www.samilpnf.co.kr

ABS ISO 9001 : 2008
ABS ISO 14001 : 2004
ABS CE (PED) : 97/23/EC

# SAMIL P&F Co., Ltd.




삼일피엔에프주식회사

# General Information

## Company Profile

### 1. COMPANY NAME

SAMIL P&F Co., Ltd.

### 2. ADDRESS & INFORMATIONS

**HEAD OFFICE**: #111, Hwajeonsandan 2-Ro, Gangseo-Gu, Busan, Korea
**TEL**: 82-51-717-2580 **FAX**: 82-51-717-2585
**WEB SITE:** www.samilpnf.co.kr **E-MAIL**: 31pf@samilpnf.co.kr



# History

## Company History

- **July. 2013** — Samil P&F was established as Investment in Samil Industry.
- **Sep. 2013** — Moved to 10, No.98, 5-Hwajeonsandan 5-Ro, Gangseo-ku, Busan in KOREA
- **Jan. 2014** — Certificate for ABS ISO 9001 : 2008
- **Feb. 2014** — Certificate for ABS CE PED (97/23/EC)
  Certificate for ABS ISO : 14001 : 2004
- **Feb. 2015** — The Company has plan expansion will move to new building in Feb 2015





ABS Quality Evaluations
Certificate Of Conformance
SAMIL P&F Co., Ltd.


ABS Quality Evaluations
Certificate Of Conformance
SAMIL P&F Co., Ltd.


ABS Group Ltd.
CERTIFICATE OF CONFORMANCE
FOR METALLIC MATERIAL MANUFACTURER
SAMIL P&F Co., Ltd.

# Manufacturing Process



## Receiving Inspection



## Material Cutting



## Forging



## Heat Treatment



## Machining



## Drilling



## Final Inspection



## Marking



## Packing



# Production Facilities



## Machining Facilities



| FACILITY. | Turning M/C |
|---|---|
| MAKER. | O-M Ltd. |
| SIZE. | ø1400 X 1600 |
| YEAR. | 2007. 10 |
| Q'ty. | 1 EA |



| FACILITY. | Turning M/C |
|---|---|
| MAKER. | O-M Ltd. |
| SIZE. | ø3000 X 2000 |
| YEAR. | 2003. 09 |
| Q'ty. | 2 EA |



| FACILITY. | NC Turning M/C |
|---|---|
| MAKER. | OKUMA |
| SIZE. | ø1500 |
| YEAR. | 2010. 05 |
| Q'ty. | 1 EA |



| FACILITY. | Lathe |
|---|---|
| MAKER. | 한국공작기계 |
| SIZE. | 710 |
| YEAR. | 2004. 09 |
| Q'ty. | 2 EA |



| FACILITY. | Redial Drill |
|---|---|
| MAKER. | OOYA |
| SIZE. | ø1600 |
| YEAR. | 2004. 09 |
| Q'ty. | 2 EA |



| FACILITY. | Boring M/C |
|---|---|
| MAKER. | KIA M/C |
| SIZE. | ø1800 X 1700 |
| YEAR. | 1994. 03 |
| Q'ty. | 1 EA |

## Measurement Equipment



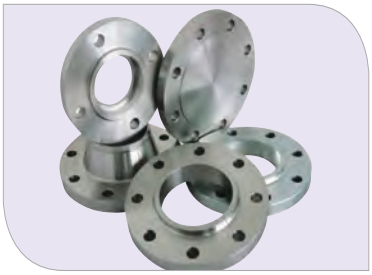




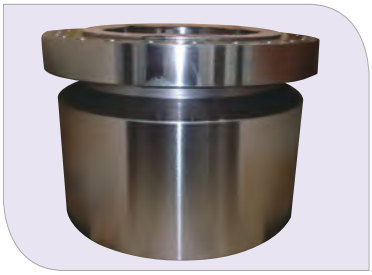




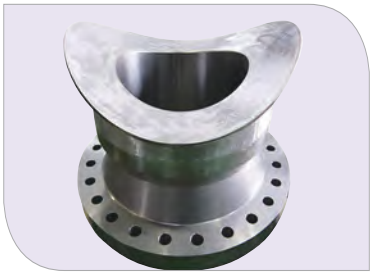
# Main Product



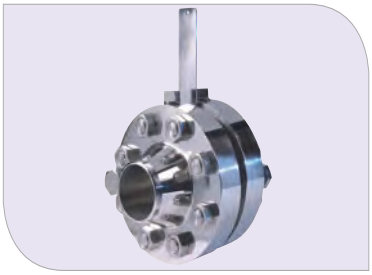
▲ STANDARD FLANGE



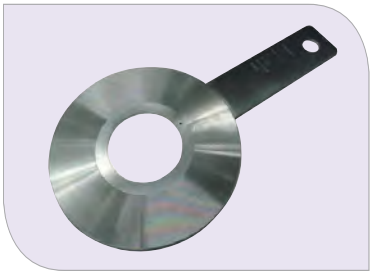
▲ FORGED NOZZLE



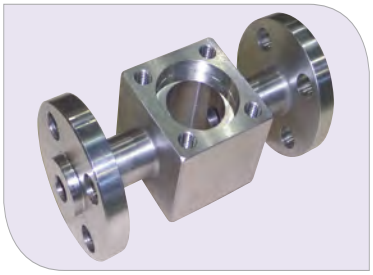
▲ FORGED NOZZLE
(RIP TYPE)



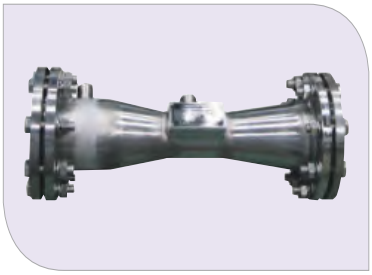
▲ ORIFICE FLANGE



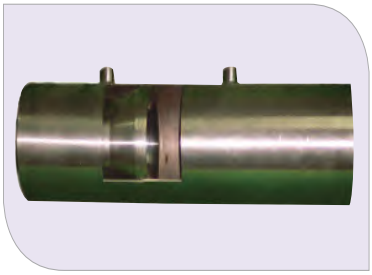
▲ ORIFICE PLATE



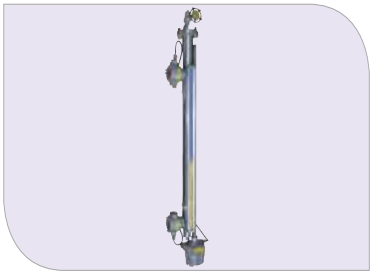
▲ SIGHT GLASS



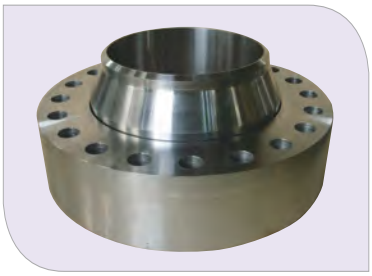
▲ VENTURI



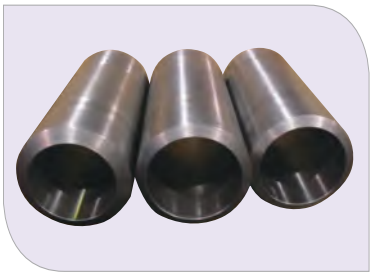
▲ FLOW NOZZLE



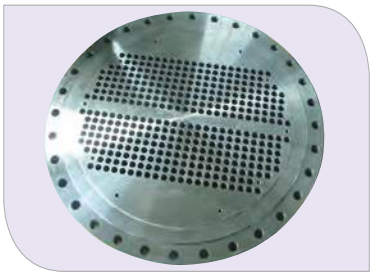
▲ LEVEL GAUGE



▲ WELDING NECK
(NON STANDARD)



▲ FORGED PIPE



▲ TUBE SHEETS



▲ ORIFICE FLANGE



▲ ORIFICE INSTALL

TÜV CERT DIN EN ISO 9001

CE

# LEVEL GAUGES
# SIGHT GLASSES
# FLOW ELEMENT







SAM IL P&F CO.,LTD.

# LEVEL GAUGE

## LIQUID LEVEL GAUGE

1

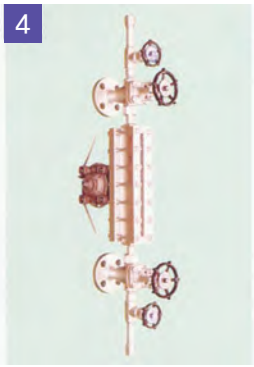
▲ SBG–1,2,3 150(LB)

2

▲ SRG–1,2,3,4 150~2500(LB)

3

▲ STG–1,2,3,4 150~2500(LB)

4

▲ STG–IL 150~2500(LB)

5

▲ SRG–1 SM 150(LB)

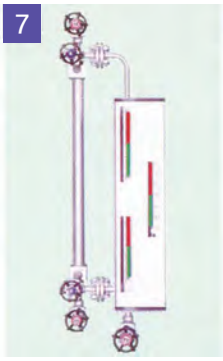
| | |
|---|---|
| 1. Tubular Type Level Gauge | Used for observing the fluid level at low temperature & low pressure with to be of low price. |
| 2. Reflex Type Level Gauge | Used for observing the level of various liquids by using reflection of light and for high pressure, high temperature excepting steam line. |
| 3. Transparent Type Level Gauge | Used for observing the fluid level in high pressure & high temperature (including Steam) and especially for steam line through transmission of light. |
| 4. Illuminator Type Level Gauge | Used for observing the fluid level in a dim place or at night by using an explosion–proof or weather–proof.<br>(Explosion–Proof : KOSHA / Exd Ⅱ B + H2 T5 & CENELEC / EExd Ⅱ B + H2 T4, IP66 ; weather –proof. |
| 5. Flat Type Self–Closing Level Gauge For Marine | Used for observing the fluid level of oil tank for ship and light weight rather than level gauge for land. |

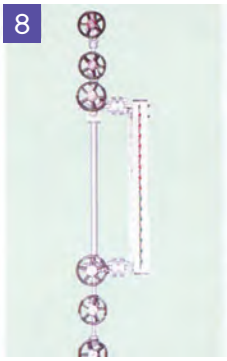
Note
1) The material of above items available in Carbon steel, Stainless steel & Alloy steel, Titanium, PVC, Teflon etc. And others are available on request by customers.
2) Other items manufactured by SAMIL are Large Chamber (SRLG, STLG) suitable for high viscosity & high specific gravity, Non–frosting (SRNG, STNG) used for below 0℃, Jacket Type for heating & Cooling (SRJG, STJC) used observing the fluid level by changing it into state of liquid after heating & cooling it though jacket as per features of fluid, Zig–Zag(SRZG, STZG) used for observing the overall fluid level by covering the invisible section (dead band).
3) The certificate of explosion–proof for Illuminator type level gauge(SRG–IL, STG–IL) is FM approved Division 1,2 and Class Ⅰ : Group B,C,D & Class Ⅱ : Group E,F,G & Class Ⅲ : Type 4.
4) The certificate of U · L is available on Class Ⅰ : Groups C, D Temp. Code T4A ; Division 1
Class Ⅰ : Group B Temp. Code T2A ; Division 2.
5) For Models not shown in this brochure as available, see our detail catalogue.

## BOILER STEAM WATER LEVEL GAUGE

6

▲ SGC–1B, 20B
150~900(LB)

7

▲ SGCZ–20B
150~900(LB)

8

▲ SGC–300B
600~2500(LB)

9

▲ SEL–G200B,300B
300~2500(LB)

10

▲ SEL–S200B, 300B
300~2500(LB)

| | |
|---|---|
| 6.Transparent Two–color Type Level Gauge | Used for observing the fluid level in boiler steam line. |
| 7. Transparent Zig–Zag Type Level Gauge | Used for observing the fluid level by covering invisible section (dead band) and in case the visible length is of this gauge, larger than standard of glass. |
| 8. Two colors Multi Port Type Level Gauge | Used for steam line of high pressure with 5 or 7 round visual ports & keeping its outstanding safety in boiler steam line. |
| 9. Electrode type level gauge | SEL–G Series is Used wherever fluid level has to be monitored, indicated and controlled in a reliable way, especially high temperature and high pressure, Fluid with steam.<br>1) (SEL–G300B) Used for observing the fluid level in super high pressure & super high temperature with outstanding safety & easy maintenance.<br>2) (SEL–G200B) Used for low & medium temp.(up to 180℃), pres.(50kgf/㎠) with easy maintenance. |
| 10. Electrode type level switch | SEL–S Series is Used detecting and remote indicating of fluid for level control systems, especially High temperature & Pressure fluids.<br>1) Used for alarm & control of the fluid with arranged level points.<br>2) Used by attaching or by dismantling freely the level switch with outstanding safert to electrode type level gauge. |

Note
1) The material of above items available in Carbon steel, Stainless steel, Alloy steel, etc,. and others are available on request by customers.
2) The material of electrodes for electrode type level gauge & level switch is 316 SS/Ceramic.
2) The destinations which center and visible length for level gauges are fabricated on request by customers.

# LEVEL GAUGE / SIGHT GLASS

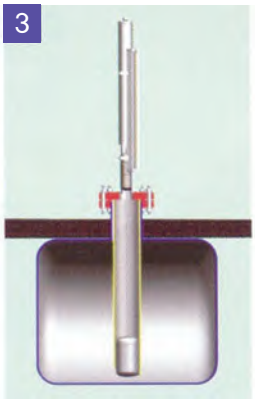
## MAGNETIC FLOAT LEVEL GAUGE

1

▲ SMF–50, 65A 150~2500(LB)

2

▲ SMF–50AST, 50AS, 65AST 150~2500(LB)

3

▲ SMF–50AU 150,300(LB)

4

▲ SMG–50ALD150,300(LB)

5

▲ SPF–1 150,300(LB)

6

▲ SCF–1 150,300(LB)

1. Magnetic Float Type Level Gauge
Magnetic Float Type Level Gauge : Used for observing almost all fluid level which is poisonous gas or liquid tank and boiler drum with lower and higher pressure and it's have weight with outstanding safety from its damage or breakage and to be of low price.

2. Magnetic Float Type Level Gauge with Level Switch or transmitter
Magnetic Float Type Level Gauge with Level Switch or transmitter Suitable for alram & control of various liquid level, any fluid level can be obsered through its central control system.

3. Magnetic Float Level Gauge For underground tank
Magnetic Float level Gauge For underground Tank : Used for observing the fluid level in underground tank or tank under manhole.

4. Magnetic Float Type Level Gauge with Teflon Lined
Magnetic Float Type Level Gauge with Teflon Lined : Uesd for observing the Corrosive Fluid level effectively by lining the wetted part of this level gauge.

5. Magnetic Float Type Level Switch
Magnetic Float Type Level Switch : Used for observing the level of liquid as well as for outputting alarm and control a contact points of liquid requested by customer arbitrarily.(ENCLOSURE – Ex d II C(H2) T5 IP 65)

6. Magnetic Float Type Level Transmitter
Magnetic Float Type Level Transmitter : Used for detecting the level of measuring object from various level in the vessels or tanks and for transmitting it after converting to electric output signal and direct indication can also be possible with gold & blue color.(ENCLOSURE – Ex d ii C(H2) T5 IP 65)

Note
1) Materials of above items available in Austenitic stainless steel, & Monel, Titanium, Hastelloy, PVC, PTFE, PVDF, etc, and others are available on request by customers.
2) Other items manufactured by SAM IL are SMF – 50 AN(Non–Frosting) used for lower temperature below 0℃, SMF–50AJ(Jacket) used for observing the fluid by changing it into state of liquid after heating & cooling it as per features of fluid through Jaket.
3) For Models not shown in this brochure as available, see our detail catalogue.

## SIGHT GLASS

1

▲ SSG–FTF 300(LB)

2

▲ SSG–BST 300(LB)

3

▲ SSG–BRT 300(LB)

4

▲ SSG–LTF, LTD 150(LB)

5

▲ SSG–SSF, SMF SLF 150(LB)~1500(LB)

| | |
|---|---|
| 1. Flapper Type Sight Glass | Used for observing the state of flow depending on opening & Closing of the flapper on fluid flow. |
| 2. Ball Type sight Glass | Used for observing the fluid flow of common flow velocity by the motion of balls within the screen. |
| 3. Ring ball type Sight glass | Used for observing the fluid flow with rapid flow velocity by the motion of balls within the rigid ring. |
| 4. Lantern Type Sight Glass | Used for observing the state of fluid flow for all direction and it can be used as calibration port. |
| 5. High Pressure Type Sight Glass | Used for high pressure & high temperature. |

Note
1) All the above items are available in C.S, SS as standards and others are available in request by customers.
2) Other items manufactured by SAM IL are See Through Types, Wiper Types, Jacket Types, Side Types, Non–Frosting Types, Lantern Types, Calibration Pot Types, Propeller Types, etc can be available.

## SIGHT GLASS

6



▲ SSG-IL(EX-PROOF) 150, 300(LB)

7



▲ SSG-WLF 150(LB)

8



▲ SSG-LT 150(LB)

9



▲ SSG-WP 150, 300, 600(LB)

6. Illuminator Type Sight Glass — Used for observing the fluid in a dim place or at night where is installed with sight glass equipped an illuminator. (Explosion-Proof : Ex d II B T3 Class I, Group C & D)
7. Wiper Type Sight Glass — Used for observing the fluid by cleaning any slag or dust produced by flowing fluid, steam or oil, etc.
8. Lined Type Sight Glass — Used for observing the high-corrosive fluid effectively by lining the wetted parts (ETFE, Rubber, PVC, P · P)
9. Welding Pad Type — Used for observing the fluid by welding this to any part of vessel (SSG-WP : Circular, Elongated, Square formed is available).

Note
1) All the above items are available in C.S, SS as standards and others materials are available on request by customers.

## PART FOR LEVEL GAUGE & SIGHT GLASS

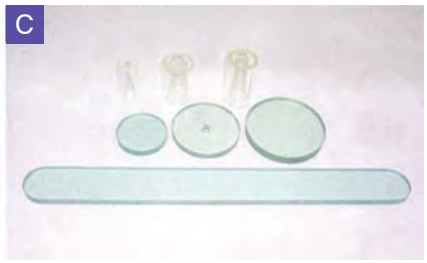
A



B



C



A. Gauge glass, Mica, Gasket for Reflex, Transparent & two color level gauges.
B. Gasket, Mica, Packing Strip & Glass for Multi-Port Type Level Gauge.
C. Various glass for sight glass.

Note
1) All the above items are available in Borosillicate glass(A), Pyrex(A), Aluminasilicate(A), Aluminasilicate(B), borosilicate glass(C), Tempered glass(C), hard Glass(C), & other materials are available on request by customers.

## VENT & DRAIN VALVE FOR LEVEL GAUGE

A



▲ NEEDLE VALVE 150~3000(LB)

B



▲ BALL VALVE 150~2500(LB)

C



▲GLOBE VALVE 150~2500(LB)

D



▲ GATE VALVE 150~2500(LB)

E



▲ FLANGED BALL VALVE 150~2500(LB)

Note
1) All the above items are available in C.S, SS, Teflon, Teflon Lined, PVC as standards & other materials are available on request by customers.

# FLOW ELEMENT




▲ SOP 150~2500(LB)




▲ SOR 150~900(LB)




▲ SOB 150~900(LB)



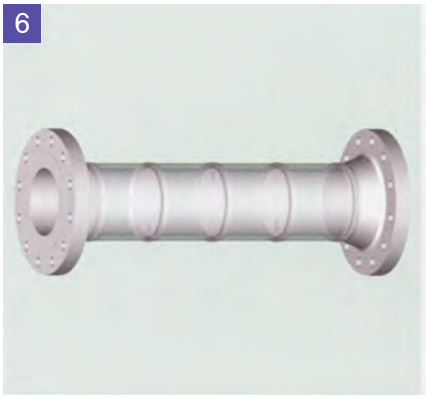

▲ SOJ 300~2500(LB)




▲ SOF 150~2500(LB)

| | |
|---|---|
| 1. Orifice Plate | Suitable for universal flow conditions and the most popular primary device with its simple shape, easy manufacturing , low cost & high reliability. |
| 2. Orifice Plate with ring | Used for flow measurement of smaller and medium pipe size at low pressure. |
| 3. Orifice Plate with integral block | Used for high pressure and high temperature service, similar to holding ring type as cutted and shaped from one block of metal. |
| 4. Ring joint type orifice plate | Orifice plate easily removable and interchangeable and calibrated bore with burr free sharp edge and suitable for a fluid having high pressure & high temperature. |
| 5. Orifice Flange Assemblies | Used in conjunction with orifice plate for flow measurement and suitable for almost all fluid conditions on primary differential device. |

Note
1) All the above items are available in C.S SS, Teflon, PVC as standards & other materials are available on request by customers.




▲ SMO 150~2500(LB)




▲ SFN 150~2500(LB)



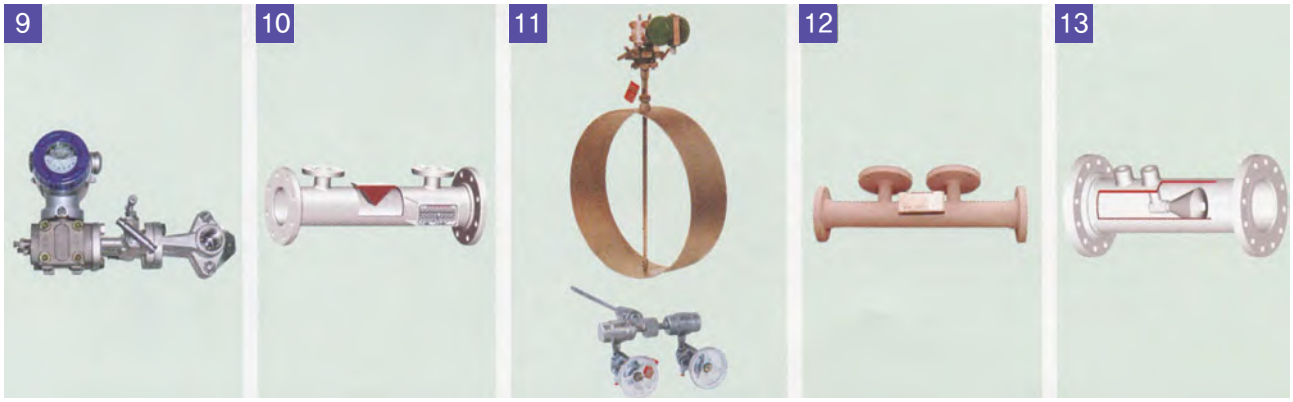

▲ SVT 150~2500(LB)

| | |
|---|---|
| 6. Multi type Restriction Orifice | Used for reducing fluid pressure & for eliminating problems by sound pressure level or cavitation. |
| 7. Flow Nozzle | Suitable for determing the flow rate of fluid flowing at high pressure and temperature and is permit approximately 65% greater capacity than the orifice plate. |
| 8. Venturi Tube | Used for measurement of flow when is important to keep the net permanent pressure loss at a minimum. Also, this is noted for long life span. |

Note
1) All the above items are available in C.S, SS as standards & materials are available in request by customers.
2) Flow nozzle is classified to butt-welding & flange type mainly and other types are available on request by customers.



