# ROYAL FORGE
## AND FITTINGS INDUSTRIES

MFG. OF SS, CS, MS, AS PIPE FITTING & FLANGES

AN ISO 9001:2015 CERTIFIED COMPANY

*Royal Solutions for Industrial Strength*

ISO | MSME सूक्ष्म, लघु एवं मध्यम उद्यम MICRO, SMALL & MEDIUM ENTERPRISES | CE

**Manufacturer, Importer, Exporters & Suppliers of :**
Stainless Steel, Carbon Steel, Flanges & Pipe Fittings, etc.
**Stockist & Suppliers of:** Ferrous & Non Ferrous Metals, All Types of Industrial Raw Material Etc.

+91 9008058632, 8460931532 | royalfittingsindustries@gmail.com | www.royalfittings.co.in

# Royal Solutions for Industrial Strength


At **Royal Forge & Fittings Industries**, we are a leading name in the manufacturing, import, export, and supply of high-quality industrial raw materials. Specializing in Stainless Steel, Carbon Steel, Flanges, and Pipe Fittings, we proudly serve as a one-stop solution for industries worldwide.

Our mission is to deliver durability, efficiency, and reliability through an extensive product line that meets the diverse and demanding needs of our clients. With a commitment to excellence, we combine innovative technology and stringent quality control to exceed expectations in every project.

## Our Expertise

With a robust presence in the industry, we cater to diverse sectors by providing a comprehensive range of:

- Stainless Steel and Carbon Steel Products
- Flanges and Pipe Fittings
- Industrial Raw Materials

Our expertise lies in delivering solutions that are customized to client requirements and aligned with international quality standards. As trusted stockists and suppliers, we ensure a seamless supply chain of ferrous and non-ferrous metals, guaranteeing timely delivery and customer satisfaction.

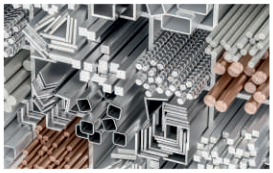
Our expertise lies in delivering solutions that are customized to client requirements and aligned with international quality standards. As trusted stockists and suppliers, we ensure a seamless supply chain of ferrous and non-ferrous metals, guaranteeing timely delivery and customer satisfaction.

## Our Mission and Vision

At Royal Forge & Fittings Industries, our mission is to deliver unparalleled industrial solutions that empower businesses globally. We envision becoming a global leader in the supply and manufacturing of industrial raw materials, driven by innovation, quality, and customer satisfaction.

## Why Choose Us?


**Quality Assurance:**
Stringent quality checks at every stage of production.



**Wide Range of Products:**
From stainless steel to ferrous and non-ferrous metals.

**Global Reach:**
Serving clients worldwide with unmatched efficiency.

**Expert Team:**
Highly skilled professionals dedicated to excellence.

## Quality Policy

At **Royal Forge & Fittings Industries**, quality is not just a standard — it is our commitment. We are dedicated to delivering products that consistently meet international specifications and exceed customer expectations. We ensure strict quality control at every stage, from procurement of raw materials to final dispatch. Our systematic inspection procedures, experienced team, and adherence to global standards enable us to maintain reliability, durability, and performance in every product we supply.

- ► Procurement from certified and trusted manufacturers
- ► Compliance with ASTM, ASME, and other international standards
- ► In-house material inspection and verification
- ► Third-party testing available upon client request
- ► 100% documentation with Mill Test Certificates (MTC)
- ► Proper packaging to ensure safe transportation
- ► On-time delivery with zero compromise on quality


## Contact Us

For inquiries and orders, reach out to us:

**FACTORY / OFFICE ADDRESS:**
RS No.103, Plot No.10, Ramdev Industrial,
Kashipura Road, Por GIDC Ramangamdi,
Vadodara - 391243, Gujarat (INDIA)

**Mobile:** +91 90080 58632
+91 8460 31532
**Email:** royalfittingsindustries@gmail.com
sales@royalfittings.co.in
**Web :** www.royalfittings.co.in

# OUR CERTIFICATE

Certificate of Compliance

Application for
**Pressure Equipment Directive (PED) 2014/68/EU.**
This is to certify that the product(s):

**MANUFACTURER, IMPORTER, EXPORTERS & SUPPLIERS OF STAINLESS STEEL, CARBON STEEL, FLANGES & PIPE FITTINGS, STOCKIST & SUPPLIERS OFFERROUS & NON FERROUS METALS & INDUSTRIAL RAW MATERIAL.**

Manufactured by

**ROYAL FORGE & FITTINGS INDUSTRIES**
**RS NO 103. 97/PAIKI 1, 2, PLOT NO. - 10, RAMAN GAMDI, POR GIDC, VADODARA - 391243, GUJARAT, INDIA.**

has been assessed & found in accordance with the requirements of **Pressure Equipment Directive (PED) 2014/68/EU.**
QCC is non-notified certification body, issue this 'compliance certificate' after audit of manufacturer product(s) & technical file(s). This certificate applies to the tested sample only not for whole production. It's manufacturer sole responsibility to meet all the necessary conformity assessment activities according to **PED 2014/68/EU** and related standards before placing them on the market & CE mark on the product(s).

Certificate No. : CE/E965/0125
Original Certificate Date : 04-January-2025
Issue Date : 04-January-2025
Expiry Date : 03-January-2028

To check this certificate status visit:
"http://uasl.uk.com/certifiedorganization"

Authorised Signature
*For* **Quality Control Certification**
UK Office: 82, Adley Street,
London - E5 0DZ, United Kingdom

CE

Quality Control Certification accredited by UASL, UK
This certificate doesn't provide the certified organisation with immunity from its legal obligations.
This certificate remains the property of QC Certification to whom it must be returned on request.

Certificate

This is to Certify that
**ROYAL FORGE & FITTINGS INDUSTRIES**
**RS NO 103. 97/PAIKI 1, 2, PLOT NO. - 10, RAMAN GAMDI, POR GIDC, VADODARA - 391243, GUJARAT, INDIA.**

has been found in Compliance with requirements of
**Quality Management System**
**ISO 9001:2015**
for the following scope:

**MANUFACTURER, IMPORTER, EXPORTERS & SUPPLIERS OF STAINLESS STEEL, CARBON STEEL, FLANGES & PIPE FITTINGS, STOCKIST & SUPPLIERS OFFERROUS & NON FERROUS METALS & INDUSTRIAL RAW MATERIAL.**

Certificate No. : QMS/A4E8/0125
Original Certificate Date : 04-January-2025
Issue Date : 04-January-2025
Expiry Date : 03-January-2028

To check this certificate status visit:
"http://uasl.uk.com/certifiedorganization"

Authorised Signature
**Quality Control Certification**
UK Office: 82, ADLEY STREET,
LONDON - E5 0DZ, United Kingdom
India Office: 2nd Floor, Aman Market,
Narela Mandi, Delhi - 110 040, India

"Quality Control Certification (QCC)" accredited by "UASL, England, UK". This certificate remains the property of "QCC" to whom it must be returned on request.

Certificate

This is to Certify that
**ROYAL FORGE & FITTINGS INDUSTRIES**
**RS NO 103. 97/PAIKI 1, 2, PLOT NO. - 10, RAMAN GAMDI, POR GIDC, VADODARA - 391243, GUJARAT, INDIA.**

has been found in Compliance with requirements of
**Environmental Management System**
**ISO 14001:2015**
for the following scope:

**MANUFACTURER, IMPORTER, EXPORTERS & SUPPLIERS OF STAINLESS STEEL, CARBON STEEL, FLANGES & PIPE FITTINGS, STOCKIST & SUPPLIERS OFFERROUS & NON FERROUS METALS & INDUSTRIAL RAW MATERIAL.**

Certificate No. : EMS/A50B/0125
Original Certificate Date : 04-January-2025
Issue Date : 04-January-2025
Expiry Date : 03-January-2028

To check this certificate status visit:
"http://uasl.uk.com/certifiedorganization"

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**ROYAL FORGE & FITTINGS INDUSTRIES**
**RS NO 103. 97/PAIKI 1, 2, PLOT NO. - 10, RAMAN GAMDI, POR GIDC, VADODARA - 391243, GUJARAT, INDIA.**

has been found in Compliance with requirements of
**Occupational Health and Safety Management Systems**
**ISO 45001:2018**
for the following scope:

**MANUFACTURER, IMPORTER, EXPORTERS & SUPPLIERS OF STAINLESS STEEL, CARBON STEEL, FLANGES & PIPE FITTINGS, STOCKIST & SUPPLIERS OFFERROUS & NON FERROUS METALS & INDUSTRIAL RAW MATERIAL.**

Certificate No. : OHSMS/E942/0125
Original Certificate Date : 04-January-2025
Issue Date : 04-January-2025
Expiry Date : 03-January-2028

To check this certificate status visit:
"http://uasl.uk.com/certifiedorganization"

Authorised Signature
**Quality Control Certification**
UK Office: 82, ADLEY STREET,
LONDON - E5 0DZ, United Kingdom
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Narela Mandi, Delhi - 110 040, India

"Quality Control Certification (QCC)" accredited by "UASL, England, UK". This certificate remains the property of "QCC" to whom it must be returned on request.

Dear Valued Customer,

**Subject: Vendor Registration Request for Supply of Ferrous and Non-Ferrous Metals**

We hope this message finds you in excellent health and high spirits.

It gives us immense pleasure to introduce **Royal Forge & Fittings Industries**, a leading manufacturer, stockist, and supplier of premium ferrous and non-ferrous metals. With years of expertise and a proven track record, we specialize in producing superior-quality stainless steel pipes and fittings, available in an extensive range of grades, shapes, and sizes to cater to the diverse needs of our customers.

At **Royal Forge & Fittings Industries**, our commitment to excellence drives us to serve a broad spectrum of industries, including but not limited to **Food & Beverages, Chemicals, Fertilizers, Petrochemicals, Nuclear and Thermal Power Plants, Cement, Paper, Refineries, and more.** Our mission is to consistently deliver products that meet your exacting requirements, ensuring the success of your manufacturing and operational processes.

We take pride in our ability to provide:
- **High-Quality Products:** Designed and manufactured to meet stringent industry standards.
- **Timely Deliveries:** Ensuring minimal downtime in your operations.
- **Customized Solutions:** Tailored to meet specific application needs.
- **Reliable Support:** Backed by an experienced team and state-of-the-art facilities.

To formalize this association, we would be delighted to initiate and complete any vendor registration formalities required by your organization. We see this process not merely as an administrative step but as the foundation for a long-lasting and meaningful partnership.

Should there be any specific requirements or documents needed to facilitate this registration, please do not hesitate to contact us. We are committed to ensuring a smooth and efficient onboarding process. Our team is ready to provide all necessary details and address any queries you may have.

As a company dedicated to quality, reliability, and customer satisfaction, we look forward to the opportunity to serve you as an approved vendor. It would be an honor to contribute to your organization's growth and success by delivering products and services that meet and exceed your expectations.

Thank you for considering **Royal Forge & Fittings Industries** as a trusted partner. We assure you of our unwavering commitment to excellence and look forward to the prospect of working together.

*Best Regards,*
For, **Royal Forge & Fittings Industries**


royalfittingsindustries@gmail.com www.royalfittings.co.in

# BUTT-WELD FITTINGS

45° Elbow

90° Elbow

180° Elbow

Tee

Reducing Tee

Concentric Reducer

Cross

Long Pattern Stub Ends

Short Pattern Stub Ends

Ball Caps

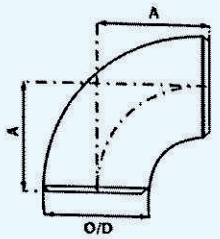
Eccentric Reducer

The following table represents the size range, product standards, and material grades of industrial pipe fittings like stainless steel, carbon steel & alloy steel pipe fittings, etc. The range includes.

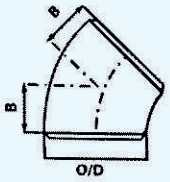
## Material, Size & Specification

| | | | |
|---|---|---|---|
| Standards | ASME / ANSI B16.9, ANSI B16.28, MSS-SP-43 | | |
| Size | 1/8" NB TO 48" NB. (Seamless & 100% X-Ray Welded, Fabricated) | | |
| Thickness | SCH: 5s, 10s, 40s, 80s, 10, 20, 40, STD, 60, 80, XS, 100, 120, 140, 160, XXS, Custom Thickness. | | |
| Dimension | B16.5, BS 4504, EN-1092, | | |
| Specialize | Long Bend with Radius – R = 3D, 5D & 10D<br>Pigabble Bend & As per your drawing | | |
| Value Added Service | Polish (Electro & Commercial)<br>Heat Treatment | Annealed & Pickled,<br>Sand Blasting | Machining Etc. |

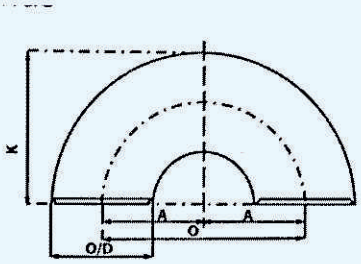
Used to allow the flow of Fluids, like steam, water, air, oil, etc, through the desired cross-section with diversion of flow to the desired point.




90 Deg. LR Elbow




45 Deg. LR Elbow




180 Deg. LR Return Bend

| Nominal Pipe Size (NPS) | Outside Diameter at Bevel (O/D) | Dimension A | Dimension B | Center to Center O | Back to Face K |
|---|---|---|---|---|---|
| 1/2" | 21.3 | 38.0 | 16 | 76 | 48 |
| 3/4" | 26.7 | 38.0 | 19 | 76 | 51 |
| 1" | 33.4 | 38.0 | 22 | 76 | 56 |
| 1¼" | 42.2 | 48.0 | 25 | 95 | 70 |
| 1½" | 48.3 | 57.0 | 29 | 114 | 83 |
| 2" | 60.3 | 76.0 | 35 | 152 | 108 |
| 2½" | 73.0 | 95.0 | 44 | 190 | 132 |
| 3" | 88.9 | 114.0 | 51 | 229 | 159 |
| 3½" | 101.6 | 133.0 | 57 | 267 | 184 |
| 4" | 114.3 | 152.0 | 64 | 305 | 210 |
| 5" | 141.3 | 190.0 | 79 | 381 | 262 |
| 6" | 168.3 | 229.0 | 95 | 457 | 313 |
| 8" | 219.1 | 305.0 | 127 | 610 | 414 |
| 10" | 273.0 | 381.0 | 159 | 762 | 518 |
| 12" | 323.8 | 457.0 | 190 | 914 | 619 |
| 14" | 355.6 | 533.0 | 222 | 1067 | 711 |
| 16" | 406.4 | 610.0 | 254 | 1219 | 813 |
| 18" | 457.0 | 686.0 | 286 | 1372 | 914 |
| 20" | 508.0 | 762.0 | 318 | 1524 | 1016 |
| 22" | 559.0 | 838.0 | 343 | 1676 | 1118 |
| 24" | 610.0 | 914.0 | 381 | 1829 | 1219 |
| 26" | 660.0 | 991.0 | 406 | — | — |
| 28" | 711.0 | 1067.0 | 438 | — | — |
| 30" | 762.0 | 1143.0 | 470 | — | — |
| 32" | 813.0 | 1219.0 | 502 | — | — |
| 34" | 864.0 | 1295.0 | 533 | — | — |
| 36" | 914.0 | 1372.0 | 565 | — | — |

Note : All Dimensions are in MM.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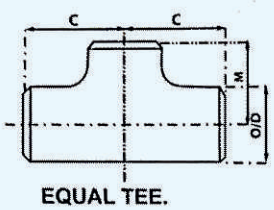
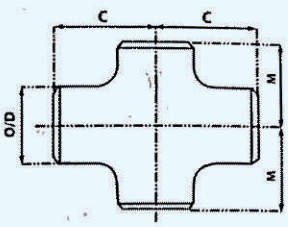
# BUTT-WELD FITTINGS (as per B 16.28)



EQUAL TEE.

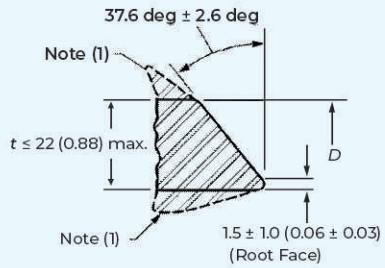


CROSS

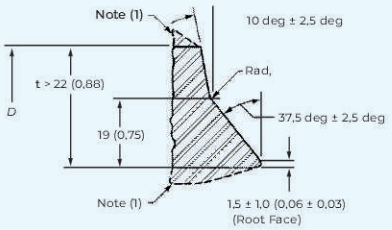
| Nominal Pipe Size (NPS) | Outside Diameter at Bevel (O/D) | Run 'C' | Outlet 'M' | Nominal Pipe Size (NPS) | Outside Diameter at Bevel (O/D) | Run 'C' | Outlet 'M' |
|---|---|---|---|---|---|---|---|
| 1/2" | 21.3 | 25 | 25 | 12" | 323.8 | 279 | 254 |
| 3/4" | 26.7 | 29 | 29 | 14" | 355.6 | 305 | 279 |
| 1" | 33.4 | 38 | 38 | 16" | 406.4 | 343 | 305 |
| 1¼" | 42.2 | 48 | 48 | 18" | 457.0 | 343 | 343 |
| 1½" | 48.3 | 57 | 57 | 20" | 508.0 | 381 | 381 |
| 2" | 60.3 | 64 | 64 | 22" | 559.0 | 419 | 419 |
| 2½" | 73.0 | 86 | 76 | 24" | 610.0 | 432 | 432 |
| 3" | 88.9 | 95 | 86 | 26" | 660.0 | 495 | 495 |
| 3½" | 101.6 | 105 | 95 | 28" | 711.0 | 521 | 521 |
| 4" | 114.3 | 124 | 105 | 30" | 762.0 | 559 | 559 |
| 5" | 141.3 | 143 | 124 | 32" | 813.0 | 597 | 597 |
| 6" | 168.3 | 178 | 143 | 34" | 864.0 | 635 | 635 |
| 8" | 219.1 | 216 | 178 | 36" | 914.0 | 673 | 673 |
| 10" | 273.0 | 254 | 216 | | | | |

Note : All Dimensions are in MM.

## TABLE 8-1 WELDING BEVELS AND ROOT FACE



(a) Plain Bevel



(b) Compound Bevel

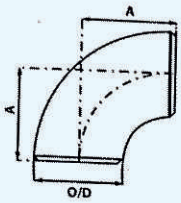
| Nominal Wall Thickness, $t_1$, mm (in.) | End Preparation |
|---|---|
| Less than x [Note (2)] | Cut square or slightly chamfer, at manufacturer's option (not illustrated) |
| x to 22 (0.88), inclusive [Note (2)] | Plain bevel as in Illustration (a) above |
| More than 22 (0.88) | Compound bevel as in illustration (b) above |

**GENERAL NOTE:** In the illustrations, dimensions in parentheses are in Inches; other dimensions are in millimeters.

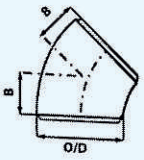
**NOTES :**

(1) See section 8 and Figure 8-1 for transition contours.

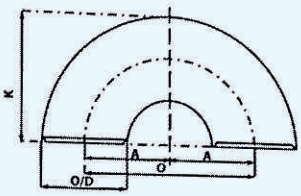
(2) x = 5 mm (0.19 in.) for carbon steel ar ferritic alloy steel and 3 mm (0.12 in.) for austenitic steel or nonferrous alloys.



