End to end | Approx weight (kg/pc) |      |       |       |       |        |            |       |
|------------------|------------------|------------|-----------------------|------|-------|-------|-------|--------|------------|-------|
|                  |                  |            | DN                    | NPS  | D1xD2 | H     | sch5S | sch10S | sch40S/STD | sch40 |
| 500×300          | 20×12            | 529×325    | 508                   | 26.2 | 30.30 | 50.80 | 79.4  | 67.2   | 134        | 134   |
|                  |                  | 508×23.9   |                       |      |       |       |       |        |            |       |
| 500×250          | 20×10            | 529×273    | 508                   | 24.8 | 28.7  | 48.2  | 75.2  | 63.7   | 127        | 127   |
|                  |                  | 508×273.1  |                       |      |       |       |       |        |            |       |
| 500×200          | 20×8             | 529×219    | 508                   | 23.5 | 27.1  | 45.5  | 70.9  | 60.1   | 119        | 119   |
|                  |                  | 508×219.1  |                       |      |       |       |       |        |            |       |
| 550×500          | 22×20            | 559×508    | 508                   | 32.1 | 37.3  | 62.7  | -     | 83.0   | 182        | 182   |
|                  |                  | 559×508    |                       |      |       |       |       |        |            |       |
| 550×450          | 22×18            | 559×457    | 508                   | 30.8 | 35.0  | 59.9  | -     | 79.3   | 174        | 174   |
|                  |                  | 559×457    |                       |      |       |       |       |        |            |       |
| 550×400          | 22×16            | 559×406.4  | 508                   | 29.4 | 34.0  | 57.2  | -     | 75.7   | 165        | 165   |
|                  |                  | 559×406.4  |                       |      |       |       |       |        |            |       |
| 550×350          | 22×14            | 559×355.6  | 508                   | 28.0 | 32.5  | 54.5  | -     | 72.1   | 157        | 157   |
|                  |                  | 559×355.6  |                       |      |       |       |       |        |            |       |
| 600×550          | 24×22            | 610×559    | 508                   | 28.0 | 46.8  | 68.8  | -     | 91.2   | 215        | 215   |
|                  |                  | 610×559    |                       |      |       |       |       |        |            |       |
| 600×500          | 24×20            | 630×529    | 508                   | 40.4 | 46.2  | 68.0  | 123   | 90.1   | 212        | 212   |
|                  |                  | 610×508    |                       |      |       |       |       |        |            |       |
| 600×450          | 24×18            | 630×478    | 508                   | 39.1 | 44.7  | 65.8  | 119   | 87.1   | 205        | 205   |
|                  |                  | 610×457    |                       |      |       |       |       |        |            |       |
| 600×400          | 24×16            | 630×426    | 508                   | 37.5 | 43.0  | 63.1  | 114   | 83.6   | 197        | 197   |
|                  |                  | 610×406.4  |                       |      |       |       |       |        |            |       |
| 650×600          | 26×24            | 660×610    | 610                   | -    | -     | 89.8  | -     | 119    | -          | -     |
|                  |                  | 660×610    |                       |      |       |       |       |        |            |       |
| 650×550          | 26×22            | 660×559    | 610                   | -    | -     | 86.3  | -     | 114    | -          | -     |
|                  |                  | 660×559    |                       |      |       |       |       |        |            |       |
| 660×500          | 26×20            | 660×508    | 610                   | -    | -     | 83.0  | -     | 110    | -          | -     |
|                  |                  | 660×508    |                       |      |       |       |       |        |            |       |
| 650×450          | 26×18            | 660×457    | 610                   | -    | -     | 89.0  | -     | 105    | -          | -     |
|                  |                  | 660×457    |                       |      |       |       |       |        |            |       |
| 700×650          | 28×26            | 711×660    | 610                   | -    | -     | 97.1  | -     | 129    | -          | -     |
|                  |                  | 711×660    |                       |      |       |       |       |        |            |       |
| 700×600          | 28×24            | 720×630    | 610                   | -    | -     | 95.7  | -     | 127    | -          | -     |
|                  |                  | 711×610    |                       |      |       |       |       |        |            |       |
| 700×550          | 28×22            | 711×559    | 610                   | -    | -     | 90.4  | -     | 120    | -          | -     |
|                  |                  | 711×559    |                       |      |       |       |       |        |            |       |
| 750×700          | 30×28            | 762×711    | 610                   | -    | -     | 104.0 | -     | 139    | -          | -     |
|                  |                  | 762×711    |                       |      |       |       |       |        |            |       |
| 750×650          | 30×26            | 762×660    | 610                   | -    | -     | 101.0 | -     | 133    | -          | -     |
|                  |                  | 762×660    |                       |      |       |       |       |        |            |       |
| 750×600          | 30×24            | 762×610    | 610                   | 66.4 | 82.7  | 97.8  | -     | 130    | -          | -     |
|                  |                  | 762×610    |                       |      |       |       |       |        |            |       |
| 750×550          | 30×22            | 762×559    | 610                   | 63.9 | 80    | 94.5  | -     | 125    | -          | -     |
|                  |                  | 762×559    |                       |      |       |       |       |        |            |       |
| 800×750          | 32×30            | 813×762    | 610                   | -    | -     | 112   | -     | 148    | -          |       |