# FLOW ELEMENT




▲ SIO 150~600(LB) ▲ STS 150~600(LB) (FOR LINE CONN.) ▲ AVERAGE PITOT TUBE(ITABAR) ▲ STV 150~600(LB) ▲ SCM

| | |
|---|---|
| 9. Integral Orifice | Suitable for measuring fluid of small bore with its high accuracy & used in combination with differential pressure transmitter, with easy installation as well as simple maintenance. |
| 10. Taper Seg Tube | Suitable for a wide reynolds range of flow measurement, especially measuring clean as well as non-clean fluids such as slurries & having shorter length of straight pipe for upstream & downstream compared to other fluid meter using differential pressure flow meter with excellent repeatability and accuracy. |
| 11. Averaging Pitot tube | Suitable for measuring fluid of small bore with its high accuracy & high flow measurement, easy & simple installation due to its insertion into pipeline & economic energy cost due to its less pressure loss rather than orifices. |
| 12. Tapless Venturi | Used for measuring slurry fluid, solidified liquids at low temp. or liquid vaporizing at high temperature & no pressure taps for measuring differential pressure. |
| 13. Cone Venturi Flowmeter | The total new concept of flow measurement by Differential pressure theory and it eliminates all of weak points by orifice plate & Vortex flowmeter. |

Note
1) All the above items are available in C.S, SS as standards & others materials are available on request by customers.
2) Line Connection can be available on request by customer even though 3/4" is SAM IL's standard size in integral orifice.
3) Taper Seg Tube can be manufacture according to end user's specification.




▲ SRV ▲ SCP-20, 40, 80, 160 ▲ SMFV

| | |
|---|---|
| 1. Flow Conditioner(Rectifier Vane) | Used for removing or significantly reducing swirl or tubulent flow and it can product a fully developed flow profile downstream from flow obstructions. |
| 2. Seal Pot (Condensating pot) | Used for providing an adequate liquid seal on top of differential pressure. transmitter & also used for steam measurement, corrosive gases, certain liquid and to avoid freezing. |
| 3. 3-Way Manifold valve | Used for the protection, calibration and maintenace of differential pressure Instrument & For supplying & isolating, equalizing the process pressure between high and low pressure chamber of these instruments. |

Note
1) Nipple available in various materials on request by customer.
2) Line connection can be available on request by customer even though 1) is Samil's standard size in integral orifice.

# Type of Flanges

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

## Slip–On Flange



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

## Blind Flange



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

## Lap Joint Flange



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

## Threaded(Screwed) Flange



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





## Socket Welding Flange



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

## Welding Neck Flange



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

## Orifice Flange



Orifice Flanges are used with orifice meters for the purpose of measuring the flow rate of either liquid or gas in the respective pipeline. Pairs of pressure "Tappings", mostly on 2 sides, directly opposite each other, are machined into the orifice flange. This makes separate orifice carriers or tappings in the pipe wall unnecessary.

## Long Welding Neck Flange



Long welding neck flange Manufacturer antong supplies LWN flange , long welded neck forged Flange, Long welding neck Flanges in forged steel, Stainless Steel, Carbon steel etc.

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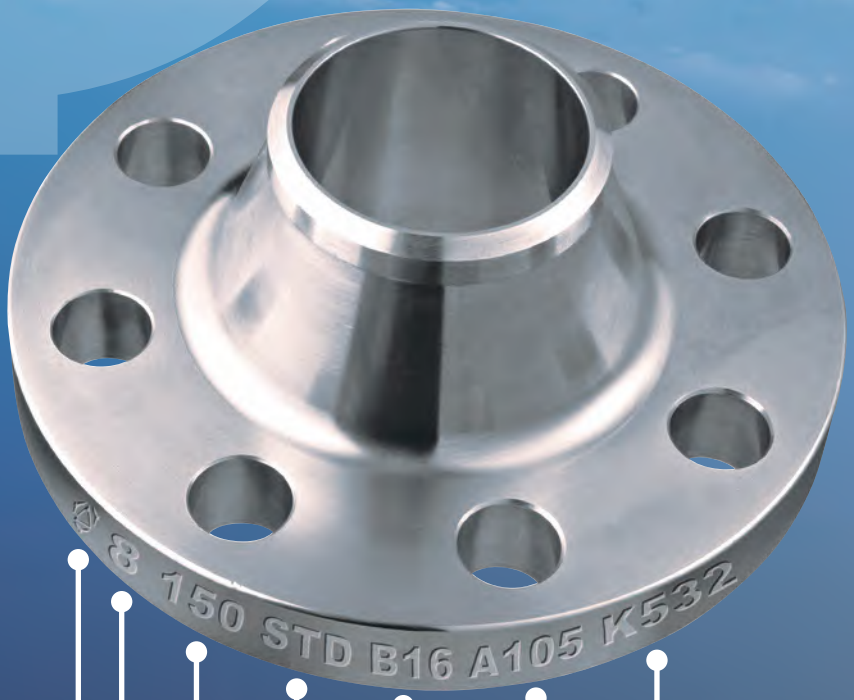

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# SAMIL P&F
# STANDARD MARKING




TRADE MARK

NONMIMAL SIZE

CLASS

NOMINAL
WALL THICKNESS

HEAT NO.

MATERIAL
DESIGNATION

ASME STANDARD



# ASME B16.5 FLANGES(2013)

- Class 150 Flanges
- Class 300 Flanges
- Class 400 Flanges
- Class 600 Flanges
- Class 900 Flanges
- Class 1500 Flanges
- Class 2500 Flanges

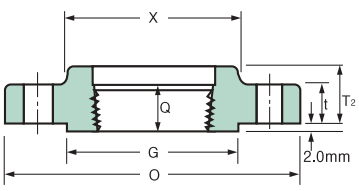
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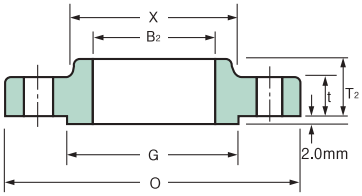




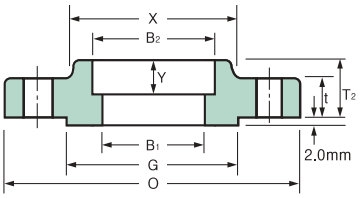





THREADED




SLIP–ON




SOCKET WELDING

## ASME B16.5 FORGED FLANGES

Unit : mm

| SIZE | Out–Side Diam. of Flange | Thick–ness of Flange | Thick–ness Lap Joint | Diam. of HUB Base | O.D of Raised Face | Diam. of Hub at Bavel | Length Through Hub | | | Thread Length | Bore | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Wel–ding Neck | Slip–On Threaded Socket | Lap Joint | | Welding Neck /Socket Welding | Slip–On Threaded Socket | Lap Joint |
| | O | t | t | X | G | A | $T_1$ | $T_2$ | $T_3$ | Q | $B_1$ | $B_2$ | $B_3$ |
| 1/2 | 90 | 9.6 | 11.2 | 30 | 34.9 | 21.3 | 46 | 14 | 16 | 16 | 15.8 | 22.2 | 22.9 |
| 3/4 | 100 | 11.2 | 12.7 | 38 | 42.9 | 26.7 | 51 | 14 | 16 | 16 | 20.9 | 27.7 | 28.2 |
| 1 | 110 | 12.7 | 14.3 | 49 | 50.8 | 33.4 | 54 | 16 | 17 | 17 | 26.6 | 34.5 | 34.9 |
| 1 1/4 | 115 | 14.3 | 15.9 | 59 | 63.5 | 42.2 | 56 | 19 | 21 | 21 | 35.1 | 43.2 | 43.7 |
| 1 1/2 | 125 | 15.9 | 17.5 | 65 | 73.0 | 48.3 | 60 | 21 | 22 | 22 | 40.9 | 49.5 | 50.0 |
| 2 | 150 | 17.5 | 19.1 | 78 | 92.1 | 60.3 | 62 | 24 | 25 | 25 | 52.5 | 61.9 | 62.5 |
| 2 1/2 | 180 | 20.7 | 22.3 | 90 | 104.8 | 73.0 | 68 | 27 | 29 | 29 | 62.7 | 74.6 | 75.4 |
| 3 | 190 | 22.3 | 23.9 | 108 | 127.0 | 88.9 | 68 | 29 | 30 | 30 | 77.9 | 90.7 | 91.4 |
| 3 1/2 | 215 | 22.3 | 23.9 | 122 | 139.7 | 101.6 | 70 | 30 | 32 | 32 | 90.1 | 103.4 | 104.1 |
| 4 | 230 | 22.3 | 23.9 | 135 | 157.2 | 114.3 | 75 | 32 | 33 | 33 | 102.3 | 116.1 | 116.8 |
| 5 | 255 | 22.3 | 23.9 | 164 | 185.7 | 141.3 | 87 | 35 | 36 | 36 | 128.2 | 143.8 | 144.4 |
| 6 | 280 | 23.9 | 25.4 | 192 | 215.9 | 168.3 | 87 | 38 | 40 | 40 | 154.1 | 170.7 | 171.4 |
| 8 | 345 | 27.0 | 28.6 | 246 | 269.9 | 219.1 | 100 | 43 | 44 | 44 | 202.7 | 221.5 | 222.2 |
| 10 | 405 | 28.6 | 30.2 | 305 | 323.8 | 273.0 | 100 | 48 | 49 | 49 | 254.6 | 276.2 | 277.4 |
| 12 | 485 | 30.2 | 31.8 | 365 | 381.0 | 323.8 | 113 | 54 | 56 | 56 | 304.8 | 327.0 | 328.2 |
| 14 | 535 | 33.4 | 35.0 | 400 | 412.8 | 355.6 | 125 | 56 | 79 | 57 | To be Specified by Pur–chaser | 359.2 | 360.2 |
| 16 | 595 | 35.0 | 36.6 | 457 | 469.9 | 406.4 | 125 | 62 | 87 | 64 | | 410.5 | 411.2 |
| 18 | 635 | 38.1 | 39.7 | 505 | 533.4 | 457.0 | 138 | 67 | 97 | 68 | | 461.8 | 462.3 |
| 20 | 700 | 41.3 | 42.9 | 559 | 584.2 | 508.0 | 143 | 71 | 103 | 73 | | 513.1 | 514.4 |
| 24 | 815 | 46.1 | 47.7 | 663 | 692.2 | 610.0 | 151 | 81 | 111 | 83 | | 616.0 | 616.0 |

Notes :

(a) For the 'BORE' (B1) other than Standard Wall Thickness, refer to page 70–71

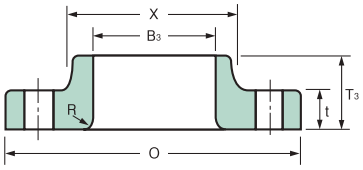
(b) These flanges may be supplied with a flat face. The flat face may be either the full t dimension of thickness plus 2 mm, or the t dimension thickness without the raised face height.

(c) This dimension is for large end of hub, which may be stright or tapered. Taper shall not exceed 7deg on threaded, slip–on, socket–welding, and lapped flanges. This dimension is defined as the diameter at the intersection between the hub taper and the back face of the flange.

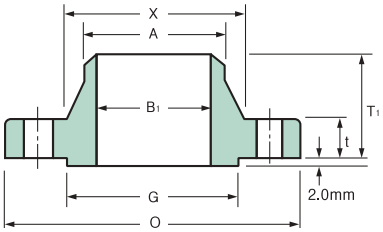




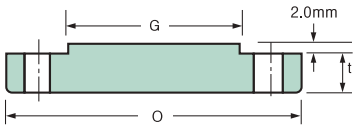





LAP JOINT




WELDING NECK




BLIND

Unit : mm

| SIZE | Ridius of Fillet | Depth of Socket | DRILLING | | | LENGTH OF BOLTS | | | | APPROXIMATE WEIGHT(kg) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Bolt Circle Diam. | Number of Holes | Diam. of Holes | Diam.of Bolt (inch) | Machine Bolt Length (Raised Face) | Stud Bolt Length | | Welding Neck | Slip-On/ Threaded | Lap Joint | Blind | Socket Welding |
| | | | | | | | | 2mm Raised Face | Ring Joint | | | | | |
| | R | Y | | | | | | | | | | | | |
| 1/2 | 3 | 10 | 60.3 | 4 | 15.9 | 1/2 | 50 | 55 | – | 0.51 | 0.47 | 0.51 | 0.47 | 0.47 |
| 3/4 | 3 | 11 | 69.9 | 4 | 15.9 | 1/2 | 50 | 65 | – | 0.73 | 0.58 | 0.64 | 0.63 | 0.59 |
| 1 | 3 | 13 | 79.4 | 4 | 15.9 | 1/2 | 55 | 65 | 75 | 1.07 | 0.86 | 0.93 | 0.94 | 0.87 |
| 1 1/4 | 5 | 14 | 88.9 | 4 | 15.9 | 1/2 | 55 | 70 | 85 | 1.40 | 1.08 | 1.16 | 1.23 | 1.11 |
| 1 1/2 | 6 | 16 | 98.4 | 4 | 15.9 | 1/2 | 65 | 70 | 85 | 1.81 | 1.41 | 1.51 | 1.62 | 1.45 |
| 2 | 8 | 17 | 120.7 | 4 | 19.1 | 5/8 | 70 | 85 | 95 | 2.59 | 2.26 | 2.38 | 2.64 | 2.33 |
| 2 1/2 | 8 | 19 | 139.7 | 4 | 19.1 | 5/8 | 75 | 90 | 100 | 4.28 | 3.43 | 3.60 | 4.06 | 3.55 |
| 3 | 10 | 21 | 152.4 | 4 | 19.1 | 5/8 | 75 | 90 | 100 | 5.18 | 3.87 | 4.04 | 4.90 | 4.02 |
| 3 1/2 | 10 | 22.4 | 177.8 | 8 | 19.1 | 5/8 | 75 | 90 | 100 | 5.45 | 4.99 | 4.99 | 5.90 | 4.99 |
| 4 | 11 | 24.1 | 190.5 | 8 | 19.1 | 5/8 | 75 | 90 | 100 | 7.32 | 5.75 | 5.96 | 7.41 | 5.99 |
| 5 | 11 | 23.9 | 215.9 | 8 | 22.2 | 3/4 | 85 | 95 | 110 | 8.91 | 6.22 | 6.44 | 8.76 | 6.68 |
| 6 | 13 | 26.9 | 241.3 | 8 | 22.2 | 3/4 | 85 | 100 | 115 | 11.26 | 7.38 | 7.59 | 11.31 | 7.99 |
| 8 | 13 | 31.8 | 298.5 | 8 | 22.2 | 3/4 | 90 | 110 | 120 | 17.68 | 12.36 | 12.66 | 19.92 | 13.29 |
| 10 | 13 | 33.3 | 362.0 | 12 | 25.4 | 7/8 | 100 | 115 | 125 | 24.79 | 17.10 | 16.78 | 29.39 | 19.50 |
| 12 | 13 | 39.6 | 431.8 | 12 | 25.4 | 7/8 | 100 | 120 | 135 | 38.98 | 27.68 | 28.30 | 43.70 | 29.03 |
| 14 | 13 | 41.4 | 476.3 | 12 | 28.6 | 1 | 115 | 135 | 145 | 51.71 | 35.20 | 41.50 | 59.42 | 38.56 |
| 16 | 13 | 44.5 | 539.8 | 16 | 28.6 | 1 | 115 | 135 | 145 | 64.41 | 42.18 | 52.98 | 77.11 | 44.49 |
| 18 | 13 | 49.3 | 577.9 | 16 | 31.8 | 1 1/8 | 125 | 145 | 160 | 74.84 | 49.71 | 59.00 | 94.80 | 54.43 |
| 20 | 13 | 54.1 | 635.0 | 20 | 31.8 | 1 1/8 | 140 | 160 | 170 | 89.36 | 65.50 | 72.12 | 123.38 | 70.31 |
| 24 | 13 | 63.5 | 749.3 | 20 | 34.9 | 1 1/4 | 150 | 170 | 185 | 119.66 | 90.50 | 99.02 | 188.24 | 95.25 |

(d) Blind flanges may be made with or without hubs at the manufacturer's option.
(e) Dimensions in B1 correspond to the inside diameters of pipe as given in ASME B36. 10M for Standard Wall pipe. Thickness of Standard Wall is the same as Schedule 40 in sizes NPS 10 and smaller. These bore sizes are furnished unless otherwise specified by the purchaser.
(f) Depth of Socket(Y) is covered by ASME B16.5 only in sizes throught 3 inch, over 3 inch is at the manufacture's option.

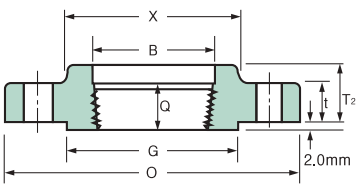
# CLASS 300 FLANGES



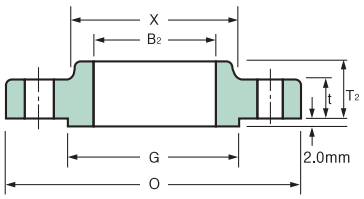




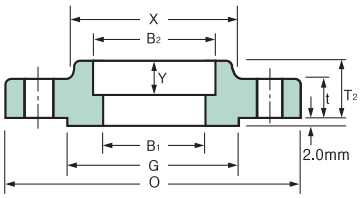





THREADED




SLIP–ON




SOCKET WELDING

## ASME B16.5 FORGED FLANGES

Unit : mm

| Nom–inal Pipe Size | Out–side Diam. of Flange | Thick–ness of Flange | Thick–ness Lap Joint | Diam. of Hub Base | O.D of Rais–ed Face | Diam. of Hub at Bavel | Length Through Hub | | | Thread Length | BORE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Weld–ing Neck | Slip–On Threaded Socket Welding | Lap Joint | | Welding Neck /Socket Welding | Slip–On /Socket–Welding | Lap Joint | Counter Bore Min. Threaded |
| | O | t | t | X | G | A | $T_1$ | $T_2$ | $T_3$ | Q | $B_1$ | $B_2$ | $B_3$ | B |
| 1/2 | 95 | 12.7 | 14.3 | 38 | 34.9 | 21.3 | 51 | 21 | 22 | 16 | 15.8 | 22.2 | 22.9 | 23.6 |
| 3/4 | 115 | 14.3 | 15.9 | 48 | 42.9 | 26.7 | 56 | 24 | 25 | 16 | 20.9 | 27.7 | 28.2 | 29.0 |
| 1 | 125 | 15.9 | 17.5 | 54 | 50.8 | 33.4 | 60 | 25 | 27 | 18 | 26.6 | 34.5 | 34.9 | 35.8 |
| 1 1/4 | 135 | 17.5 | 19.1 | 64 | 63.5 | 42.2 | 64 | 25 | 27 | 21 | 35.1 | 43.2 | 43.7 | 44.4 |
| 1 1/2 | 155 | 19.1 | 20.7 | 70 | 73.0 | 48.3 | 67 | 29 | 30 | 23 | 40.9 | 49.5 | 50.0 | 50.3 |
| 2 | 165 | 20.7 | 22.3 | 84 | 92.1 | 60.3 | 68 | 32 | 33 | 29 | 52.5 | 61.9 | 62.5 | 63.5 |
| 2 1/2 | 190 | 23.9 | 25.4 | 100 | 104.8 | 73.0 | 75 | 37 | 38 | 32 | 62.7 | 74.6 | 75.4 | 76.2 |
| 3 | 210 | 27.0 | 28.6 | 117 | 127.0 | 88.9 | 78 | 41 | 43 | 32 | 77.9 | 90.7 | 91.4 | 92.2 |
| 3 1/2 | 230 | 28.6 | 30.2 | 133 | 139.7 | 101.6 | 79 | 43 | 44 | 37 | 90.1 | 103.4 | 104.1 | 104.9 |
| 4 | 255 | 30.2 | 31.8 | 146 | 157.2 | 114.3 | 84 | 46 | 48 | 37 | 102.3 | 116.1 | 116.8 | 117.6 |
| 5 | 280 | 33.4 | 35.0 | 178 | 185.7 | 141.3 | 97 | 49 | 51 | 43 | 128.2 | 143.8 | 144.4 | 144.4 |
| 6 | 320 | 35.0 | 36.6 | 206 | 215.9 | 168.3 | 97 | 51 | 52 | 47 | 154.1 | 170.7 | 171.4 | 171.4 |
| 8 | 380 | 39.7 | 41.3 | 260 | 269.9 | 219.1 | 110 | 60 | 62 | 51 | 202.7 | 221.5 | 222.2 | 222.2 |
| 10 | 445 | 46.1 | 47.7 | 321 | 323.8 | 273.0 | 116 | 65 | 95 | 56 | 254.6 | 276.2 | 277.4 | 276.2 |
| 12 | 520 | 49.3 | 50.8 | 375 | 381.0 | 323.8 | 129 | 71 | 102 | 61 | 304.8 | 327.0 | 328.2 | 328.6 |
| 14 | 585 | 52.4 | 54.0 | 425 | 412.8 | 355.6 | 141 | 75 | 111 | 64 | To be Specified by Pur–chaser | 359.2 | 360.2 | 360.4 |
| 16 | 650 | 55.6 | 57.2 | 483 | 469.9 | 406.4 | 144 | 81 | 121 | 69 | | 410.5 | 411.2 | 411.2 |
| 18 | 710 | 58.8 | 60.4 | 533 | 533.4 | 457.0 | 157 | 87 | 130 | 70 | | 461.8 | 462.3 | 462.0 |
| 20 | 775 | 62.0 | 63.5 | 587 | 584.2 | 508.0 | 160 | 94 | 140 | 74 | | 513.1 | 514.4 | 512.8 |
| 24 | 915 | 68.3 | 69.9 | 702 | 692.2 | 610.0 | 167 | 105 | 152 | 83 | | 616.0 | 616.0 | 614.4 |

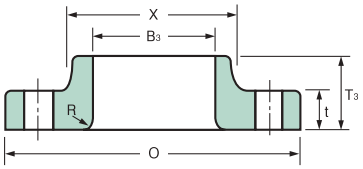
Notes :

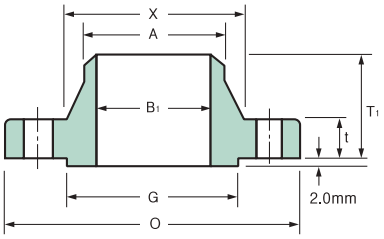
(a) For the 'BORE'(B1) other than Standared Wall Thickness, refer to page 70–71
(b) These flanges may be supplied with a flat face. The flat face may be either the full t demension of thickness plus 2 mm, or the t dimension thickness without the raised face height.
(c) This dimension is for large end of hub, which may be straight or tapered. Taper shall not exceed 7 deg on threaded, slip–on, socket–welding, and lapped flanges. This dimension is defined as the diameter at the intersection between the hub taper and the back face of the flange.