90 Deg. SR ELBOW



45 Deg. SR ELBOW



180 Deg. SR RETURN BEND

| Nominal Pipe Size (NPS) | Outside Diameter at Bevel (O/D) | Dimension A | Dimension B | Centre to Centre O | Back to Face K |
|---|---|---|---|---|---|
| 1/2" | 21.3 | — | — | — | — |
| 3/4" | 26.7 | — | — | — | — |
| 1" | 33.4 | 25 | — | 51 | 41 |
| 1¼" | 42.2 | 32 | — | 64 | 52 |
| 1½" | 48.3 | 38 | — | 76 | 62 |
| 2" | 60.3 | 51 | — | 102 | 81 |
| 2½" | 73.0 | 64 | — | 127 | 100 |
| 3" | 88.9 | 76 | 31.6 | 162 | 121 |
| 3½" | 101.6 | 89 | 36.8 | 178 | 140 |
| 4" | 114.3 | 102 | 42.1 | 203 | 159 |
| 5" | 141.3 | 127 | 52.6 | 254 | 197 |
| 6" | 168.3 | 152 | 63.4 | 305 | 237 |
| 8" | 219.1 | 203 | 84.2 | 406 | 313 |
| 10" | 273.0 | 254 | 105.2 | 508 | 391 |
| 12" | 323.8 | 305 | 126.3 | 610 | 467 |
| 14" | 355.6 | 356 | 147.3 | 711 | 533 |
| 16" | 406.4 | 406 | 168.3 | 813 | 610 |
| 18" | 457.0 | 457 | 189.4 | 914 | 686 |
| 20" | 508.0 | 508 | 210.4 | 1016 | 762 |
| 22" | 559.0 | 559 | 231.5 | 1118 | 838 |
| 24" | 610.0 | 610 | 252.5 | 1219 | 914 |

Note : All Dimensions are in MM.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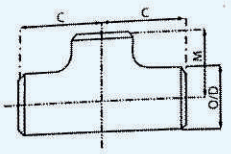
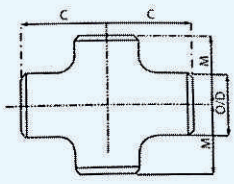
# BUTT-WELD FITTINGS



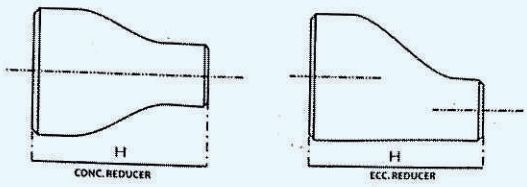
UNEQUAL TEE.



CROSS UNEQUAL

| Nominal Pipe Size (NPS) | Outside Diameter at Bevel (O/D) | | Outside Diameter at Bevel (O/D) | |
|---|---|---|---|---|
| | Run | Outlet | Run 'c' | Outlet 'M' |
| 1/2" x 3/8" | 21.3 | 17.3 | 25 | 25 |
| 1/2" x 1/4" | 21.3 | 13.7 | 25 | 25 |
| 3/4" x 1/2" | 26.7 | 21.3 | 29 | 29 |
| 3/4" x 3/8" | 26.7 | 17.3 | 29 | 29 |
| 1"x3/4" | 33.4 | 26.7 | 38 | 38 |
| 1" x 1/2" | 33.4 | 21.3 | 38 | 38 |
| 1¼" x 1" | 42.2 | 33.4 | 48 | 48 |
| 1¼" x 3/4" | 42.2 | 26.7 | 48 | 48 |
| 1¼" x 1/2" | 42.2 | 21.3 | 48 | 48 |
| 1½" x 1¼" | 48.3 | 42.2 | 57 | 57 |
| 1½" x 1" | 48.3 | 33.4 | 57 | 57 |
| 1½" x 3/4" | 48.3 | 26.7 | 57 | 57 |
| 1½" x 1/2" | 48.3 | 21.3 | 57 | 57 |
| 2"x1½" | 60.3 | 48.3 | 64 | 60 |
| 2" x 1¼" | 60.3 | 42.2 | 64 | 57 |
| 2" x 1" | 60.3 | 33.4 | 64 | 51 |
| 2" x 3/4" | 60.3 | 26.7 | 64 | 44 |
| 2½" x 2" | 73.0 | 60.3 | 76 | 70 |
| 2½" x 1½" | 73.0 | 48.3 | 76 | 67 |
| 2½" x 1¼" | 73.0 | 42.2 | 76 | 64 |
| 2½" x 1" | 73.0 | 33.4 | 76 | 57 |
| 3" x 2½" | 88.9 | 73.0 | 86 | 83 |
| 3" x 2" | 88.9 | 60.3 | 86 | 76 |
| 3" x 1½" | 88.9 | 48.3 | 86 | 73 |
| 3" x 1¼" | 88.9 | 42.2 | 86 | 70 |
| 3½" x 3" | 101.6 | 88.9 | 95 | 92 |
| 3½" x 2½" | 101.6 | 73.0 | 95 | 89 |
| 3½" x 2" | 101.6 | 60.3 | 95 | 83 |
| 3½" x 1½" | 101.6 | 48.3 | 95 | 79 |
| 4 x 3½" | 114.3 | 101.6 | 105 | 102 |
| 4" x 3" | 114.3 | 88.9 | 105 | 98 |
| 4" x 2½" | 114.3 | 73.0 | 105 | 95 |
| 4"x2" | 114.3 | 60.3 | 105 | 89 |
| 4" x 1½" | 114.3 | 48.3 | 105 | 86 |
| 5" x 4" | 141.3 | 114.3 | 124 | 117 |
| 5" x 3½" | 141.3 | 101.6 | 124 | 114 |
| 5"x3" | 141.3 | 88.9 | 124 | 111 |
| 5"x2½" | 141.3 | 73.0 | 124 | 108 |
| 5"x2" | 141.3 | 60.3 | 124 | 105 |
| 6"x5" | 168.3 | 141.3 | 143 | 137 |
| 6"x4" | 168.3 | 114.3 | 143 | 130 |
| 6"x3½" | 168.3 | 101.6 | 143 | 127 |
| 6" x 3" | 168.3 | 88.9 | 143 | 124 |
| 6" x 2½" | 168.3 | 73.0 | 143 | 121 |
| 8" x 6" | 219.1 | 168.3 | 178 | 166 |
| 8" x 5" | 219.1 | 141.3 | 178 | 162 |
| 8" x 4" | 219.1 | 114.3 | 178 | 156 |
| 8" x 3½" | 219.1 | 101.6 | 178 | 152 |

| Nominal Pipe Size (NPS) | Outside Diameter at Bevel (O/D) | | Outside Diameter at Bevel (O/D) | |
|---|---|---|---|---|
| | Run | Outlet | Run 'c' | Outlet 'M' |
| 10" x 8" | 273.0 | 219.1 | 216 | 203 |
| 10" x 6" | 273.0 | 168.3 | 216 | 194 |
| 10" x 5" | 273.0 | 141.3 | 216 | 191 |
| 10" x 4" | 273.0 | 114.3 | 216 | 184 |
| 12" x 10" | 323.8 | 273.0 | 254 | 241 |
| 12" x 8" | 323.8 | 219.1 | 254 | 229 |
| 12" x 6" | 323.8 | 168.3 | 254 | 219 |
| 12" x 5" | 323.8 | 141.3 | 254 | 216 |
| 14" x 12" | 355.6 | 323.8 | 279 | 270 |
| 14" x 10' | 355.6 | 273.0 | 279 | 257 |
| 14" x 8" | 355.6 | 219.1 | 279 | 248 |
| 14" x 6" | 355.6 | 168.3 | 279 | 238 |
| 16" x 14" | 406.4 | 355.6 | 305 | 305 |
| 16" x 12" | 406.4 | 323.8 | 305 | 295 |
| 16" x 10" | 406.4 | 273.0 | 305 | 283 |
| 16" x 8" | 406.4 | 219.1 | 305 | 273 |
| 16" x 6" | 406.4 | 168.3 | 305 | 264 |
| 18" x 16" | 457.0 | 406.4 | 343 | 330 |
| 18" x 14" | 457.0 | 355.6 | 343 | 330 |
| 18" x 12" | 457.0 | 323.8 | 343 | 321 |
| 18" x 10" | 457.0 | 273.0 | 343 | 308 |
| 18" x 8" | 457.0 | 219.1 | 343 | 298 |
| 20" x 18" | 508.0 | 457.0 | 381 | 368 |
| 20" x 16" | 508.0 | 406.4 | 381 | 356 |
| 20" x 14" | 508.0 | 355.6 | 381 | 356 |
| 20" x 12" | 508.0 | 323.8 | 381 | 346 |
| 20" x 10" | 508.0 | 273.0 | 381 | 333 |
| 20" x 8" | 508.0 | 219.1 | 381 | 324 |
| 22" x 20" | 559.0 | 508.0 | 419 | 406 |
| 22" x 18" | 559.0 | 457.0 | 419 | 394 |
| 22" x 16" | 559.0 | 406.4 | 419 | 381 |
| 22" x 14" | 559.0 | 355.6 | 419 | 381 |
| 22" x 12" | 559.0 | 323.8 | 419 | 371 |
| 22" x 10" | 559.0 | 273.0 | 419 | 359 |
| 24" x 22" | 610.0 | 559.0 | 432 | 432 |
| 24" x 20" | 610.0 | 508.0 | 432 | 432 |
| 24" x 18" | 610.0 | 457.0 | 432 | 419 |
| 24" x 16" | 610.0 | 406.4 | 432 | 406 |
| 24" x 14" | 610.0 | 355.6 | 432 | 406 |
| 24" x 12" | 610.0 | 323.8 | 432 | 397 |
| 24" x 10" | 610.0 | 273.0 | 432 | 384 |
| 26" x 24" | 660.0 | 610.0 | 495 | 483 |
| 26" x 22" | 660.0 | 559.0 | 495 | 470 |
| 26" x 20" | 660.0 | 508.0 | 495 | 457 |
| 26" x 18" | 660.0 | 457.0 | 495 | 444 |
| 26 " x 16" | 660.0 | 406.4 | 495 | 432 |
| 26" x 14" | 660.0 | 355.6 | 495 | 432 |
| 26" x 12" | 660.0 | 323.8 | 495 | 422 |
| 28" x 26" | 711.0 | 660.0 | 521 | 521 |
| 28" x 24" | 711.0 | 610.0 | 521 | 508 |
| 28" x 22" | 711.0 | 559.0 | 521 | 495 |
| 28" x 20" | 711.0 | 508.0 | 521 | 483 |




| Nominal Pipe Size (NPS) | Outside Diameter at Bevel (O/D) | | End to End |
|---|---|---|---|
| | Run | Outlet | H |
| 3/4" x 1/2" | 26.7 | 21.3 | 38 |
| 3/4" x 3/8" | 26.7 | 17.3 | 38 |
| 1" x 3/4" | 33.4 | 26.7 | 51 |
| 1" x 1/2" | 33.4 | 21.3 | 51 |
| 1¼" x 1" | 42.2 | 33.4 | 51 |
| 1¼" x 3/4" | 42.2 | 26.7 | 51 |
| 1¼" x 1/2" | 42.2 | 21.3 | 51 |
| 1½" x 1¼" | 48.3 | 42.2 | 64 |
| 1½" x 1" | 48.3 | 33.4 | 64 |
| 1½" x 3/4" | 48.3 | 26.7 | 64 |
| 1½" x 1/2" | 48.3 | 21.3 | 64 |
| 2" x 1½" | 60.3 | 48.3 | 76 |
| 2" x 1¼" | 60.3 | 42.2 | 76 |
| 2" x 1" | 60.3 | 33.4 | 76 |
| 2" x 3/4" | 60.3 | 26.7 | 76 |
| 2½" x 2" | 73.0 | 60.3 | 89 |
| 2½" x 1½" | 73.0 | 48.3 | 89 |
| 2½" x 1¼" | 73.0 | 42.2 | 89 |
| 2½ x 1" | 73.0 | 33.4 | 89 |
| 3" x 2½" | 88.9 | 73.0 | 89 |
| 3" x 2" | 88.9 | 60.3 | 89 |
| 3" x 1½" | 88.9 | 48.3 | 89 |
| 3" x 1¼" | 88.9 | 42.2 | 89 |
| 3½" x 3" | 101.6 | 88.9 | 102 |
| 3½" x 2½" | 101.6 | 73.0 | 102 |
| 3½" x 2" | 101.6 | 60.3 | 102 |
| 3½" x 1½" | 101.6 | 48.3 | 102 |
| 4" x 3½" | 114.3 | 101.6 | 102 |
| 4" x 3" | 114.3 | 88.9 | 102 |
| 4" x 2½" | 114.3 | 73.0 | 102 |
| 4" x 2" | 114.3 | 60.3 | 102 |
| 4" x 1½" | 114.3 | 48.3 | 102 |
| 5" x 4" | 141.3 | 114.3 | 127 |
| 5" x 3½" | 141.3 | 101.6 | 127 |
| 5" x 3" | 141.3 | 88.9 | 127 |
| 5" x 2½" | 141.3 | 73.0 | 127 |
| 5" x 2" | 141.3 | 60.3 | 127 |
| 6" x 5" | 168.3 | 141.3 | 140 |
| 6" x 4" | 168.3 | 114.3 | 140 |
| 6" x 3½" | 168.3 | 101.6 | 140 |
| 6" x 3" | 168,3 | 88.9 | 140 |
| 6" x 2½" | 168.3 | 73.0 | 140 |
| 8" x 6" | 219.1 | 168.3 | 152 |
| 8" x 5" | 219.1 | 141.3 | 152 |
| 8" x 4" | 219.1 | 114.3 | 152 |
| 8" x 3½" | 219.1 | 101.6 | 152 |
| 10" x 8" | 273.0 | 219.1 | 178 |
| 10" x 6" | 273.0 | 168.3 | 178 |
| 10" x 5" | 273.0 | 141.3 | 178 |
| 10" x 4" | 273.0 | 114.3 | 178 |

| Nominal Pipe Size (NPS) | Outside Diameter at Bevel (O/D) | | End to End |
|---|---|---|---|
| | Run | Outlet | H |
| 12" x10" | 323.8 | 273.0 | 203 |
| 12" x 8" | 323.8 | 219.1 | 203 |
| 12" x 6" | 323.8 | 168.3 | 203 |
| 12" x 5" | 323.8 | 141.3 | 203 |
| 14" x 12" | 355.6 | 323.8 | 330 |
| 14" x 10" | 355.6 | 273.0 | 330 |
| 14" x 8" | 355.6 | 219.1 | 330 |
| 14" x 6" | 355.6 | 168.3 | 330 |
| 16" x 14" | 406.4 | 355.6 | 356 |
| 16" x 12" | 406.4 | 323.8 | 356 |
| 16" x 10" | 406.4 | 273.0 | 356 |
| 16" x 8" | 406.4 | 219.1 | 356 |
| 18" x 16" | 457.0 | 406.4 | 381 |
| 18" x 14" | 457.0 | 356.6 | 381 |
| 18" x 12" | 457.0 | 323.8 | 381 |
| 18" x 10" | 457.0 | 273.0 | 381 |
| 20" x 18" | 508.0 | 457.0 | 508 |
| 20" x 16" | 508.0 | 406.4 | 508 |
| 20" x 14" | 508.0 | 355.6 | 508 |
| 20"x12" | 508.0 | 323.8 | 508 |
| 22" x 20" | 559.0 | 508.0 | 508 |
| 22" x 18" | 559.0 | 457.0 | 508 |
| 22" x 16" | 559.0 | 406.4 | 508 |
| 22" x 14" | 559.0 | 355.6 | 508 |
| 24" x 22" | 610.0 | 559.0 | 508 |
| 24" x 20" | 610.0 | 508.0 | 508 |
| 24" x 18" | 610.0 | 457.0 | 508 |
| 24" x 16" | 610.0 | 406.4 | 508 |
| 26" x 24" | 660.0 | 610.0 | 610 |
| 26" x 22" | 660.0 | 559.0 | 610 |
| 26" x 20" | 660.0 | 508.0 | 610 |
| 26" x 18" | 660.0 | 457.0 | 610 |
| 28" x 26" | 711.0 | 660.0 | 610 |
| 28" x 24" | 711.0 | 610.0 | 610 |
| 28" x 20" | 711.0 | 508.0 | 610 |
| 28" x 18" | 711.0 | 457.0 | 610 |
| 30" x 28" | 762.0 | 711.0 | 610 |
| 30" x 26" | 762.0 | 660.0 | 610 |
| 30" x 24" | 762.0 | 610.0 | 610 |
| 30" x 20" | 762.0 | 508.0 | 610 |
| 32" x 30" | 813.0 | 762.0 | 610 |
| 32" x 28" | 813.0 | 711.0 | 610 |
| 32" x 26" | 813.0 | 660.0 | 610 |
| 32" x 24" | 813.0 | 610.0 | 610 |
| 34" x 32" | 864.0 | 813.0 | 610 |
| 34" x 30" | 864.0 | 762.0 | 610 |
| 34" x 26" | 864.0 | 660.0 | 610 |
| 34" x 24" | 864.0 | 610.0 | 610 |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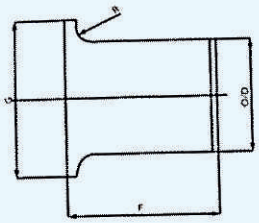
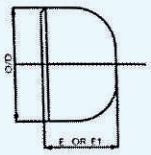
# BUTT-WELD FITTINGS (as per B 16.9)




STUBEND




CAP

| Nominal Pipe Size (NPS) | Outside Diameter at Bevel (O/D) | Long Pattern Length "F" | Short Pattern "F" | Radius of Follet "R" | Dia of Lap "G" | Length "E" | Limiting Wall Thk for Length "E" | Length "E 1" |
|---|---|---|---|---|---|---|---|---|
| 1/2" | 21.3 | 76.0 | 51 | 3 | 35 | 25 | 4.57 | 25 |
| 3/4" | 26.7 | 76.0 | 51 | 3 | 43 | 25 | 3.81 | 25 |
| 1" | 33.4 | 102.0 | 51 | 3 | 51 | 38 | 4.57 | 38 |
| 1¼" | 42.2 | 102.0 | 51 | 5 | 64 | 38 | 4.83 | 38 |
| 1½" | 48.3 | 102.0 | 51 | 6 | 73 | 38 | 5.08 | 38 |
| 2" | 60.3 | 152.0 | 64 | 8 | 92 | 38 | 5.59 | 44 |
| 2½" | 73.0 | 152.0 | 64 | 8 | 105 | 38 | 7.11 | 51 |
| 3" | 88.9 | 152.0 | 64 | 10 | 127 | 51 | 7.62 | 64 |
| 3½" | 101.6 | 152.0 | 76 | 10 | 140 | 64 | 8.13 | 76 |
| 4" | 114.3 | 152.0 | 76 | 11 | 157 | 64 | 8.64 | 76 |
| 5" | 141.3 | 203.0 | 76 | 11 | 186 | 76 | 9.65 | 89 |
| 6" | 168.3 | 203.0 | 89 | 13 | 216 | 89 | 10.92 | 102 |
| 8" | 219.1 | 203.0 | 102 | 13 | 270 | 102 | 12.7 | 127 |
| 10" | 273.0 | 254.0 | 127 | 13 | 324 | 127 | 12.7 | 152 |
| 12" | 323.8 | 254.0 | 152 | 13 | 381 | 152 | 12.7 | 178 |
| 14" | 355.6 | 305.0 | 152 | 13 | 413 | 165 | 12.7 | 191 |
| 16" | 406.4 | 305.0 | 152 | 13 | 470 | 178 | 12.7 | 203 |
| 18" | 457.0 | 305.0 | 152 | 13 | 533 | 203 | 12.7 | 229 |
| 20" | 508.0 | 305.0 | 152 | 13 | 584 | 229 | 12.7 | 254 |
| 22" | 559.0 | 305.0 | 152 | 13 | 641 | 254 | 12.7 | 254 |
| 24" | 610.0 | 305.0 | 152 | 13 | 692 | 267 | 12.7 | 305 |