## Stub End

Above dimensions acc. to GBMSS SP-43, ASME B16.9.



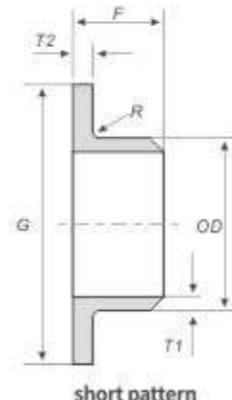
short pattern



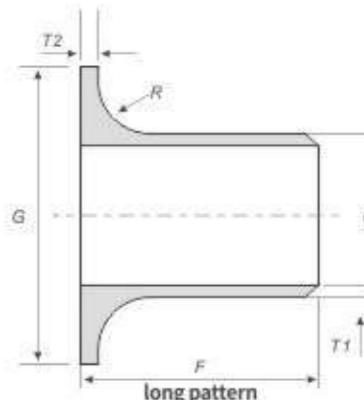
long pattern

Sizes one the following table is applied to SE central-song sets of welded steel pipe flanges (HG20599-97) PN1.6Mpa.

Different pressures and models required by customer, should be indicated on the contract.



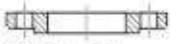
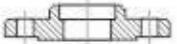
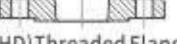
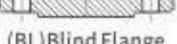
short pattern