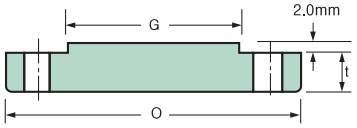









LAP JOINT

WELDING NECK

BLIND

Unit : mm

| SIZE | Ridius of Fillet | Depth of Socket | DRILLING | | | LENGTH OF BOLTS | | | | APPROXIMATE WEIGHT(kg) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Bolt Circle Diam. | Number of Holes | Diam. of Holes | Diam.of Bolt (inch) | Machine Bolt Length (Raised Face) | Stud Bolt Length | | Welding Neck | Slip-On/ Threaded | Lap Joint | Blind | Socket Welding |
| | | | | | | | | 2mm Raised Face | Ring Joint | | | | | |
| | R | Y | | | | | | | | | | | | |
| 1/2 | 3 | 10 | 66.7 | 4 | 15.9 | 1/2 | 55 | 65 | 75 | 0.78 | 0.62 | 0.61 | 0.62 | 0.62 |
| 3/4 | 3 | 11 | 82.6 | 4 | 19.1 | 5/8 | 65 | 75 | 90 | 1.34 | 1.15 | 1.15 | 1.16 | 1.19 |
| 1 | 3 | 13 | 88.9 | 4 | 19.1 | 5/8 | 65 | 75 | 90 | 1.64 | 1.39 | 1.38 | 1.42 | 1.44 |
| 1 1/4 | 5 | 14 | 98.4 | 4 | 19.1 | 5/8 | 70 | 85 | 95 | 2.06 | 1.67 | 1.66 | 1.79 | 1.73 |
| 1 1/2 | 6 | 16 | 114.3 | 4 | 22.2 | 3/4 | 75 | 90 | 100 | 3.06 | 2.53 | 2.52 | 2.68 | 2.62 |
| 2 | 8 | 17 | 127.0 | 8 | 19.1 | 5/8 | 75 | 90 | 100 | 3.40 | 2.80 | 2.79 | 3.09 | 2.94 |
| 2 1/2 | 8 | 19 | 149.2 | 8 | 22.2 | 3/4 | 85 | 100 | 115 | 5.31 | 4.25 | 4.22 | 4.75 | 4.49 |
| 3 | 10 | 21 | 168.3 | 8 | 22.2 | 3/4 | 90 | 110 | 120 | 7.32 | 5.81 | 5.78 | 6.79 | 6.20 |
| 3 1/2 | 10 | 22.4 | 184.2 | 8 | 22.2 | 3/4 | 95 | 110 | 125 | 8.17 | 7.72 | 7.72 | 9.53 | – |
| 4 | 11 | 23.9 | 200.0 | 8 | 22.2 | 3/4 | 95 | 115 | 125 | 11.30 | 10.13 | 10.07 | 12.00 | – |
| 5 | 11 | 23.9 | 235.0 | 8 | 22.2 | 3/4 | 110 | 120 | 135 | 15.12 | 12.58 | 12.52 | 15.96 | – |
| 6 | 13 | 26.9 | 269.9 | 12 | 22.2 | 3/4 | 110 | 120 | 140 | 19.68 | 16.04 | 15.95 | 21.20 | – |
| 8 | 13 | 31.8 | 330.2 | 12 | 25.4 | 7/8 | 120 | 140 | 150 | 30.48 | 24.50 | 24.37 | 34.60 | – |
| 10 | 13 | 33.3 | 387.4 | 16 | 28.6 | 1 | 140 | 160 | 170 | 43.74 | 34.16 | 39.92 | 55.34 | – |
| 12 | 13 | 39.6 | 450.8 | 16 | 31.8 | 1 1/8 | 145 | 170 | 185 | 64.41 | 51.26 | 58.70 | 78.90 | – |
| 14 | 13 | 41.4 | 514.4 | 20 | 31.8 | 1 1/8 | 160 | 180 | 190 | 88.30 | 71.12 | 83.46 | 107.05 | – |
| 16 | 13 | 44.5 | 571.5 | 20 | 34.9 | 1 1/4 | 165 | 190 | 205 | 112.94 | 90.40 | 106.14 | 139.25 | – |
| 18 | 13 | 49.3 | 628.6 | 24 | 34.9 | 1 1/4 | 170 | 195 | 210 | 138.34 | 109.00 | 133.95 | 176.90 | – |
| 20 | 13 | 54.1 | 685.8 | 24 | 34.9 | 1 1/4 | 185 | 205 | 220 | 167.37 | 136.00 | 157.65 | 223.17 | – |
| 24 | 13 | 63.5 | 812.8 | 24 | 41.3 | 1 1/2 | 205 | 230 | 255 | 235.41 | 204.00 | 240.40 | 342.00 | – |

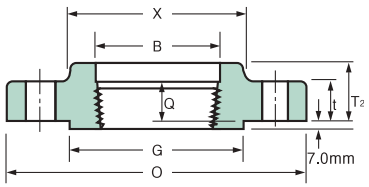
(d) Blind flanges may be made with or without hubs at the manufacturers option.
(e) Dimesions in B1 correspond to the inside diameters of pipe as given in ASME B36, 10M for Standard Wall pipe. Thickness of Standard Wall is the same as Schedule 40 in sizes NPS 10 and smaller. These bore sizes are furnished unless otherwise specified by the purchaser.
(f) Depth of Socket(Y) is covered by ASME B16.5 only in size through 3 inch, over 3 inch is at the manufacture's option.

# CLASS 400 FLANGES

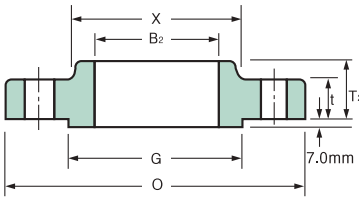









THREADED




SLIP–ON

## ASME B16.5 FORGED FLANGES

Unit : mm

| Nom–inal Pipe Size | Out–side Diam. of Flange | Thick–ness of Flange | Diam. of Hub Base | O.D of Raised Face | Diam. of Hub at Bavel | Length Through Hub | | | Thread Length | BORE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Weld–ing Neck | Slip–On Threaded Socket Welding | Lap Joint | | Welding Neck /Socket Welding | Slip–On /Socket–Welding | Lap Joint | Counter Bore Min. Threaded |
| | O | t | X | G | A | $T_1$ | $T_2$ | $T_3$ | Q | $B_1$ | $B_2$ | $B_3$ | B |
| 1/2 | 95 | 14.3 | 38 | 34.9 | 21.3 | 52 | 22 | 22 | 16 | To be specified by Purchaser | 22.2 | 22.9 | 23.6 |
| 3/4 | 115 | 15.9 | 48 | 42.9 | 26.7 | 57 | 25 | 25 | 16 | | 27.7 | 28.2 | 29.0 |
| 1 | 125 | 17.5 | 54 | 50.8 | 33.4 | 62 | 27 | 27 | 18 | | 34.5 | 34.9 | 35.8 |
| 1 1/4 | 135 | 20.7 | 64 | 63.5 | 42.2 | 67 | 29 | 29 | 21 | | 43.2 | 43.7 | 44.4 |
| 1 1/2 | 155 | 22.3 | 70 | 73.0 | 48.3 | 70 | 32 | 32 | 23 | | 49.5 | 50.0 | 50.6 |
| 2 | 165 | 25.4 | 84 | 92.1 | 60.3 | 73 | 37 | 37 | 29 | | 61.9 | 62.5 | 63.5 |
| 2 1/2 | 190 | 28.6 | 100 | 104.8 | 73.0 | 79 | 41 | 41 | 32 | | 74.6 | 75.4 | 76.2 |
| 3 | 210 | 31.8 | 117 | 127.0 | 88.9 | 83 | 46 | 46 | 35 | | 90.7 | 91.4 | 92.2 |
| 3 1/2 | 230 | 35.0 | 133 | 139.7 | 101.6 | 86 | 49 | 49 | 40 | | 103.4 | 104.1 | 104.9 |
| 4 | 255 | 35.0 | 146 | 157.2 | 114.3 | 89 | 51 | 51 | 37 | | 116.1 | 116.8 | 117.6 |
| 5 | 280 | 38.1 | 178 | 185.7 | 141.3 | 102 | 54 | 54 | 43 | | 143.8 | 144.5 | 144.4 |
| 6 | 320 | 41.3 | 206 | 215.9 | 168.3 | 103 | 57 | 57 | 46 | | 170.7 | 171.4 | 171.4 |
| 8 | 380 | 47.7 | 260 | 269.9 | 219.1 | 117 | 68 | 68 | 51 | | 221.5 | 222.2 | 222.2 |
| 10 | 445 | 54.0 | 321 | 323.8 | 273.0 | 124 | 73 | 102 | 56 | | 276.2 | 277.4 | 276.2 |
| 12 | 520 | 57.2 | 375 | 381.0 | 323.8 | 137 | 79 | 108 | 61 | | 327.0 | 328.2 | 328.6 |
| 14 | 585 | 60.4 | 425 | 412.8 | 355.6 | 149 | 84 | 117 | 64 | | 359.2 | 360.2 | 360.4 |
| 16 | 650 | 63.5 | 483 | 469.9 | 406.4 | 152 | 94 | 127 | 69 | | 410.5 | 411.2 | 411.2 |
| 18 | 710 | 66.7 | 533 | 533.4 | 457.0 | 165 | 98 | 137 | 70 | | 461.8 | 462.3 | 462.0 |
| 20 | 775 | 69.9 | 587 | 584.2 | 508.0 | 168 | 102 | 146 | 74 | | 513.1 | 514.4 | 512.8 |
| 24 | 915 | 76.2 | 702 | 692.2 | 610.0 | 175 | 114 | 159 | 83 | | 616.0 | 616.0 | 614.4 |

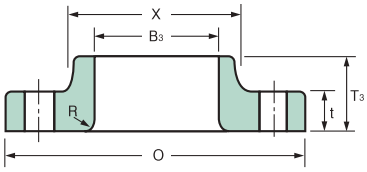
Notes :

(a) For the 'BORE' (B1) other than Standard Wall Thickness, refer to page 70–71
(b) These flanges may by supplied with a flat face. The flat face may be be either the full t dimension of thickness plus 7mm, or the t dimension thickness without the raised face height.
(c) This dimension is for large end of hub, which may be sraight or tapered. Taper shall not exceed 7 deg on threaded, slip–on, socket–welding, and lapped flanges. This dimension is defined as the diameter at the intersection between the hub taper and the back face of the flange.

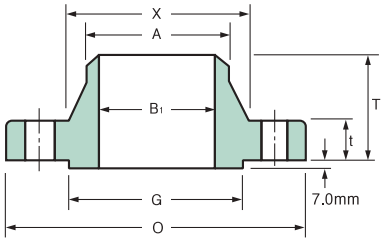




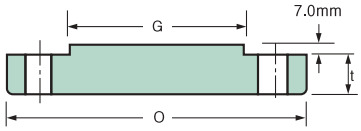





LAP JOINT




WELDING NECK




BLIND

Unit : mm

| Nominal Pipe Size | Ridius of Fillet | DRILLING | | | LENGTH OF BOLTS | | | | APPROXIMATE WEIGHT(kg) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Stud Bolt Length | | | | | | |
| | R | Bolt Circle Diam. | Number of Holes | Diam. of Holes | Diam.of Bolt (inch) | Male and Female / Tongue and Groove | 7mm Raised Face | Ring Joint | Welding Neck | Slip-On/ Threaded | Lap Joint | Blind |
| 1/2 | 3 | 66.7 | 4 | 15.9 | 1/2 | 70 | 75 | 75 | 1.36 | 0.91 | 0.80 | 0.91 |
| 3/4 | 3 | 82.6 | 4 | 19.1 | 5/8 | 85 | 90 | 90 | 1.59 | 1.36 | 1.36 | 1.40 |
| 1 | 3 | 88.9 | 4 | 19.1 | 5/8 | 85 | 90 | 90 | 1.81 | 1.59 | 1.59 | 1.70 |
| 1 1/4 | 5 | 98.4 | 4 | 19.1 | 5/8 | 90 | 95 | 95 | 2.50 | 2.10 | 2.04 | 2.27 |
| 1 1/2 | 6 | 114.3 | 4 | 22.2 | 3/4 | 100 | 110 | 110 | 3.63 | 3.10 | 2.95 | 3.40 |
| 2 | 8 | 127.0 | 8 | 19.1 | 5/8 | 100 | 110 | 110 | 4.54 | 3.63 | 3.63 | 4.40 |
| 2 1/2 | 8 | 149.2 | 8 | 22.2 | 3/4 | 115 | 120 | 120 | 6.35 | 5.44 | 4.99 | 6.80 |
| 3 | 10 | 168.3 | 8 | 22.2 | 3/4 | 120 | 125 | 125 | 8.17 | 7.26 | 6.35 | 8.90 |
| 3 1/2 | 10 | 184.2 | 8 | 25.4 | 7/8 | 135 | 140 | 140 | 11.80 | 9.53 | 9.08 | 13.17 |
| 4 | 11 | 200.0 | 8 | 25.4 | 7/8 | 135 | 140 | 140 | 13.61 | 10.89 | 9.98 | 14.40 |
| 5 | 11 | 235.0 | 8 | 25.4 | 7/8 | 135 | 145 | 145 | 17.69 | 14.07 | 13.15 | 19.50 |
| 6 | 13 | 269.9 | 12 | 25.4 | 7/8 | 145 | 150 | 150 | 22.23 | 19.98 | 16.78 | 27.67 |
| 8 | 13 | 330.0 | 12 | 28.6 | 1 | 165 | 170 | 170 | 35.38 | 30.40 | 26.16 | 45.36 |
| 10 | 13 | 387.4 | 16 | 31.8 | 1 1/8 | 185 | 190 | 190 | 49.89 | 41.28 | 43.09 | 68.00 |
| 12 | 13 | 450.8 | 16 | 34.9 | 1 1/4 | 195 | 205 | 205 | 72.57 | 59.02 | 68.95 | 98.00 |
| 14 | 13 | 514.4 | 20 | 34.9 | 1 1/4 | 205 | 210 | 210 | 105.69 | 81.72 | 95.25 | 131.66 |
| 16 | 13 | 571.5 | 20 | 38.1 | 1 3/8 | 215 | 220 | 220 | 133.30 | 106.69 | 127.00 | 167.00 |
| 18 | 13 | 628.6 | 24 | 38.1 | 1 3/8 | 220 | 230 | 230 | 158.90 | 129.39 | 156.49 | 206.57 |
| 20 | 13 | 685.8 | 24 | 41.3 | 1 1/2 | 235 | 240 | 250 | 193.00 | 152.00 | 190.51 | 261.00 |
| 24 | 13 | 812.8 | 24 | 47.6 | 1 3/4 | 260 | 265 | 280 | 281.48 | 231.54 | 278.96 | 395.00 |

(d) Blind flanges may be made with or without hubs at the manufacturer's option.
(e) Dimensions in B1 correspond to the inside diameters of pipe as given in ASME B36, 10M for Standard Wall pipe. Thickness of Standard Wall is the same as Schedule 40 in sizes NPS 10 and smaller. These bore sizes are furnished unless otherwise specified by the purchaser.
(f) Dimensions of sizes 1/2" through 3 1/2" are the same as for Class 600 flanges.

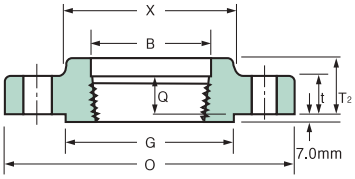
# CLASS 600 FLANGES



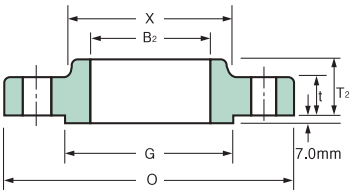




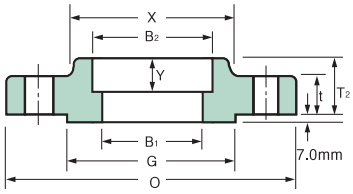





THREADED




SLIP–ON




SOCKET WELDING

## ASME B16.5 FORGED FLANGES

Unit : mm

| Nom–inal Pipe Size | Out–side Diam. of Flange | Thick–ness of Flange | Diam. of Hub | O.D of Raised Face | Diam. of Hub at Bavel | Length Through Hub | | | Thread Length | BORE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Weld–ing Neck | Slip–On Threaded Socket Welding | Lap Joint | | Welding Neck /Socket Welding | Slip–On /Socket–Welding | Lap Joint | Counter Bore Min. Threaded |
| | O | t | X | G | A | $T_1$ | $T_2$ | $T_3$ | Q | $B_1$ | $B_2$ | $B_3$ | B |
| 1/2 | 95 | 14.3 | 38 | 34.9 | 21.3 | 52 | 22 | 22 | 16 | To be specified by Purchaser | 22.2 | 22.9 | 23.6 |
| 3/4 | 115 | 15.9 | 48 | 42.9 | 26.7 | 57 | 25 | 25 | 16 | | 27.7 | 28.2 | 29.0 |
| 1 | 125 | 17.5 | 54 | 50.8 | 33.4 | 62 | 27 | 27 | 18 | | 34.5 | 34.9 | 35.8 |
| 1 1/4 | 135 | 20.7 | 64 | 63.5 | 42.2 | 67 | 29 | 29 | 21 | | 43.2 | 43.7 | 44.4 |
| 1 1/2 | 155 | 22.3 | 70 | 73.0 | 48.3 | 70 | 32 | 32 | 23 | | 49.5 | 50.0 | 50.6 |
| 2 | 165 | 25.4 | 84 | 92.1 | 60.3 | 73 | 37 | 37 | 29 | | 61.9 | 62.5 | 63.5 |
| 2 1/2 | 190 | 28.6 | 100 | 104.8 | 73.0 | 79 | 41 | 41 | 32 | | 74.6 | 75.4 | 76.2 |
| 3 | 210 | 31.8 | 117 | 127.0 | 88.9 | 83 | 46 | 46 | 35 | | 90.7 | 91.4 | 92.2 |
| 3 1/2 | 230 | 35.0 | 133 | 139.7 | 101.6 | 86 | 49 | 49 | 40 | | 103.4 | 104.1 | 104.9 |
| 4 | 275 | 38.1 | 152 | 157.2 | 114.3 | 102 | 54 | 54 | 42 | | 116.1 | 116.8 | 117.6 |
| 5 | 330 | 44.5 | 189 | 185.7 | 141.3 | 114 | 60 | 60 | 48 | | 143.8 | 144.4 | 144.4 |
| 6 | 355 | 47.7 | 222 | 215.9 | 168.3 | 117 | 67 | 67 | 51 | | 170.7 | 171.4 | 171.4 |
| 8 | 420 | 55.6 | 273 | 269.9 | 219.1 | 133 | 76 | 76 | 58 | | 221.5 | 222.2 | 222.2 |
| 10 | 510 | 63.5 | 343 | 323.8 | 273.0 | 152 | 86 | 111 | 66 | | 276.2 | 277.4 | 276.2 |
| 12 | 560 | 66.7 | 400 | 381.0 | 323.8 | 156 | 92 | 117 | 70 | | 327.0 | 328.2 | 328.6 |
| 14 | 605 | 69.9 | 432 | 412.8 | 355.6 | 165 | 94 | 127 | 74 | | 359.2 | 360.2 | 360.4 |
| 16 | 685 | 76.2 | 495 | 469.9 | 406.4 | 178 | 106 | 140 | 78 | | 410.5 | 411.2 | 411.2 |
| 18 | 745 | 82.6 | 546 | 533.4 | 457.0 | 184 | 117 | 152 | 80 | | 461.8 | 462.3 | 462.0 |
| 20 | 815 | 88.9 | 610 | 584.2 | 508.0 | 190 | 127 | 165 | 83 | | 513.1 | 514.4 | 512.8 |
| 24 | 940 | 101.6 | 718 | 692.2 | 610.0 | 203 | 140 | 184 | 93 | | 616.0 | 616.0 | 614.4 |

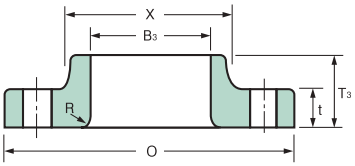
Notes :

(a) For the 'BORE' (B1) other than Standard Wall Thickness, refer to page 70–71

(b) These flanges may be supplied with a flat face. The flat face may be either the full t dimension of thickness plus 7mm, or the t dimension thickness without the raised face height.

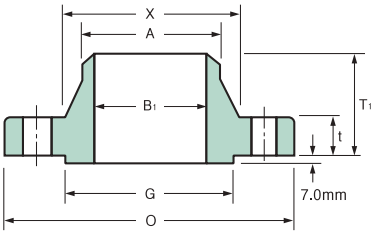
(c) This dimension is for large end of hubs, which may be straight or tapered, Taper shall not exceed 7 deg on the theraded, slip–on, socket–welding, and lapped flanges. This dimension is defined as the diameter at the intersection between the hub taper and the back face of the flange.