# DIMENSIONAL TOLERANCES AS PER ANSI B 16.9/ B 16.28/ MSS SP-43 BUTT WELD FITTING

| All Fittings | | | | | 0 Deg. and 45 Deg. Elbows and Tees | Reducers & Lap Joints Stub Ends | Caps | 180 deg. Returns | | | | lap Joint Stub Ends | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nominal Pipe size (NPS) | Outside Diameter at Bewel (1), (2) D | | Inside Diameter at End (1), (2), (3) | Wall Thickness (3) | Centre to end Dimension A, B, C, M | Centre to Overall Length F, H | Overall Length E | Centre to Centre Dimension O | Back to Face Dimension K | Alignment of ends U | Outside Diameter of Lap G | Fillet Radius of Lap R | Outside Diameter of Barrel |
| 1/2 to 2½ | 1 | | 0.8 | Not Less than 87.5% of nominal thickness | 2 | 2 | 4 | 7 | 7 | 1 | +0.1 | +0.1 | See Table 7 for limiting dimensions |
| 3 to 3½ | 1 | | 1.6 | | 2 | 2 | 4 | 7 | 7 | 1 | +0-1 | +0-1 | |
| 4 | +2 | -1 | 1.6 | | 2 | 2 | 4 | 7 | 7 | 1 | +0-1 | +0-1 | |
| 5 to 6 | -3 | -1 | 1.6 | | 2 | 2 | 7 | 7 | 7 | 1 | +0-1 | +0-1 | |
| 8 | +4 | -3 | 1.6 | | 2 | 2 | 7 | 7 | 7 | 1 | +0-1 | +0.2 | |
| 10 | +4 | -3 | 3.2 | | 2 | 2 | 7 | 10 | 7 | 2 | +0.2 | +0-2 | |
| 12 to 18 | +4 | -3 | 3.2 | | 2 | 2 | 7 | 10 | 7 | 2 | +0-2 | +0-2 | |
| 20 to 24 | +6 | -5 | 4.8 | | 3 | 3 | 7 | 10 | 7 | 2 | +0-2 | +0-2 | |
| 26 to 30 | +7 | -5 | 4.8 | | 3 | 3 | 10 | – | – | – | – | – | |
| 32 to 48 | +7 | -5 | 4.8 | | 5 | 5 | 10 | – | – | – | – | – | |

| Nominal Pipe size (NPS) | Angularity - Tall | |
|---|---|---|
| | Off Angle Q | Off Plane P |
| 1/2 to 4 | 1 | 2 |
| 5 to 8 | 2 | 4 |
| 10 to 12 | 3 | 5 |
| 14 to 16 | 3 | 7 |
| 18 to 24 | 4 | 10 |
| 26 to 30 | 5 | 10 |
| 32 to 42 | 5 | 13 |
| 44 to 48 | 5 | 20 |





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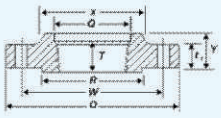
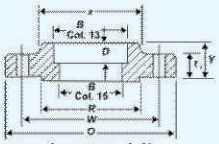
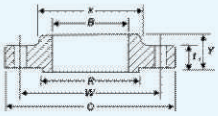
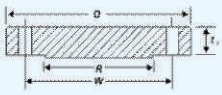
## Material, Size & Specification

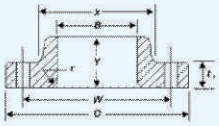
| | |
|---|---|
| Standards | ANSI B16.5, ANSI B16.47 Series A & B, MSS SP44, ASA, API-605, |
| Size | 1/2" (15 NB) to 48" (1200NB) |
| Thickness | 150#, 300#, 400#, 600#, 900#, 1500#, 2500#<br>PN6, PN10, PN16, PN25, PN40, PN64, etc. |
| Stainless Steel | ASTM A182 F202, F304/304L/304H, F316/316L, F316H, F316TI, F310, F321, F904L |
| Alloys Steel | ASTM A182 F1, F5, F9, F11, F22, F91 |
| Alloys Steel | ASTM A105/A105N, A350 LF1, LF2 CL1/CL2, LF3 CL1/CL2, A694 F42, F46, F48, F50, F52, F56, F60, F65, F70, A516.60, 65, 70 (Spectacle Blind Flange, Spacer Ring/Spade Flange), Steel RST37.2, C22.8 |
| Other | Monel, Nickel, Inconel, Hastalloy, Copper, Brass, Bronze, Tantalum, Bismuth, Aluminum, High Speed Steel, Zinc. Lead, etc. |
| Types of Flanges | Weld neck Flanges (WNRF), Slip-on Flanges (SORF), Blind Flanges (BLRF), Lap Joint Flanges (SOLJ), Socket-weld Flanges (SWRF), Screwed (Threaded) Flanges, Long weld neck Flanges (LWNRF), Spectacle Blind Flanges, Spacer & Blind Flanges, Ring Type Joint Flanges (RTJ), Reducing Flanges, Raised Face (RF) Flanges, Orifice Flanges, Large Diameter Flanges, Custom Flanges, Drawing Flanges, Forged Flanges, Plate Flanges, Flat Face Flanges, etc. |

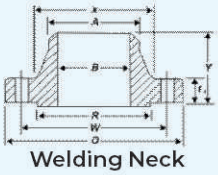

Threaded


Socket Welding
(½" to 2½" Only)


Slip-on Welding


Blind


Lapped


Welding Neck

## DIMENSIONS OF CLASS 150 FLANGES

| Nominal Pipe Size NPS | Outside Diameter of Flange O | Thickness of Flange, Min., Tl | Drilling | | | | Diameter of Hub, X | Hub Diameter Beginning of Chamfer Welding Neck A | Lenght Thru Hub | | | Threaded/Lenght Threaded Min. B | Bore | | | Comer Radius of Bore Lapped Flange and Pipe, R | Depth of Socket D | Diameter of RF, R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thickness Lap Joint Min., tl | Diameter of Blot Circle W | Diameter of Blot Holes | Numbers of Blots | | | Threaded/ Slip-On/Socket Welding, Y | Lapped Y | Welding, Y | | Slip-On/Socket Welding. Min. B | Lapped Min. B | Welding Neck /Socket Welding B (Note(2) | | | |
| 1/2 | 90 | 9.6 | 11.2 | 60.3 | 15.9 | 4 | 30 | 21.3 | 14 | 16 | 46 | 16 | 22.2 | 22.9 | 15.8 | 3 | 10 | 34.9 |
| 3/4 | 100 | 11.2 | 12.7 | 69.9 | 15.9 | 4 | 38 | 26.7 | 14 | 16 | 51 | 16 | 27.7 | 28.2 | 20.9 | 3 | 11 | 42.9 |
| 1 | 110 | 12.7 | 14.3 | 79.4 | 15.9 | 4 | 49 | 33.4 | 16 | 17 | 54 | 17 | 34.5 | 34.9 | 26.6 | 3 | 13 | 50.8 |
| 1 ¼ | 115 | 14.3 | 15.9 | 88.9 | 15.9 | 4 | 59 | 42.2 | 19 | 21 | 56 | 21 | 43.2 | 43.7 | 35.1 | 5 | 14 | 63.5 |
| 1½ | 125 | 15.9 | 17.5 | 984 | 15.9 | 4 | 65 | 48.3 | 21 | 22 | 60 | 22 | 49.5 | 50.0 | 40.9 | 6 | 16 | 73.0 |
| 2 | 150 | 17.5 | 19.1 | 120.7 | 19.1 | 4 | 78 | 60.3 | 24 | 25 | 62 | 25 | 61.9 | 62.5 | 52.5 | 8 | 17 | 92.1 |
| 2½ | 180 | 20.7 | 22.3 | 139.7 | 19.1 | 4 | 90 | 73.0 | 27 | 29 | 68 | 29 | 74.6 | 75.4 | 62.7 | 8 | 19 | 104.8 |
| 3 | 190 | 22.3 | 23.9 | 152.4 | 19.1 | 4 | 108 | 88.9 | 29 | 30 | 68 | 30 | 90.7 | 91.4 | 77.9 | 10 | 21 | 127.0 |
| 3½ | 215 | 22.3 | 23.9 | 177.8 | 19.1 | 8 | 122 | 101.6 | 30 | 32 | 70 | 32 | 103.4 | 104.1 | 90.1 | 10 | – | 139.7 |
| 4 | 230 | 22.3 | 23.9 | 190.5 | 19.1 | 8 | 135 | 114.3 | 32 | 33 | 75 | 33 | 116.1 | 116.8 | 102.9 | 11 | – | 157.2 |
| 5 | 255 | 22.3 | 23.9 | 215.9 | 22.3 | 8 | 164 | 141.3 | 35 | 36 | 87 | 36 | 143.8 | 144.4 | 128.2 | 11 | – | 185.7 |
| 6 | 280 | 23.9 | 25.4 | 241.3 | 22.3 | 8 | 192 | 168.3 | 38 | 40 | 87 | 40 | 170.7 | 171.4 | 154.1 | 13 | – | 215.9 |
| 8 | 345 | 27.0 | 28.6 | 298.2 | 22.3 | 8 | 246 | 219.1 | 43 | 44 | 100 | 44 | 221.5 | 222.2 | 202.7 | 13 | – | 269.9 |
| 10 | 406 | 28.6 | 30.2 | 362.0 | 25.4 | 12 | 355 | 273.0 | 48 | 49 | 100 | 49 | 276.2 | 277.4 | 254.6 | 13 | – | 323.8 |
| 12 | 445 | 32.0 | 31.8 | 431.8 | 25.4 | 12 | 365 | 323.8 | 54 | 55 | 113 | 55 | 327.0 | 328.2 | 304.8 | 13 | – | 381.0 |
| 14 | 535 | 33.4 | 35.0 | 476.3 | 28.6 | 12 | 400 | 355.6 | 56 | 79 | 125 | 57 | 359.2 | 360.2 | To be Specified by Purchaser | 13 | – | 412.8 |
| 16 | 595 | 35.0 | 36.6 | 539.8 | 28.6 | 16 | 457 | 406.4 | 62 | 87 | 125 | 64 | 410.5 | 411.2 | | 13 | – | 469.9 |
| 18 | 635 | 38.1 | 39.7 | 577.9 | 31.8 | 16 | 505 | 457.0 | 67 | 97 | 138 | 68 | 461.8 | 462.3 | | 13 | – | 533.4 |
| 20 | 700 | 41.3 | 42.9 | 635.0 | 31.8 | 20 | 559 | 508.0 | 71 | 103 | 143 | 73 | 513.1 | 514.4 | | 13 | – | 584.2 |
| 24 | 815 | 46.1 | 47.7 | 749.3 | 35.0 | 20 | 663 | 610.0 | 81 | 111 | 151 | 83 | 616.0 | 616.0 | | 13 | – | 692.2 |

## DIMENSIONS OF CLASS 300 FLANGES

| Nominal Pipe Size NPS | Outside Diameter of Flange O | Thickness of Flange, Min., Tl | Thickness Lap Joint Min., tl | Drilling | | | Diameter of Hub, X | Hub Diameter Beginning of Chamfer Welding Neck A | Lenght Thru Hub | | | Threaded/Lenght Threaded Min. B | Bore | | | Comer Radius of Bore Lapped Flange and Pipe, R | Counter Bore Threaded FLANGE Min Q | Depth of Socket D | Diameter of RF, R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Diameter of Blot Circle W | Diameter of Blot Holes | Numbers of Blots | | | Threaded/Slip-On /Socket Welding, Y | Lapped Y | Welding, Y | | Slip-On/Socket Welding. Min. B | Lapped Min. B | Welding Neck/Socket Welding B (Note(2) | | | | |
| 1/2 | 95 | 12.7 | 14.3 | 66.7 | 15.9 | 4 | 38 | 21.3 | 21 | 22 | 51 | 16 | 22.2 | 22.9 | 15.8 | 3 | 23.6 | 10 | 34.9 |
| 3/4 | 115 | 14.9 | 15.9 | 82.6 | 19.1 | 4 | 48 | 26.7 | 24 | 25 | 56 | 16 | 27.7 | 28.2 | 20.9 | 3 | 29.0 | 11 | 42.9 |
| 1 | 125 | 15.9 | 17.5 | 88.9 | 19.1 | 4 | 54 | 33.4 | 25 | 27 | 60 | 18 | 34.5 | 34.9 | 26.6 | 3 | 35.8 | 13 | 50.8 |
| 1¼ | 135 | 17.5 | 19.1 | 98.4 | 19.1 | 4 | 64 | 42.2 | 25 | 27 | 64 | 21 | 43.2 | 43.7 | 35.1 | 5 | 44.4 | 14 | 63.5 |
| 1 ½ | 155 | 19.1 | 20.7 | 114.3 | 22.2 | 4 | 70 | 48.3 | 29 | 30 | 67 | 23 | 49.5 | 50.2 | 40.9 | 6 | 50.3 | 16 | 73.0 |
| 2 | 165 | 207 | 22.3 | 127.0 | 19.0 | 4 | 84 | 60.3 | 32 | 33 | 68 | 29 | 61.9 | 62.5 | 52.5 | 8 | 63.5 | 17 | 92.1 |
| 2 ½ | 190 | 23.9 | 25.4 | 149.2 | 22.3 | 4 | 100 | 73.0 | 37 | 38 | 75 | 32 | 74.6 | 754 | 62.7 | 8 | 76.2 | 19 | 104.8 |
| 3 | 210 | 27.0 | 28.6 | 168.3 | 22.3 | 4 | 117 | 88.9 | 41 | 43 | 78 | 32 | 90.7 | 91.4 | 77.9 | 10 | 92.2 | 21 | 127.0 |
| 3½ | 230 | 28.6 | 30.2 | 184.2 | 22.3 | 8 | 133 | 101.6 | 43 | 44 | 79 | 37 | 103.4 | 104.1 | 90.1 | 10 | 104.9 | – | 139.7 |
| 4 | 255 | 30.2 | 31.8 | 200.0 | 22.3 | 8 | 146 | 114.3 | 46 | 48 | 84 | 37 | 116.1 | 116.1 | 102.3 | 11 | 117.6 | – | 157.2 |
| 5 | 280 | 33.4 | 35.0 | 235.0 | 22.3 | 8 | 178 | 141.3 | 49 | 51 | 97 | 43 | 143.8 | 144.4 | 128.2 | 11 | 144.4 | – | 185.7 |
| 6 | 320 | 35.0 | 36.6 | 269.9 | 22.3 | 8 | 206 | 168.3 | 51 | 52 | 97 | 47 | 170.7 | 171.4 | 154.1 | 13 | 171.1 | – | 215.9 |
| 8 | 380 | 39.7 | 41.3 | 330.2 | 25.4 | 8 | 260 | 219.1 | 60 | 62 | 110 | 51 | 221.5 | 222.2 | 202.7 | 13 | 222.2 | – | 269.9 |
| 10 | 445 | 46.1 | 47.7 | 387.4 | 28.6 | 12 | 321 | 273.0 | 65 | 95 | 116 | 56 | 276.2 | 277.4 | 254.6 | 13 | 276.2 | – | 323.8 |
| 12 | 520 | 49.3 | 50.8 | 450.8 | 31.8 | 12 | 375 | 323.8 | 71 | 102 | 129 | 61 | 327.0 | 328.2 | 304.8 | 13 | 328.3 | – | 381.0 |
| 14 | 585 | 52.4 | 54.0 | 514.4 | 31.8 | 12 | 425 | 355.6 | 75 | 111 | 141 | 64 | 359.2 | 360.2 | To be Specified by Purchaser | 13 | 360.4 | – | 412.8 |
| 16 | 650 | 55.6 | 57.2 | 571.5 | 35.0 | 16 | 483 | 406.4 | 81 | 121 | 144 | 69 | 410.5 | 411.2 | | 13 | 411.2 | – | 469.9 |
| 18 | 710 | 58.8 | 60.4 | 628.6 | 35.0 | 16 | 533 | 457.0 | 87 | 130 | 157 | 70 | 461.8 | 462.3 | | 13 | 462.0 | – | 533.4 |
| 20 | 775 | 62.0 | 63.5 | 685.8 | 35.0 | 20 | 587 | 508.0 | 94 | 140 | 160 | 74 | 513.1 | 514.4 | | 13 | 512 | – | 584.2 |
| 24 | 915 | 68.3 | 69.9 | 812.8 | 41.3 | 20 | 702 | 610.0 | 105 | 152 | 167 | 83 | 616.0 | 616.0 | | 13 | 614.4 | – | 692.2 |

NOTE : (1) Height of RE 2mm

(2) Dimensions column 16 Correspond to the inside diameters of the pipe as given in ASME B36.10M for Standard Wall Pipe, The Thickness of the Standard Wall is the same as Schedule 40 in Size NPS 10 and smaller. These bore sizes are furnished unless otherwise specified by the Purchaser.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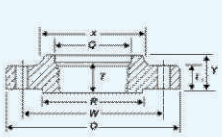
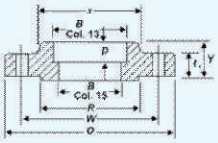
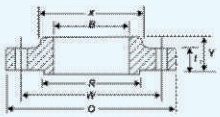


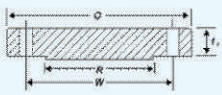
Threaded
(NPS1/2" to 1/2" ONly)



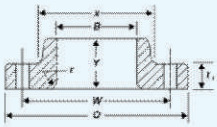
Socket Welding
(½" to 2½" Only)



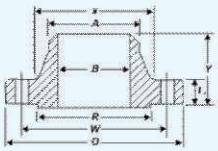
Slip-On Welding



Blind



Lapped



Welding Neck

## DIMENSIONS OF CLASS 400 FLANGES

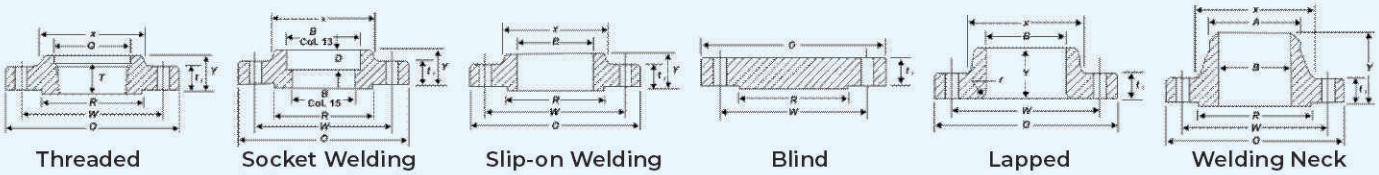
| Nominal Pipe Size NPS | Outside Diameter of Flange O | Thickness of Flanges Min F | Diameter of Hub, X | Drilling | | | Hub Diameter Beginning of Chamfer Welding Neck A | Length Thru Hub | | | Threaded /Length Threaded Flange Min., T | Bore | | | Corner Radius of Bore of Lapped Flange and Pipe,R | Counter Bore Threaded Flange Min., Q | Diameter of RF R | Socket Weld D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Diameter of Bolt Circle W | Diameter of Bolt Holes in | Number of Bolts | | Threaded/ Slip-On Y | Lapped, Y | Welding Neck Y | | Slip-On Min., B | Lapped Min., B | Welding Neck B | | | | |
| 1/2 | 95 | 14.3 | 38 | 66.7 | 15.9 | 4 | 21.3 | 22 | 22 | 52 | 16 | 22.2 | 22.9 | To be Specified by Purchaser | 3 | 23.6 | 10 | 34.9 |
| 3/4 | 115 | 15.9 | 48 | 82.6 | 19.0 | 4 | 26.7 | 25 | 25 | 57 | 16 | 27.7 | 28.2 | | 3 | 29.6 | 11 | 42.9 |
| 1 | 125 | 17.5 | 54 | 88.9 | 19.0 | 4 | 33.4 | 27 | 27 | 62 | 18 | 34.5 | 34.9 | | 3 | 35.8 | 13 | 50.8 |
| 1¼ | 135 | 20.7 | 64 | 98.4 | 19.0 | 4 | 42.2 | 29 | 29 | 67 | 21 | 43.2 | 43.7 | | 5 | 44.4 | 14 | 63.5 |
| 1½ | 155 | 22.3 | 70 | 114.3 | 22.2 | 4 | 48.3 | 32 | 32 | 70 | 23 | 49.5 | 50.0 | | 6 | 50.6 | 16 | 73.0 |
| 2 | 165 | 25.4 | 84 | 127.0 | 19.0 | 8 | 60.3 | 37 | 37 | 73 | 29 | 61.9 | 62.5 | | 8 | 63.5 | 17 | 92.7 |
| 2½ | 190 | 28.6 | 100 | 149.2 | 22.2 | 8 | 73.0 | 41 | 41 | 79 | 32 | 74.6 | 75.4 | | 8 | 76.2 | 19 | 104.8 |
| 3 | 210 | 31.8 | 117 | 168.3 | 22.2 | 8 | 88.9 | 46 | 46 | 83 | 35 | 90.7 | 91.4 | | 10 | 92.2 | 21 | 127.0 |
| 4 | 255 | 35.0 | 146 | 200.0 | 25.4 | 8 | 114.3 | 51 | 51 | 89 | 37 | 116.1 | 116.8 | | 11 | 117.6 | - | 157.2 |
| 5 | 280 | 38.1 | 178 | 235.0 | 25.4 | 8 | 141.3 | 54 | 54 | 102 | 48 | 143.8 | 144.4 | | 11 | 144.4 | - | 185.7 |
| 6 | 320 | 41.3 | 206 | 269.9 | 25.4 | 12 | 168.3 | 57 | 57 | 103 | 46 | 170.7 | 171.4 | | 13 | 171.4 | - | 215.9 |
| 8 | 380 | 47.7 | 260 | 330.0 | 28.6 | 12 | 219.1 | 68 | 68 | 117 | 51 | 221.5 | 222.2 | | 13 | 222.2 | - | 269.9 |
| 10 | 445 | 54.0 | 321 | 387.4 | 31.8 | 16 | 273.0 | 73 | 102 | 124 | 56 | 276.2 | 277.4 | | 13 | 276.2 | - | 323.8 |
| 12 | 520 | 57.2 | 375 | 450.8 | 35.0 | 16 | 323.8 | 79 | 108 | 137 | 61 | 327.0 | 328.2 | | 13 | 328.6 | - | 381.0 |
| 14 | 585 | 60.4 | 425 | 514.4 | 35.0 | 20 | 355.6 | 84 | 117 | 149 | 64 | 359.2 | 360.2 | | 13 | 360.4 | - | 412.8 |
| 16 | 650 | 63.5 | 483 | 571.5 | 38.1 | 20 | 406.4 | 94 | 127 | 152 | 69 | 410.5 | 411.2 | | 13 | 411.2 | - | 469.9 |
| 18 | 710 | 66.7 | 533 | 628.6 | 38.1 | 24 | 457.0 | 98 | 137 | 165 | 70 | 461.8 | 462.3 | | 13 | 462.0 | - | 533.4 |
| 20 | 775 | 69.9 | 587 | 685.8 | 41.3 | 24 | 508.0 | 102 | 146 | 168 | 74 | 513.1 | 514.4 | | 13 | 512.8 | - | 584.2 |
| 24 | 915 | 76.2 | 702 | 812.8 | 47.7 | 24 | 610.0 | 114 | 159 | 175 | 83 | 616.0 | 616.0 | | 13 | 614.4 | - | 692.2 |