long pattern

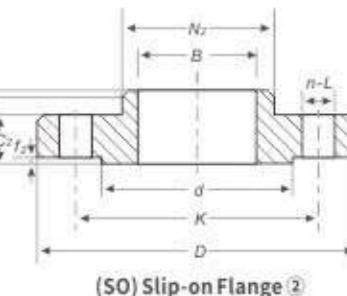
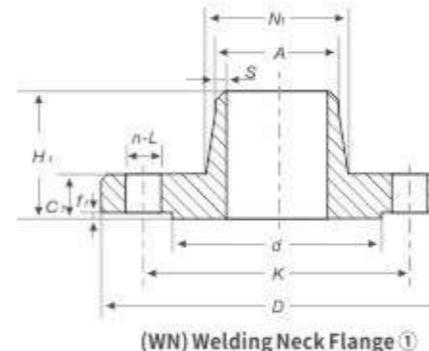
| Nominal diameter |       | Outside diameter | Length F |       | Diameter of lap nominal&maximum | Radius of fillet R | Approx weight (kg/pc) |        |        |        |        |        |    |    |    |    |    |    |
|------------------|-------|------------------|----------|-------|---------------------------------|--------------------|-----------------------|--------|--------|--------|--------|--------|----|----|----|----|----|----|
| DN               | NPS   | OD               | SP       | LP    | G                               | A max B max        | sch5S                 |        | sch10S |        | sch40S |        | SP | LP | SP | LP | SP | LP |
| 15               | 1/2   | 21.3             | 50.8     | 76.2  | 35.1                            | 3 0.75             | 0.049                 | 0.067  | 0.062  | 0.084  | 0.079  | 0.106  |    |    |    |    |    |    |
| 20               | 3/4   | 26.7             | 50.8     | 76.2  | 42.9                            | 3 0.75             | 0.064                 | 0.087  | 0.081  | 0.109  | 0.101  | 0.144  |    |    |    |    |    |    |
| 26               | 1     | 33.4             | 50.8     | 101.6 | 50.8                            | 3 0.75             | 0.082                 | 0.144  | 0.134  | 0.233  | 0.16   | 0.279  |    |    |    |    |    |    |
| 32               | 1.1/4 | 42.4             | 50.8     | 101.6 | 63.5                            | 5 0.75             | 0.109                 | 0.188  | 0.178  | 0.307  | 0.225  | 0.386  |    |    |    |    |    |    |
| 40               | 1.1/2 | 48.3             | 50.8     | 101.6 | 73.2                            | 6 0.75             | 0.129                 | 0.219  | 0.213  | 0.358  | 0.279  | 0.467  |    |    |    |    |    |    |
| 50               | 2     | 60.3             | 63.5     | 152.4 | 91.9                            | 8 0.75             | 0.204                 | 0.406  | 0.338  | 0.667  | 0.471  | 0.924  |    |    |    |    |    |    |
| 65               | 2.1/2 | 73.0             | 63.5     | 152.4 | 104.6                           | 8 0.75             | 0.313                 | 0.626  | 0.448  | 0.893  | 0.74   | 1.465  |    |    |    |    |    |    |
| 80               | 3     | 88.9             | 63.5     | 152.4 | 127                             | 10 0.75            | 0.4                   | 0.781  | 0.574  | 1.117  | 1.01   | 1.954  |    |    |    |    |    |    |
| 90               | 3.1/2 | 101.6            | 76.2     | 152.4 | 139.7                           | 10 0.75            | 0.522                 | 0.896  | 0.65   | 1.283  | 1.38   | 2.35   |    |    |    |    |    |    |
| 100              | 4     | 114.3            | 76.2     | 152.4 | 157.2                           | 11 0.75            | 0.606                 | 1.024  | 0.87   | 1.474  | 1.68   | 2.822  |    |    |    |    |    |    |
| 125              | 5     | 141.3            | 76.2     | 203.2 | 185.7                           | 11 1.5             | 0.985                 | 2.153  | 1.21   | 2.635  | 2.08   | 4.957  |    |    |    |    |    |    |
| 150              | 6     | 168.3            | 88.9     | 203.0 | 215.9                           | 13 1.5             | 1.34                  | 2.591  | 1.64   | 3.174  | 3.374  | 6.482  |    |    |    |    |    |    |
| 200              | 8     | 219.1            | 101.6    | 203.2 | 269.7                           | 13 1.5             | 1.96                  | 3.409  | 2.65   | 4.607  | 5.67   | 9.819  |    |    |    |    |    |    |
| 250              | 10    | 273.1            | 127.0    | 254.0 | 323.9                           | 13 1.5             | 3.57                  | 6.389  | 4.38   | 7.843  | 9.55   | 17.023 |    |    |    |    |    |    |
| 300              | 12    | 323.9            | 152.4    | 254.0 | 381                             | 13 1.5             | 5.85                  | 8.922  | 6.74   | 10.275 | 13.8   | 21.075 |    |    |    |    |    |    |
| 350              | 14    | 355.6            | 152.4    | 304.8 | 412.8                           | 13 1.5             | 6.55                  | 11.571 | 7.49   | 13.912 | 16.88  |        |    |    |    |    |    |    |
| 400              | 16    | 406.4            | 152.4    | 304.8 | 469.9                           | 13 1.5             | 7.778                 | 14.216 | 8.797  | 16.078 | -      |        |    |    |    |    |    |    |
| 450              | 18    | 457.2            | 152.4    | 304.8 | 533.4                           | 13 1.5             | 9.009                 | 16.216 | 10.252 | 18.453 | -      |        |    |    |    |    |    |    |
| 500              | 20    | 508              | 152.4    | 304.8 | 584.2                           | 13 1.5             | 11.102                | 19.984 | 13.202 | 23.764 | -      |        |    |    |    |    |    |    |
| 550              | 22    | 559              | 152.4    | 304.8 | 641.4                           | 13 1.5             | 12.763                | 22.81  | 14.779 | 26.413 | -      |        |    |    |    |    |    |    |
| 600              | 24    | 610              | 152.4    | 304.8 | 692.2                           | 13 1.5             | 16.132                | 28.839 | 18.476 | 33.028 | -      |        |    |    |    |    |    |    |