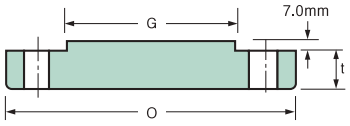

LAP JOINT






WELDING NECK






BLIND

Unit : mm

| SIZE | Ridius of Fillet | Depth of Socket | DRILLING | | | LENGTH OF BOLTS | | | | APPROXIMATE WEIGHT(kg) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Bolt Circle Diam. | Number of Holes | Diam. of Holes | Diam.of Bolt (inch) | Male and Female / Tongue and Groove | Stud Bolt Length | | Welding Neck | Slip-On/ Threaded | Lap Joint | Blind | Socket Welding |
| | | | | | | | | 7mm Raised Face | Ring Joint | | | | | |
| | R | Y | | | | | | | | | | | | |
| 1/2 | 3 | 10 | 66.7 | 4 | 15.9 | 1/2 | 70 | 75 | 75 | 0.90 | 0.91 | 0.80 | 0.91 | 0.91 |
| 3/4 | 3 | 11 | 82.6 | 4 | 19.1 | 5/8 | 85 | 90 | 90 | 1.59 | 1.40 | 1.36 | 1.40 | 1.36 |
| 1 | 3 | 13 | 88.9 | 4 | 19.1 | 5/8 | 85 | 90 | 90 | 1.90 | 1.70 | 1.59 | 1.81 | 1.81 |
| 1 1/4 | 5 | 14 | 98.4 | 4 | 19.1 | 5/8 | 90 | 95 | 95 | 2.49 | 2.27 | 2.04 | 2.40 | 2.60 |
| 1 1/2 | 6 | 16 | 114.3 | 4 | 22.2 | 3/4 | 100 | 110 | 110 | 3.63 | 3.10 | 2.95 | 3.40 | 3.18 |
| 2 | 8 | 17 | 127.0 | 8 | 19.1 | 5/8 | 100 | 110 | 110 | 4.54 | 3.63 | 3.63 | 4.40 | 3.90 |
| 2 1/2 | 8 | 19 | 149.2 | 8 | 22.2 | 3/4 | 115 | 120 | 120 | 6.35 | 5.44 | 4.99 | 6.80 | 5.90 |
| 3 | 10 | 21 | 168.3 | 8 | 22.2 | 3/4 | 120 | 125 | 125 | 8.16 | 7.26 | 6.35 | 8.90 | 7.40 |
| 3 1/2 | 10 | 22.4 | 184.2 | 8 | 25.4 | 7/8 | 135 | 140 | 140 | 11.80 | 9.53 | 9.08 | 13.17 | – |
| 4 | 11 | 23.9 | 215.9 | 8 | 25.4 | 7/8 | 140 | 145 | 145 | 16.78 | 14.97 | 14.06 | 18.60 | – |
| 5 | 11 | 23.9 | 266.7 | 8 | 28.6 | 1 | 160 | 165 | 165 | 30.87 | 28.50 | 27.50 | 30.84 | – |
| 6 | 13 | 26.9 | 292.1 | 12 | 28.6 | 1 | 165 | 170 | 170 | 36.77 | 36.32 | 35.38 | 38.00 | – |
| 8 | 13 | 31.8 | 349.2 | 12 | 31.8 | 1 1/8 | 185 | 190 | 195 | 50.80 | 44.00 | 50.80 | 62.20 | – |
| 10 | 13 | 33.3 | 431.8 | 16 | 34.9 | 1 1/4 | 210 | 215 | 215 | 86.26 | 76.20 | 74.00 | 102.00 | – |
| 12 | 13 | 39.6 | 489.0 | 20 | 34.9 | 1 1/4 | 215 | 220 | 220 | 102.51 | 97.52 | 108.86 | 132.00 | – |
| 14 | 13 | 41.4 | 527.0 | 20 | 38.1 | 1 3/8 | 230 | 235 | 235 | 121.56 | 102.00 | 111.00 | 158.00 | – |
| 16 | 13 | 44.5 | 603.2 | 20 | 41.3 | 1 1/2 | 250 | 255 | 255 | 177.06 | 149.82 | 165.71 | 224.73 | – |
| 18 | 13 | 49.3 | 654.0 | 20 | 44.5 | 1 5/8 | 265 | 275 | 275 | 215.65 | 180.10 | 194.00 | 285.00 | – |
| 20 | 13 | 54.1 | 723.9 | 24 | 44.5 | 1 5/8 | 280 | 285 | 290 | 267.86 | 231.54 | 258.78 | 365.00 | – |
| 24 | 13 | 63.5 | 838.2 | 24 | 50.8 | 1 7/8 | 325 | 330 | 335 | 372.00 | 330.00 | 362.00 | 533.45 | – |

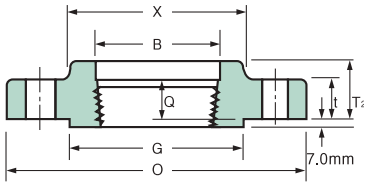
(d) Blind flanges may be made with or without hubs at the manufacturer's option.
(e) Dimensions in B1 correspond to the inside diameters of pipe as given in ASME B36.10M for Standard Wall pipe. Thickness of Stndard Wall is the same as Schedule 40 in sizes NPS 10 and smaller. These bore sizes are furnished unless otherwise specified by the purchaser.
(f) Depth of Socket(Y) is covered by ASME B16.5 only in sizes through 3 inch, over 3 inch is at the manufacturer's option.

# CLASS 900 FLANGES

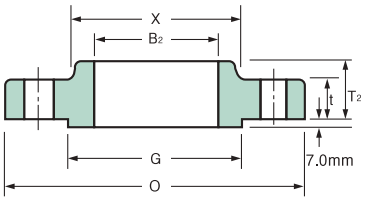









THREADED




SLIP–ON

## ASME B16.5 FORGED FLANGES

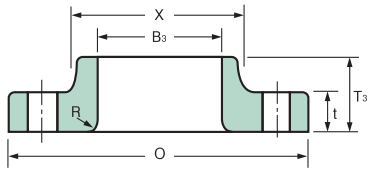
Unit : mm

| Nom–inal Pipe Size | Out–side Diam. of Flange | Thick–ness of Flange | Diam. of Hub Base | O.D of Raised Face | Diam. of Hub at Bavel | Length Through Hub | | | Thread Length | BORE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Weld–ing Neck | Slip–On Threaded Socket Welding | Lap Joint | | Welding Neck /Socket Welding | Slip–On /Socket–Welding | Lap Joint | Counter Bore Min. Threaded |
| | O | t | X | G | A | $T_1$ | $T_2$ | $T_3$ | Q | $B_1$ | $B_2$ | $B_3$ | B |
| 1/2 | 120 | 22.3 | 38 | 34.9 | 21.3 | 60.0 | 32.0 | 32.0 | 23.0 | To be specified by Purchaser | 22.2 | 22.9 | 23.6 |
| 3/4 | 130 | 25.4 | 44 | 42.9 | 26.7 | 70.0 | 35.0 | 35.0 | 26.0 | | 27.7 | 28.2 | 29.0 |
| 1 | 150 | 28.6 | 52 | 50.8 | 33.4 | 73.0 | 41.0 | 41.0 | 29.0 | | 34.5 | 34.9 | 35.8 |
| 1 1/4 | 160 | 28.6 | 64 | 63.5 | 42.2 | 73.0 | 41.0 | 41.0 | 31.0 | | 43.2 | 43.7 | 44.4 |
| 1 1/2 | 180 | 31.8 | 70 | 73.0 | 48.3 | 83.0 | 44.0 | 44.0 | 32.0 | | 49.5 | 50.0 | 50.6 |
| 2 | 215 | 38.1 | 105 | 92.1 | 60.3 | 102.0 | 57.0 | 57.0 | 39.0 | | 61.9 | 62.5 | 63.5 |
| 2 1/2 | 245 | 41.3 | 124 | 104.8 | 73.0 | 105.0 | 64.0 | 64.0 | 48.0 | | 74.6 | 75.4 | 76.2 |
| 3 | 240 | 38.1 | 127 | 127.0 | 88.9 | 102.0 | 54.0 | 54.0 | 42.0 | | 90.7 | 91.4 | 92.2 |
| 4 | 290 | 44.5 | 159 | 157.2 | 114.3 | 114.0 | 70.0 | 70.0 | 48.0 | | 116.1 | 116.8 | 117.6 |
| 5 | 350 | 50.8 | 190 | 185.7 | 141.3 | 127.0 | 79.0 | 79.0 | 54.0 | | 143.8 | 144.4 | 144.4 |
| 6 | 380 | 55.6 | 235 | 215.9 | 168.3 | 140.0 | 86.0 | 86.0 | 58.0 | | 170.7 | 171.4 | 171.4 |
| 8 | 470 | 63.5 | 298 | 269.9 | 219.1 | 162.0 | 102.0 | 114.0 | 64.0 | | 221.5 | 222.2 | 222.2 |
| 10 | 545 | 69.9 | 368 | 323.8 | 273.0 | 184.0 | 108.0 | 127.0 | 72.0 | | 276.2 | 277.4 | 276.2 |
| 12 | 610 | 79.4 | 419 | 381.0 | 323.8 | 200.0 | 117.0 | 143.0 | 77.0 | | 327.0 | 328.2 | 328.6 |
| 14 | 640 | 85.8 | 451 | 412.8 | 355.6 | 213.0 | 130.0 | 156.0 | 83.0 | | 359.2 | 360.2 | 360.4 |
| 16 | 705 | 88.9 | 508 | 469.9 | 406.4 | 216.0 | 133.0 | 165.0 | 86.0 | | 410.5 | 411.2 | 411.2 |
| 18 | 785 | 101.6 | 565 | 533.4 | 457.0 | 229.0 | 152.0 | 190.0 | 89.0 | | 461.8 | 462.3 | 462.0 |
| 20 | 855 | 108.0 | 622 | 584.2 | 508.0 | 248.0 | 159.0 | 210.0 | 93.0 | | 513.1 | 514.4 | 512.8 |
| 24 | 1040 | 139.7 | 749 | 692.2 | 610.0 | 292.0 | 203.0 | 267.0 | 102.0 | | 616.0 | 616.0 | 614.4 |

Notes :

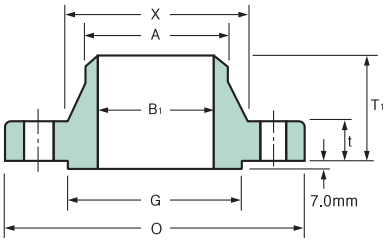
(a) For the 'BORE'(B1) other than Standard Wall Thickness, refer to page 70–71
(b) These flanges may be supplied with a flat face. The flat face may be either the full t dimension of thickness plus 7mm, or the t dimension thickness without the raised face height.
(c) This dimension is for large end of hubs, which may be straight or tapered, Taper shall not exceed 7 deg on the theraded, slip–on, socket–welding, and lapped flanges. This dimension is defined as the diameter at the intersection between the hub taper and the back face of the flange.





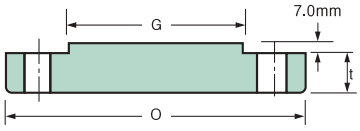

LAP JOINT






WELDING NECK






BLIND

Unit : mm

| Nominal Pipe Size | Ridius of Fillet | DRILLING | | | LENGTH OF BOLTS | | | | APPROXIMATE WEIGHT(kg) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Stud Bolt Length | | | | | | |
| | R | Bolt Circle Diam. | Number of Holes | Diam. of Holes | Diam.of Bolt (inch) | Male and Female / Tongue and Groove | 7mm Raised Face | Ring Joint | Welding Neck | Slip-On/ Threaded | Lap Joint | Blind |
| 1/2 | 3 | 82.6 | 4 | 22.2 | 3/4 | 100 | 110 | 110 | 2.10 | 1.81 | 1.81 | 1.90 |
| 3/4 | 3 | 88.9 | 4 | 22.2 | 3/4 | 110 | 115 | 115 | 2.72 | 2.40 | 2.30 | 2.70 |
| 1 | 3 | 101.6 | 4 | 25.4 | 7/8 | 120 | 125 | 125 | 3.86 | 3.41 | 3.40 | 4.09 |
| 1 1/4 | 5 | 111.1 | 4 | 25.4 | 7/8 | 120 | 125 | 125 | 4.54 | 4.10 | 4.09 | 4.54 |
| 1 1/2 | 6 | 123.8 | 4 | 28.6 | 1 | 135 | 140 | 140 | 5.90 | 5.45 | 5.40 | 5.90 |
| 2 | 8 | 165.1 | 8 | 25.4 | 7/8 | 140 | 145 | 145 | 10.89 | 9.98 | 9.53 | 11.34 |
| 2 1/2 | 8 | 190.5 | 8 | 28.6 | 1 | 150 | 160 | 160 | 16.33 | 15.80 | 13.15 | 16.00 |
| 3 | 10 | 190.5 | 8 | 25.4 | 7/8 | 140 | 145 | 145 | 15.00 | 11.80 | 11.34 | 13.17 |
| 4 | 11 | 235.0 | 8 | 31.8 | 1 1/8 | 165 | 170 | 170 | 23.13 | 23.20 | 22.60 | 24.50 |
| 5 | 11 | 279.4 | 8 | 34.9 | 1 1/4 | 185 | 190 | 190 | 38.50 | 37.65 | 36.74 | 39.46 |
| 6 | 13 | 317.5 | 12 | 31.8 | 1 1/8 | 185 | 190 | 195 | 49.89 | 48.30 | 47.50 | 51.50 |
| 8 | 13 | 393.7 | 12 | 38.1 | 1 3/8 | 215 | 220 | 220 | 79.45 | 75.00 | 86.00 | 89.00 |
| 10 | 13 | 469.9 | 16 | 38.1 | 1 3/8 | 230 | 235 | 235 | 118.04 | 111.13 | 125.64 | 131.54 |
| 12 | 13 | 533.4 | 20 | 38.1 | 1 3/8 | 250 | 255 | 255 | 157.00 | 146.00 | 167.00 | 187.00 |
| 14 | 13 | 558.8 | 20 | 41.3 | 1 1/2 | 265 | 275 | 280 | 181.60 | 172.36 | 180.07 | 224.07 |
| 16 | 13 | 616.0 | 20 | 44.5 | 1 5/8 | 280 | 285 | 290 | 224.73 | 192.95 | 211.11 | 272.40 |
| 18 | 13 | 685.8 | 20 | 50.8 | 1 7/8 | 320 | 325 | 335 | 308.72 | 272.40 | 295.10 | 385.90 |
| 20 | 13 | 749.3 | 20 | 54.0 | 2 | 345 | 350 | 360 | 376.82 | 331.42 | 367.74 | 488.00 |
| 24 | 13 | 901.7 | 20 | 66.7 | 2 1/2 | 430 | 440 | 455 | 685.00 | 632.00 | 700.00 | 905.00 |

(d) Blind flanges may be made with or without hubs at the manufacturer's option.
(e) Dimensions in B1 correspond to the inside diameters of pipe as given in ASME B36.10M for Standard.

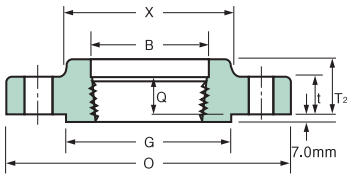
# CLASS 1500 FLANGES



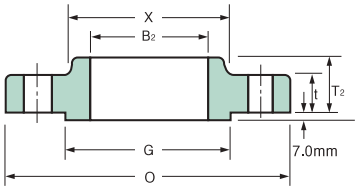




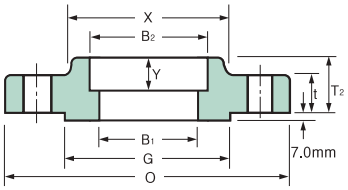





THREADED




SLIP–ON




SOCKET WELDING

## ASME B16.5 FORGED FLANGES

Unit : mm

| Nom–inal Pipe Size | Out–side Diam. of Flange | Thick–ness of Flange | Diam. of Hub Base | O.D of Raised Face | Diam. of Hub at Bavel | Length Through Hub | | | Thread Length | BORE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Weld–ing Neck | Slip–On Threaded Socket Welding | Lap Joint | | Welding Neck /Socket Welding | Slip–On /Socket–Welding | Lap Joint | Counter Bore Min. Threaded |
| | O | t | X | G | A | $T_1$ | $T_2$ | $T_3$ | Q | $B_1$ | $B_2$ | $B_3$ | B |
| 1/2 | 120 | 22.3 | 38 | 34.9 | 21.3 | 60 | 32 | 32 | 23 | To be specified by Purchaser | 22.2 | 22.9 | 23.6 |
| 3/4 | 130 | 25.4 | 44 | 42.9 | 26.7 | 70 | 35 | 35 | 26 | | 27.7 | 28.2 | 29.0 |
| 1 | 150 | 28.6 | 52 | 50.8 | 33.4 | 73 | 41 | 41 | 29 | | 34.5 | 34.9 | 35.8 |
| 1 1/4 | 160 | 28.6 | 64 | 63.5 | 42.2 | 73 | 41 | 41 | 31 | | 43.2 | 43.7 | 44.4 |
| 1 1/2 | 180 | 31.8 | 70 | 73.0 | 48.3 | 83 | 44 | 44 | 32 | | 49.5 | 50.0 | 50.6 |
| 2 | 215 | 38.1 | 105 | 92.1 | 60.3 | 102 | 57 | 57 | 39 | | 61.9 | 62.5 | 63.5 |
| 2 1/2 | 245 | 41.3 | 124 | 104.8 | 73.0 | 105 | 64 | 64 | 48 | | 74.6 | 75.4 | 76.2 |
| 3 | 265 | 47.7 | 133 | 127.0 | 88.9 | 117 | 73.2 | 73 | 50.8 | | 90.7 | 91.4 | 92.2 |
| 4 | 310 | 54.0 | 162 | 157.2 | 114.3 | 124 | 90.4 | 90 | 57.2 | | 116.1 | 116.8 | 117.6 |
| 5 | 375 | 73.1 | 197 | 185.7 | 141.3 | 156 | 104.6 | 105 | 57.2 | | 143.8 | 144.4 | 144.5 |
| 6 | 395 | 82.6 | 229 | 215.9 | 168.3 | 171 | 119.1 | 119 | 69.9 | | 170.7 | 171.4 | 171.5 |
| 8 | 485 | 92.1 | 292 | 269.9 | 219.1 | 213 | 142.7 | 143 | 76.2 | | 221.5 | 222.2 | 222.3 |
| 10 | 585 | 108.0 | 368 | 323.8 | 273.0 | 254 | 158.8 | 178 | 84.1 | | 276.4 | 277.4 | 276.4 |
| 12 | 675 | 123.9 | 451 | 381.0 | 323.8 | 283 | 180.8 | 219 | 91.9 | | 327.2 | 328.2 | 328.7 |
| 14 | 750 | 133.4 | 495 | 412.8 | 355.6 | 298 | – | 241 | – | | 359.2 | 360.2 | 360.4 |
| 16 | 825 | 146.1 | 552 | 469.9 | 406.4 | 311 | – | 260 | – | | 410.5 | 411.2 | 411.2 |
| 18 | 915 | 162.0 | 597 | 533.4 | 457.0 | 327 | – | 276 | – | | 461.8 | 462.3 | 462.0 |
| 20 | 985 | 177.8 | 641 | 584.2 | 508.0 | 356 | – | 292 | – | | 513.1 | 514.4 | 512.8 |
| 24 | 1170 | 203.2 | 762 | 692.2 | 610.0 | 406 | – | 330 | – | | 616.0 | 616.0 | 614.4 |

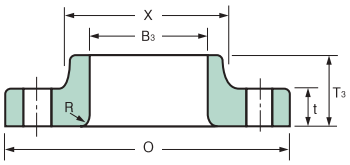
Notes :

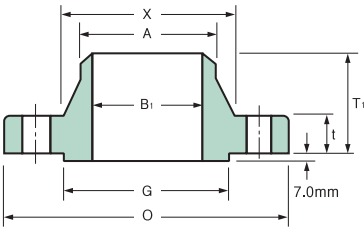
(a) For the 'BORE' (B1) other than Standard Wall Thickness, refer to page 70–71
(b) These flanges may be supplied with a flat face. The flat face may be either the full t dimension of thickness plus 7 mm, or the t dimension thickness without the raised face height.
(c) This dimension is for large end of hub, which may be stright or tapered. Taper shall not exceed 7deg on threaded, slip–on, socket–welding, and lapped flanges. This dimension is defined as the diameter at the intersection between the hub taper and the back face of the flange.