Note : (1) Height of 7mm

## DIMENSIONS OF CLASS 600 FLANGES

| Nominal Pipe Size NPS | Outside Diameter of Flange O | Thickness of Flanges Min F | Diameter of Hub, X | Drilling | | | Hub Diameter Beginning of Chamfer Welding Neck A | Length Thru Hub | | | Threaded /Length Threaded Flange Min., T | Bore | | | Corner Radius of Bore of Lapped Flange and Pipe,R | Counter Bore Threaded Flange Min., Q | Diameter of RF R | Socket Weld D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Diameter of Bolt Circle W | Diameter of Bolt Holes in | Number of Bolts | | Threaded/ Slip-On Y | Lapped, Y | Welding Neck Y | | Slip-On Min., B | Lapped Min., B | Welding Neck B | | | | |
| ½ | 95.5 | 14.3 | 38 | 66.7 | 15.9 | 4 | 21.3 | 22 | 22 | 52 | 16 | 22.2 | 22.9 | To be Specified by Purchaser | 3 | 23.6 | 10 | 34.9 |
| 3/4 | 117.5 | 15.9 | 48 | 82.6 | 19.1 | 4 | 26.7 | 25 | 25 | 57 | 16 | 27.7 | 28.2 | | 3 | 29.6 | 11 | 42.9 |
| 1 | 124.0 | 17.5 | 54 | 88.9 | 19.1 | 4 | 33.4 | 27 | 27 | 62 | 18 | 34.5 | 34.9 | | 3 | 35.8 | 13 | 50.8 |
| 1¼ | 133.5 | 20.7 | 64 | 98.4 | 19.1 | 4 | 42.2 | 29 | 29 | 67 | 21 | 43.2 | 43.7 | | 5 | 44.4 | 14 | 63.5 |
| 1½ | 155.5 | 22.3 | 70 | 114.3 | 22.3 | 4 | 48.3 | 32 | 32 | 70 | 23 | 49.5 | 50.0 | | 6 | 50.6 | 16 | 73.0 |
| 2 | 165.0 | 25.4 | 84 | 127.0 | 19.1 | 8 | 60.3 | 37 | 37 | 73 | 29 | 61.9 | 62.5 | | 8 | 63.5 | 17 | 92.1 |
| 2½ | 190.5 | 28.6 | 100 | 149.2 | 22.3 | 8 | 73.0 | 41 | 41 | 79 | 32 | 74.6 | 75.4 | | 8 | 76.2 | 19 | 104.8 |
| 3 | 209.5 | 31.8 | 117 | 168.3 | 22.3 | 8 | 88.9 | 46 | 46 | 83 | 35 | 90.7 | 91.4 | | 10 | 92.2 | 21 | 127.0 |
| 4 | 273.0 | 38.1 | 152 | 215.9 | 25.4 | 8 | 114.3 | 54 | 54 | 102 | 42 | 116.1 | 116.8 | | 11 | 117.6 | – | 157.2 |
| 5 | 330.0 | 44.5 | 189 | 266.7 | 28.6 | 8 | 141.3 | 60 | 60 | 114 | 48 | 143.8 | 144.4 | | 11 | 144.4 | – | 185.7 |
| 6 | 355.5 | 47.7 | 222 | 292.1 | 28.6 | 12 | 168.3 | 67 | 67 | 117 | 51 | 170.7 | 171.4 | | 13 | 171.4 | – | 215.9 |
| 8 | 419.0 | 55.6 | 273 | 349.2 | 31.8 | 12 | 219.1 | 76 | 76 | 133 | 58 | 221.5 | 222.2 | | 13 | 222.2 | – | 269.9 |
| 10 | 508.0 | 63.5 | 343 | 431.8 | 35.0 | 16 | 273.0 | 86 | 111 | 152 | 66 | 276.2 | 277.4 | | 13 | 276.2 | – | 323.8 |
| 12 | 559.0 | 66.7 | 400 | 489.0 | 35.0 | 20 | 323.8 | 92 | 117 | 156 | 70 | 327.0 | 328.2 | | 13 | 328.6 | – | 381.0 |
| 14 | 603.5 | 69.9 | 432 | 527.0 | 38.1 | 20 | 355.6 | 94 | 127 | 165 | 74 | 359.2 | 360.2 | | 13 | 360.4 | – | 412.8 |
| 16 | 686.0 | 76.2 | 495 | 603.0 | 41.3 | 20 | 406.4 | 106 | 140 | 178 | 78 | 410.5 | 411.2 | | 13 | 411.2 | – | 469.9 |
| 18 | 743.0 | 82.6 | 546 | 654.0 | 44.5 | 20 | 457.0 | 117 | 152 | 184 | 80 | 461.8 | 462.3 | | 13 | 462.0 | – | 533.4 |
| 20 | 813.0 | 88.9 | 610 | 723.9 | 44.5 | 24 | 508.0 | 127 | 165 | 190 | 83 | 513.1 | 514.4 | | 13 | 512.8 | – | 584.2 |
| 24 | 940.0 | 101.6 | 718 | 838.2 | 50.8 | 24 | 610.0 | 140 | 184 | 203 | 93 | 616.0 | 616.0 | | 13 | 614.4 | – | 692.2 |

Note : (1) Height of 7mm



Threaded | Socket Welding (½" to 2½" Only) | Slip-on Welding | Blind | Lapped | Welding Neck

## DIMENSIONS OF CLASS 900 FLANGES

| Nominal Pipe Size NPS | Outside Diameter of Flange O | Thickness of Flanges Min F | Diameter of Hub, X | Drilling | | | Hub Diameter Beginning of Chamfer Welding Neck A | Length Thru Hub | | | Threaded /Length Threaded Flange Min., T | Bore | | | Corner Radius of Bore of Lapped Flange and Pipe,R | Counter Bore Threaded Flange Min., Q | Diameter of RF R | Socket Weld D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Diameter of Bolt Circle W | Diameter of Bolt Holes in | Number of Bolts | | Threaded/Slip-On y | Lapped, Y | Welding Neck Y | | Slip-On Min., B | Lapped Min., B | Welding Neck B | | | | |
| 1/2 | 120.7 | 22.3 | 38 | 82.6 | 22.3 | 4 | 21.3 | 32 | 32 | 60 | 23 | 22.2 | 22.9 | To be Specified by Purchaser | 3 | 23.6 | 34.9 | 10 |
| 3/4 | 130.0 | 25.4 | 44 | 88.9 | 22.3 | 4 | 26.7 | 35 | 35 | 70 | 26 | 27.7 | 28.2 | | 3 | 29.0 | 42.9 | 11 |
| 1 | 149.4 | 28.6 | 52 | 101.6 | 25.4 | 4 | 33.4 | 41 | 41 | 73 | 29 | 34.5 | 34.9 | | 3 | 35.8 | 50.8 | 13 |
| 1¼ | 158.8 | 28.6 | 64 | 111.1 | 25.4 | 4 | 42.2 | 41 | 41 | 73 | 31 | 43.2 | 43.7 | | 5 | 44.4 | 63.5 | 14 |
| 1½ | 177.8 | 31.8 | 70 | 123.8 | 28.6 | 4 | 48.3 | 44 | 44 | 83 | 32 | 49.5 | 50.0 | | 6 | 50.6 | 73.0 | 16 |
| 2 | 215.9 | 38.1 | 105 | 165.1 | 25.4 | 8 | 60.3 | 57 | 57 | 102 | 39 | 61.9 | 62.5 | | 8 | 63.5 | 92.1 | 17 |
| 2½ | 244.3 | 41.3 | 124 | 190.5 | 28.6 | 8 | 73.0 | 64 | 64 | 105 | 48 | 74.6 | 75.4 | | 8 | 76.2 | 104.8 | 19 |
| 3 | 241.3 | 38.1 | 127 | 190.5 | 25.4 | 8 | 88.9 | 54 | 54 | 102 | 42 | 90.7 | 91.4 | | 10 | 92.2 | 127.0 | – |
| 4 | 292.1 | 44.5 | 159 | 235.0 | 31.8 | 8 | 114.3 | 70 | 70 | 114 | 48 | 116.1 | 116.8 | | 11 | 117.6 | 157.2 | – |
| 5 | 349.3 | 50.8 | 190 | 279.4 | 35.0 | 8 | 141.3 | 79 | 79 | 127 | 54 | 143.8 | 144.4 | | 11 | 144.4 | 185.7 | – |
| 6 | 381.0 | 55.6 | 235 | 317.5 | 31.8 | 12 | 168.3 | 86 | 86 | 140 | 58 | 170.7 | 171.4 | | 13 | 171.4 | 215.9 | – |
| 8 | 469.9 | 63.5 | 298 | 393.7 | 38.1 | 12 | 219.1 | 102 | 114 | 162 | 64 | 221.5 | 222.2 | | 13 | 222.2 | 269.9 | – |
| 10 | 546.1 | 69.9 | 368 | 469.9 | 38.1 | 16 | 273.0 | 108 | 127 | 184 | 72 | 276.2 | 277.4 | | 13 | 276.2 | 323.8 | – |
| 12 | 609.5 | 79.4 | 419 | 533.4 | 38.1 | 20 | 323.8 | 117 | 143 | 200 | 77 | 327.0 | 328.2 | | 13 | 328.6 | 381.0 | – |
| 14 | 641.4 | 85.8 | 451 | 558.8 | 41.3 | 20 | 355.6 | 130 | 156 | 213 | 89 | 359.2 | 360.2 | | 13 | 360.4 | 412.8 | – |
| 16 | 704.9 | 88.9 | 508 | 616.0 | 44.5 | 20 | 406.4 | 133 | 165 | 216 | 86 | 410.5 | 411.2 | | 13 | 411.2 | 469.9 | – |
| 18 | 787.4 | 101.6 | 565 | 685.8 | 50.8 | 20 | 457.0 | 152 | 190 | 229 | 89 | 461.8 | 462.3 | | 13 | 462.0 | 533.4 | – |
| 20 | 857.3 | 108.0 | 622 | 749.3 | 54.0 | 20 | 508.0 | 159 | 210 | 248 | 97 | 513.1 | 514.4 | | 13 | 512.8 | 584.2 | – |
| 24 | 1041.4 | 139.7 | 749 | 901.7 | 66.7 | 20 | 610.0 | 203 | 267 | 292 | 102 | 616.0 | 616.0 | | 13 | 614.4 | 692.2 | – |

Note : (1) Height of 7mm

## DIMENSIONS OF CLASS 1500 FLANGES

| Nominal Pipe Size NPS | Outside Diameter of Flange O | Thickness of Flanges Min F | Diameter of Hub, X | Drilling | | | Hub Diameter Beginning of Chamfer Welding Neck A | Length Thru Hub | | | Threaded /Length Threaded Flange Min., T | Bore | | | Corner Radius of Bore of Lapped Flange and Pipe,R | Counter Bore Threaded Flange Min., Q | Diameter of RF R | Socket Weld D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Diameter of Bolt Circle W | Diameter of Bolt Holes in | Number of Bolts | | Threaded/Slip-On y | Lapped, Y | Welding Neck Y | | Slip-On Min., B | Lapped Min., B | Welding Neck B | | | | |
| ½ | 120.7 | 22.3 | 38 | 82.6 | 22.3 | 4 | 21.3 | 32 | 32 | 60 | 23 | 22.2 | 22.9 | To be Specified by Purchaser | 3 | 23.6 | 10 | 34.9 |
| 3/4 | 130.0 | 25.4 | 44 | 88.9 | 22.3 | 4 | 26.7 | 35 | 35 | 70 | 26 | 27.7 | 28.2 | | 3 | 29.0 | 11 | 42.9 |
| 1 | 149.4 | 28.6 | 52 | 101.6 | 25.4 | 4 | 33.4 | 41 | 41 | 73 | 29 | 34.5 | 34.9 | | 3 | 35.8 | 13 | 50.8 |
| 1¼ | 158.8 | 28.6 | 64 | 111.1 | 25.4 | 4 | 42.2 | 41 | 41 | 73 | 31 | 43.2 | 43.7 | | 5 | 44.4 | 14 | 63.5 |
| 1½ | 177.8 | 31.8 | 70 | 123.8 | 28.6 | 4 | 48.3 | 44 | 44 | 83 | 32 | 49.5 | 50.0 | | 6 | 50.6 | 16 | 73.0 |
| 2 | 215.9 | 38.1 | 105 | 165.1 | 25.4 | 8 | 60.3 | 57 | 57 | 102 | 39 | 61.9 | 62.5 | | 8 | 63.5 | 17 | 92.1 |
| 2½ | 244.3 | 41.3 | 124 | 190.5 | 28.6 | 8 | 73.0 | 64 | 64 | 105 | 48 | 74.6 | 75.4 | | 8 | 76.2 | 19 | 104.8 |
| 3 | 266.7 | 47.7 | 133 | 203.2 | 31.8 | 8 | 88.9 | – | 73 | 117 | – | – | 91.4 | | 10 | – | – | 127.0 |
| 4 | 311.2 | 54.0 | 162 | 241.3 | 35.0 | 8 | 114.3 | – | 90 | 124 | – | – | 116.8 | | 11 | – | – | 157.2 |
| 5 | 374.7 | 73.1 | 197 | 292.1 | 41.3 | 8 | 141.3 | – | 105 | 156 | – | – | 144.4 | | 11 | – | – | 185.7 |
| 6 | 393.7 | 82.6 | 229 | 317.5 | 38.1 | 12 | 168.3 | – | 119 | 171 | – | – | 171.4 | | 13 | – | – | 215.9 |
| 8 | 482.6 | 92.1 | 292 | 393.7 | 44.5 | 12 | 219.1 | – | 143 | 213 | – | – | 222.2 | | 13 | – | – | 269.9 |
| 10 | 584.2 | 108.0 | 368 | 482.6 | 50.8 | 12 | 273.0 | – | 178 | 254 | – | – | 277.4 | | 13 | – | – | 323.8 |
| 12 | 673.1 | 123.9 | 451 | 571.5 | 54.0 | 16 | 323.8 | – | 219 | 283 | – | – | 328.2 | | 13 | – | – | 381.0 |
| 14 | 749.3 | 133.4 | 495 | 635.0 | 60.4 | 16 | 355.6 | – | 241 | 298 | – | – | 360.2 | | 13 | – | – | 412.8 |
| 16 | 825.5 | 146.1 | 552 | 704.8 | 66.7 | 16 | 406.4 | – | 260 | 311 | – | – | 411.2 | | 13 | – | – | 469.9 |
| 18 | 914.4 | 162.0 | 597 | 774.7 | 73.0 | 16 | 457.0 | – | 276 | 237 | – | – | 462.3 | | 13 | – | – | 533.4 |
| 20 | 984.3 | 177.8 | 641 | 831.8 | 79.4 | 16 | 508.0 | – | 292 | 356 | – | – | 514.4 | | 13 | – | – | 584.2 |
| 24 | 1168.4 | 203.2 | 762 | 990.6 | 92.1 | 16 | 610.0 | – | 330 | 406 | – | – | 616.0 | | 13 | – | – | 692.2 |

NOTE : (1) Height of RE 2mm

(2) Dimensions column 16 Correspond to the inside diameters of the pipe as given in ASME B36.10M for Standard Wall Pipe, The Thickness of the Standard Wall is the same as Schedule 40 in Size NPS 10 and smaller. These bore sizes are furnished unless otherwise specified by the Purchaser.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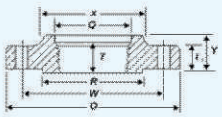
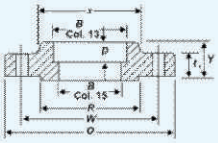
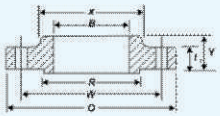
# FLANGES



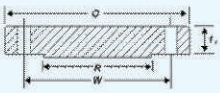
Threaded
(NPS1/2" to 1/2" ONly)



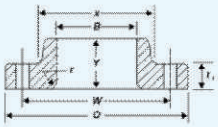
Socket Welding
(½" to 2½" Only)



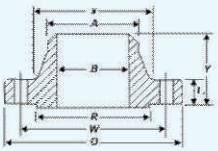
Slip-On Welding



Blind



Lapped

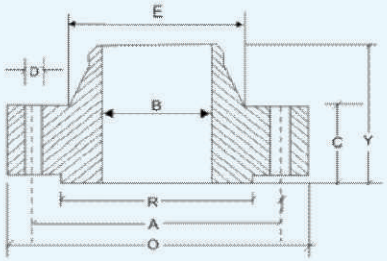


Welding Neck

## DIMENSIONS OF CLASS 2500 FLANGES

| Nominal Pipe Size NPS | Outside Diameter of Flange O | Thickness of Flanges Min F | Diameter of Hub, X | Drilling | | | Hub Diameter Beginning of Chamfer Welding Neck A | Length Thru Hub | | | Threaded /Length Threaded Flange Min., T | Bore | | Corner Radius of Bore of Lapped Flange and Pipe,R | Counter Bore Threaded Flange Min., Q | Socket Weld D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Diameter of Bolt Circle W | Diameter of Bolt Holes in | Number of Bolts | | Threaded Y | Lapped, Y | Welding Neck Y | | Lapped Min., B | Welding Neck B | | | |
| 1/2 | 133.4 | 30.2 | 48 | 88.9 | 22.3 | 4 | 21.3 | 40 | 40 | 73 | 29 | 22.9 | To be Specified by Purchaser | 3 | 23.6 | 34.9 |
| 3/4 | 139.7 | 31.8 | 51 | 95.2 | 22.3 | 4 | 26.7 | 43 | 43 | 79 | 32 | 28.2 | | 3 | 29.0 | 42.9 |
| 1 | 158.8 | 35.0 | 57 | 108.0 | 25.4 | 4 | 33.4 | 48 | 48 | 89 | 35 | 34.9 | | 3 | 35.8 | 50.8 |
| 1¼ | 184.2 | 38.1 | 73 | 130.2 | 28.6 | 4 | 42.2 | 52 | 52 | 95 | 39 | 43.7 | | 5 | 44.4 | 63.5 |
| 1½ | 203.2 | 44.5 | 79 | 146.0 | 31.8 | 4 | 48.3 | 60 | 60 | 111 | 45 | 50.0 | | 6 | 50.6 | 73.0 |
| 2 | 235.0 | 50.9 | 95 | 171.4 | 28.6 | 8 | 60.3 | 70 | 70 | 127 | 51 | 62.5 | | 8 | 63.5 | 92.1 |
| 2½ | 266.7 | 57.2 | 114 | 196.8 | 31.8 | 8 | 73.0 | 79 | 79 | 143 | 58 | 75.4 | | 8 | 76.2 | 104.8 |
| 3 | 304.8 | 66.7 | 133 | 228.6 | 35.0 | 8 | 88.9 | – | 92 | 168 | – | 91.4 | | 10 | – | 127.0 |
| 4 | 355.6 | 76.2 | 165 | 273.0 | 41.3 | 8 | 114.3 | – | 108 | 190 | – | 116.8 | | 11 | – | 157.2 |
| 5 | 419.1 | 92.1 | 203 | 323.8 | 47.7 | 8 | 141.3 | – | 130 | 229 | – | 144.4 | | 11 | – | 185.7 |
| 6 | 482.6 | 108.0 | 235 | 368.3 | 54.0 | 8 | 168.3 | – | 152 | 273 | – | 171.4 | | 13 | – | 215.9 |
| 8 | 552.5 | 127.0 | 305 | 438.2 | 54.0 | 12 | 219.1 | – | 178 | 318 | – | 222.2 | | 13 | – | 269.9 |
| 10 | 673.1 | 165.1 | 375 | 539.8 | 66.7 | 12 | 273.0 | – | 229 | 419 | – | 277.4 | | 13 | – | 323.8 |
| 12 | 762.0 | 184.2 | 441 | 619.1 | 73.0 | 12 | 323.8 | – | 254 | 464 | – | 328.2 | | 13 | – | 381.0 |