| Nominal diameter | Outside diameter at bevel D |          | End to end | Radius of fillet R | Diameter of lap G |
|------------------|-----------------------------|----------|------------|--------------------|-------------------|
|                  | DN                          | series A | series B   |                    |                   |
| 15               | 21.3                        | 18       | 38         | 2                  | 46                |
| 20               | 26.9                        | 25       | 40         | 2                  | 56                |
| 25               | 33.7                        | 32       | 40         | 3                  | 65                |
| 32               | 42.4                        | 38       | 42         | 3                  | 76                |
| 40               | 48.3                        | 45       | 45         | 3                  | 84                |
| 50               | 60.3                        | 57       | 48         | 3                  | 99                |
| 65               | 76.1                        | 76       | 48         | 3                  | 118               |
| 80               | 88.9                        | 89       | 50         | 4                  | 132               |
| 100              | 114.3                       | 108      | 52         | 4                  | 156               |
| 125              | 139.7                       | 133      | 55         | 4                  | 184               |
| 150              | 168.3                       | 159      | 55         | 4                  | 211               |
| 200              | 219.1                       | 219      | 62         | 5                  | 266               |
| 250              | 273                         | 273      | 70         | 5                  | 319               |
| 300              | 323.9                       | 325      | 78         | 5                  | 370               |
| 350              | 355.6                       | 377      | 82         | 5                  | 429               |
| 400              | 406.4                       | 426      | 85         | 5                  | 480               |
| 450              | 457                         | 478      | 87         | 5                  | 548               |
| 500              | 508                         | 529      | 90         | 6                  | 609               |
| 600              | 610                         | 630      | 95         | 6                  | 720               |

| Type of Flange   | Type of Sealing Surface | Pressure Class(Mpa) | Manufacturing Standard |
|--|-------------------------|---------------------|------------------------|
| <br>(PL)Plate Flange                        | (RF)                    | 0.25-2.5            |                        |
|  | (FF)                    | 0.25-1.6            |                        |
|  | (RF)                    | 0.6-0.4             |                        |
|  | (MFM)                   | 1.0-4.0             |                        |
|  | (TG)                    | 0.6-1.6             |                        |
|  | (FF)                    | 1.0-25.0            |                        |
| <br>(SO)Slip-on Flange                      | (RF)                    | 1.0-16.0            |                        |
|  | (MFM)                   | 1.0-16.0            |                        |
|  | (TG)                    | 6.3-25.0            |                        |
|  | (RJ)                    | 1.0-1.6             |                        |
|  | (FF)                    | 1.0-10.0            |                        |
|  | (RF)                    | 1.0-10.0            |                        |
| <br>(WN)Welding Neck Flange                 | (MFM)                   | 1.0-10.0            |                        |
|  | (TG)                    | 0.6-0.4             |                        |
|  | (RJ)                    | 0.6-1.6             |                        |
| <br>(SW)Socket Welding Flange             | (FF)                    | 0.6-4.0             |                        |
|  | (RF)                    | 1.0-10.0            |                        |
|  | (MFM)                   | 1.0-10.0            |                        |
| <br>(THD)Threaded Flange                  | (TG)                    | 0.6-0.4             |                        |
|  | (RJ)                    | 0.6-1.6             |                        |
|  | (FF)                    | 0.6-4.0             |                        |
| <br>(LF/SE)ButT Welding Ring Loose Flange | (RF)                    | 0.6-1.6             |                        |
|  | (RF)                    | 1.6-1.6             |                        |
|  | (MFM)                   | 1.0-1.6             |                        |
| <br>(RJ/RJ)Flat Welding Ring Loose Flange | (TG)                    | 1.0-1.6             |                        |
|  | (RJ)                    | 0.25-0.25           |                        |
|  | (MFM)                   | 1.0-16.0            |                        |
| <br>(BL)Blind Flange                      | (TG)                    | 1.0-16.0            |                        |
|  | (RJ)                    | 6.3-25.0            |                        |
|  | (FF)                    | 0.25-1.6            |                        |
|  | (RF)                    | 0.6-4.0             |                        |
| <br>(BL(S))Lining Blind Flange            | (MFM)                   | 1.0-4.0             |                        |
|  | (TG)                    | 1.0-4.0             |                        |
|  | (RF)                    | 0.6-4.0             |                        |