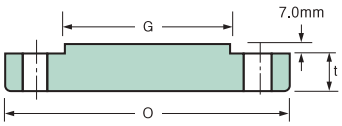









LAP JOINT

WELDING NECK

BLIND

Unit : mm

| SIZE | Ridius of Fillet | Depth of Socket | DRILLING | | | LENGTH OF BOLTS | | | | APPROXIMATE WEIGHT(kg) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Bolt Circle Diam. | Number of Holes | Diam. of Holes | Diam.of Bolt (inch) | Male and Female/ Tongue and Groove | Stud Bolt Length | | Welding Neck | Slip-On/ Threaded | Lap Joint | Blind | Socket Welding |
| | | | | | | | | 7mm Raised Face | Ring Joint | | | | | |
| | R | Y | | | | | | | | | | | | |
| 1/2 | 3 | 10 | 82.6 | 4 | 22.2 | 3/4 | 100 | 110 | 110 | 2.10 | 1.80 | 1.80 | 1.90 | 1.80 |
| 3/4 | 3 | 11 | 88.9 | 4 | 22.2 | 3/4 | 110 | 115 | 115 | 2.72 | 2.27 | 2.27 | 2.72 | 2.81 |
| 1 | 3 | 13 | 101.6 | 4 | 25.4 | 7/8 | 120 | 125 | 125 | 3.86 | 3.40 | 3.40 | 4.08 | 3.61 |
| 1 1/4 | 5 | 14 | 111.1 | 4 | 25.4 | 7/8 | 120 | 125 | 125 | 4.54 | 4.10 | 4.09 | 4.30 | 4.99 |
| 1 1/2 | 6 | 16 | 123.8 | 4 | 28.6 | 1 | 135 | 140 | 140 | 5.90 | 5.45 | 5.40 | 5.90 | 6.76 |
| 2 | 8 | 17 | 165.1 | 8 | 25.4 | 7/8 | 140 | 145 | 145 | 10.89 | 10.50 | 9.53 | 11.30 | 10.89 |
| 2 1/2 | 8 | 19 | 190.5 | 8 | 28.6 | 1 | 150 | 160 | 160 | 16.34 | 15.80 | 13.15 | 16.00 | 16.34 |
| 3 | 10 | 20.6 | 203.2 | 8 | 31.8 | 1 1/8 | 170 | 180 | 180 | 21.79 | 21.77 | 17.24 | 21.79 | – |
| 4 | 11 | 23.9 | 241.3 | 8 | 34.9 | 1 1/4 | 190 | 195 | 195 | 31.30 | 31.00 | 29.00 | 33.11 | – |
| 5 | 11 | 23.9 | 292.1 | 8 | 41.3 | 1 1/2 | 240 | 250 | 250 | 59.02 | 58.80 | 54.00 | 60.00 | – |
| 6 | 13 | 26.9 | 317.5 | 12 | 38.1 | 1 3/8 | 255 | 260 | 265 | 74.91 | 74.00 | 62.00 | 75.00 | – |
| 8 | 13 | 31.8 | 393.7 | 12 | 44.5 | 1 5/8 | 285 | 290 | 300 | 123.83 | 117.73 | 129.73 | 136.98 | – |
| 10 | 13 | 33.3 | 482.6 | 12 | 50.8 | 1 7/8 | 330 | 335 | 345 | 205.93 | 197.49 | 220.19 | 229.97 | – |
| 12 | 13 | 39.6 | 571.5 | 16 | 54.0 | 2 | 370 | 375 | 385 | 306.00 | 264.00 | 286.02 | 316.00 | – |
| 14 | 13 | 41.4 | 635.0 | 16 | 60.3 | 2 1/4 | 400 | 405 | 425 | 416.00 | – | 404.06 | 421.00 | – |
| 16 | 13 | 44.5 | 704.8 | 16 | 66.7 | 2 1/2 | 440 | 445 | 470 | 567.50 | – | 522.10 | 559.00 | – |
| 18 | 13 | 49.3 | 774.7 | 16 | 73.0 | 2 3/4 | 490 | 495 | 525 | 736.00 | – | 669.65 | 761.00 | – |
| 20 | 13 | 54.1 | 831.8 | 16 | 79.4 | 3 | 535 | 540 | 565 | 929.00 | – | 805.85 | 967.00 | – |
| 24 | 13 | 63.5 | 990.6 | 16 | 92.1 | 3 1/2 | 610 | 615 | 650 | 1504.00 | – | 1285.55 | 1568.00 | – |

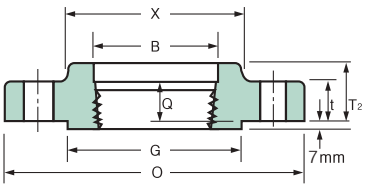
(d) Blind flanges may be made with or without hubs at the manufacturer's option.
(e) Dimensions in B1 correspond to the inside diameters of pipe as given in ASME B36. 10M for Standard Wall pipe. Thickness of Standard Wall is the same as Schedule 40 in sizes NPS 10 and smaller. These bore sizes are furnished unless otherwise specified by the purchaser.
(f) Depth of Socket(Y) is covered by ASME B16.5 only in sizes throught 3 inch, over 3 inch is at the manufacture's option.
(g) Dimensions of sizes 1/2" through 2 1'2" are the same as for Class 900 flanges.
(h) Over 2 1/2inch of Bore(B, B2)and Thread Length(Q) are at the manufacturer's option.

# CLASS 2500 FLANGES

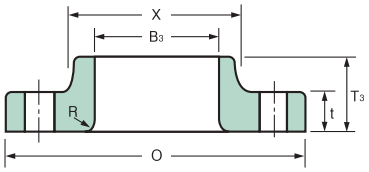









THREADED




LAP JOINT

## ASME B16.5 FORGED FLANGES

Unit : mm

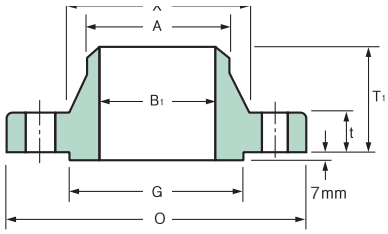
| Nom–inal Pipe Size | Out–side Diam. of Flange | Thick–ness of Flange | Diam. of Hub Base | O.D of Raised Face | Diam. of Hub at Bavel | Length Through Hub | | | Thread Length | BORE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Weld–ing Neck | Slip–On Threaded Socket Welding | Lap Joint | | Welding Neck /Socket Welding | Lap Joint | Counter Bore Min. Threaded |
| | O | t | X | G | A | $T_1$ | $T_2$ | $T_3$ | Q | $B_1$ | $B_3$ | B |
| 1/2 | 135 | 30.2 | 43 | 34.9 | 21.3 | 73 | 40 | 40 | 29 | To be specified by Purchaser | 22.9 | 23.6 |
| 3/4 | 140 | 31.8 | 51 | 42.9 | 26.7 | 79 | 43 | 43 | 32 | | 28.2 | 29.0 |
| 1 | 160 | 35.0 | 57 | 50.8 | 33.4 | 89 | 48 | 48 | 35 | | 34.9 | 35.8 |
| 1 1/4 | 185 | 38.1 | 73 | 63.5 | 42.2 | 95 | 52 | 52 | 39 | | 43.7 | 44.4 |
| 1 1/2 | 205 | 44.5 | 79 | 73.0 | 48.3 | 111 | 60 | 60 | 45 | | 50.0 | 50.6 |
| 2 | 235 | 50.9 | 95 | 92.1 | 60.3 | 127 | 70 | 70 | 51 | | 62.5 | 63.5 |
| 2 1/2 | 265 | 57.2 | 114 | 104.8 | 73.0 | 143 | 79 | 79 | 58 | | 75.4 | 76.2 |
| 3 | 305 | 66.7 | 133 | 127.0 | 88.9 | 168 | – | 92 | 63.5 | | 91.4 | 92.2 |
| 4 | 355 | 76.2 | 165 | 157.2 | 114.3 | 190 | – | 108 | 69.9 | | 116.8 | 117.6 |
| 5 | 420 | 92.1 | 203 | 185.7 | 141.3 | 229 | – | 130 | 76.2 | | 144.4 | 144.5 |
| 6 | 485 | 108.0 | 235 | 215.9 | 168.3 | 273 | – | 152 | 82.6 | | 171.4 | 171.5 |
| 8 | 550 | 127.0 | 305 | 269.9 | 219.1 | 318 | – | 178 | 95.3 | | 222.2 | 222.3 |
| 10 | 675 | 165.1 | 375 | 323.8 | 273.0 | 419 | – | 229 | 108.0 | | 277.4 | 276.4 |
| 12 | 760 | 184.2 | 441 | 381.0 | 323.8 | 464 | – | 254 | 120.7 | | 328.2 | 328.7 |

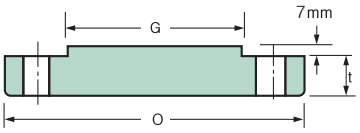
Notes :

(a) For the 'BORE'(B1) other than Standard Wall Thickness, refer to page 70–71
(b) These flanges may be supplied with a flat face. The flat face may be either the full t dimension of thickness plus 7mm, or the t dimension thickness without the raised face height.
(c) This dimension is for large end of hub, which may be stright or tapered. Taper shall not exceed 7deg on threaded, slip–on, socket–welding, and lapped flanges. This dimension is defined as the diameter at the intersection between the hub taper and the back face of the flange.







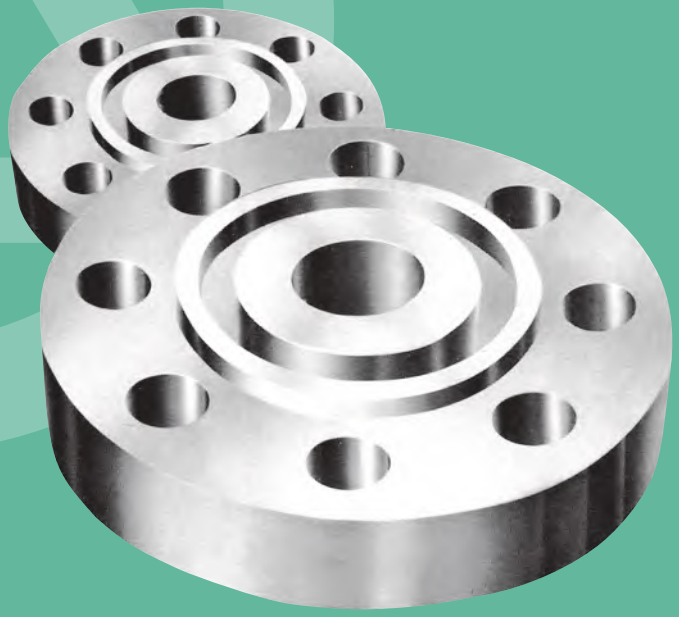

WELDING NECK

BLIND

Unit : mm

| Nominal Pipe Size | Ridius of Fillet R | DRILLING | | | LENGTH OF BOLTS | | | | APPROXIMATE WEIGHT(kg) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Bolt Circle Diam. | Number of Holes | Diam. of Holes | Diam.of Bolt (inch) | Stud Bolt Length | | | Welding Neck | Threaded | Lap Joint | Blind |
| | | | | | | Male and Female / Tongue and Groove | 7mm Raised Face | Ring Joint | | | | |
| 1/2 | 3 | 88.9 | 4 | 22.2 | 3/4 | 115 | 120 | 120 | 3.18 | 3.18 | 3.00 | 3.18 |
| 3/4 | 3 | 95.2 | 4 | 22.2 | 3/4 | 120 | 125 | 125 | 4.08 | 4.08 | 3.63 | 4.54 |
| 1 | 3 | 108.0 | 4 | 25.4 | 7/8 | 135 | 140 | 140 | 5.45 | 5.44 | 4.99 | 5.44 |
| 1 1/4 | 5 | 130.2 | 4 | 28.6 | 1 | 145 | 150 | 150 | 9.07 | 8.16 | 7.26 | 8.16 |
| 1 1/2 | 6 | 146.0 | 4 | 31.8 | 1 1/8 | 165 | 170 | 170 | 11.35 | 11.00 | 9.99 | 10.44 |
| 2 | 8 | 171.4 | 8 | 28.6 | 1 | 170 | 180 | 180 | 19.07 | 17.25 | 16.80 | 17.71 |
| 2 1/2 | 8 | 196.8 | 8 | 31.8 | 1 1/8 | 190 | 195 | 205 | 23.61 | 24.97 | 24.06 | 25.42 |
| 3 | 10 | 228.6 | 8 | 34.9 | 1 1/4 | 215 | 220 | 230 | 42.68 | 37.68 | 36.32 | 39.04 |
| 4 | 11 | 273.0 | 8 | 41.3 | 1 1/2 | 250 | 255 | 260 | 64.00 | 58.00 | 54.48 | 60.38 |
| 5 | 11 | 323.8 | 8 | 47.6 | 1 3/4 | 290 | 300 | 310 | 110.68 | 95.25 | 92.53 | 101.15 |
| 6 | 13 | 368.3 | 8 | 54.0 | 2 | 335 | 345 | 355 | 176.46 | 146.51 | 143.01 | 156.63 |
| 8 | 13 | 438.2 | 12 | 54.0 | 2 | 375 | 380 | 395 | 261.27 | 219.99 | 213.38 | 240.62 |
| 10 | 13 | 539.8 | 12 | 66.7 | 2 1/2 | 485 | 490 | 510 | 484.43 | 419.57 | 408.60 | 465.36 |
| 12 | 13 | 619.1 | 12 | 73.0 | 2 3/4 | 535 | 540 | 560 | 692.35 | 590.20 | 572.95 | 664.06 |

(d) Blind flanges may be made with or without hubs at the manufacturer's option.
(e) Dimensions in B1 correspond to the inside diameters of pipe as given in ASME B36. 10M for Standard Wall pipe. Thickness of Standard Wall is the same as Schedule 40 in sizes NPS 10 and smaller. These bore sizes are furnished unless otherwise specified by the purchaser.
(f) Class 2500 Slip-on are not by ASME B16.5. Slip-on flanges are at the manufacturer's option.
(g) Thread Length(Q) and Length Through Hub(T3) are covered by ASME B16.5 only in sizes through 2 1/2 inch, over 2 1/2 inch is at the manufacturer's option.



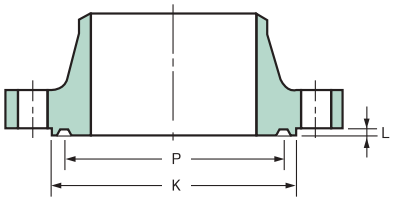
# RING JOINT FLANGES

- Class 150 Flanges
- Class 300,400,600 Flanges
- Class 900 Flanges
- Class 2500 Flanges

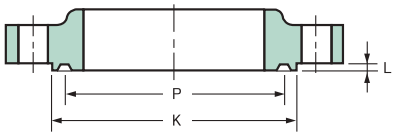
# CLASS 150 FLANGES



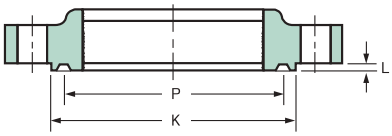
WELDING NECK

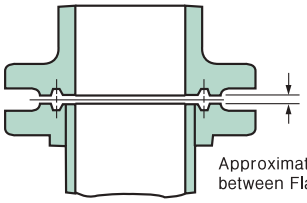


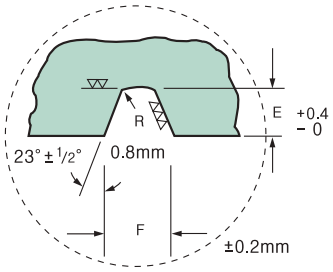

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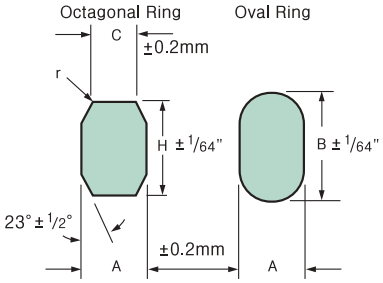



THREADED




## RING JOINT FLANGES FACING DIMENSIONS

Unit : mm

| Nominal Pipe Size | Pitch Diam. Ring & Groove | Width of Ring | Height of Ring | | Width Flat on Octa.Ring | Width of Groove | Depth of Groove | Diam. of R.F for Ring Joint or Lapped | Ring Number | Approximate Distance Between Flanges |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Oval | Octagonal | | | | | | |
| | P | A | B | H | C | F | E(L*) | K(Min) | | |
| 1 | 47.63 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 63.5 | R15 | 4 |
| 1 1/4 | 57.15 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 73.0 | R17 | 4 |
| 1 1/2 | 65.07 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 82.5 | R19 | 4 |
| 2 | 82.55 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 102.0 | R22 | 4 |
| 2 1/2 | 101.6 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 121.0 | R25 | 4 |
| 3 | 114.3 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 133.0 | R29 | 4 |
| 3 1/2 | 131.78 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 154.0 | R33 | 4 |
| 4 | 149.23 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 171.0 | R36 | 4 |
| 5 | 171.45 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 194.0 | R40 | 4 |
| 6 | 193.68 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 219.0 | R43 | 4 |
| 8 | 247.65 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 273.0 | R48 | 4 |
| 10 | 304.8 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 330.0 | R52 | 4 |
| 12 | 381.0 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 406.0 | R56 | 4 |
| 14 | 396.88 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 425.0 | R59 | 3 |
| 16 | 454.03 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 483.0 | R64 | 3 |
| 18 | 517.53 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 546.0 | R68 | 3 |
| 20 | 558.8 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 597.0 | R72 | 3 |
| 24 | 673.1 | 8 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 711.0 | R76 | 3 |

Notes :

Unless otherwise specified by the customer, Ring Type Joint Flanges will be furnished in accordance with these details. The depth of groove is added to the minimum flanges thickness.
* Raised face "L" is equal to groove dimension "E" but is not subject to tolerance for "E"
* A plus tolerance of 3/64 in, for heights B and H is permitted providing the variation in the height of any given ring does not exceed 1/64 in, throughtout its entire circumference.
Dimension "R" is max.
Radius "r" is 1/16 for ring widths 7/8″ and less 3/32″ for ring width 1″ and over.

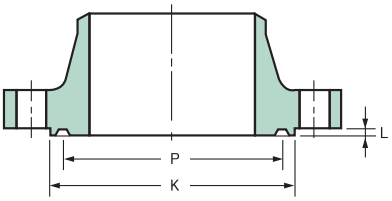
TOLERANCES :

* E (depth) +0.4, −0.0
* F (width) ±0.2
* P (pitch diameter) ±0.13
* R (radius at bottom)
R≤2+0.8, −0.0
R≥2±0.8
* 23 deg (angle) ± 1/2 deg

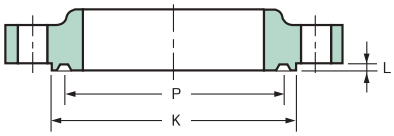
# CLASS 300 / 400 / 600 FLANGES



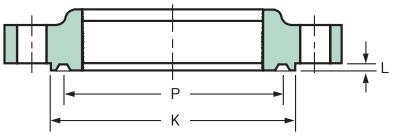
WELDING NECK

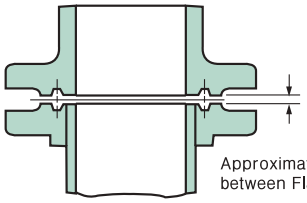


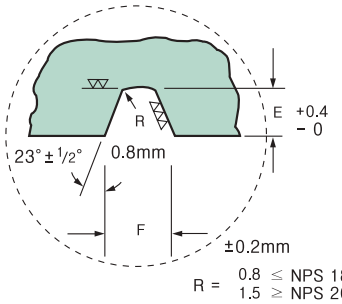

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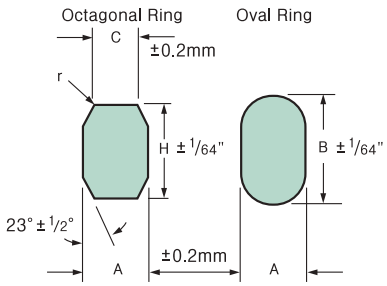



THREADED




## RING JOINT FLANGES FACING DIMENSIONS

Unit : mm

| Nominal Pipe Size | Pitch Diam. Ring & Groove | Width of Ring | Height of Ring | | Width Flat on Octa.Ring | Width of Groove | Depth of Groove | Diam. of R.F for Ring Joint or Lapped | Ring Number | Approximate Distance Between Flanges | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Oval | Octagonal | | | | | | CLASS 300 | CLASS 400 | CLASS 600 |
| | P | A | B | H | C | F | E(L*) | K(Min) | | | | |
| 1/2 | 34.14 | 6.4 | 11.1 | 9.5 | 4.3 | 7.14 | 5.54 | 51.0 | R11 | 3 | | 3 |
| 3/4 | 42.88 | 8.0 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 63.5 | R13 | 4 | | 4 |
| 1 | 50.8 | 8.0 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 70.0 | R16 | 4 | | 4 |
| 1 1/4 | 60.33 | 8.0 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 79.5 | R18 | 4 | | 4 |
| 1 1/2 | 68.27 | 8.0 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 90.5 | R20 | 4 | | 4 |
| 2 | 82.55 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 108.0 | R23 | 6 | | 5 |
| 2 1/2 | 101.6 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 127.0 | R26 | 6 | | 5 |
| 3 | 123.83 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 146.0 | R31 | 6 | | 5 |
| 3 1/2 | 131.78 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 159.0 | R34 | 6 | | 5 |
| 4 | 149.23 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 175.0 | R37 | 6 | 6 | 5 |
| 5 | 180.98 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 210.0 | R41 | 6 | 6 | 5 |
| 6 | 211.12 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 241.0 | R45 | 6 | 6 | 5 |
| 8 | 269.88 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 302.0 | R49 | 6 | 6 | 5 |
| 10 | 323.85 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 356.0 | R53 | 6 | 6 | 5 |
| 12 | 381.0 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 413.0 | R57 | 6 | 6 | 5 |
| 14 | 419.1 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 457.0 | R61 | 6 | 6 | 5 |
| 16 | 469.9 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 508.0 | R65 | 6 | 6 | 5 |
| 18 | 533.4 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 575.0 | R69 | 6 | 6 | 5 |
| 20 | 584.2 | 12.7 | 19.1 | 17.5 | 8.7 | 13.49 | 9.53 | 635.0 | R73 | 6 | 6 | 5 |
| 24 | 692.15 | 15.9 | 22.2 | 20.7 | 10.5 | 16.66 | 11.13 | 749.0 | R77 | 6 | 6 | 6 |

Notes :

Unless otherwise specified by the customer, Ring Type Joint Flanges will be furnished in accordance with these details. The depth of groove is added to the minimum flanges thickness.
* Raised face "L" is equal to groove dimension "E" but is not subject to tolerance for "E"
* A plus tolerance of 3/64 in, for heights B and H is permitted providing the variation in the height of any given ring does not exceed 1/64 in, throughtout its entire circumference.
  Dimension "R" is max.
  Radius "r" is 1/16 for ring widths 7/8″ and less 3/32″ for ring width 1″ and over.