## WELDING NECK FLANGE BORES (B)




| Nominal Pipe Size | Outside Dia | Sch. 20 | Sch. 30 | Std. Wall | Sch. 40 | Extra Strong | Sch. 80 | Sch. 120 | Sch. 160 | Double Extra Strong |
|---|---|---|---|---|---|---|---|---|---|---|
| 15 | 21.33 | – | – | 15.7 | 15.7 | 13.3 | 13.3 | – | 11.7 | 6.5 |
| 20 | 26.67 | – | – | 20.8 | 20.8 | 18.8 | 18.8 | – | 15.5 | 11.0 |
| 25 | 33.40 | – | – | 26.6 | 25.4 | 24.3 | 24.3 | – | 20.7 | 15.2 |
| 32 | 42.16 | – | – | 35.0 | 35.0 | 32.4 | 32.4 | – | 29.4 | 22.7 |
| 40 | 48.26 | – | – | 40.8 | 40.8 | 38.1 | 38.1 | – | 33.7 | 27.9 |
| 50 | 60.31 | – | – | 52.3 | 52.3 | 49.2 | 49.2 | – | 42.8 | 38.1 |
| 65 | 73.02 | – | – | 62.4 | 62.4 | 59.2 | 59.2 | – | 53.9 | 44.9 |
| 80 | 88.90 | – | – | 77.9 | 77.9 | 73.6 | 73.6 | – | 66.6 | 58.4 |
| 100 | 114.30 | – | – | 102.2 | 102.2 | 97.1 | 97.1 | 92.0 | 87.3 | 80.0 |
| 125 | 141.30 | – | – | 128.1 | 128.1 | 122.2 | 122.2 | 115.9 | 109.5 | 103.2 |
| 150 | 168.27 | – | – | 154.0 | 154.0 | 146.3 | 146.3 | 139.7 | 131.7 | 124.3 |
| 200 | 219.07 | 206.2 | 204.9 | 202.7 | 202.7 | 193.6 | 193.6 | 182.5 | 173.0 | 174.6 |
| 250 | 273.05 | 260.3 | 257.4 | 252.5 | 254.5 | 242.8 | 242.8 | 230.1 | 215.9 | 222.2 |
| 300 | 323.85 | 311.1 | 307.0 | 304.8 | 303.2 | 288.8 | 288.8 | 273.0 | 257.2 | 273.0 |
| 350 | 355.60 | 337.8 | 336.5 | 336.5 | 333.3 | 371.5 | 371.5 | 300.0 | 284.1 | – |
| 400 | 406.40 | 390.3 | 387.3 | 387.3 | 381.0 | 363.5 | 363.5 | 344.5 | 325.4 | – |
| 450 | 457.20 | 441.1 | 434.9 | 438.1 | 428.6 | 409.5 | 409.5 | 387.3 | 366.7 | – |
| 500 | 508.00 | 488.9 | 482.6 | 488.9 | 477.8 | 455.6 | 455.6 | 431.8 | 407.9 | – |
| 600 | 609.60 | 590.5 | 581.0 | 590.5 | 574.6 | 547.6 | 547.6 | 517.5 | 490.5 | – |
| | | | | | | | | | | – |

## ANSI FLANGE WEIGHTS (Kgs.)

| N.P | 150 Lb | | 300 Lb | | 600 Lb | | 900 Lb | |
|---|---|---|---|---|---|---|---|---|
| Size | WN | SO | WN | SO | WN | SO | WN | SO |
| 1/2" | 0.7 | 0.4 | 0.8 | 0.7 | 0.9 | 0.8 | 1.9 | 1.8 |
| 3/4" | 0.9 | 0.7 | 1.4 | 1.2 | 1.6 | 1.4 | 2.7 | 2.5 |
| 1" | 1.1 | 0.8 | 1.7 | 1.4 | 1.98 | 1.7 | 3.9 | 3.6 |
| 1¼" | 1.5 | 1.2 | 2.2 | 1.8 | 2.6 | 2.1 | 4.5 | 4.1 |
| 1½" | 1.8 | 1.4 | 3.2 | 2.7 | 3.5 | 3.1 | 6.2 | 5.6 |
| 2" | 2.7 | 2.2 | 3.6 | 3.2 | 4.7 | 3.8 | 11.3 | 10.3 |
| 2½" | 4.4 | 3.5 | 5.5 | 4.5 | 6.7 | 5.5 | 15.5 | 14.3 |
| 3" | 5.1 | 4.1 | 7.3 | 6.1 | 8.7 | 7.3 | 15 | 12.3 |
| 3½" | 6.4 | 5.2 | 9 | 7.5 | 11.2 | 8.9 | - | - |
| 4" | 7.5 | 5.6 | 11.9 | 10 | 18.3 | 15.8 | 24 | 20.5 |
| 5" | 9 | 6.3 | 16 | 12.5 | 30.5 | 25 | 37.5 | 33.5 |
| 6" | 11 | 7.8 | 20 | 16.2 | 37 | 29.5 | 50 | 43 |
| 8" | 18.5 | 12.6 | 31 | 25 | 55 | 44 | 85 | 74 |
| 10" | 25 | 18 | 44.3 | 35 | 91 | 71 | 125 | 105 |
| 12" | 38 | 27.5 | 64 | 50 | 108 | 85 | 165 | 136 |
| 14" | 51 | 37 | 88 | 72 | 150 | 96 | 198 | 158 |
| 16" | 63 | 46 | 112 | 90 | 180 | 145 | 224 | 184 |
| 18" | 71 | 50 | 1.8 | 115 | 240 | 175 | 320 | 258 |
| 20" | 88 | 64 | 171 | 137 | 295 | 220 | 375 | 316 |
| 24" | 120 | 90 | 240 | 210 | 363 | 315 | 680 | 608 |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# DIMENSION OF FLANGES AS PER TABLE BS - 10

## TABLE D

**FOR WORKING STEAM PRESSURE UPTO 50 LBS PER SQ. INCH**

| Nominal Pipe Size | O.D. of Pipe | O.D. | P.C. D. | No. of Bolt | Dia of Bolt | Thick. |
|---|---|---|---|---|---|---|
| 1/2" | 21.3 | 95.3 | 66.7 | 4 | 12.7 | 4.8 |
| 3/4" | 26.7 | 101.3 | 73.0 | 4 | 12.7 | 4.8 |
| 1" | 33.4 | 114.3 | 82.6 | 4 | 12.7 | 4.8 |
| 1¼" | 42.2 | 120.7 | 87.3 | 4 | 12.7 | 6.4 |
| 1½" | 48.3 | 133.4 | 98.4 | 4 | 12.7 | 6.4 |
| 2" | 60.3 | 152.4 | 114.3 | 4 | 15.9 | 7.9 |
| 2½" | 73.0 | 165.1 | 127.0 | 4 | 15.9 | 7.9 |
| 3" | 88.9 | 184.2 | 145.1 | 4 | 15.9 | 9.5 |
| 3½" | 101.6 | 203.2 | 165.1 | 4 | 15.9 | 9.5 |
| 4" | 114.3 | 215.9 | 177.8 | 4 | 15.9 | 9.5 |
| 5" | 141.3 | 254.0 | 209.6 | 8 | 15.9 | 12.7 |
| 6" | 168.3 | 279.4 | 235.6 | 8 | 15.9 | 12.7 |
| 7" | 190.5 | 304.8 | 260.4 | 8 | 15.9 | 12.7 |
| 8" | 219.1 | 336.6 | 292.1 | 8 | 15.9 | 12.7 |
| 9" | 244.5 | 368.3 | 323.9 | 8 | 15.9 | 15.9 |
| 10" | 273.0 | 406.4 | 355.6 | 8 | 19.1 | 15.9 |
| 12" | 323.9 | 457.2 | 406.4 | 12 | 19.1 | 15.9 |
| 14" | 355.6 | 527.1 | 469.6 | 12 | 22.2 | 19.1 |
| 16" | 406.4 | 577.9 | 520.7 | 12 | 22.2 | 19.1 |
| 18" | 457.2 | 641.4 | 584.2 | 12 | 22.2 | 22.2 |
| 20" | 508.0 | 704.9 | 641.4 | 16 | 22.5 | 25.4 |
| 24" | 609.6 | 825.5 | 755.7 | 16 | 25.4 | 28.6 |

## TABLE E

**FOR WORKING STEAM PRESSURE UPTO 100 LBS PER SQ. INCH**

| Nominal Pipe Size | O.D. of Pipe | O.D. | P.C. D. | No. of Bolt | Dia of Bolt | Thick. |
|---|---|---|---|---|---|---|
| 1/2" | 21.3 | 95.3 | 66.7 | 4 | 12.7 | 6.4 |
| 3/4" | 26.7 | 101.3 | 73.0 | 4 | 12.7 | 6.4 |
| 1" | 33.4 | 114.3 | 82.6 | 4 | 12.7 | 7.1 |
| 1¼" | 42.2 | 120.7 | 87.3 | 4 | 12.7 | 7.9 |
| 1½" | 48.3 | 133.4 | 98.4 | 4 | 12.7 | 8.7 |
| 2" | 60.3 | 152.4 | 114.3 | 4 | 15.9 | 9.5 |
| 2½" | 73.0 | 165.1 | 127.0 | 4 | 15.9 | 10.3 |
| 3" | 88.9 | 184.2 | 145.0 | 4 | 15.9 | 11.1 |
| 3½" | 101.6 | 203.2 | 165.1 | 8 | 15.9 | 11.9 |
| 4" | 114.3 | 215.9 | 177.8 | 8 | 15.9 | 12.7 |
| 5" | 141.3 | 254.0 | 209.6 | 8 | 15.9 | 14.3 |
| 6" | 168.3 | 279.4 | 235.6 | 8 | 19.1 | 17.5 |
| 7" | 190.5 | 304.8 | 260.4 | 8 | 19.1 | 19.1 |
| 8" | 219.1 | 336.6 | 292.1 | 8 | 19.1 | 19.1 |
| 9" | 244.5 | 368.3 | 323.9 | 12 | 19.1 | 20.6 |
| 10" | 273.0 | 406.4 | 355.6 | 12 | 19.1 | 22.2 |
| 12" | 323.9 | 457.2 | 406.4 | 12 | 22.2 | 25.4 |
| 14" | 355.6 | 527.1 | 469.6 | 12 | 22.2 | 25.4 |
| 16" | 406.4 | 577.9 | 520.7 | 12 | 22.2 | 25.4 |
| 18" | 457.2 | 641.4 | 584.2 | 16 | 22.2 | 28.6 |
| 20" | 508.0 | 704.9 | 641.0 | 16 | 22.2 | 31.8 |
| 24" | 609.6 | 825.5 | 755.7 | 16 | 25.4 | 38.1 |

## TABLE F FOR WORKING STEAM PRESSURE

**ABOVE 100 LBS AND UPTO 150 LBS PER SQ. INCH**

| Nominal Pipe Size | O.D. of Pipe | O.D. | P.C. D. | No. of Bolt | Dia of Bolt | Thick. |
|---|---|---|---|---|---|---|
| 1/2" | 21.3 | 95.3 | 66.7 | 4 | 12.7 | 9.5 |
| 3/4" | 26.7 | 101.3 | 73.0 | 4 | 12.7 | 9.5 |
| 1" | 33.4 | 120.7 | 87.3 | 4 | 15.9 | 9.5 |
| 1¼" | 42.2 | 133.4 | 98.4 | 4 | 15.9 | 12.7 |
| 1½" | 48.3 | 139.7 | 104.8 | 4 | 15.9 | 12.7 |
| 2" | 60.3 | 165.1 | 127.0 | 4 | 15.9 | 15.9 |
| 2½" | 73.0 | 184.2 | 145.0 | 8 | 15.9 | 15.9 |
| 3" | 88.9 | 203.2 | 165.1 | 8 | 15.9 | 15.9 |
| 3½" | 101.6 | 215.9 | 177.8 | 8 | 15.9 | 19.1 |
| 4" | 114.3 | 228.6 | 190.5 | 8 | 15.9 | 19.1 |
| 5" | 141.3 | 279.4 | 235.0 | 8 | 19.1 | 22.2 |
| 6" | 168.3 | 304.8 | 260.4 | 12 | 19.1 | 22.2 |
| 7" | 190.5 | 336.6 | 292.1 | 12 | 19.1 | 22.2 |
| 8" | 219.1 | 368.3 | 323.9 | 12 | 19.1 | 25.0 |
| 9" | 244.5 | 406.4 | 355.6 | 12 | 22.2 | 25.0 |
| 10" | 273.0 | 431.8 | 381.0 | 12 | 22.2 | 25.0 |
| 12" | 323.9 | 489.0 | 438.2 | 16 | 22.2 | 28.6 |
| 14" | 355.6 | 552.5 | 495.3 | 16 | 25.4 | 31.8 |
| 16" | 406.4 | 609.6 | 552.5 | 20 | 25.4 | 31.8 |
| 18" | 457.2 | 673.1 | 609.6 | 20 | 28.6 | 34.9 |
| 20" | 508.0 | 736.6 | 673.1 | 24 | 28.6 | 38.1 |
| 24" | 609.6 | 850.9 | 781.1 | 24 | 31.8 | 41.3 |

## TABLE H For working Steam pressure

**ABOVE 150 LBS AND UPTO 250 LBS PER SQ. INCH**

| Nominal Pipe Size | O.D. of Pipe | O.D. | P.C. D. | No. of Bolt | Dia of Bolt | Thick. |
|---|---|---|---|---|---|---|
| 1/2" | 21.3 | 114.3 | 82.6 | 4 | 15.9 | 12.7 |
| 3/4" | 26.7 | 114.3 | 82.6 | 4 | 15.9 | 12.7 |
| 1" | 33.4 | 120.7 | 87.3 | 4 | 15.9 | 14.3 |
| 1¼" | 42.2 | 133.4 | 98.4 | 4 | 15.9 | 17.0 |
| 1½" | 48.3 | 139.7 | 104.8 | 4 | 15.9 | 17.0 |
| 2" | 60.3 | 165.1 | 127.0 | 4 | 15.9 | 19.1 |
| 2½" | 73.0 | 184.2 | 145.0 | 8 | 15.9 | 19.1 |
| 3" | 88.9 | 203.0 | 165.1 | 8 | 15.9 | 22.2 |
| 3½" | 101.6 | 215.9 | 177.8 | 8 | 15.9 | 22.2 |
| 4" | 114.3 | 228.6 | 190.5 | 8 | 15.9 | 25.4 |
| 5" | 141.3 | 279.4 | 235.0 | 8 | 19.1 | 28.6 |
| 6" | 168.3 | 304.8 | 260.4 | 12 | 19.1 | 28.6 |
| 7" | 190.5 | 336.6 | 292.1 | 12 | 19.1 | 31.8 |
| 8" | 219.1 | 368.3 | 323.9 | 12 | 19.1 | 31.8 |
| 9" | 244.5 | 406.4 | 355.6 | 12 | 22.2 | 34.9 |
| 10" | 273.0 | 431.8 | 381.0 | 12 | 22.2 | 34.9 |
| 12" | 323.9 | 489.0 | 438.2 | 16 | 22.2 | 38.1 |
| 14" | 355.6 | 552.5 | 495.3 | 16 | 25.4 | 41.3 |
| 16" | 406.4 | 609.6 | 552.5 | 20 | 25.4 | 44.5 |
| 18" | 457.2 | 673.1 | 609.6 | 20 | 28.6 | 47.6 |
| 20" | 508.0 | 736.6 | 673.1 | 24 | 28.6 | 50.8 |
| 24" | 609.6 | 850.9 | 781.1 | 24 | 31.8 | 57.2 |

NOTE : FOR 12.7 MM AND 15.87 BOLTS DIA THE DIAMETERS OF THE HOLES WILL BE 1.58MM LARGER AND FOR 19.01 AND ABOVE THE HOLE DIA WILL BE 3.17 LARGER.

| Threaded, Socket-Welding, Slip-on, Lap Joint and Blind | | |
|---|---|---|
| Outside Diameter | When O.D. is 24" or less | ± 1/16" (16mm) |
| | When O.D. is 24" or less | ± 1/8" (3.2mm) |
| Inside Diameter | Threaded | Within limits on boring guage |
| | Socket-Welding, Slip-on and Lap joint | 10" & Smaller + 1/32" (0.8mm)-0" 12" & Larger +1/16" (1.6mm) -0" |
| Outside Diameter of Hub | 12" and Smalier | +1/32" (0.8mm) 1/16" (1.6mm) |
| | 14" and Larger | ± 1/8" (3.2mm) |
| Diameter of Contact Face | 1 /16" Raised Face | ± 1/32" (0.8mm) |
| | 1 /4" Raised Face Tongue & Groove Male, Female | ± 1/64" (0.4mm) |
| Diameter of Counterbore | Same as for Inside Diameter | |
| Drilling | Bolt Circle | ± 1/16" (1.6MM) |
| | Bolt hole Spacing | ± 1/32" (0.8MM) |
| | Eccentricity of Both Circle with Respect to Facing | 2½" & Smaller 1/32" (0.8mm) max 3" & Larger 1/16" (1.6mm) max |
| | Eccentricity of Both Circle with Respect to Bore | 1/32" (0.8mm) Max |
| | Eccentricity of Facing with Respect to Bore | 1/32" (0.8mm) max |
| Thickness | 18" and Smaller | + 1/8" (3.2mm) -0" |
| | 20" and Larger | + 3/16" (4.8mm) - 0" |
| Length | 10" and Smaller | ± 1/16" (1.6mm) |
| Thru Hub | 12" and Larger | ± 1/8" (3.2mm) |

| Welding Neck | | |
|---|---|---|
| Outside Diameter | When O.D. is 24" or less | ± 1/16" (16mm) |
| | When O.D. is 24" or less | ± 1/8" (3.2mm) |
| Inside Diameter | 10" and Smaller | +1/32" (0.8mm) |
| | 12" thru 18" | + 1/16" (1.6mm) |
| | 20" and Larger | +1/8" (3.2mm) - 1/16" (1.6mm) |
| Diameter of Contact Face | 1/16" Raised Face | +1/32" (0.8mm) |
| | 1 /4" Raised Face Tongue & Groove Male, Female | +1/64" (0.4mm) |
| Diameter of Hub at Base | When Hub Base is 24" or Smaller | =1/16" (1.6mm) |
| | When Hub Base is Over 24" | -1/8" (3.2mm) |
| Diameter of Hub at Point of Welding | 5" and Smaller | +3/32" (2.4mm) -1/32" (0.8mm) |
| | 6" and Larger | +5/32" (4.0mm) -1/32" (0.8mm) |
| | Bolt Circle | +1/16" (1.6mm) |
| Drilling | Bolt hole spacing | +1/32" (0.8mm) |
| | Eccentricity of Bolt Circle with Respect to Facing | 2½" Smaller 1/32" (0.8mm) max 3" Larger 1/16" (1.6mm) max |
| | Eccentricity of Bolt Circle with Respect to Bore | 1/32" (0.8mm) max |
| | Eccentricity of Facing with Respect to Bore | 1/32" (0.8mm) max |
| Thickness | 18" and Smaller | + 1/8" (3.2mm) -0" |
| | 20" and Larger | + 3/16" (4.8mm) - 0" |
| Length | 10" and Smaller | ± 1/16" (1.6mm) |
| Thru Hub | 12" and Larger | ± 1/8" (3.2mm) |

# SOCKET-WELD FITTINGS


45° Elbow


Tee


90° Elbow


Reducing Tee


Cross


Union


Caps


Concentric Reducer

The following table represents size range, product standards and material grades of forged high pressure fittings, socket, weld like stainless steel, carbon steel & alloy steel etc. The range includes:

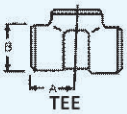
## Material, Size & Specification

| | |
|---|---|
| Stainless Steel | ASTM A182 F304/304L/ 304H/ 316/ 316L/ 317/ 317L/ 321/ 310/ 904L etc. |
| Carbon Steel | ASTM A105/ A105N/ A694 F42/46/52/56/60/65/70/A350LF3/A350LF2 etc. |
| Alloy Steel | ASTM A182 F1/F5/F9/F11/F22/F91etc. |
| Others | Monel, Nickel, Inconel, Hastalloy, Copper, Brass, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed Steel, Zinc, Lead etc.<br><br>Elbow, Tee, Union, Cross, Coupling, Cap, Bushing, Plug, Swage nipple, Welding Boss, Hexagon Nipple, Barrel Nipple, Barrel Nipple, Welding Nipple, Parraler Nipple, Street Elbow, Hexagon Nut, Hose Nipple, Bend, Adapter, Insert, Cross, Weldolet, Elbowlet, Sockolet, Thredolet, Nipolet Letrolet etc. |
| Size Range | 1/8" NB to 4" NB (Socket weld) |
| Thread Class | 2000 LBS, 3000 LBS, 6000 LBS, 9000 LBS |

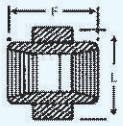
Used To Allow Flow Of Fluids, Like Steam, Water, Air, Oil, etc., Through The Desired Size Of Flowing Cross-section With Diversion Of Flow To The Desired Point Under Critical Working Conditions.