Manufacturing standard can be  
GB/T9112-9124  
HG20592-20635  
SH3406 ASME B16.5  
JISB2220 ASME B16.47 etc.

## Steel Flange(American System)



### American System Flange Class 150(PN2.0Mpa)

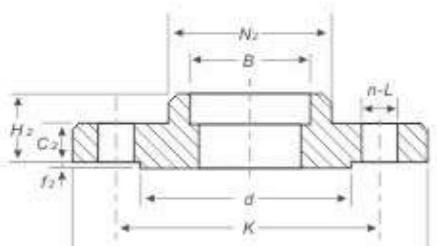
| Nominal diameter | Hub Diam. Top | O.D. of Flange | Raised Face Diam. | Diam. of Bolt Circle | Diam. of Bolt Holes | No. of Bolt Holes | Diam. of Bolt (inch) | Thickness of Flange | Diam. of Hub | Length Through Hub |     |     |       | Approximate Weight of Flange |       |       |   |    |     |   |    |    |    |    |    |    |
|------------------|---------------|----------------|-------------------|----------------------|---------------------|-------------------|----------------------|---------------------|--------------|--------------------|-----|-----|-------|------------------------------|-------|-------|---|----|-----|---|----|----|----|----|----|----|
|                  |               |                |                   |                      |                     |                   |                      |                     |              | DN                 | NPS | A   | D     | d                            | K     | L     | n | Th | C14 | N | H1 | H2 | H3 | W1 | W2 | W3 |
| 15               | 1/2           | 21.3           | 90                | 35                   | 60.5                | 16                | M14                  | 11.5                | 30           | 48                 | 16  | 16  | 0.65  | 0.42                         | 0.53  | 0.43  |   |    |     |   |    |    |    |    |    |    |
| 20               | 3/4           | 26.9           | 100               | 43                   | 70                  | 16                | M14                  | 13                  | 38           | 52                 | 16  | 16  | 0.91  | 0.6                          | 0.73  | 0.63  |   |    |     |   |    |    |    |    |    |    |
| 25               | 1             | 33.7           | 110               | 51                   | 79.5                | 16                | M14                  | 14.5                | 49           | 56                 | 17  | 17  | 1.14  | 0.83                         | 0.89  | 0.89  |   |    |     |   |    |    |    |    |    |    |
| (32)             | 1(1/4)        | 42.4           | 120               | 63.5                 | 89                  | 16                | M14                  | 16                  | 59           | 57                 | 21  | 21  | 1.46  | 1.12                         | 1.17  | 1.2   |   |    |     |   |    |    |    |    |    |    |
| 40               | 1(1/2)        | 48.3           | 130               | 73                   | 98.5                | 16                | M14                  | 17.5                | 65           | 62                 | 22  | 22  | 1.86  | 1.43                         | 1.48  | 1.58  |   |    |     |   |    |    |    |    |    |    |
| 50               | 2             | 60.3           | 150               | 92                   | 120.5               | 18                | M16                  | 19.5                | 78           | 64                 | 25  | 25  | 2.72  | 2.07                         | 2.1   | 2.39  |   |    |     |   |    |    |    |    |    |    |
| (65)             | 2(1/2)        | 76.1           | 180               | 105                  | 139.5               | 18                | M16                  | 22.5                | 90           | 70                 | 29  | 29  | 4.45  | 3.53                         | 3.56  | 4.07  |   |    |     |   |    |    |    |    |    |    |
| 80               | 3             | 88.9           | 190               | 127                  | 152.5               | 18                | M16                  | 24                  | 108          | 70                 | 30  | 30  | 5.22  | 4.01                         | 3.96  | 4.92  |   |    |     |   |    |    |    |    |    |    |
| (90)             | 3(1/2)        | 101.6          | 216               | 140                  | 178                 | 18                | M16                  | 24                  | 122          | 71                 | -   | 32  | 5.45  | -                            | 4.99  | 5.9   |   |    |     |   |    |    |    |    |    |    |