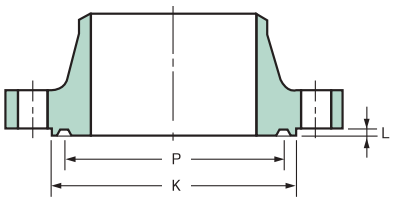
TOLERANCES :

* E (depth) +0.4, −0.0
* F (width) ±0.2
* P (pitch diameter) ±0.13
* R (radius at bottom)
  R≤2+0.8, −0.0
  R≤2±0.8
* 23 deg (angle) ± 1/2 deg

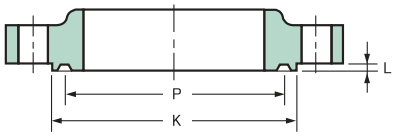
# CLASS 900 FLANGES



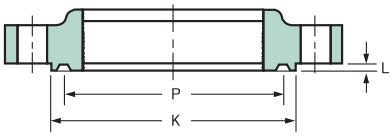
WELDING NECK

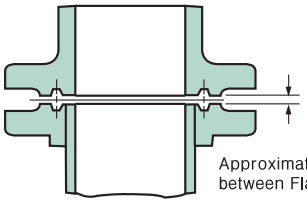


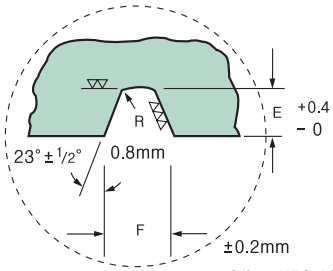

SLIP-ON

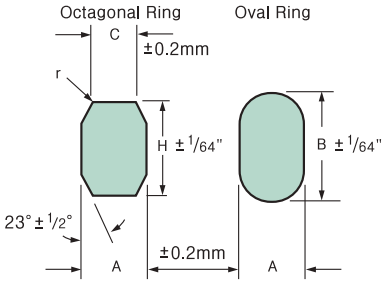



THREADED




## RING JOINT FLANGES FACING DIMENSIONS

Unit : mm

| Nominal Pipe Size | Pitch Diam. Ring & Groove | Width of Ring | Height of Ring | | Width Flat on Octa.Ring | Width of Groove | Depth of Groove | Diam. of R.F for Ring Joint or Lapped | Ring Number | Approximate Distance Between Flanges |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Oval | Octagonal | | | | | | |
| | P | A | B | H | C | F | E(L*) | K(Min) | | |
| 1/2 | 39.67 | 8.0 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 60.5 | R12 | 4 |
| 3/4 | 44.45 | 8.0 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 66.5 | R14 | 4 |
| 1 | 50.8 | 8.0 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 71.5 | R16 | 4 |
| 1 1/4 | 60.33 | 8.0 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 81.0 | R18 | 4 |
| 1 1/2 | 68.27 | 8.0 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 92.0 | R20 | 4 |
| 2 | 95.25 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 124.0 | R24 | 3 |
| 2 1/2 | 107.95 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 137.0 | R27 | 3 |
| 3 | 123.83 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 156.0 | R31 | 4 |
| 4 | 149.23 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 181.0 | R37 | 4 |
| 5 | 180.98 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 216.0 | R41 | 4 |
| 6 | 211.12 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 241.0 | R45 | 4 |
| 8 | 269.88 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 308.0 | R49 | 4 |
| 10 | 323.85 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 362.0 | R53 | 4 |
| 12 | 381.0 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 419.0 | R57 | 4 |
| 14 | 419.1 | 15.9 | 22.2 | 20.7 | 10.5 | 16.66 | 11.13 | 467.0 | R62 | 4 |
| 16 | 469.9 | 15.9 | 22.2 | 20.7 | 10.5 | 16.66 | 11.13 | 524.0 | R66 | 4 |
| 18 | 533.4 | 19.1 | 25.4 | 23.8 | 11.1 | 19.84 | 12.70 | 594.0 | R70 | 5 |
| 20 | 584.2 | 19.1 | 25.4 | 23.8 | 12.3 | 19.84 | 12.70 | 648.0 | R74 | 5 |
| 24 | 692.15 | 25.4 | 33.4 | 31.8 | 17.3 | 26.97 | 15.88 | 772.0 | R78 | 6 |

Notes :

Unless otherwise specified by the customer, Ring Type Joint Flanges will be furnished in accordance with these details. The depth of groove is added to the minimum flanges thickness.

* Raised face "L" is equal to groove dimension "E" but is not subject to tolerance for "E"
* A plus tolerance of 3/64 in, for heights B and H is permitted providing the variation in the height of any given ring does not exceed 1/64 in, throughtout its entire circumference.
  Dimension "R" is max.
  Radius "r" is 1/16 for ring widths 7/8″ and less 3/32″ for ring width 1″ and over.

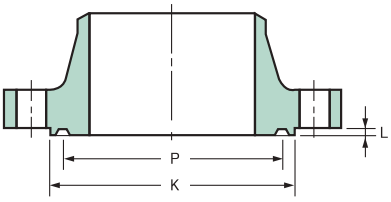
TOLERANCES :

* E (depth) +0.4, −0.0
* F (width) ±0.2
* P (pitch diameter) ±0.13
* R (radius at bottom)
  R≤2+0.8, −0.0
  R≥2±0.8
* 23 deg (angle) ± 1/2 deg

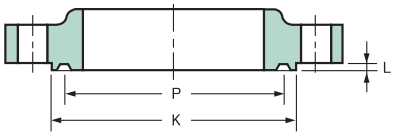
# CLASS 1500 FLANGES



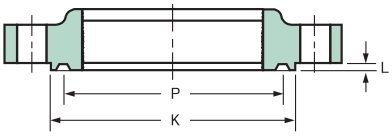
WELDING NECK

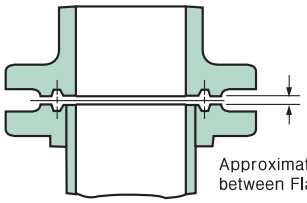


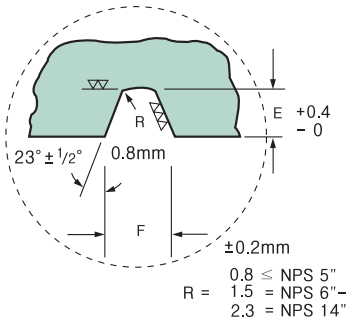

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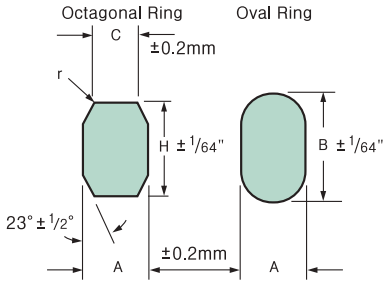



THREADED




## RING JOINT FLANGES FACING DIMENSIONS

Unit : mm

| Nominal Pipe Size | Pitch Diam. Ring & Groove | Width of Ring | Height of Ring | | Width Flat on Octa.Ring | Width of Groove | Depth of Groove | Diam. of R.F for Ring Joint or Lapped | Ring Number | Approximate Distance Between Flanges |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Oval | Octagonal | | | | | | |
| | P | A | B | H | C | F | E(L*) | K(Min) | | |
| 1/2 | 39.67 | 8.0 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 60.5 | R12 | 4 |
| 3/4 | 44.45 | 8.0 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 66.5 | R14 | 4 |
| 1 | 50.8 | 8.0 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 71.5 | R16 | 4 |
| 1 1/4 | 60.33 | 8.0 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 81.0 | R18 | 4 |
| 1 1/2 | 68.27 | 8.0 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 92.0 | R20 | 4 |
| 2 | 95.25 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 124.0 | R24 | 3 |
| 2 1/2 | 107.95 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 137.0 | R27 | 3 |
| 3 | 136.53 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 168.0 | R35 | 3 |
| 4 | 161.93 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 194.0 | R39 | 3 |
| 5 | 193.68 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 229.0 | R44 | 3 |
| 6 | 211.14 | 12.7 | 19.1 | 17.5 | 8.7 | 13.49 | 9.53 | 248.0 | R46 | 3 |
| 8 | 269.88 | 15.9 | 22.2 | 20.7 | 10.5 | 16.66 | 11.13 | 318.0 | R50 | 4 |
| 10 | 323.85 | 15.9 | 22.2 | 20.7 | 10.5 | 16.66 | 11.13 | 371.0 | R54 | 4 |
| 12 | 381.0 | 22.2 | 28.6 | 27.0 | 14.8 | 23.01 | 14.27 | 438.0 | R58 | 5 |
| 14 | 419.1 | 25.4 | 33.4 | 31.8 | 17.3 | 26.97 | 15.88 | 489.0 | R63 | 6 |
| 16 | 469.9 | 28.6 | 36.5 | 34.9 | 19.8 | 30.18 | 17.48 | 546.0 | R67 | 8 |
| 18 | 533.4 | 28.6 | 36.5 | 34.9 | 19.8 | 30.18 | 17.48 | 613.0 | R71 | 8 |
| 20 | 584.2 | 31.8 | 39.7 | 38.1 | 22.3 | 33.32 | 17.48 | 673.0 | R75 | 10 |
| 24 | 692.15 | 34.9 | 44.5 | 41.3 | 24.8 | 36.53 | 20.62 | 794.0 | R79 | 11 |

Notes :

Unless otherwise specified by the customer, Ring Type Joint Flanges will be furnished in accordance with these details. The depth of groove is added to the minimum flanges thickness.

* Raised face "L" is equal to groove dimension "E" but is not subject to tolerance for "E"
* A plus tolerance of 3/64 in, for heights B and H is permitted providing the variation in the height of any given ring does not exceed 1/64 in, throughtout its entire circumference.
  Dimension "R" is max.
  Radius "r" is 1/16 for ring widths 7/8″ and less 3/32″ for ring width 1″ and over.

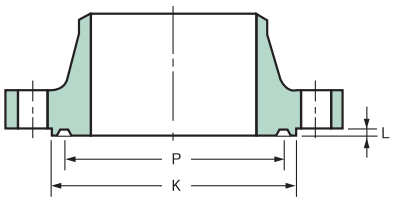
TOLERANCES :

* E (depth) +0.4, −0.0
* F (width) ±0.2
* P (pitch diameter) ±0.13
* R (radius at bottom)
  R≤2+0.8, −0.0
  R≥2±0.8
* 23 deg (angle) ± 1/2 deg

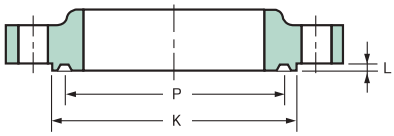
# CLASS 2500 FLANGES



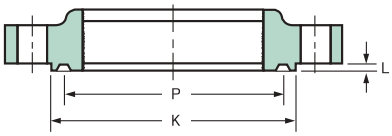
WELDING NECK

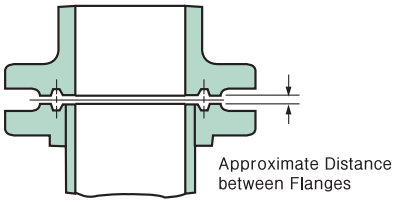


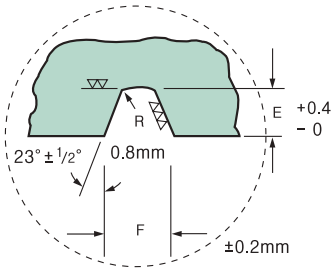

SLIP-ON



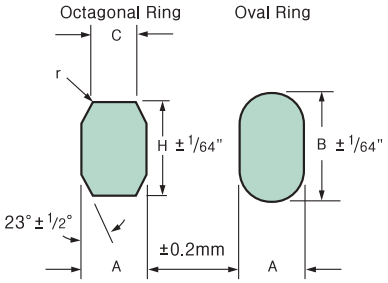

THREADED




R = 0.8 ≤ NPS 2"
1.5 = NPS 2 1/2"-8"
2.3 ≥ NPS 10"




## RING JOINT FLANGES FACING DIMENSIONS

Unit : mm

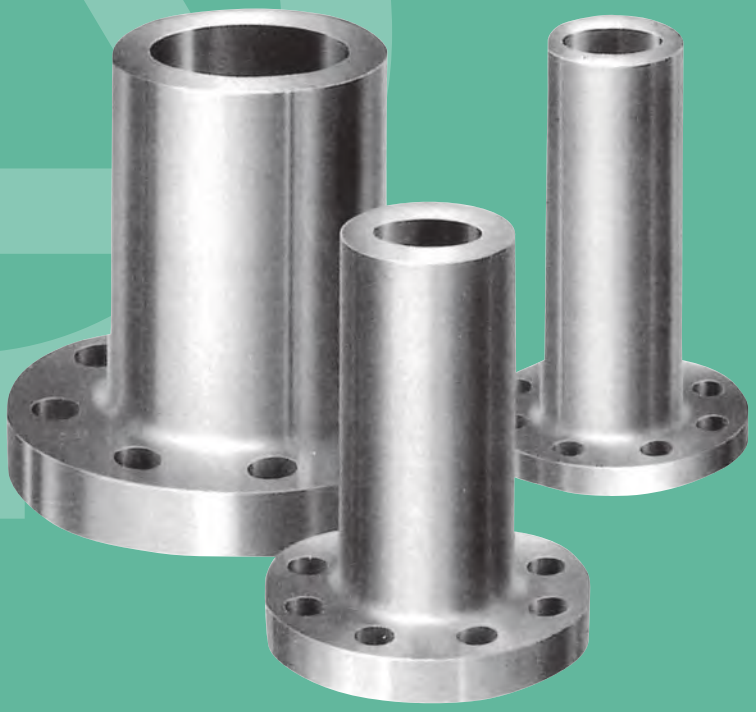
| Nominal Pipe Size | Pitch Diam. Ring & Groove | Width of Ring | Height of Ring | | Width Flat on Octa.Ring | Width of Groove | Depth of Groove | Diam. of R.F for Ring Joint or Lapped | Ring Number | Approximate Distance Between Flanges |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Oval | Octagonal | | | | | | |
| | P | A | B | H | C | F | E(L*) | K(Min) | | |
| 1/2 | 42.88 | 8.0 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 65.0 | R13 | 4 |
| 3/4 | 50.8 | 8.0 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 73.0 | R16 | 4 |
| 1 | 60.33 | 8.0 | 14.3 | 12.7 | 5.2 | 8.74 | 6.35 | 82.5 | R18 | 4 |
| 1 1/4 | 72.23 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 102.0 | R21 | 3 |
| 1 1/2 | 82.55 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 114.0 | R23 | 3 |
| 2 | 101.6 | 11.1 | 17.5 | 15.9 | 7.7 | 11.91 | 7.92 | 133.0 | R26 | 3 |
| 2 1/2 | 111.13 | 12.7 | 19.1 | 17.5 | 8.7 | 13.49 | 9.53 | 149.0 | R28 | 3 |
| 3 | 127.0 | 12.7 | 19.1 | 17.5 | 8.7 | 13.49 | 9.53 | 168.0 | R32 | 3 |
| 4 | 157.18 | 15.9 | 22.2 | 20.7 | 10.5 | 16.66 | 11.13 | 203.0 | R38 | 4 |
| 5 | 190.5 | 19.1 | 25.4 | 23.8 | 12.3 | 19.84 | 12.7 | 241.0 | R42 | 4 |
| 6 | 228.6 | 19.1 | 25.4 | 23.8 | 12.3 | 19.84 | 12.7 | 279.0 | R47 | 4 |
| 8 | 279.4 | 22.2 | 28.6 | 27.0 | 14.8 | 23.01 | 14.27 | 340.0 | R51 | 5 |
| 10 | 342.9 | 28.6 | 36.5 | 34.9 | 19.8 | 30.18 | 17.48 | 425.0 | R55 | 6 |
| 12 | 406.4 | 31.8 | 39.7 | 38.1 | 22.3 | 33.32 | 17.48 | 495.0 | R60 | 8 |

Notes :

Unless otherwise specified by the customer, Ring Type Joint Flanges will be furnished in accordance with these details. The depth of groove is added to the minimum flanges thickness.
* Raised face "L" is equal to groove dimension "E" but is not subject to tolerance for "E"
* A plus tolerance of 3/64 in, for heights B and H is permitted providing the variation in the height of any given ring does not exceed 1/64 in, throughtout its entire circumference.
Dimension "R" is max.
Radius "r" is 1/16 for ring widths 7/8″ and less 3/32″ for ring width 1″ and over.

TOLERANCES :

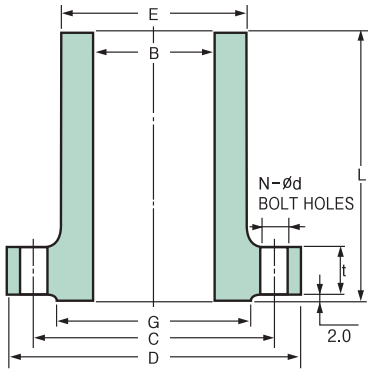
* E (depth) +0.4, −0.0
* F (width) ±0.2
* P (pitch diameter) ±0.13
* R (radius at bottom)
R≤2+0.8, −0.0
R≥2±0.8
* 23 deg (angle) ± 1/2 deg



# LONG WELDING NECK FLANGES

- Class 150 Flanges
- Class 300 Flanges
- Class 400 Flanges
- Class 600 Flanges
- Class 900 Flanges
- Class 1500 Flanges
- Class 2500 Flanges






## CLASS 150

Unit : mm

| Nominal Pipe Size | Outside Diameter | O.D of Raised Face | Hub Diam. at Bevel | Diameter of Bore | Thickness of Flange Min | Length Through Hub | Diameter of Bolt Circle | Number of Holes | Diameter of Holes |
|---|---|---|---|---|---|---|---|---|---|
| | D | G | E | B | t | L | C | N | d |
| 1/2 | 90 | 34.9 | 30 | 12.7 | 9.6 | 229 | 60.3 | 4 | 15.9 |
| 3/4 | 100 | 42.9 | 38 | 19.1 | 11.2 | 229 | 69.9 | 4 | 15.9 |
| 1 | 110 | 50.8 | 49 | 25.4 | 12.7 | 229 | 79.4 | 4 | 15.9 |
| 1 1/4 | 115 | 63.5 | 59 | 31.8 | 14.3 | 229 | 88.9 | 4 | 15.9 |
| 1 1/2 | 125 | 73.0 | 65 | 38.1 | 15.9 | 229 | 98.4 | 4 | 15.9 |
| 2 | 150 | 92.1 | 78 | 50.8 | 17.5 | 229 | 120.7 | 4 | 19.1 |
| 2 1/2 | 180 | 104.8 | 90 | 63.5 | 20.7 | 229 | 139.7 | 4 | 19.1 |
| 3 | 190 | 127.0 | 108 | 76.2 | 22.3 | 229 | 152.4 | 4 | 19.1 |
| 3 1/2 | 215 | 139.7 | 122 | 88.9 | 22.3 | 229 | 177.8 | 8 | 19.1 |
| 4 | 230 | 157.2 | 135 | 101.6 | 22.3 | 229 | 190.5 | 8 | 19.1 |
| 5 | 255 | 185.7 | 164 | 127.0 | 22.3 | 305 | 215.9 | 8 | 22.2 |
| 6 | 280 | 215.9 | 192 | 152.4 | 23.9 | 305 | 241.3 | 8 | 22.2 |
| 8 | 345 | 269.9 | 246 | 203.2 | 27.0 | 305 | 298.5 | 8 | 22.2 |
| 10 | 405 | 323.8 | 305 | 254.0 | 28.6 | 305 | 362.0 | 12 | 25.4 |
| 12 | 485 | 381.0 | 365 | 304.8 | 30.2 | 305 | 431.8 | 12 | 25.4 |
| 14 | 535 | 412.8 | 400 | 355.6 | 33.4 | 305 | 476.3 | 12 | 28.6 |
| 16 | 595 | 469.9 | 457 | 406.4 | 35.0 | 305 | 539.8 | 16 | 28.6 |
| 18 | 635 | 533.4 | 505 | 457.2 | 38.1 | 305 | 577.9 | 16 | 31.8 |
| 20 | 700 | 584.2 | 559 | 508.0 | 41.3 | 305 | 635.0 | 20 | 31.8 |
| 24 | 815 | 692.2 | 663 | 609.6 | 46.1 | 305 | 749.3 | 20 | 34.9 |

## CLASS 300

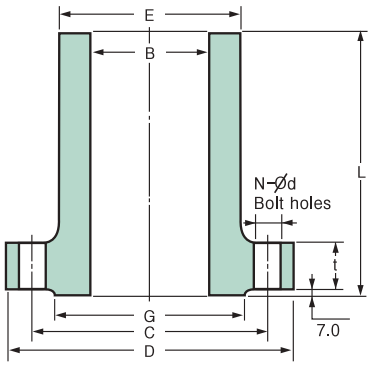
Unit : mm

| Nominal Pipe Size | Outside Diameter | O.D of Raised Face | Hub Diam. at Bevel | Diameter of Bore | Thickness of Flange Min | Length Through Hub | Diameter of Bolt Circle | Number of Holes | Diameter of Holes |
|---|---|---|---|---|---|---|---|---|---|
| | D | G | E | B | t | L | C | N | d |
| 1/2 | 95 | 34.9 | 38 | 12.7 | 12.7 | 229 | 66.7 | 4 | 15.9 |
| 3/4 | 115 | 42.9 | 48 | 19.1 | 14.3 | 229 | 82.6 | 4 | 19.1 |
| 1 | 125 | 50.8 | 54 | 25.4 | 15.9 | 229 | 88.9 | 4 | 19.1 |
| 1 1/4 | 135 | 63.5 | 64 | 31.8 | 17.5 | 229 | 98.4 | 4 | 19.1 |
| 1 1/2 | 155 | 73.0 | 70 | 38.1 | 19.1 | 229 | 114.3 | 4 | 22.2 |
| 2 | 165 | 92.1 | 84 | 50.8 | 20.7 | 229 | 127.0 | 8 | 19.1 |
| 2 1/2 | 190 | 104.8 | 100 | 63.5 | 23.9 | 229 | 149.2 | 8 | 22.2 |
| 3 | 210 | 127.0 | 117 | 76.2 | 27.0 | 229 | 168.3 | 8 | 22.2 |
| 3 1/2 | 230 | 139.7 | 133 | 88.9 | 28.6 | 229 | 184.2 | 8 | 22.2 |
| 4 | 255 | 157.2 | 146 | 101.6 | 30.2 | 229 | 200.0 | 8 | 22.2 |
| 5 | 280 | 185.7 | 178 | 127.0 | 33.4 | 305 | 235.0 | 8 | 22.2 |
| 6 | 320 | 215.9 | 206 | 152.4 | 35.0 | 305 | 269.9 | 12 | 22.2 |
| 8 | 380 | 269.9 | 260 | 203.2 | 39.7 | 305 | 330.2 | 12 | 25.4 |
| 10 | 445 | 323.8 | 321 | 254.0 | 46.1 | 305 | 387.4 | 16 | 28.6 |
| 12 | 520 | 381.0 | 375 | 304.8 | 49.3 | 305 | 450.8 | 16 | 31.8 |
| 14 | 585 | 412.8 | 425 | 355.6 | 52.4 | 305 | 514.4 | 20 | 31.8 |
| 16 | 650 | 469.9 | 483 | 406.4 | 55.6 | 305 | 571.5 | 20 | 34.9 |
| 18 | 710 | 533.4 | 533 | 457.2 | 58.8 | 305 | 628.6 | 24 | 34.9 |
| 20 | 775 | 584.2 | 587 | 508.0 | 62.0 | 305 | 685.8 | 24 | 34.9 |
| 24 | 915 | 692.2 | 702 | 609.6 | 68.3 | 305 | 812.8 | 24 | 41.3 |