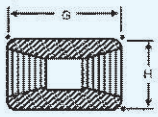
# DIMENSION IN MM OF FORGED SCREWED FITTINGS TO ANSI B-16.11 THREADED TO ASA B 2.1

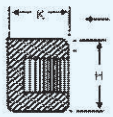

90° ELBOWS

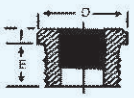

TEE

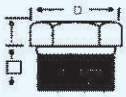

45° ELBOW


UNION


COUPLING


PIPE CAP

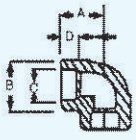

BUSHING

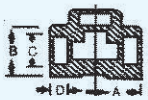

HEX HEAD PLUG

HALF COUPLING = G/2

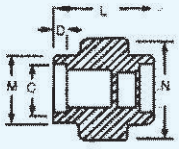
| NOM BORE | PIPE O.D. | 3000 L.B.S. | | | | | | COMMON FACTORS | | | | | | 6000 L.B.S. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | G | H | K | D | E | F | I | J | L | A | B | C | G | H | K |
| 1/8" | 10.3 | 21 | 22 | 17 | 32 | 16 | 19 | 11 | 10 | 40 | - | 6 | - | 25 | 25 | 19 | 32 | 22 | - |
| 1/4" | 13.7 | 25 | 25 | 19 | 35 | 19 | 25 | 16 | 11 | 43 | 4 | 6 | 32 | 29 | 33 | 22 | 35 | 25 | 27 |
| 3/8" | 17.2 | 29 | 33 | 22 | 38 | 22 | 25 | 17.5 | 13 | 48 | 4 | 8 | 38 | 33 | 38 | 28 | 38 | 32 | 27 |
| 1/2" | 21.3 | 33 | 38 | 25 | 48 | 29 | 32 | 22 | 15 | 51 | 5 | 8 | 46 | 38 | 46 | 29 | 48 | 38 | 33 |
| 3/4" | 26.7 | 38 | 46 | 29 | 51 | 35 | 37 | 27 | 16 | 57 | 6 | 10 | 51 | 44 | 56 | 33 | 51 | 44 | 38 |
| 1" | 33.4 | 44 | 56 | 33 | 60 | 44 | 41 | 35 | 19 | 64 | 6 | 10 | 60 | 51 | 62 | 35 | 60 | 57 | 43 |
| 1¼" | 42.2 | 51 | 62 | 35 | 67 | 57 | 44 | 44.5 | 21 | 70 | 7 | 14 | 72 | 60 | 75 | 43 | 67 | 64 | 46 |
| 1½" | 48.3 | 60 | 75 | 43 | 79 | 64 | 44 | 51 | 21 | 79 | 8 | 16 | 80 | 64 | 84 | 44 | 79 | 76 | 48 |
| 2" | 60.3 | 64 | 84 | 45 | 86 | 76 | 48 | 63.5 | 22 | 88 | 9 | 17 | 94 | 83 | 102 | 52 | 86 | 92 | 51 |
| 2½" | 73.02 | 83 | 102 | 52 | 92 | 92 | 60 | 76 | 27 | 118 | 10 | 21 | 122 | 95 | 121 | 64 | 92 | 108 | 64 |
| 3" | 89.0 | 95 | 121 | 64 | 108 | 108 | 65 | 89 | 29 | 121 | 10 | 25 | 140 | 106 | 146 | 79 | 108 | 127 | 68 |
| 4" | 114.5 | 114 | 152 | 79 | 121 | 140 | 68 | 117.5 | 32 | 150 | 13 | 25 | 180 | 114 | 152 | 79 | 121 | 159 | 75 |

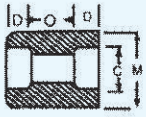
## SOCKET WELD FITTING TO ANSI B-16.11

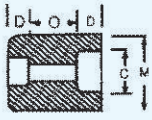

90° ELBOWS

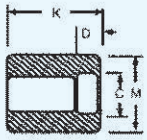

TEE

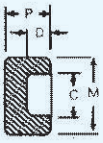

45° ELBOW


UNION


COUPLING


REDUCER


HALF COUPLING


CAP

| NOM BORE | PIPE O.D. | 3000 L.B.S. | | | | | | COMMON FACTORS | | | | | | 6000 L.B.S. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | K | J | L | M | N | P | Q | C | D | O | O | A | B | M | K | N |
| 1/8" | 10.3 | 22 | 18.5 | 26 | 16 | 40 | 17.3 | 32 | 17.5 | 10 | 10.7 | 10 | 5 | 8 | 22 | 22 | 20 | 25 | 46 |
| 1/4" | 13.7 | 22 | 22 | 26 | 18 | 43 | 21.2 | 32 | 17.5 | 10 | 14.1 | 10 | 5 | 8 | 27 | 25 | 24 | 25 | 51 |
| 3/8" | 17.2 | 25 | 25 | 26 | 19 | 48 | 25.4 | 36 | 19 | 10 | 17.6 | 10 | 3 | 9 | 27 | 28 | 28 | 26 | 60 |
| 1/2" | 21.3 | 27 | 32 | 30 | 21 | 51 | 31 | 43 | 22 | 10 | 21.7 | 10 | 6 | 13 | 31 | 34 | 34 | 31 | 72 |
| 3/4" | 26.7 | 34 | 38 | 36 | 24 | 57 | 37 | 50 | 25 | 13 | 27 | 13 | 6 | 13 | 37 | 42 | 41 | 35 | 80 |
| 1" | 33.4 | 37 | 46 | 40 | 25 | 64 | 45.2 | 60 | 27 | 13 | 33.8 | 13 | 9 | 17 | 42 | 50 | 50 | 40 | 94 |
| 1¼" | 42.2 | 42 | 56 | 40 | 29 | 70 | 55 | 70 | 30 | 13 | 42.6 | 13 | 9 | 17 | 47 | 59 | 58 | 41 | 100 |
| 1½" | 48.3 | 47 | 62 | 40 | 30 | 79 | 61.4 | 78 | 32 | 13 | 48.7 | 13 | 9 | 17 | 53 | 67 | 66 | 43 | 122 |
| 2" | 60.3 | 56 | 75 | 52 | 37 | 89 | 75 | 95 | 38 | 13 | 61.2 | 16 | 15 | 23 | 59 | 84 | 83 | 55 | |
| 2½" | 73.02 | 60 | 92 | 52 | 48 | 114 | 91.3 | 125 | 38 | 16 | 73.8 | 16 | 14 | 24 | | 102 | | 56 | |
| 3" | 89.00 | 76 | 110 | 52 | 51 | 127 | 108.8 | 140 | 44 | 16 | 89.8 | 16 | 14 | 24 | | 121 | | 58 | |
| 4" | 114.50 | 88 | 137 | 58 | | 150 | 136.9 | | 48 | 19 | 115.5 | 19 | 14 | 24 | | 152 | | 64 | |

DIMENSIONS AND OTHER SPECIFICATIONS AS PER CUSTOMERS REQUIREMENTS ARE AVAILABLE ON REQUEST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Royal Forge and Fitting Industries is India's fastest-growing Stockist of high-quality stainless steel ERW / NB pipes which are used in various applications across various sectors. Our diverse range of industrial Piping is being manufactured by using optimum quality raw materials and contemporary technology to meet definite industrial standards.

## Material, Size & Specification

### Welded Pipe

| | |
|---|---|
| Size Range | 1/8" NB to 48" NB |
| Thickness | Sch. 5S to Sch. 80S |
| Length | as per requirement (Max. up to 24 mtr. long) |
| Grades | 304/L/H/LN, 316/L/H/LN/Ti, 309, 310/L/H/S, 317/L/H, 321/H, 347/H, UNS S31500, UNS S31803, UNS S2205, UNS S32750, UNS S32760 |
| Specification | ASTM A-312, A-554, A-778, A-790 |

### Seamless Pipe

| | |
|---|---|
| Size Range | 1/8" NB to 24" NB |
| Thickness | Sch. 10S to Sch. XXS |
| Length | as per requirement (Max. up to 24 mtr. long) |
| Grades | 304/L/H/LN, 316/L/H/LN/Ti, 309, 310/L/H/S, 317/L/H, 321/H, 347/H, UNS S31500, UNS S31803, UNS S2205, UNS S32750, UNS S32760 |
| Specification | ASTM A-312, A, A-790 |

# ASTM STANDARDS FOR SEAMLESS & WELDED PIPES & TUBES

| | Allowable Outside Diameter Variation In mm | | | Allowable wall | | Exact Length | | Testing |
|---|---|---|---|---|---|---|---|---|
| | Nominal Diameter | | Over | Under | Over % | Under % | Over | Under | |
| ASTM A-213 Seamless Boiler Superheater & Heat Exchanger tubes | Under 25.4 | | 0.1016 | 0.1016 | +20 | -0 | 3.175 | 0 | Tension Test<br>Flattening Test<br>Flaring Test<br>Hardness Test<br>100% Hydrostatic Test<br>Refer to ASTM A-1016 |
| | 25.4- | 38.1 Incl. | 0.1524 | 0.1524 | +20 | -0 | 3.175 | 0 | |
| | 38.1- | 50.8 Excl. | 0.2032 | 0.2032 | +22 | -0 | 3.176 | 0 | |
| | 50.8- | 63.5 Excl. | 0.2540 | 0.2540 | +22 | -0 | 3.76 | 0 | |
| | 63.5- | 76.2 Excl. | 0.3048 | 0.3048 | +22 | -0 | 4.76 | 0 | |
| | 76.2- | 101.6 Incl. | 0.3810 | 0.3810 | +22 | -0 | 4.76 | 0 | |
| ASTM A-249 Welded Boiler Superheater, heat Exchanger & Condenser Tubes | Under 25.4 | | 0.1016 | 0.1016 | +10 | -10 | 3.175 | 0 | Tension Test<br>Flattening Test<br>Flaring Test<br>*Reverse Bend Test<br>Hardness Test<br>100% Hydrostatic Test<br>*Reverse Flattering Test<br>Refer to ASTM A-1016<br>*Whenever Applicable |
| | 25.4- | 38.1 Incl. | 0.1524 | 0.1524 | +10 | -10 | 3.175 | 0 | |
| | 38.1- | 50.8 Excl. | 0.2032 | 0.2032 | +10 | -10 | 3.176 | 0 | |
| | 50.8- | 63.5 Excl. | 0.2540 | 0.2540 | +10 | -10 | 4.76 | 0 | |
| | 63.5- | 76.2 Excl. | 0.3048 | 0.3048 | +10 | -10 | 4.76 | 0 | |
| | 76.2- | 101.6 Incl. | 0.3810 | 0.3810 | +10 | -10 | 4.76 | 0 | |
| | | | | | Minium Wall Tubes +18% - 0 available on request | | | | |
| ASTM A-269 Seamless & Welded Tubing for General Service | Under 12.7 | | 0.13 | 0.13 | +15 | -15 | 3.2 | 0 | Flare Test (Seamless Tube)<br>Flange Test (Welded Only)<br>Hardness Test<br>Reverse Flattering Test (Welded Only)<br>100% Hydrostatic Test<br>Refer to ASTM A-1016 |
| | 25.7- | 38.1 Incl. | 0.13 | 0.13 | +10 | -10 | 3.2 | 0 | |
| | 38.1- | 50.8 Excl. | 0.25 | 0.25 | +10 | -10 | 4.8 | 0 | |
| | 88.9 | 139.7 Excl. | 0.38 | 0.38 | +10 | -10 | 4.8 | 0 | |
| | 139.7 | 203.2 Excl. | 0.76 | 0.76 | +10 | -10 | 4.8 | 0 | |
| ASTM A-312 Seamless & Welded Austenitic Pipe | 10.29 - 48.26 | | 0.40 | 0.80 | + 20 % | | | | Tension Test<br>Flattering Test<br>100% Hydrostatic Test |
| | 48.3 - 73.03 | | 0.80 | 0.80 | - 12.5 % | | | | |
| | 73.03 - 114-3 | | 0.80 | 0.80 | + 22.5 % | | | | |
| | 114.3 - 219.08 | | 1.60 | 0.80 | - 12.5 % | | | | |
| ASTM A-270 Seamless & Welded Austenitic Pipe | 25.4 | | 0.05 | 0.20 | +12.5 | -12.5 | 3.2 | 0 | Reverse Flattering Test<br>100% Hydrostatic Test<br>External Polish on all tubes<br>Refer to ASTM A - 1016 |
| | 38.1 | | 0.05 | 0.20 | +12.5 | -12.5 | 3.2 | 0 | |
| | 50.8 | | 0.05 | 0.28 | +12.5 | -12.5 | 3.2 | 0 | |
| | 63.5 | | 0.05 | 0.28 | +12.5 | -12.5 | 3.2 | 0 | |
| | 76.2 | | 0.08 | 0.30 | +12.5 | -12.5 | 3.2 | 0 | |
| | 101.6 | | 0.08 | 0.38 | +12.5 | -12.5 | 3.2 | 0 | |
| ASTM A-268 Seamless & Welded Ferritic & Martengitic Stainless Steel tubes | Under 12.7 | | 0.13 | 0.13 | +15 | -15 | 3.2 | 0 | Tension test, Flaring Test, Flange Test, (ERW only) Hardness Test, Reverse Flattening Test, 100% Hydrostatic Test<br>Refer to ASTM A-450 |
| | 12.7 | 38.1 Incl. | 0.13 | 0.13 | +10 | -10 | 3.2 | 0 | |
| | 38.1 excl. | 88.9 Incl. | 0.28 | 0.28 | +10 | -10 | 4.8 | 0 | |
| | 88.9- | 168.3 Excl. | 0.38 | 0.38 | 10 | -10 | 4.8 | 0 | |
| ASTM A-358 for Welded big diameter Pipes | for all sizes 5" NB & above | | +0.5% | -0.5% | - | -03 mm | Customer's Specification | | Transverse tension test, Transverse guided bend test Hydrostatic test, radiographic examination (as specified) dye penetrant (optional) |
| ASTM A-688 for Welded Feed Water-heater 'U' Tubes | Under 25.4mm | | 0.1016 | 0.1016 | +20<br>+10 | -0 (for min wall thk.)<br>-10 (for Avg. wall thk.) | 3 to 13 | 0 | Tension, Hardness, Corrosion, Reverse bend, Flange, Flattening. Hydrostatic Test, Pneumatic Test, Non Destructive Test |
| ASTM A-778 Austenitic Stainless Steel Tubuler Product | As per Table 1 Welded Unannealed ASTM A 530 | | | | 12.5% | 12.5% | RL 10ft > 3 meter<br>FL 6 meter + 6mm - 0mm | | Transverse Tension Test<br>Transverse Guided Test |

*Eddy current non destructive test & inter granular corrosion test can be offered on request.

## EQUIVALENT EN SPECIFICATIONS

| | |
|---|---|
| EN 10216-5 | Seamless Stainless Steel Tubes for Pressure Purpose |
| EN 10297-2 | Seamless Stainless Steel for Mechanical & General Engineering Purpose |
| EN 10246-2 | Non - Destructive Testing of Steel Tubes |
| EN ISO 1127 | Dimensions & Tolerances of Stainless Steel Tubes |

| Tolerance on OD | Permissible Deviation on OD (Whichever is Greater) | Tolerance on THK | Permissible Deviation on THK (Whichever is Greater) |
|---|---|---|---|
| D1 | ±1.5% or ± 0.75 mm | T1 | ± 15 % or ± 0.6 mm |
| D2 | ± 1% or ± 0.5 mm | T2 | ± 12.5 % or ± 0.4 mm |
| D3 | +0.75% or ± 0.3 mm | T3 | ± 10 % or ± 0.2 mm |
| D4 | + 0.5% or ± 0.1 mm | T4 | ± 7.5 % or ± 0.15 mm |