| 100              | 4             | 114.3          | 230               | 157.5                | 190.5               | 18                | M16                  | 24                  | 135          | 76                 | 33  | 33  | 7.49  | 5.4                          | 5.57  | 7.13  |   |    |     |   |    |    |    |    |    |    |
| 125              | (5)           | 139.7          | 255               | 186                  | 216                 | 22                | M20                  | 24                  | 164          | 89                 | 36  | 36  | 9.53  | 6.29                         | 6.33  | 9.31  |   |    |     |   |    |    |    |    |    |    |
| (150)            | 6             | 168.3          | 280               | 216                  | 241.5               | 22                | M20                  | 25.5                | 192          | 89                 | 40  | 40  | 11.8  | 7.82                         | 7.57  | 11.7  |   |    |     |   |    |    |    |    |    |    |
| 200              | 8             | 219.1          | 345               | 270                  | 298.5               | 22                | M20                  | 29                  | 246          | 102                | 44  | 45  | 19.17 | 12.75                        | 12.67 | 20.46 |   |    |     |   |    |    |    |    |    |    |
| 250              | 10            | 273            | 405               | 324                  | 362                 | 26                | M24                  | 30.5                | 305          | 102                | 49  | 49  | 25.67 | 16.78                        | 16.56 | 29.19 |   |    |     |   |    |    |    |    |    |    |
| 300              | 12            | 323.9          | 485               | 381                  | 432                 | 26                | M24                  | 32                  | 365          | 114                | 56  | 56  | 39.9  | 26.91                        | 27.2  | 44.11 |   |    |     |   |    |    |    |    |    |    |
| 350              | 14            | 355.6          | 535               | 413                  | 476                 | 29.5              | M27                  | 35                  | 400          | 127                | 57  | 79  | 53.3  | 35.24                        | 39.29 | 58.83 |   |    |     |   |    |    |    |    |    |    |
| 400              | 16            | 406.4          | 600               | 470                  | 540                 | 29.5              | M27                  | 37                  | 457          | 127                | 64  | 87  | 68.5  | 46.46                        | 52    | 78.19 |   |    |     |   |    |    |    |    |    |    |
| 450              | 18            | 457            | 635               | 533.5                | 57B                 | 32.5              | M30                  | 40                  | 505          | 140                | 68  | 97  | 79.99 | 49.26                        | 56.21 | 94.72 |   |    |     |   |    |    |    |    |    |    |
| 500              | 20            | 508            | 700               | 584                  | 635                 | 32.5              | M30                  | 43                  | 559          | 145                | 73  | 103 | 101   | 62.94                        | 73.4  | 123.6 |   |    |     |   |    |    |    |    |    |    |
| 550              | (22)          | 559            | 750               | 641                  | 692                 | 35.5              | M33                  | 46                  | 610          | 149                | -   | -   | 113.5 | -                            | -     | 150.7 |   |    |     |   |    |    |    |    |    |    |
| 600              | 24            | 610            | 816               | 692                  | 749.5               | 35.5              | M33                  | 48                  | 664          | 152                | 83  | 83  | 111   | 88.11                        | 99.83 | 187.1 |   |    |     |   |    |    |    |    |    |    |