Notes :
(1) Bore(B) is the same as nominal pipe size.
(2) Welding neck longer than listed are available in all sizes on special order.
(3) E=diameter of hub tolerance (3mm-0) B16.5-2013

# LONG WELDING NECK FLANGES






## CLASS 400

Unit : mm

| Nominal Pipe Size | Outside Diameter | O.D of Raised Face | Hub Diam. at Bevel | Diameter of Bore | Thickness of Flange Min | Length Through Hub | Diameter of Bolt Circle | Number of Holes | Diameter of Holes |
|---|---|---|---|---|---|---|---|---|---|
| | D | G | E | B | t | L | C | N | d |
| 1 | 125 | 50.8 | 54 | 25.4 | 17.5 | 229 | 88.9 | 4 | 19.1 |
| 1 1/4 | 135 | 63.5 | 64 | 31.8 | 20.7 | 229 | 98.4 | 4 | 19.1 |
| 1 1/2 | 155 | 73.0 | 70 | 38.1 | 22.3 | 229 | 114.3 | 4 | 22.2 |
| 2 | 165 | 92.1 | 84 | 50.8 | 25.4 | 229 | 127.0 | 8 | 19.1 |
| 2 1/2 | 190 | 104.8 | 100 | 63.5 | 28.6 | 229 | 149.2 | 8 | 22.2 |
| 3 | 210 | 127.0 | 117 | 76.2 | 31.8 | 229 | 168.3 | 8 | 22.2 |
| 3 1/2 | 230 | 139.7 | 133 | 88.9 | 35.0 | 229 | 184.2 | 8 | 25.4 |
| 4 | 255 | 157.2 | 146 | 101.6 | 35.0 | 229 | 200.0 | 8 | 25.4 |
| 5 | 280 | 185.7 | 178 | 127.0 | 38.1 | 305 | 235.0 | 8 | 25.4 |
| 6 | 320 | 215.9 | 206 | 152.4 | 41.3 | 305 | 269.9 | 12 | 25.4 |
| 8 | 380 | 269.9 | 260 | 203.2 | 47.7 | 305 | 330.0 | 12 | 28.6 |
| 10 | 445 | 323.8 | 321 | 254.0 | 54.0 | 305 | 387.4 | 16 | 31.8 |
| 12 | 520 | 381.0 | 375 | 304.8 | 57.2 | 305 | 450.8 | 16 | 34.9 |
| 14 | 585 | 412.8 | 425 | 355.6 | 60.4 | 305 | 514.4 | 20 | 34.9 |
| 16 | 650 | 469.9 | 483 | 406.4 | 63.5 | 305 | 571.5 | 20 | 38.1 |
| 18 | 710 | 533.4 | 533 | 457.2 | 66.7 | 305 | 628.6 | 24 | 38.1 |
| 20 | 775 | 584.2 | 587 | 508.0 | 69.9 | 305 | 685.8 | 24 | 41.3 |
| 24 | 915 | 692.2 | 702 | 609.6 | 76.2 | 305 | 812.8 | 24 | 47.6 |

## CLASS 600

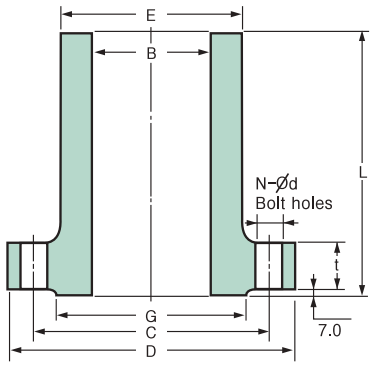
Unit : mm

| Nominal Pipe Size | Outside Diameter | O.D of Raised Face | Hub Diam. at Bevel | Diameter of Bore | Thickness of Flange Min | Length Through Hub | Diameter of Bolt Circle | Number of Holes | Diameter of Holes |
|---|---|---|---|---|---|---|---|---|---|
| | D | G | E | B | t | L | C | N | d |
| 1 | 125 | 50.8 | 54 | 25.4 | 17.5 | 229 | 88.9 | 4 | 19.1 |
| 1 1/4 | 135 | 63.5 | 64 | 31.8 | 20.7 | 229 | 98.4 | 4 | 19.1 |
| 1 1/2 | 155 | 73.0 | 70 | 38.1 | 22.3 | 229 | 114.3 | 4 | 22.2 |
| 2 | 165 | 92.1 | 84 | 50.8 | 25.4 | 229 | 127.0 | 8 | 19.1 |
| 2 1/2 | 190 | 104.8 | 100 | 63.5 | 28.6 | 229 | 149.2 | 8 | 22.2 |
| 3 | 210 | 127.0 | 117 | 76.2 | 31.8 | 229 | 168.3 | 8 | 22.2 |
| 3 1/2 | 230 | 139.7 | 133 | 88.9 | 35.0 | 229 | 184.2 | 8 | 25.4 |
| 4 | 275 | 157.2 | 152 | 101.6 | 38.1 | 229 | 215.9 | 8 | 25.4 |
| 5 | 330 | 185.7 | 189 | 127.0 | 44.5 | 305 | 266.7 | 8 | 28.6 |
| 6 | 355 | 215.9 | 222 | 152.4 | 47.7 | 305 | 292.1 | 12 | 28.6 |
| 8 | 420 | 269.9 | 273 | 203.2 | 55.6 | 305 | 349.2 | 12 | 31.8 |
| 10 | 510 | 323.8 | 343 | 254.0 | 63.5 | 305 | 431.8 | 16 | 34.9 |
| 12 | 560 | 381.0 | 400 | 304.8 | 66.7 | 305 | 489.0 | 20 | 34.9 |
| 14 | 605 | 412.8 | 432 | 355.6 | 69.9 | 305 | 527.0 | 20 | 38.1 |
| 16 | 685 | 469.9 | 495 | 406.4 | 76.2 | 305 | 603.2 | 20 | 41.3 |
| 18 | 745 | 533.4 | 546 | 457.2 | 82.6 | 305 | 654.0 | 20 | 44.5 |
| 20 | 815 | 584.2 | 610 | 508.0 | 88.9 | 305 | 723.9 | 24 | 44.5 |
| 24 | 940 | 692.2 | 718 | 609.6 | 101.6 | 305 | 838.2 | 24 | 50.8 |

Notes :
(1) Bore(B) is the same as nominal pipe size.
(2) Welding neck longer than listed are available in all sizes on special order.
(3) E=diameter of hub tolerance (3mm–0) B16.5–2013

# LONG WELDING NECK FLANGES






## CLASS 900

Unit : mm

| Nominal Pipe Size | Outside Diameter | O.D of Raised Face | Hub Diam. at Bevel | Diameter of Bore | Thickness of Flange Min | Length Through Hub | Diameter of Bolt Circle | Number of Holes | Diameter of Holes |
|---|---|---|---|---|---|---|---|---|---|
| | D | G | E | B | t | L | C | N | d |
| 1 | 150 | 50.8 | 52 | 25.4 | 28.6 | 229 | 101.6 | 4 | 25.4 |
| 1 1/4 | 160 | 63.5 | 64 | 31.8 | 28.6 | 229 | 111.1 | 4 | 25.4 |
| 1 1/2 | 180 | 73.0 | 70 | 38.1 | 31.8 | 229 | 123.8 | 4 | 28.6 |
| 2 | 215 | 92.1 | 105 | 50.8 | 38.1 | 229 | 165.1 | 8 | 25.4 |
| 2 1/2 | 245 | 104.8 | 124 | 63.5 | 41.3 | 229 | 190.5 | 8 | 28.6 |
| 3 | 240 | 127.0 | 127 | 76.2 | 38.1 | 229 | 190.5 | 8 | 25.4 |
| 4 | 290 | 157.2 | 159 | 101.6 | 44.5 | 229 | 235.0 | 8 | 31.8 |
| 5 | 350 | 185.7 | 190 | 127.0 | 50.8 | 305 | 279.4 | 8 | 34.9 |
| 6 | 380 | 215.9 | 235 | 152.4 | 55.6 | 305 | 317.5 | 12 | 31.8 |
| 8 | 470 | 269.9 | 298 | 203.2 | 63.5 | 305 | 393.7 | 12 | 38.1 |
| 10 | 545 | 323.8 | 368 | 254.0 | 69.9 | 305 | 469.9 | 16 | 38.1 |
| 12 | 610 | 381.0 | 419 | 304.8 | 79.4 | 305 | 533.4 | 20 | 38.1 |
| 14 | 640 | 412.8 | 451 | 355.6 | 85.8 | 305 | 558.8 | 20 | 41.3 |
| 16 | 705 | 469.9 | 508 | 406.4 | 88.9 | 305 | 616.0 | 20 | 44.5 |
| 18 | 785 | 533.4 | 565 | 457.2 | 101.6 | 305 | 685.8 | 20 | 50.8 |
| 20 | 855 | 584.2 | 622 | 508.0 | 108.0 | 305 | 749.3 | 20 | 54.0 |
| 24 | 1040 | 692.2 | 749 | 609.6 | 139.7 | 305 | 901.7 | 20 | 66.7 |

## CLASS 1500

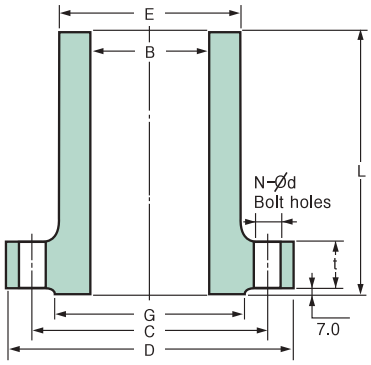
Unit : mm

| Nominal Pipe Size | Outside Diameter | O.D of Raised Face | Hub Diam. at Bevel | Diameter of Bore | Thickness of Flange Min | Length Through Hub | Diameter of Bolt Circle | Number of Holes | Diameter of Holes |
|---|---|---|---|---|---|---|---|---|---|
| | D | G | E | B | t | L | C | N | d |
| 1 | 150 | 50.8 | 52 | 25.4 | 28.6 | 229 | 101.6 | 4 | 25.4 |
| 1 1/4 | 160 | 63.5 | 64 | 31.8 | 28.6 | 229 | 111.1 | 4 | 25.4 |
| 1 1/2 | 180 | 73.0 | 70 | 38.1 | 31.8 | 229 | 123.8 | 4 | 28.6 |
| 2 | 215 | 92.1 | 105 | 50.8 | 38.1 | 229 | 165.1 | 8 | 25.4 |
| 2 1/2 | 245 | 104.8 | 124 | 63.5 | 41.3 | 229 | 190.5 | 8 | 28.6 |
| 3 | 265 | 127.0 | 133 | 76.2 | 47.7 | 229 | 203.2 | 8 | 31.8 |
| 4 | 310 | 157.2 | 162 | 101.6 | 54.0 | 229 | 241.3 | 8 | 34.9 |
| 5 | 375 | 185.7 | 197 | 127.0 | 73.1 | 305 | 292.1 | 8 | 41.3 |
| 6 | 395 | 215.9 | 229 | 152.4 | 82.6 | 305 | 317.5 | 12 | 38.1 |
| 8 | 485 | 269.9 | 292 | 203.2 | 92.1 | 305 | 393.7 | 12 | 44.5 |
| 10 | 585 | 323.8 | 368 | 254.0 | 108.0 | 305 | 482.6 | 12 | 50.8 |
| 12 | 675 | 381.0 | 451 | 304.8 | 123.9 | 305 | 571.5 | 16 | 54.0 |
| 14 | 750 | 412.8 | 495 | 355.6 | 133.4 | 305 | 635.0 | 16 | 60.3 |
| 16 | 825 | 469.9 | 552 | 406.4 | 146.1 | 305 | 704.8 | 16 | 66.7 |
| 18 | 915 | 533.4 | 597 | 457.2 | 162.0 | 305 | 774.7 | 16 | 73.0 |
| 20 | 985 | 584.2 | 641 | 508.0 | 177.8 | 305 | 831.8 | 16 | 79.4 |
| 24 | 1170 | 692.2 | 762 | 609.6 | 203.2 | 305 | 990.6 | 16 | 92.1 |

Notes :
(1) Bore(B) is the same as nominal pipe size.
(2) Welding neck longer than listed are available in all sizes on special order.
(3) E=diameter of hub tolerance (3mm-0) B16.5-2013

# LONG WELDING NECK FLANGES






## CLASS 2500

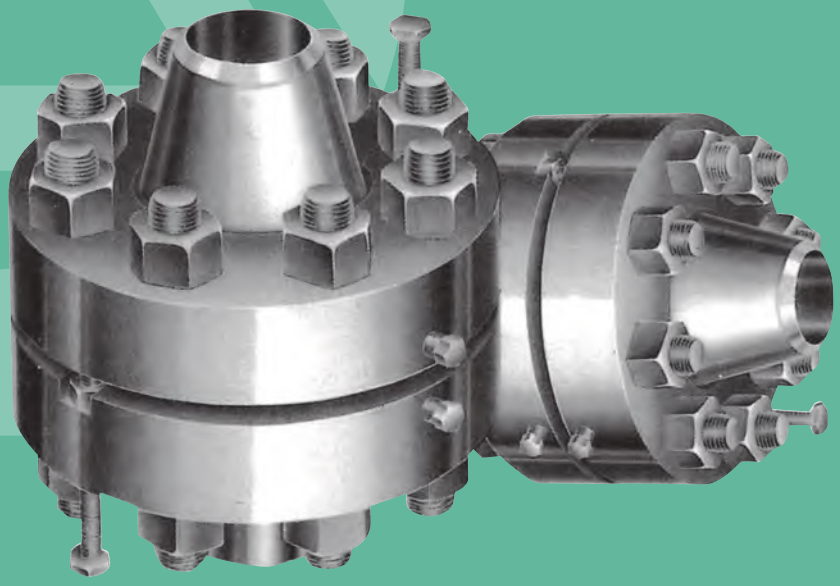
Unit : mm

| Nominal Pipe Size | Outside Diameter | O.D of Raised Face | Hub Diam. at Bevel | Diameter of Bore | Thickness of Flange Min | Length Through Hub | Diameter of Bolt Circle | Number of Holes | Diameter of Holes |
|---|---|---|---|---|---|---|---|---|---|
| | D | G | E | B | t | L | C | N4 | d |
| 1 | 160 | 50.8 | 57 | 25.4 | 35.0 | 229 | 108.0 | 4 | 25.4 |
| 1 1/4 | 185 | 63.5 | 73 | 31.8 | 38.1 | 229 | 130.2 | 4 | 28.6 |
| 1 1/2 | 205 | 73.0 | 79 | 38.1 | 44.5 | 229 | 146.0 | 4 | 31.8 |
| 2 | 235 | 92.1 | 95 | 50.8 | 50.9 | 229 | 171.4 | 8 | 28.6 |
| 2 1/2 | 265 | 104.8 | 114 | 63.5 | 57.2 | 229 | 196.8 | 8 | 31.8 |
| 3 | 305 | 127.0 | 133 | 76.2 | 66.7 | 229 | 228.6 | 8 | 34.9 |
| 4 | 355 | 157.2 | 165 | 101.6 | 76.2 | 229 | 273.0 | 8 | 41.3 |
| 5 | 420 | 185.7 | 203 | 127.0 | 92.1 | 305 | 323.8 | 8 | 47.6 |
| 6 | 485 | 215.9 | 235 | 152.4 | 108.0 | 305 | 368.3 | 8 | 54.0 |
| 8 | 550 | 269.9 | 305 | 203.2 | 127.0 | 305 | 438.2 | 12 | 54.0 |
| 10 | 675 | 323.8 | 375 | 254.0 | 165.1 | 305 | 539.8 | 12 | 66.7 |
| 12 | 760 | 381.0 | 441 | 304.8 | 184.2 | 305 | 619.1 | 12 | 73.0 |

Notes :

(1) Bore(B) is the same as nominal pipe size.
(2) Welding neck longer than listed are available in all sizes on special order.
(3) E=diameter of hub tolerance (3mm–0) B16.5–2013

▶ Straight Hub Welding Flanges
– Straight Hub Welding Flanges are an extension of Welding Neck flanges and have straight hubs of uniform thickness.
With the exception of the following, the straight hub welding flanges shall have dimensions of the welding neck flanges of the size.

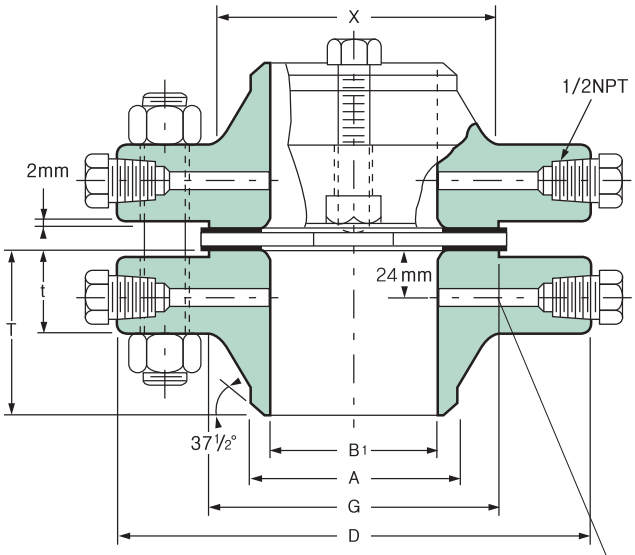


# ASME B16.36
# ORIFICE FLANGES(2006)

- Class 300 Flanges
- Class 600 Flanges
- Class 900,1500 Flanges
- Class 2500 Flanges

# CLASS 300 ORIFICE FLANGES

WELDING NECK (RAISED FACE)




Ø6.4 Drill for size 2 1/2 ″ and under
Ø9.5 Drill for size 3 ″
Ø12.7 Drill for size 4 ″ and Over

## ASME B16.36 FORGED FLANGES

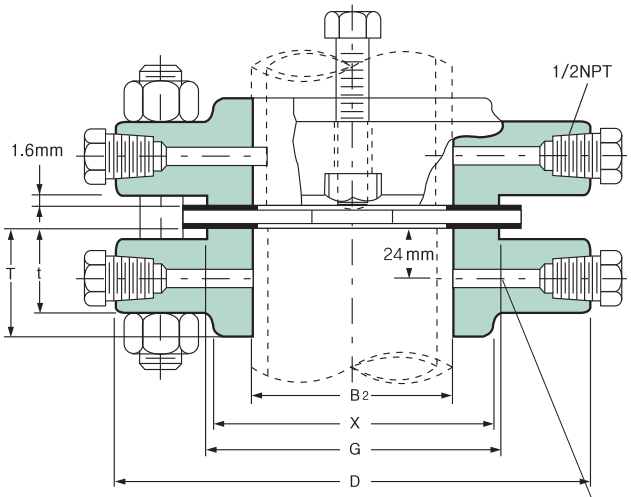
Unit : mm

| Nominal Pipe Size | Outside Diam. of Flange | THICKNESS OF FLANGE(t) | Diam. of Hub at Base | Diam. of Raised Face | Diam. of Hub. at Bevel | LENGTH THRU HUB(T) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Welding Neck | Slip-on & Threaded |
| | O | t | X | G | A | T | |
| 1 | 125 | 36.6 | 54 | 50.8 | 33.4 | 81 | 46 |
| 1 1/2 | 155 | 36.6 | 70 | 73.0 | 48.3 | 84 | 46 |
| 2 | 165 | 36.6 | 84 | 92.1 | 60.3 | 84 | 48 |
| 2 1/2 | 190 | 36.6 | 100 | 104.8 | 73.0 | 87 | 49 |
| 3 | 210 | 36.6 | 117 | 127.0 | 88.9 | 87 | 51 |
| 4 | 255 | 36.6 | 146 | 157.2 | 114.3 | 90 | 52 |
| 6 | 320 | 36.6 | 206 | 215.9 | 168.3 | 98 | 52 |
| 8 | 380 | 39.7 | 260 | 269.9 | 219.1 | 110 | 60 |
| 10 | 445 | 46.1 | 321 | 323.8 | 273.0 | 116 | 65 |
| 12 | 520 | 49.3 | 375 | 381.0 | 323.8 | 129 | 71 |
| 14 | 585 | 52.4 | 425 | 412.8 | 355.6 | 141 | 75 |
| 16 | 650 | 55.6 | 483 | 469.9 | 406.4 | 144 | 81 |
| 18 | 710 | 58.8 | 533 | 533.4 | 457.0 | 157 | 87 |
| 20 | 775 | 62.0 | 587 | 584.2 | 508.0 | 160 | 94 |
| 24 | 915 | 68.3 | 702 | 692.2 | 610.0 | 167 | 105 |

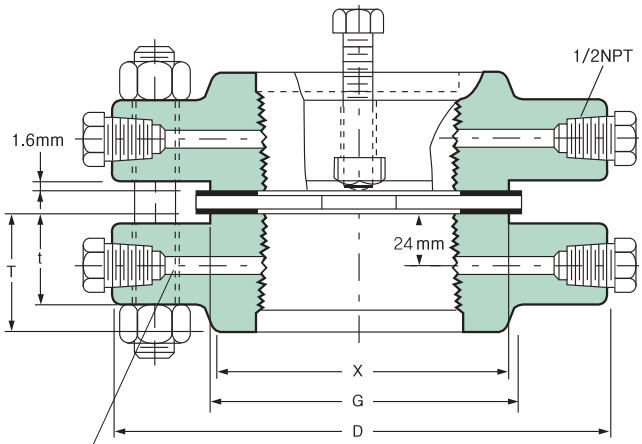
Notes :