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# PIPE AND TUBES SIZE CHART

| Nominal Size | | OD | Sch 5S | Sch 5 | Sch 10S | Sch 10 | Sch 20 | Sch 30 | STD WT | Sch 40S |
|---|---|---|---|---|---|---|---|---|---|---|
| Inch | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm |
| 1/8 | 6 | 10.3 | - | - | 1.24 | 1.24 | - | - | 1.73 | 1.73 |
| 1/4 | 8 | 13.7 | - | - | 1.65 | 1.65 | - | - | 2.24 | 2.24 |
| 3/8 | 10 | 17.1 | - | - | 1.65 | 1.65 | - | - | 2.31 | 2.31 |
| 1/2 | 15 | 21.3 | 1.65 | 1.65 | 2.11 | 2.11 | - | - | 2.77 | 2.77 |
| 3/4 | 20 | 26.7 | 1.65 | 1.65 | 2.11 | 2.11 | - | - | 2.87 | 2.87 |
| 1 | 25 | 33.4 | 1.65 | 1.65 | 2.77 | 2.77 | - | - | 3.38 | 3.38 |
| 1¼ | 32 | 42.2 | 1.65 | 1.65 | 2.77 | 2.77 | - | - | 3.56 | 3.56 |
| 1½ | 40 | 48.3 | 1.65 | 1.65 | 2.77 | 2.77 | - | - | 3.68 | 3.68 |
| 2 | 50 | 60.3 | 1.65 | 1.65 | 2.77 | 2.77 | - | - | 3.91 | 3.91 |
| 2½ | 65 | 73.0 | 2.11 | 2.11 | 3.05 | 3.05 | - | - | 5.16 | 5.16 |
| 3 | 80 | 88.9 | 2.11 | 2.11 | 3.05 | 3.05 | - | - | 5.49 | 5.49 |
| 3½ | 90 | 101.6 | 2.11 | 2.11 | 3.05 | 3.05 | - | - | 5.74 | 5.74 |
| 4 | 100 | 114.3 | 2.11 | 2.11 | 3.05 | 3.05 | - | - | 6.02 | 6.02 |
| 5 | 125 | 141.3 | 2.77 | 2.77 | 3.40 | 3.40 | - | - | 6.55 | 6.55 |
| 6 | 150 | 168.3 | 2.77 | 2.77 | 3.40 | 3.40 | - | - | 7.11 | 7.11 |
| 8 | 200 | 219.1 | 2.77 | 2.77 | 3.76 | 3.76 | 6.35 | 7.04 | 8.18 | 8.18 |
| 10 | 250 | 273.0 | 3.40 | 3.40 | 4.19 | 4.19 | 6.35 | 7.80 | 9.27 | 9.27 |
| 12 | 300 | 323.8 | 3.96 | 3.96 | 4.57 | 4.57 | 6.35 | 8.38 | 9.53 | 9.53 |
| 14 | 350 | 355.6 | 3.96 | 3.96 | 4.78 | 6.35 | 7.92 | 9.53 | 9.53 | 9.53 |
| 16 | 400 | 406.4 | 4.19 | 4.19 | 4.78 | 6.35 | 7.92 | 9.53 | 9.53 | 9.53 |
| 18 | 450 | 457.2 | 4.19 | 4.19 | 4.78 | 6.35 | 7.92 | 11.13 | 9.53 | 9.53 |
| 20 | 500 | 508.0 | 4.78 | 4.78 | 5.54 | 6.35 | 9.53 | 12.70 | 9.53 | 9.53 |
| 22 | 550 | 559.0 | 4.78 | 4.78 | 5.54 | 6.35 | 9.53 | 12.70 | 9.53 | 9.53 |
| 24 | 600 | 610.0 | 5.54 | 5.54 | 6.35 | 6.35 | 9.53 | 14.27 | 9.53 | 9.53 |
| 26 | 650 | 660.4 | - | - | - | 7.93 | 12.70 | - | 9.53 | 9.53 |
| 28 | 700 | 711.4 | - | - | - | 7.93 | 12.70 | 15.88 | 9.53 | 9.53 |
| 30 | 750 | 762.0 | 6.35 | 6.35 | 7.92 | 7.93 | 12.70 | 15.88 | 9.53 | 9.53 |
| 32 | 800 | 812.8 | - | - | - | 7.93 | 12.70 | 15.88 | 9.53 | 9.53 |
| 34 | 850 | 863.6 | - | - | - | 7.93 | 12.70 | 15.88 | 9.53 | 9.53 |
| 36 | 900 | 914.4 | - | - | - | 7.93 | 12.70 | 15.88 | 9.53 | 9.53 |
| 38 | 950 | 965.2 | - | - | - | - | - | - | 9.53 | - |
| 40 | 1000 | 1016 | - | - | - | - | - | - | 9.53 | - |
| 42 | 1050 | 1066.8 | - | - | - | - | - | - | 9.53 | - |
| 44 | 1100 | 1117.6 | - | - | - | - | - | - | 9.53 | - |
| 46 | 1150 | 1168.4 | - | - | - | - | - | - | 9.53 | - |
| 48 | 1200 | 1219.2 | - | - | - | - | - | - | 9.53 | - |

| Sch 40 | Sch 60 | Sch XS | Sch 80S | Sch 80 | Sch 100 | Sch 120 | Sch 140 | Sch 160 | Sch XXS |
|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | mm | mm | mm | mm | mm | mm | mm |
| 1.73 | - | 2.41 | 2.41 | 2.41 | - | - | - | - | - |
| 2.24 | - | 3.02 | 3.02 | 3.02 | - | - | - | - | - |
| 2.31 | - | 3.20 | 3.20 | 3.20 | - | - | - | - | - |
| 2.77 | - | 3.73 | 3.73 | 3.73 | - | - | - | 4.78 | 7.47 |
| 2.87 | - | 3.91 | 3.91 | 3.91 | - | - | - | 5.56 | 7.82 |
| 3.38 | - | 4.55 | 4.55 | 4.55 | - | - | - | 6.35 | 9.09 |
| 3.56 | - | 4.85 | 4.85 | 4.85 | - | - | - | 6.35 | 9.70 |
| 3.68 | - | 5.08 | 5.08 | 5.08 | - | - | - | 7.14 | 10.15 |
| 3.91 | - | 5.54 | 5.54 | 5.54 | - | - | - | 8.74 | 11.07 |
| 5.16 | - | 7.01 | 7.01 | 7.01 | - | - | - | 9.53 | 14.02 |
| 5.49 | - | 7.62 | 7.62 | 7.62 | - | - | - | 11.13 | 15.24 |
| 5.74 | - | 8.08 | 8.08 | 8.08 | - | - | - | - | - |
| 6.02 | - | 8.56 | 8.56 | 8.56 | - | 11.13 | - | 13.49 | 17.12 |
| 6.55 | - | 9.53 | 9.53 | 9.53 | - | 12.70 | - | 15.88 | 19.05 |
| 7.11 | - | 10.97 | 10.97 | 10.97 | - | 14.27 | - | 18.26 | 21.95 |
| 8.18 | 10.31 | 12.70 | 12.70 | 12.70 | 15.09 | 18.26 | 20.62 | 23.01 | 22.23 |
| 9.27 | 12.70 | 12.70 | 12.70 | 15.09 | 18.26 | 21.44 | 25.40 | 28.58 | 25.40 |
| 10.31 | 14.27 | 12.70 | 12.70 | 17.48 | 21.44 | 25.40 | 28.58 | 33.32 | 25.40 |
| 11.13 | 15.09 | 12.70 | 12.70 | 19.05 | 23.83 | 27.79 | 31.75 | 35.71 | - |
| 12.70 | 16.66 | 12.70 | 12.70 | 21.44 | 26.19 | 30.96 | 36.53 | 40.49 | - |
| 14.27 | 19.05 | 12.70 | 12.70 | 23.83 | 29.36 | 34.93 | 39.67 | 45.24 | - |
| 15.09 | 20.62 | 12.70 | 12.70 | 26.19 | 32.54 | 38.10 | 44.45 | 50.01 | - |
| - | 22.23 | 12.70 | 12.70 | 28.58 | 34.93 | 41.28 | 47.63 | 53.98 | - |
| 17.48 | 24.61 | 12.70 | 12.70 | 30.96 | 38.89 | 46.02 | 52.37 | 59.54 | - |
| - | - | 12.70 | - | - | - | - | - | - | - |
| - | - | 12.70 | - | - | - | - | - | - | - |
| - | - | 12.70 | 12.70 | - | - | - | - | - | - |
| 17.48 | - | 12.70 | - | - | - | - | - | - | - |
| 17.48 | - | 12.70 | - | - | - | - | - | - | - |
| 19.05 | - | 12.70 | - | - | - | - | - | - | - |
| - | - | 12.70 | - | - | - | - | - | - | - |
| - | - | 12.70 | - | - | - | - | - | - | 25.40 |
| - | - | 12.70 | - | - | - | - | - | - | 25.40 |
| - | - | 12.70 | - | - | - | - | - | - | 25.40 |
| - | - | 12.70 | - | - | - | - | - | - | 25.40 |
| - | - | 12.70 | - | - | - | - | - | - | 25.40 |


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# WEIGHT & THICKNESS CHART OF PIPES

| Nominal Pipe Size | | Outside Diameter | | Sch-5S | | Sch-10S | | Sch-10 | | Sch-20 | | Sch-30 | | Sch-40S | | Sch-80 | | Sch-160 | | Sch-XX | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | Thick (mm) | Wt. (Mtr) | Thick (mm) | Wt. (Mtr) | Thick (mm) | Wt. (Mtr) | Thick (mm) | Wt. (Mtr) | Thick (mm) | Wt. (Mtr) | Thick (mm) | Wt. (Mtr) | Thick (mm) | Wt. (Mtr) | Thick (mm) | Wt. (Mtr) | Thick (mm) | Wt. (Mtr) |
| 6 | 1/8 | 10.29 | 0.405 | 1 | 0.23 | 1.24 | 0.28 | | | – | – | – | – | 1.73 | 0.37 | 2.41 | 0.48 | – | – | – | – |
| 8 | 1/4 | 13.72 | 0.540 | 1.2 | 0.37 | 1.65 | 0.49 | | | – | – | – | – | 2.24 | 0.64 | 3.02 | 0.81 | – | – | – | – |
| 10 | 3/8 | 17.15 | 0.675 | 1.2 | 0.47 | 1.65 | 0.63 | | | – | – | – | – | 2.31 | 0.86 | 3.20 | 1.12 | – | – | – | – |
| 15 | 1/2 | 21.34 | 0.840 | 1.65 | 0.81 | 2.11 | 1.00 | | | – | – | – | – | 2.77 | 1.29 | 3.73 | 1.64 | 4.78 | 1.98 | 7.47 | 2.59 |
| 20 | 3/4 | 26.67 | 1.050 | 1.65 | 1.03 | 2.11 | 1.28 | | | – | – | – | – | 2.87 | 1.71 | 3.91 | 2.23 | 5.56 | 2.94 | 7.82 | 3.69 |
| 25 | 1 | 33.4 | 1.315 | 1.65 | 1.31 | 2.77 | 2.09 | | | – | – | – | – | 3.38 | 2.54 | 4.55 | 3.29 | 6.35 | 4.30 | 9.09 | 5.53 |
| 32 | 1¼ | 42.16 | 1.660 | 1.65 | 1.67 | 2.77 | 2.69 | | | – | – | – | – | 3.56 | 3.44 | 4.85 | 4.53 | 6.35 | 5.69 | 9.7 | 7.88 |
| 40 | 1½ | 48.26 | 1.900 | 1.65 | 1.93 | 2.77 | 3.10 | | | – | – | – | – | 3.68 | 4.11 | 5.08 | 5.49 | 7.23 | 7.43 | 10.16 | 9.69 |
| 50 | 2 | 60.33 | 2.375 | 1.65 | 2.42 | 2.77 | 3.92 | | | – | – | – | – | 3.91 | 5.52 | 5.54 | 7.60 | 8.74 | 11.29 | 11.07 | 13.65 |
| 65 | 2½ | 73.03 | 2.875 | 2.11 | 3.75 | 3.05 | 5.27 | | | – | – | – | – | 5.16 | 8.77 | 7.01 | 11.58 | 9.53 | 15.15 | 14.05 | 20.71 |
| 80 | 3 | 88.9 | 3.500 | 2.11 | 4.59 | 3.05 | 6.45 | | | – | – | – | – | 5.49 | 11.46 | 7.62 | 15.50 | 11.13 | 21.67 | 15.24 | 28.10 |
| 90 | 3½ | 101.6 | 4.000 | 2.11 | 5.25 | 3.05 | 7.40 | | | – | – | – | – | 5.74 | 13.77 | 8.08 | 18.91 | – | – | 16.15 | 34.54 |
| 100 | 4 | 114.3 | 4.500 | 2.11 | 5.93 | 3.05 | 8.35 | | | – | – | – | – | 6.02 | 16.32 | 8.56 | 22.66 | 13.49 | 34.04 | 17.12 | 41.64 |
| 125 | 5 | 141.3 | 5.563 | 2.77 | 9.61 | 3.4 | 11.56 | | | – | – | – | – | 6.55 | 22.09 | 9.53 | 31.43 | 15.88 | 49.85 | 19.05 | 58.29 |
| 150 | 6 | 168.28 | 6.625 | 2.77 | 11.48 | 3.4 | 14.04 | | | – | – | – | – | 7.11 | 28.68 | 10.97 | 43.19 | 18.26 | 68.57 | 21.95 | 80.39 |
| 200 | 8 | 219.1 | 8.625 | 2.77 | 15.01 | 3.76 | 20.26 | | | 6.35 | 33.81 | 7.04 | 37.37 | 8.18 | 43.18 | 12.70 | 65.61 | 23.01 | 112.94 | 22.23 | 109.54 |
| 250 | 10 | 273.0 | 10.750 | 3.4 | 22.92 | 4.19 | 28.20 | | | 6.35 | 42.38 | 7.8 | 51.78 | 9.27 | 61.19 | 15.06 | 97.23 | 28.58 | 174.85 | 25.4 | 157.41 |
| 300 | 12 | 323.9 | 12.750 | 3.96 | 31.72 | 4.57 | 36.53 | | | 6.35 | 50.47 | 8.38 | 66.18 | 9.53 | 74.99 | 17.45 | 133.85 | 33.32 | 242.34 | 25.4 | 189.77 |
| 350 | 14 | 355.6 | 14.000 | 3.96 | 34.87 | 4.78 | 41.97 | 6.35 | 54.77 | 7.92 | 68.92 | 9.53 | 82.55 | 9.53 | 82.55 | 19.05 | 160.47 | 35.71 | 285.92 | – | – |
| 400 | 16 | 406.4 | 16.000 | 4.19 | 42.20 | 4.78 | 48.05 | 6.35 | 62.74 | 7.92 | 78.99 | 9.53 | 94.67 | 9.53 | 94.67 | 21.41 | 206.31 | 40.49 | 370.84 | – | – |
| 450 | 18 | 457.2 | 18.000 | 4.19 | 47.53 | 4.78 | 5341 | 6.35 | 70.71 | 7.92 | 89.06 | 11.13 | 124.27 | 9.53 | 106.79 | – | – | 45.24 | 466.49 | – | – |
| 500 | 20 | 508.0 | 20.000 | 4.78 | 60.23 | 5.54 | 68.75 | 6.35 | 78.68 | 9.53 | 118.90 | 12.7 | 157.45 | 9.53 | 118.90 | – | – | 50.01 | 573.29 | – | – |
| 550 | 22 | 558.8 | 22.000 | 4.78 | 66.28 | 5.54 | 75.53 | 6.35 | 86.64 | 9.53 | 131.02 | 12.7 | 173.59 | 9.53 | 131.02 | – | – | 53.97 | 681.96 | – | – |
| 600 | 24 | 609.6 | 24.000 | 5.54 | 83.76 | 6.35 | 94.45 | 6.35 | 94.61 | 9.53 | 143.14 | 14.27 | 212.64 | 9.53 | 143.14 | – | – | 59.54 | 819.75 | – | – |

## SWG / BWG DIMENSION & WEIGHT PER METER

| Gauge No. | | 10 | | 12 | | 14 | | 16 | | 18 | | 19 | | 20 | | 22 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimension | | SWG | BWG | SWG | BWG | SWG | BWG | SWG | BWG | SWG | BWG | SWG | BWG | SWG | BWG | SWG | BWG |
| Size | OD (mm) | 3.251 | 3.404 | 2.642 | 2.769 | 2.032 | 2.1089 | 1.626 | 1.651 | 1.219 | 1.245 | 1.016 | 1.067 | 0.914 | 0.889 | 0.711 | 0.711 |
| 1/4 | 6.35 | - | - | - | - | 0.218 | 0.222 | 0.191 | 0.192 | 0.155 | 0.158 | 0.134 | 0.140 | 0.123 | 0.120 | 0.099 | 0.099 |
| 5/16 | 7.93 | - | - | - | - | 0.297 | 0.305 | 0.254 | 0.257 | 0.203 | 0.206 | 0.174 | 0.182 | 0.159 | 0.155 | 0.127 | 0.127 |
| 3/8 | 9.52 | 0.506 | 0.517 | 0.451 | 0.464 | 0.377 | 0.388 | 0.318 | 0.322 | 0.251 | 0.256 | 0.214 | 0.224 | 0.195 | 0.190 | 0.155 | 0.155 |
| 1/2 | 12.70 | 0.762 | 0.785 | 0.659 | 0.682 | 0.538 | 0.554 | 0.447 | 0.453 | 0.347 | 0.354 | 0.295 | 0.308 | 0.267 | 0.261 | 0.211 | 0.211 |
| 5/8 | 15.87 | 1.018 | 1.053 | 0.867 | 0.900 | 0.698 | 0.720 | 0.575 | 0.582 | 0.443 | 0.452 | 0.374 | 0.392 | 0.339 | 0.330 | 0.267 | 0.267 |
| 3/4 | 19.05 | 1.274 | 1.321 | 1.076 | 1.118 | 0.858 | 0.886 | 0.703 | 0.713 | 0.539 | 0.550 | 0.455 | 0.476 | 0.411 | 0.401 | 0.323 | 0.323 |
| 1 | 25.40 | 1.786 | 1.858 | 1.492 | 1.555 | 1.178 | 1.219 | 0.959 | 0.973 | 0.731 | 0.746 | 0.615 | 0.644 | 0.555 | 0.541 | 0.436 | 0.436 |
| 1¼ | 31.82 | 2.304 | 2.400 | 1.913 | 1.996 | 1.502 | 1.555 | 1.218 | 1.236 | 0.925 | 0.944 | 0.776 | 0.814 | 0.701 | 0.682 | – | – |
| 1½ | 38.10 | 2.811 | 2.930 | 2.324 | 2.427 | 1.818 | 1.883 | 1.471 | 1.493 | 1.115 | 1.138 | 0.935 | 0.980 | 0.843 | 0.821 | – | – |
| 1¾ | 45.45 | 3.404 | 3.551 | 2.806 | 2.932 | 2.189 | 2.268 | 1.768 | 1.794 | 1.338 | 1.365 | 1.120 | 1.175 | 1.010 | 0.983 | – | – |
| 2 | 50.80 | 3.825 | 4.003 | 3.157 | 3.300 | 2.459 | 2.548 | 1.984 | 2.013 | 1.499 | 1.531 | 1.255 | 1.317 | 1.131 | 1.101 | – | – |
| 2¼ | 57.15 | 4.347 | 4.539 | 3.573 | 3.736 | 2.779 | 2.880 | 2.240 | 2.273 | 1.692 | 1.727 | 1.415 | – | – | – | – | – |
| 2½ | 63.50 | 4.860 | 5.075 | 3.989 | 4.172 | 3.099 | 3.212 | 2.496 | 2.533 | 1.884 | 1.923 | 1.575 | – | – | – | – | – |
| 2¾ | 69.85 | 5.372 | 5.612 | 4.405 | 4.608 | 3.419 | 3.544 | 2.752 | 2.794 | 2.076 | 2.119 | 1.735 | – | – | – | – | – |
| 3 | 76.20 | 5.884 | 6.148 | 4.822 | 5.045 | 3.739 | 3.877 | 3.008 | 3.054 | – | – | – | – | – | – | – | – |
| 3½ | 88.90 | 6.908 | 7.220 | 5.654 | 5.917 | 4.379 | 4.541 | – | – | – | – | – | – | – | – | – | – |
| 4 | 101.60 | 7.933 | 8.293 | 6.487 | 6.790 | 5.020 | 5.206 | – | – | – | – | – | – | – | – | – | – |

| | ALLOWABLE OUTSIDE DIAMETER TOLERANCE IN mm | ALLOWABLE WALL THICKNESS TOLERANCES |
|---|---|---|
| **ASTM A-270/A1016** (Seamless and Welded Austenitic and Ferritic/] Austenitic Stainless Steel Sanitary Tubing | | |
| OUTSIDE DIAMETER (mm) | | |
| [25] and under | +0.13, -0.13 | +12.5%, -12.5% |
| Over [25] to 2 [50] | +0.20, -0.20 | +12.5%, -12.5% |
| Over [50] to 3 [75] | +0.25, -0.25 | +12.5%, -12.5% |
| Over 3 [75] to 4 [100] | +0.38, -0.38 | +12.5%, -12.5% |
| [100] to 5½ [140], excl. | +0.38, -0.38 | +12.5%, -12.5% |
| [140] to 8 [200], excl. | +0.75, -0.75 | +12.5%, -12.5% |
| 8 [200] to 12 [300] | +1.25, -1.25 | +12.5%, -12.5% |
| **ASTM A-249/A1016** (Welded, Austenitic Steel Boiler, Superheater, Heat-Exchanger and Condenser Tubes) | | |
| Under 1 [25] | +0.1, -0.11 | +10.0%, -10.0% |
| 1 to 1½ [25 to 40], incl | +0.15, -0.15 | +10.0%, -10.0% |
| Over 1½ to 2 [40 to 50], excl | +0.2, -0.20 | +10.0%, -10.0% |
| 2 to 2½ [50 to 65], excl | +0.25, -0.25 | +10.0%, -10.0% |
| 2½ to 3 [65 to 75], excl | +0.30, -0.30 | +10.0%, -10.0% |
| 3 to 4 [75 to 100], incl | +0.38, -0.38 | +10.0%, -10.0% |
| Over 4 to 7½ [100 to 200], incl | +0.38, -0.64 | +10.0%, -10.0% |
| Over 7½ to 9 [200 to 225], incl | +0.38, -1.14 | +10.0%, -10.0% |
| **ASTM A-269/A 1016** (Seamless and Welded Austenitic Stainless Steel Tubing for General Service) | | |
| Up to 1/2 [13] | +0.13, -0.13 | +15.0%, -15.0% |
| 1/2 to 1½ [13 to 38], excl | +0.13, -0.13 | +10.0%, -10.0% |
| 1½ to 3½ [38 to 89], excl | +0.25, -0.25 | +10.0%, -10.0% |
| 3½ to 5½ [89 to 140], excl | +0.38, -0.38 | +10.0%, -10.0% |
| 5½ to 8 [140 to 203], excl | +0.76, -0.76 | +10.0%, -10.0% |
| 8 to 12 [203 to 305], excl | +1.01, -1.01 | +10.0%, -10.0% |
| 12 to 14 [305 to 356], excl | +1.26, -1.26 | +10.0%, -10.0% |
| **ASTM A358/A999/A928** (Welded, LSAW Austenitic and Duplex pipes for High Temperature Service) | | |
| All Sizes | +0.5, -0.5% | +NSF, 0.3MM |