#### Note:

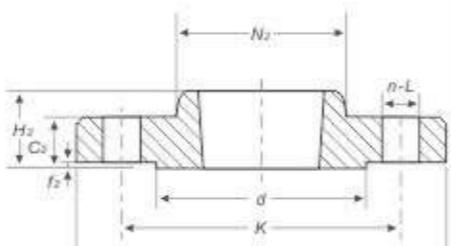
1) ①Welding Neck Flange(WN), ②Slip-on Flange(SO), Threaded Flange(THD), Socket Welding Flange(SW), ③Lap Joint Flange(LJ), ④Blind Flange(BL).

2) ASME B16.5, HG20615-20622, ASME B16.36, ASME B16.48, SH3406, GB912-9124, GB/T2506, GB/T4450 specifications are available.

## Steel Flange(American System)

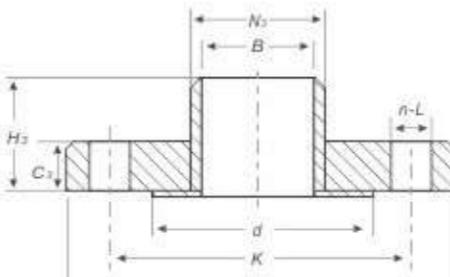


(SW) Socket Welding Flange (1)

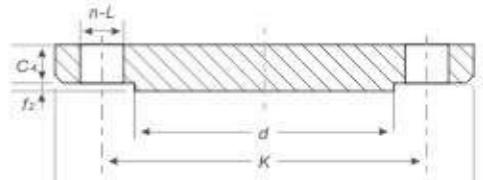


(THD) Threaded Flange (2)

## Steel Flange(American System)



(LF/SE) ButT Welding Ring Loose Flange (3)



(BL) Blind Flange (4)

American System Flange Class 300(PN5.0Mpa)

| Nominal diameter |        | Hub Diam. Top | O.D. of Flange | Raised Face Diam. | Diam. of Bolt Circle | Diam. of Bolt Holes | No. of Bolt Holes | Diam. of Bolt (inch) | Thickness of Flange | Diam. of Hub | Length Through Hub |     |     | Approximate Weight of Flange |       |       |       |  |
|------------------|--------|---------------|----------------|-------------------|----------------------|---------------------|-------------------|----------------------|---------------------|--------------|--------------------|-----|-----|------------------------------|-------|-------|-------|--|
| DN               | NPS    | A             | D              | d                 | K                    | L                   | n                 | Th                   | C14                 | N            | H1                 | H2  | H3  | W1                           | W2    | W3    | W4    |  |
| 15               | 1/2    | 21.3          | 95             | 35                | 60.5                 | 16                  | 4                 | M14                  | 14.5                | 38           | 52                 | 22  | 22  | 0.91                         | 0.64  | 0.71  | 0.63  |  |
| 20               | 3/4    | 26.9          | 120            | 43                | 82.5                 | 18                  | 4                 | M16                  | 16                  | 48           | 57                 | 25  | 25  | 1.36                         | 1.16  | 1.26  | 1.15  |  |
| 25               | 1      | 33.7          | 125            | 51                | 89                   | 18                  | 4                 | M16                  | 17.5                | 54           | 62                 | 27  | 27  | 1.82                         | 1.37  | 1.47  | 1.4   |  |
| (32)             | 1(1/4) | 42.4          | 135            | 63.5              | 98.5                 | 18                  | 4                 | M16                  | 19.5                | 64           | 65                 | 27  | 27  | 2.27                         | 1.76  | 1.86  | 1.88  |  |
| 40               | 1(1/2) | 48.3          | 155            | 73                | 114.5                | 22                  | 4                 | M20                  | 21                  | 70           | 68                 | 30  | 30  | 3.18                         | 2.53  | 2.65  | 2.65  |  |
| 50               | 2      | 60.3          | 165            | 92                | 127                  | 18                  | 8                 | M16                  | 22.5                | 84           | 70                 | 33  | 33  | 3.79                         | 2.91  | 2.98  | 3.38  |  |
| (65)             | 2(1/2) | 76.1          | 190            | 105               | 149                  | 22                  | 8                 | M20                  | 25.5                | 100          | 76                 | 38  | 38  | 5.74                         | 4.43  | 4.47  | 5.09  |  |
| 80               | 3      | 88.9          | 210            | 127               | 168.5                | 22                  | 8                 | M20                  | 29                  | 118          | 79                 | 43  | 43  | 8.17                         | 6.16  | 6.14  | 7.22  |  |
| (90)             | 3(1/2) | 101.6         | 229            | 140               | 184                  | 22                  | 8                 | M20                  | 30                  | 140          | 81                 | 45  | 45  | 9.1                          | 7.72  | 7.26  | 9.53  |  |
| 100              | 4      | 114.3         | 255            | 157.5             | 200                  | 22                  | 8                 | M20                  | 32                  | 146          | 86                 | 48  | 48  | 12.1                         | 9.74  | 10.05 | 11.62 |  |
| (125)            | (5)    | 139.7         | 280            | 186               | 235                  | 22                  | 8                 | M20                  | 35                  | 178          | 98                 | 51  | 51  | 16.3                         | 12.4  | 12.56 | 15.76 |  |
| 150              | 6      | 168.3         | 320            | 216               | 270                  | 22                  | 12                | M20                  | 37                  | 206          | 98                 | 52  | 52  | 21.29                        | 16.76 | 16.42 | 22.16 |  |
| 200              | 8      | 219.1         | 380            | 270               | 330                  | 26                  | 12                | M24                  | 41.5                | 260          | 111                | 62  | 62  | 32.2                         | 24.93 | 24.42 | 35.14 |  |
| 250              | 10     | 273           | 445            | 324               | 687.5                | 29.5                | 16                | M27                  | 48                  | 321          | 117                | 67  | 95  | 47.01                        | 35.59 | 38.85 | 54.99 |  |
| 300              | 12     | 323.9         | 520            | 381               | 451                  | 32.5                | 16                | M30                  | 51                  | 375          | 130                | 73  | 102 | 66.64                        | 50.91 | 55.75 | 19.96 |  |
| 350              | 14     | 355.6         | 585            | 413               | 514.5                | 32.5                | 20                | M30                  | 54                  | 426          | 143                | 76  | 111 | 95.69                        | 72.6  | 81    | 108.4 |  |
| 400              | 16     | 406.4         | 650            | 470               | 571.5                | 35.5                | 20                | M33                  | 57.5                | 483          | 146                | 83  | 121 | 121                          | 91.63 | 104.9 | 141.2 |  |
| 450              | 18     | 457           | 710            | 533.5             | 628.5                | 35.5                | 24                | M33                  | 60.5                | 533          | 159                | 89  | 130 | 150.2                        | 111.6 | 128.6 | 178.8 |  |
| 500              | 20     | 508           | 775            | 584               | 686                  | 35.5                | 24                | M33                  | 63.5                | 507          | 162                | 95  | 140 | 181.6                        | 136   | 156   | 223.3 |  |
| (550)            | (22)   | 559           | 840            | 641               | 743                  | 42                  | 24                | M39                  | 66.5                | 640          | 165                | -   | -   | 199.4                        | -     | -     | 268.7 |  |
| 600              | 24     | 610           | 915            | 692               | 813                  | 42                  | 24                | M39                  | 70                  | 702          | 168                | 104 | 152 | 265                          | 202.1 | 235.1 | 342   |  |

Note:

1) ① Welding Neck Flange(WN), ② Slip-on Flange(SO), Threaded Flange(THD), Socket Welding Flange(SW), ③ Lap Joint Flange(LJ), ④ Blind Flange(BL).

Note:

1) ① Welding Neck Flange(WN), ② Slip-on Flange(SO), Threaded Flange(THD), Socket Welding Flange(SW), ③ Lap Joint Flange(LJ), ④ Blind Flange(BL).