| | ALLOWABLE OUTSIDE DIAMETER TOLERANCE IN mm | ALLOWABLE WALL THICKNESS TOLERANCES |
|---|---|---|
| **ASTM A-312/A999** (Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes) | | |
| 1/8-1½, incl | +0.40, -0.40 | – |
| Over 1½ to 4, incl | +0.80, -0.80 | – |
| Over 4 to 8, incl | +1.60, -0.80 | – |
| Over 8 to 18, incl | +2.40, -0.80 | – |
| Over 18 to 26, incl | +3.20, -0.80 | – |
| Over 26 to 34, incl | +4.0, -0.80 | – |
| Over 34 to 48, incl | +4.80, -0.80 | – |
| 1/8 to 2½ incl., all t/D ratios | – | +20.0, -12.5% |
| 3 to 18 incl., t/D up to 5% incl. | – | +22.5, -12.5% |
| 3 to 18 incl., t/D > 5% | – | +15.0, -12.5% |
| 20 and larger, welded, all t/D ratios | – | +17.5, -12.5% |
| 20 and larger, seamless, t/D up to 5% incl. | – | +22.5, -12.5% |
| 20 and larger, seamless, t/D > 5% | – | +15.0, -12.5% |
| **ASTM A-268/A1016** (Seamless and Welded Ferritic and Martensitic Stainless Steel Tubing for General Service) | | |
| Up to 1/2 [12.7], excl | +0.13,-0.13 | +15.0%, -15.0% |
| 1/2 to 1½ [12.7 to 38.1], excl | +0.13,-0.13 | +10.0%, -10.0% |
| 1½ to 3½ [38.1 to 88.9], excl | +0.25,-0.25 | +10.0%, -10.0% |
| 3½ to 5½ [88.9 to 139.7], excl | +0.38,-0.38 | +10.0%, -10.0% |
| 5½ to 8 [139.7 to 203.2], incl | +0.76,-0.38 | +10.0%, -10.0% |
| **ASTM A-213/A1016** (Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater, and Heat-Exchanger Tubes) | | |
| Under 1 [25] | +0.10, -0.11 | +20%, -0.0% |
| 1 to 1½ [25 to 40], incl | +0.15, -0.15 | +20%, -0.0% |
| Over 1½ to 2 [40 to 50], excl | +0.20, -0.20 | +22%, -0.0% |
| 2 to 2½ [50 to 65], excl | +0.25, -0.25 | +22%, -0.0% |
| 2½ to 3 [65 to 75], excl | +0.30, -0.30 | +22%, -0.0% |
| 3 to 4 [75 to 100], incl | +0.38, -0.38 | +22%, -0.0% |
| Over 4 to 7½ [100 to 200], incl | +0.38, -0.64 | +22%, -0.0% |
| Over 7½ to 9 [200 to 225], incl | +0.38, -1.14 | +22%, -0.0% |

Permissible variations from the specified average wall thickness shall be ±10% of the specified average wall thickness for cold formed tubes

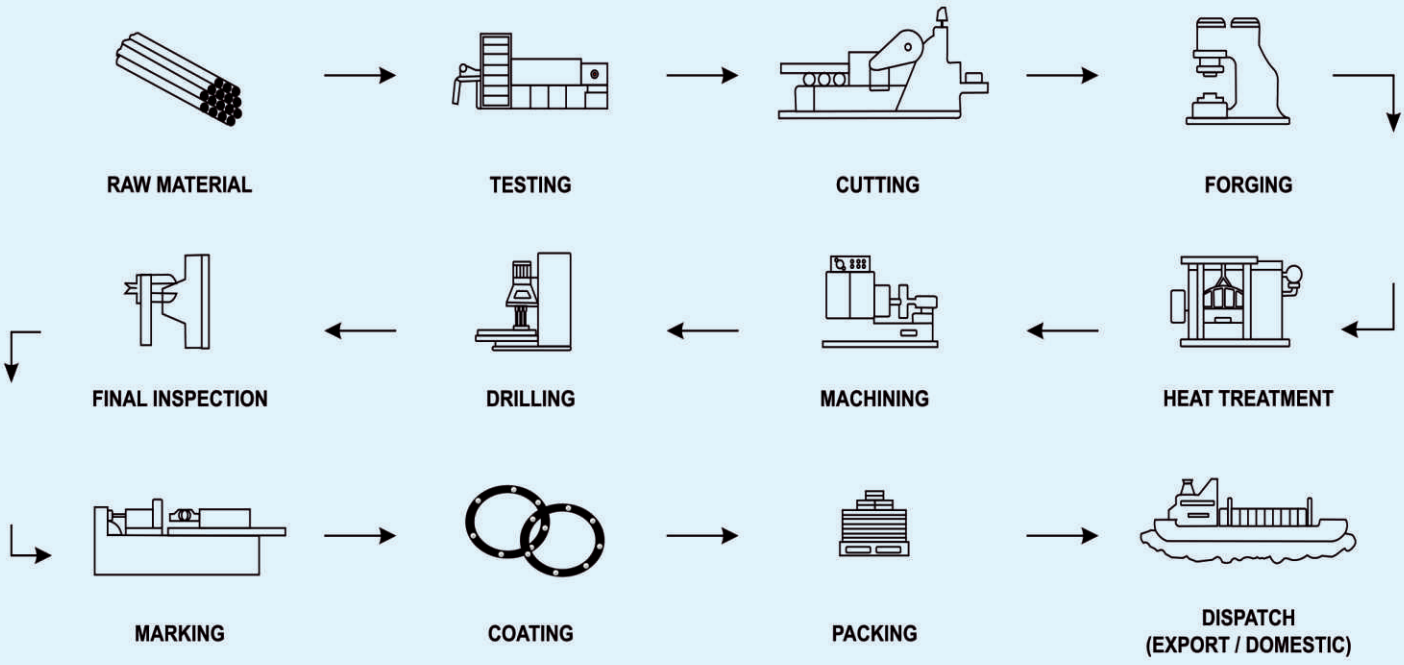
**DIN STANDARD- For Welded tube, DIN 17457: the tolerance on OD and wall thickness is given in DIN 2463 or EN 10217-7 (See below table)**

| OUTSIDE DIAMETER D (mm) | Tolerance on Outside Diameter D | | Tolerances on Wall Thickness T | |
|---|---|---|---|---|
| | Tolerance Class | Permissible Deviation | | |
| D ≤ 168.3 | D3 | '+ 0.75% or + 0.3 mm Whichever is greater | T3 | '+ 10% or + 0.2 mm Whichever is greater |
| | D4 | '+ 0.5% or + 0.1 mm Whichever is greater | | |
| D > 168.3 | D2 | '+ 1.0% | | |

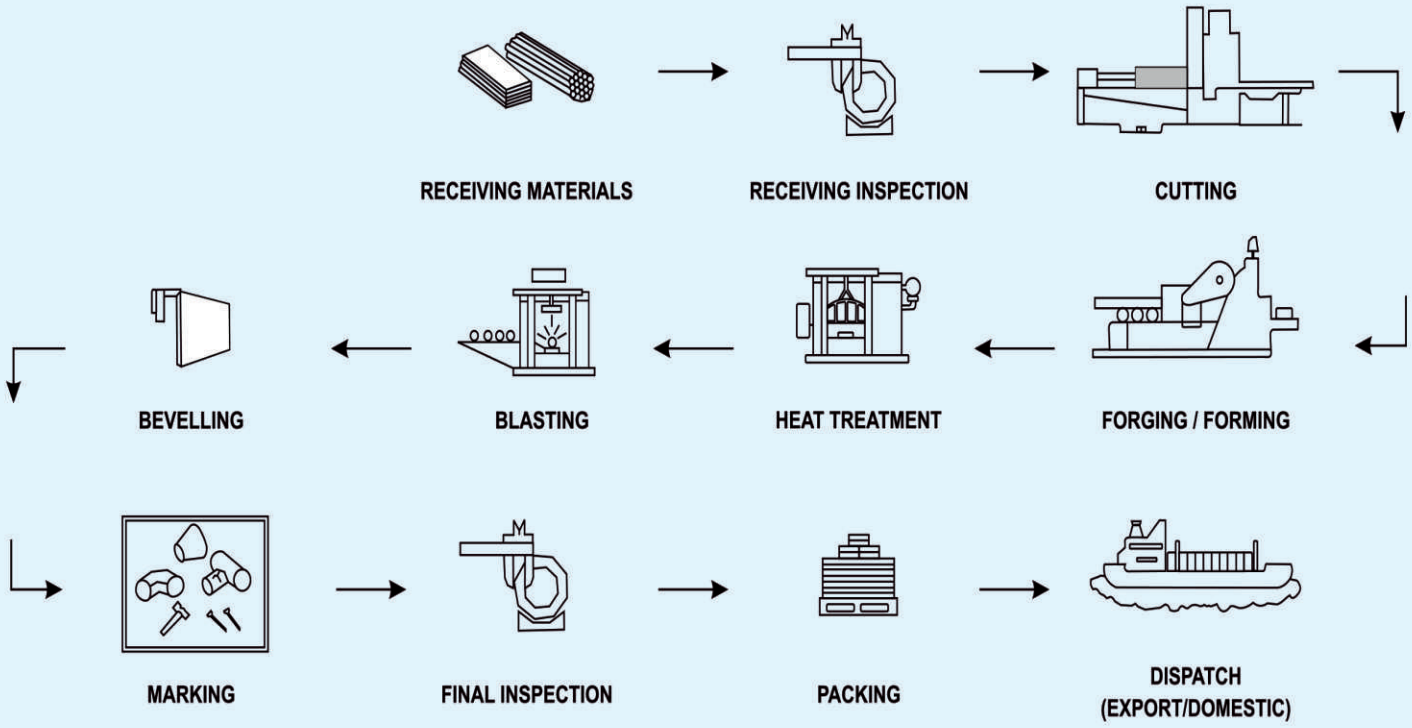
**DIN STANDARD- For Seamless tube, DIN 17456/17458: the tolerance on OD and wall thickness is given in EN 1127(See below table)**

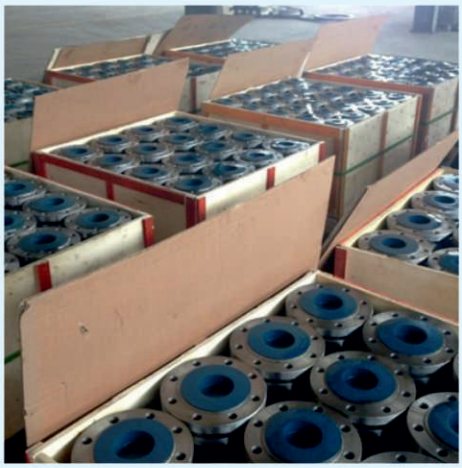
| Tolerance Class | Tolerance on Outside Diameter D | Tolerance Class | Tolerance on Wall Thickness T |
|---|---|---|---|
| D1 | + 1.5% with + 0.75mm min. | T1 | + 15% with + 0.6 mm min. |
| D2 | + 1.0% with + 0.50mm min. | T2 | + 12.5% with + 0.4 mm min. |
| D3 | + 0.75% with + 0.3mm min. | T3 | + 10% with + 0.2 mm min. |
| D4 | + 0.5% with + 0.10mm min. | T4 | + 7.5% with + 0.15 mm min. |

## SCHEMATIC DETAILS OF PRODUCTION PROCESS FOR FLANGES



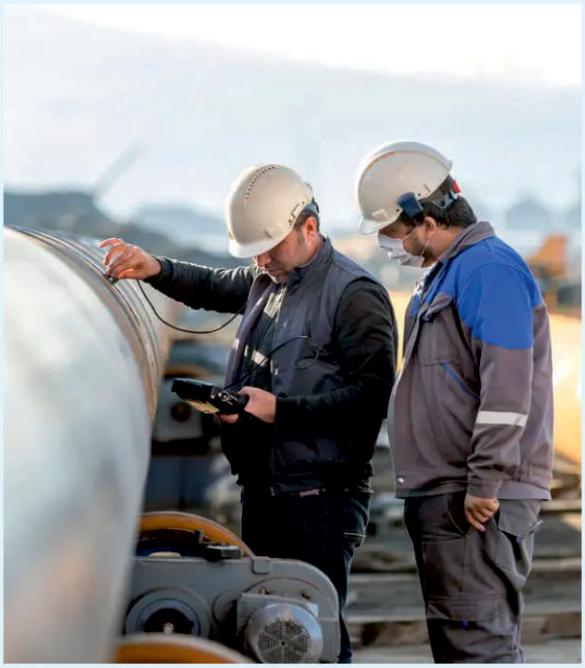
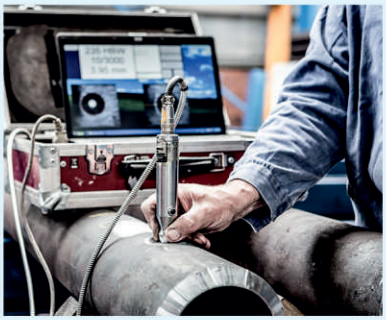

## SCHEMATIC DETAILS OF MANUFACTURING PROCEDURE OF BW PIPE FITTINGS





## TESTING PROCESS



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# QUALITY POLICY

At **Royal Forge & Fittings Industries,** quality is at the heart of everything we do. We are steadfast in our commitment to deliver world-class products that exceed customer expectations while maintaining the highest standards of safety, sustainability, and operational excellence.

**Our Quality Commitment:**

- Continuously enhance our knowledge, skills, and systems to improve organizational efficiency and ensure outstanding product quality.
- Consistently meet and surpass customer requirements by involving every employee in the pursuit of quality excellence.
- Innovate in materials, technology, and processes to deliver superior products at the most competitive prices.
- Ensure the right product, at the right time, in the right place, with accurate documentation.


**Quality Assurance**

We strictly adhere to a comprehensive quality assurance plan to guarantee product reliability and consistency. Our stainless steel pipes and fittings are manufactured under an approved quality manual and follow a client-specific Quality Assurance Plan (QAP).

**Key Steps in Quality Assurance:**

*Raw Material Control:*
Thorough inspection and verification of all incoming materials.
*In-Process Inspection:*
Stage-wise monitoring to ensure compliance with technical specifications.
*Final Inspection:*
Rigorous testing of finished products before release.
*Calibration:*
Regular calibration of equipment and measuring instruments for precision and accuracy.

**Testing Capabilities:**

*Non-Destructive Testing (NDT):*
Includes ultrasonic testing, radiographic testing, hydrostatic testing, and dye penetrant testing, ensuring structural integrity without compromising the product.

*Destructive Testing:*
Includes tensile tests, hardness tests, flattening, flare, and reverse-bend tests to validate mechanical properties.


## Continuous Improvement

We are committed to continuous improvement in quality, safety, and environmental management systems. By fostering a culture of innovation, we:

- Set measurable objectives and targets for improvement.
- Train and upskill employees to enhance competence and awareness.
- Develop new designs and technologies to remain competitive and meet emerging client needs.

## Our Promise:

- Deliver high-quality products and exceptional service at
- competitive prices.
- Build strong, lasting relationships with customers, suppliers, and stakeholders.
  Consistently enhance processes through stringent quality controls and proactive innovation.

At Royal Forge & Fittings Industries, quality is not just a policy—it is a way of life. We pledge to continue raising the bar in everything we do to ensure the satisfaction and success of our valued clients.

## OUR MACHINERY

**Key Machinery in Our Facility :**

1. Cutting Machines (4 Units) - For Precise Material Cutting.
2. Elbow Bending Machine - For Creating Seamless Bends in Pipes and Fittings.
3. Elbow Beveling Machines (2 Unit)- Ensuring Perfect Bevel Edges for Welding.
4. Elbow Machine - Dedicated to Producing High Quality Elbows.
5. Tee Machine - Specialized for Manufacturing Tees With Accuracy.
6. Tee Beveling Machine- For Creating Beveled Edges in Tees.
7. Air Machine - Supporting Various Pneumatic Operations.
8. Lathe Machine (2 Unit) - For Shaping and Finishing Components.
9. CNC Machine DX200 5A (2 Unit) - For High Precision Automated Machining.
10. VMC PX10 Machine - Delivering Precise Vertical Milling Capabilities.
11. Argen Maachine - Used for Specialized Production tasks.
12. Laser Marking Machine - For Accurate and Durable Product Markings.
13. Hard Marking Machine - For Marking in Flanges.
14. Welding Machine Argon Set - Use For Specialized Production Used.
15. Gas Cutting Hand Set - Use For Cutting for Various Materials.
16. Overhead Crean-5 Ton Capacity - Use For Lifting Material in Plant.
17. Welding Machine - Use for Welding of some Broken Die and Materials.

# THIRD-PARTY INSPECTION

At Royal Forge & Fittings Industries, inspection and testing are at the core of our commitment to delivering the finest stainless steel products to our esteemed clients. Our rigorous testing protocols encompass a wide range of assessments designed to meet and exceed industry standards, ensuring the utmost quality and reliability in every product we deliver.

Our inspection and testing process is meticulously carried out during both in-process and final stages, divided into two primary categories:

## Physical Tests (Destructive Testing)

Physical testing ensures the structural integrity and mechanical properties of our stainless steel pipes and fittings. These tests are designed to confirm the durability and performance of the materials in various applications. Key physical tests include:

**Tensile Test:** Assessing the material's strength and elongation.
**Hardness Test:** Measuring the resistance to deformation.
**Flaring Test:** Testing the ductility of the material.
**Flange Test:** Ensuring the product's structural stability under stress.
**Reverse-Bend Test:** Evaluating flexibility and resilience.
**Reverse Flattening Test:** Confirming resistance to deformation under pressure.
**Impact Test:** Measuring material toughness at different temperatures.
**IGC Test (Practice A, B, C & E):** Assessing resistance to intergranular corrosion.

## Non-Destructive Testing (NDT)

Non-destructive tests focus on identifying hidden flaws or defects without damaging the product. This ensures internal and surface integrity, critical for high-performance applications. Our NDT methods include:

**Hydro-Static Test:** Verifying the strength and leak-proof nature of the material.
**Eddy Current Test:** Detecting surface and sub-surface defects.
**Ultrasonic Testing:** Inspecting internal structures for hidden imperfections.
**Air Under Water Test:** Ensuring airtight integrity under pressure.
**Radiography Testing:** Examining the internal composition through X-rays or gamma rays.
**P.M.I. Test (Positive Material Identification):** Confirming material composition.
**Spectro Test:** Analyzing the chemical properties of the material.
**Dye Penetrant Test:** Identifying surface cracks or imperfections.

By integrating both destructive and non-destructive testing methodologies, Royal Forge & Fittings Industries ensures that every product meets the highest quality standards. Our third-party inspection process reinforces our dedication to transparency, accountability, and customer satisfaction, guaranteeing that every product delivered to our clients is reliable, durable, and fit for purpose.

At **Royal Forge & Fittings Industries**, our commitment to quality, precision, and reliability has enabled us to cater to a broad spectrum of industries. Our products are designed to meet the rigorous demands of various sectors, ensuring superior performance and durability.


Construction & Infrastructure


Oil and Gas Industry


Power Sectors


Refineries


Chemical Industry


Petrochemical Industry


Iron & Steel Plant


Cement Plant


Automotive industry


Aerospace industry


Marine Industry


Pulp and Paper Industry


Pharmaceutical Industry


Dairy Industries


Food Industry


Beverages Plant

**...and Many More!**

From small-scale enterprises to large-scale industrial operations, **Royal Forge & Fittings Industries** is proud to support diverse sectors with tailored solutions. Our dedication to innovation, quality, and customer satisfaction ensures that we remain a trusted partner across industries worldwide.

# ROYAL FORGE AND FITTINGS INDUSTRIES

MFG. OF SS, CS, MS, AS PIPE FITTING & FLANGES

AN ISO 9001:2015 CERTIFIED COMPANY

*Royal Solutions for Industrial Strength*

ISO | MSME सूक्ष्म, लघु एवं मध्यम उद्यम MICRO, SMALL & MEDIUM ENTERPRISES | CE

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