(1) For the 'Bore'(B) of Welding Neck Flanges other than Standard Wall Thickness, refer to 70-71
(2) Class 300 Welding Neck Flanges of size 24" (609.6mm) and smaller will be bored to match Standard Wall Pipe unless otherwise specified.
(3) Class 300 Orifice flanges will be furnished with 0.06" (2mm) raised face, which is included in 'thickness' (t) and 'Length through Hub'(T)

SLIP-ON




THREADED




Ø6.4 Drill for size 2 1/2 ″ and under
Ø9.5 Drill for size 3 ″
Ø12.7 Drill for size 4 ″ and Over

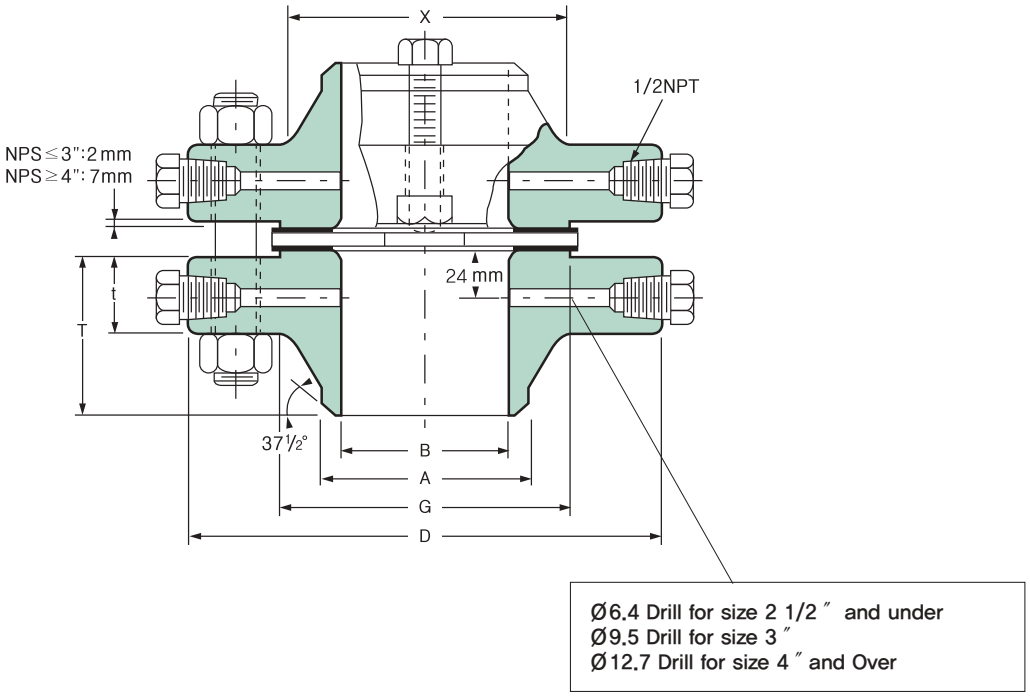
Unit : mm

| Nominal Pipe Size | BORE | DRILLING TEMPLATE | | | | |
|---|---|---|---|---|---|---|
| | SO & THREADED | Diam. Of Bolt Circle | Number of Holes | STUD BOLT | Diam. Of Holes | LENGTH OF STUD BOLT |
| | B2 | C | | | | |
| 1 | 34.5 | 88.9 | 4 | 5/8 | 17.5 | 125 |
| 1 1/2 | 49.5 | 114.3 | 4 | 3/4 | 20.6 | 135 |
| 2 | 61.9 | 127 | 8 | 5/8 | 17.5 | 125 |
| 2 1/2 | 74.6 | 149.2 | 8 | 3/4 | 20.6 | 135 |
| 3 | 90.7 | 168.3 | 8 | 3/4 | 20.6 | 135 |
| 4 | 116.1 | 200.0 | 8 | 3/4 | 20.6 | 135 |
| 6 | 170.7 | 269.9 | 12 | 3/4 | 22.2 | 135 |
| 8 | 221.5 | 330.2 | 12 | 7/8 | 25.4 | 145 |
| 10 | 276.2 | 387.4 | 16 | 1 | 28.6 | 165 |
| 12 | 327.0 | 450.8 | 16 | 1 1/8 | 31.8 | 180 |
| 14 | 359.2 | 514.4 | 20 | 1 1/8 | 31.8 | 185 |
| 16 | 410.5 | 571.5 | 20 | 1 1/4 | 34.9 | 195 |
| 18 | 461.8 | 628.6 | 24 | 1 1/4 | 34.9 | 205 |
| 20 | 513.1 | 685.8 | 24 | 1 1/4 | 34.9 | 215 |
| 24 | 616.0 | 812.8 | 24 | 1 1/2 | 41.3 | 240 |

(4) Bolt lengths for raised face flanges include allowance for orifice and gasket thickness of 0.25" (6mm) for NPS 1–12 and 0.38" (10mm) for NPS 14–24.

# CLASS 600 ORIFICE FLANGES

WELDING NECK (RAISED FACE)




## ASME B16.36 FORGED FLANGES

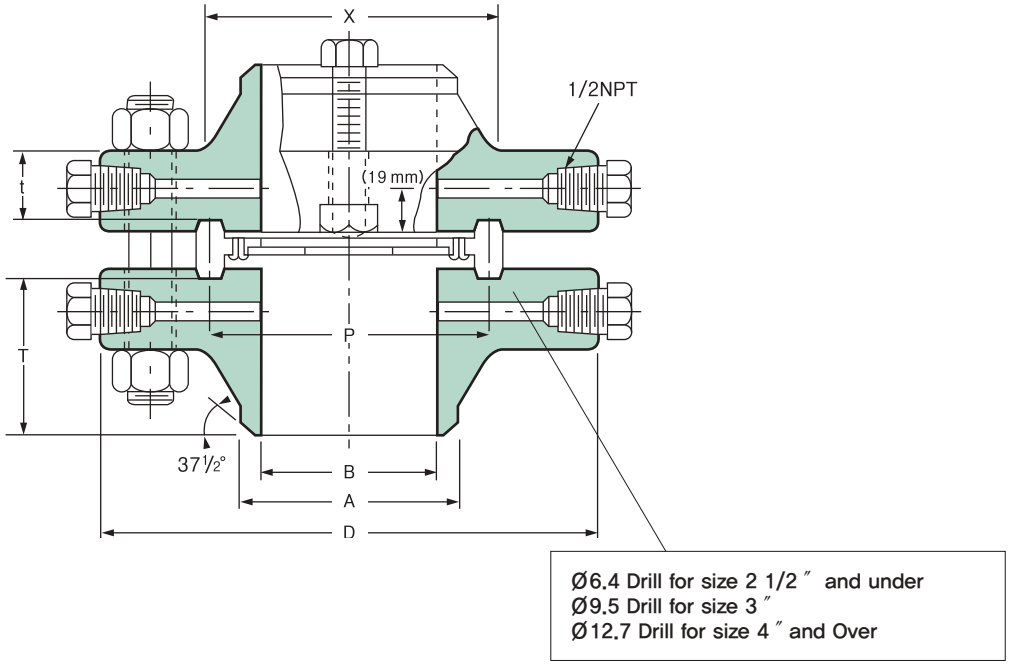
Unit : mm

| Nominal Pipe Size | Outsidediam. Of flange | Thikness of Flange | Diam. Of Hub at Base | Diam. Of Hub at Raised Face | Diam. Of Hub at Bevel | LENGTH – THRU HUB | Ring No |
|---|---|---|---|---|---|---|---|
| | O | t | X | G | A | T | |
| 1 | 125 | 36.6 | 54 | 50.8 | 33.5 | 81 | R16 |
| 1 1/2 | 155 | 36.6 | 70 | 73.0 | 48.3 | 84 | R20 |
| 2 | 165 | 36.6 | 84 | 92.1 | 60.3 | 84 | R23 |
| 2 1/2 | 190 | 36.6 | 100 | 104.8 | 73 | 87 | R26 |
| 3 | 210 | 36.6 | 117 | 127.0 | 88.9 | 87 | R31 |
| 4 | 275 | 38.1 | 152 | 157.2 | 114.3 | 102 | R37 |
| 6 | 355 | 47.7 | 222 | 215.9 | 168.3 | 117 | R45 |
| 8 | 420 | 55.6 | 273 | 269.9 | 219.1 | 133 | R49 |
| 10 | 510 | 63.5 | 343 | 323.8 | 273 | 152 | R53 |
| 12 | 560 | 66.7 | 400 | 381.0 | 323.8 | 156 | R57 |
| 14 | 605 | 69.9 | 432 | 412.8 | 355.6 | 165 | R61 |
| 16 | 685 | 76.2 | 495 | 469.9 | 406.4 | 178 | R65 |
| 18 | 745 | 82.6 | 546 | 533.4 | 457.2 | 184 | R69 |
| 20 | 815 | 88.9 | 610 | 584.2 | 508 | 190 | R73 |
| 24 | 940 | 101.6 | 718 | 692.2 | 609.6 | 203 | R77 |

Notes :

(1) For the inside diameter of pipes (corresponding to 'Bore' (B) of Welding Neck Flanges), refer to pare 70–71

## WELDING NECK (RING-TYPE JOINT)



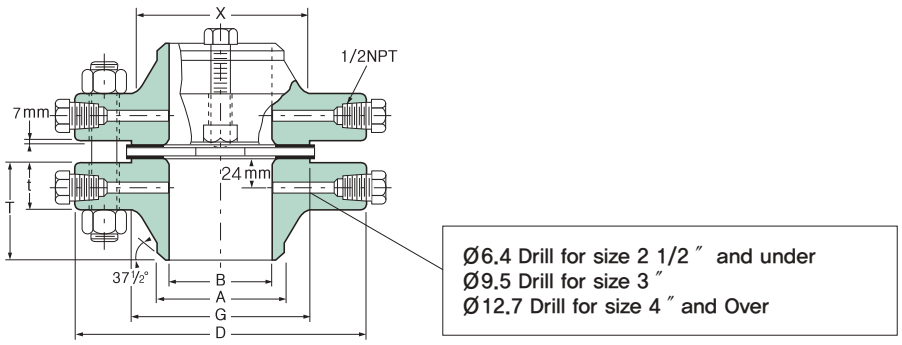

Unit : mm

| NOMINAL PIPE SIZE | Pitch Diameter | Groove Depth | Groove Width | DRILLING TEMPLATE | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Diam. Of Bolt Circle | Number of Holes | STUD BOLT | Diam. of Holes | | LENGTH OF STUD BOLT | |
| | P | E | F | C | | | RASED FACE | RING JOINT | RASED FACE | RING JOINT |
| 1 | 50.80 | 6.35 | 8.74 | 88.9 | 4 | 5/8 | 17.5 | 19.1 | 125 | 140 |
| 1 1/2 | 68.27 | 6.35 | 8.74 | 114.3 | 4 | 3/4 | 20.7 | 22.2 | 135 | 140 |
| 2 | 82.55 | 7.92 | 11.91 | 127.0 | 8 | 5/8 | 17.5 | 19.1 | 125 | 140 |
| 2 1/2 | 101.6 | 7.92 | 11.91 | 149.2 | 8 | 3/4 | 20.7 | 22.2 | 135 | 145 |
| 3 | 123.83 | 7.92 | 11.91 | 168.3 | 8 | 3/4 | 20.7 | 22.2 | 135 | 145 |
| 4 | 149.23 | 7.92 | 11.91 | 215.9 | 8 | 7/8 | 25.4 | 25.4 | 150 | 165 |
| 6 | 211.12 | 7.92 | 11.91 | 292.1 | 12 | 1 | 28.6 | 28.6 | 180 | 190 |
| 8 | 269.88 | 7.92 | 11.91 | 349.2 | 12 | 1 1/8 | 31.8 | 31.8 | 195 | 210 |
| 10 | 323.85 | 7.92 | 11.91 | 431.8 | 16 | 1 1/4 | 34.9 | 34.9 | 220 | 235 |
| 12 | 381.00 | 7.92 | 11.91 | 489.0 | 20 | 1 1/4 | 34.9 | 34.9 | 230 | 240 |
| 14 | 419.10 | 7.92 | 11.91 | 527.0 | 20 | 1 3/8 | 38.1 | 38.1 | 240 | 255 |
| 16 | 469.90 | 7.92 | 11.91 | 603.2 | 20 | 1 1/2 | 41.3 | 41.3 | 260 | 276 |
| 18 | 533.40 | 7.92 | 11.91 | 654.0 | 20 | 1 5/8 | 44.5 | 44.5 | 280 | 290 |
| 20 | 584.20 | 9.53 | 13.49 | 723.9 | 24 | 1 5/8 | 44.5 | 44.5 | 300 | 320 |
| 24 | 692.15 | 11.13 | 16.66 | 838.2 | 24 | 1 7/8 | 50.8 | 50.8 | 355 | 350 |

(2) Bolt lengths for raised face flanges include allowance for orifice and gasket thickness of 0.25" 6mm) for NPS 1-12 and 0.38" (10mm) for NPS 14-24. Bolt lengths for ring type joint flanges included allowance of 0.62" (15mm) for NPS 1-10, 0.75" (19mm) for NPS 12-18 and 0.88" (22.4mm) for NPS 20.

# CLASS 900-1500 ORIFICE FLANGES

WELDING NECK
(RAISED FACE)




## ASME B16.36 FORGED FLANGES

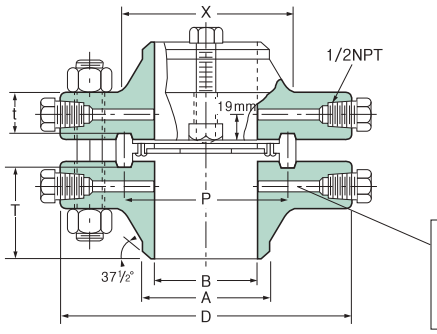
Unit : mm

| NOMINAL PIPE SIZE | Outside diam. Of flange | Thikness of Flange | Diam.Of Hub at Base | Diam. Of Hub at Raised Face | Diam. Of Hub at Bevel | LENGTH – THRU HUB | Ring No |
|---|---|---|---|---|---|---|---|
| | O | t | X | G | A | T | |
| CLASS 900 | | | | | | | |
| For NPS 2 1/2 and smaller, use class1500 | | | | | | | |
| 3 | 240 | 38.1 | 127 | 127.0 | 88.9 | 102 | R31 |
| 4 | 290 | 44.5 | 159 | 157.2 | 114.3 | 114 | R37 |
| 6 | 380 | 55.6 | 235 | 215.9 | 168.3 | 140 | R45 |
| 8 | 470 | 63.5 | 298 | 269.9 | 219.1 | 162 | R49 |
| 10 | 545 | 69.9 | 368 | 323.8 | 273.0 | 184 | R53 |
| 12 | 610 | 79.4 | 419 | 381.0 | 323.8 | 200 | R57 |
| 14 | 640 | 85.8 | 451 | 412.8 | 355.6 | 213 | R62 |
| 16 | 705 | 88.9 | 508 | 469.9 | 406.4 | 216 | R66 |
| 18 | 785 | 101.6 | 565 | 533.4 | 457.2 | 229 | R70 |
| 20 | 855 | 108 | 622 | 584.2 | 508.0 | 248 | R74 |
| 24 | 1040 | 139.7 | 749 | 692.2 | 609.6 | 292 | R78 |
| CLASS 1500 | | | | | | | |
| 1 | 150 | 38.1 | 52 | 50.8 | 33.5 | 83 | R16 |
| 1 1/2 | 180 | 38.1 | 70 | 73.0 | 48.3 | 89 | R20 |
| 2 | 215 | 38.1 | 105 | 92.1 | 60.3 | 102 | R24 |
| 2 1/2 | 245 | 41.3 | 124 | 104.8 | 73.0 | 105 | R27 |
| 3 | 265 | 47.7 | 133 | 127.0 | 88.9 | 117 | R35 |
| 4 | 310 | 54.0 | 162 | 157.2 | 114.3 | 124 | R39 |
| 6 | 395 | 82.6 | 229 | 215.9 | 168.3 | 171 | R46 |
| 8 | 485 | 92.1 | 292 | 269.9 | 219.1 | 213 | R50 |
| 10 | 585 | 108 | 368 | 323.8 | 273.0 | 254 | R54 |
| 12 | 675 | 123.9 | 451 | 381.0 | 323.8 | 283 | R58 |
| 14 | 750 | 133.4 | 495 | 412.8 | 355.6 | 298 | R63 |
| 16 | 825 | 146.1 | 552 | 469.9 | 406.4 | 311 | R67 |
| 18 | 915 | 162 | 597 | 533.4 | 457.2 | 327 | R71 |
| 20 | 985 | 177.8 | 641 | 584.2 | 508.0 | 356 | R75 |
| 24 | 1170 | 203.2 | 762 | 692.2 | 609.6 | 406 | R79 |

Notes :

(1) For the inside diameter of pipes (corresponding to 'Bore' (B) of Wilding Neck Flanges), refer to page 70–71
(2) Class 900 dimensions of size 1" (25.4mm) throught 2 1/2" are the same as for Class 1500.
(3) Class 900 and 1500 is not included in 'thickness' (t)and 'Length through Hub'(T).

## WELDING NECK
## (RING-TYPE JOINT)



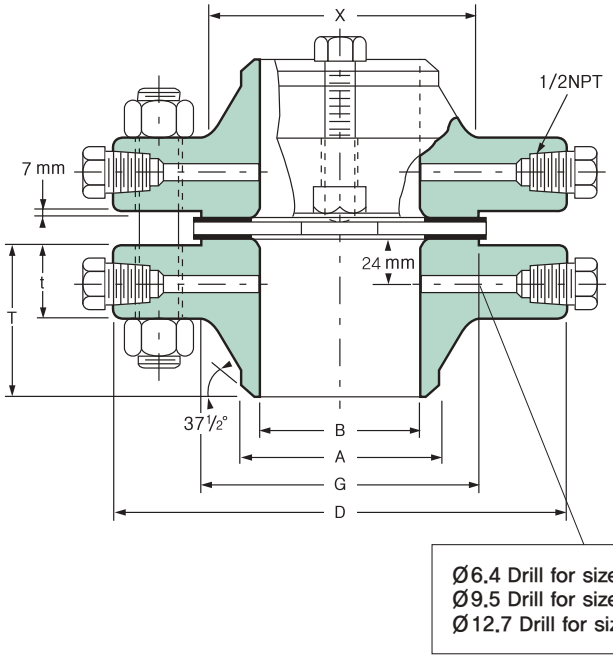

Unit : mm

| NOMINAL PIPE SIZE | Pitch Diameter | Groove Depth | Groove Width | DRILLING TEMPLATE | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Diam. Of Bolt Circle | Number of Holes | STUD BOLT | Diam. Of Holes | LENGTH OF STUD BOLT | |
| | P | E | F | C | | | | RF | RTJ |
| CLASS 900 | | | | | | | | | |
| For NPS 2 1/2 and smaller, use class1500 | | | | | | | | | |
| 3 | 123.83 | 7.92 | 11.91 | 190.5 | 8 | 7/8 | 25.4 | 150 | 165 |
| 4 | 149.23 | 7.92 | 11.91 | 235.0 | 8 | 1 1/8 | 31.8 | 180 | 190 |
| 6 | 211.12 | 7.92 | 11.91 | 317.5 | 12 | 1 1/8 | 31.8 | 195 | 210 |
| 8 | 269.88 | 7.92 | 11.91 | 393.7 | 12 | 1 3/8 | 38.1 | 230 | 240 |
| 10 | 323.85 | 7.92 | 11.91 | 469.9 | 16 | 1 3/8 | 38.1 | 240 | 255 |
| 12 | 381.00 | 7.92 | 11.91 | 533.4 | 20 | 1 3/8 | 38.1 | 260 | 275 |
| 14 | 419.10 | 11.13 | 16.66 | 558.8 | 20 | 1 1/2 | 41.3 | 280 | 290 |
| 16 | 469.90 | 11.13 | 16.66 | 616.0 | 20 | 1 5/8 | 44.5 | 290 | 305 |
| 18 | 533.40 | 12.70 | 19.84 | 685.8 | 20 | 1 7/8 | 50.8 | 330 | 350 |
| 20 | 584.20 | 12.70 | 19.84 | 749.3 | 20 | 2 | 54 | 355 | 375 |
| 24 | 692.15 | 15.88 | 26.97 | 901.7 | 20 | 2 1/2 | 66.7 | 445 | 470 |
| CLASS 1500 | | | | | | | | | |
| 1 | 50.80 | 6.35 | 8.74 | 101.6 | 4 | 7/8 | 25.4 | 150 | 160 |
| 1 1/2 | 68.27 | 6.35 | 8.74 | 123.8 | 4 | 1 | 28.6 | 160 | 165 |
| 2 | 95.25 | 7.92 | 11.91 | 165.1 | 8 | 7/8 | 25.4 | 150 | 165 |
| 2 1/2 | 107.95 | 7.92 | 11.91 | 190.5 | 8 | 1 | 28.6 | 165 | 180 |
| 3 | 136.53 | 7.92 | 11.91 | 203.2 | 8 | 1 1/8 | 31.8 | 185 | 185 |
| 4 | 161.93 | 7.92 | 11.91 | 241.3 | 8 | 1 1/4 | 34.9 | 205 | 215 |
| 6 | 211.14 | 9.52 | 13.49 | 317.5 | 12 | 1 3/8 | 38.1 | 265 | 280 |
| 8 | 269.88 | 11.13 | 16.66 | 393.7 | 12 | 1 5/8 | 44.5 | 300 | 310 |
| 10 | 323.85 | 11.13 | 16.66 | 482.6 | 12 | 1 7/8 | 50.8 | 345 | 355 |
| 12 | 381.00 | 14.27 | 23.01 | 571.6 | 16 | 2 | 54.0 | 380 | 400 |
| 14 | 419.10 | 15.88 | 26.97 | 635.0 | 16 | 2 1/4 | 60.3 | 415 | 445 |
| 16 | 469.90 | 17.48 | 30.18 | 704.8 | 16 | 2 1/2 | 66.7 | 450 | 485 |
| 18 | 533.40 | 17.48 | 30.18 | 774.7 | 16 | 2 3/4 | 73.0 | 500 | 535 |
| 20 | 584.20 | 17.48 | 33.32 | 831.8 | 16 | 3 | 79.4 | 545 | 570 |
| 24 | 692.15 | 20.62 | 36.53 | 990.6 | 16 | 3 1/2 | 92.1 | 620 | 660 |

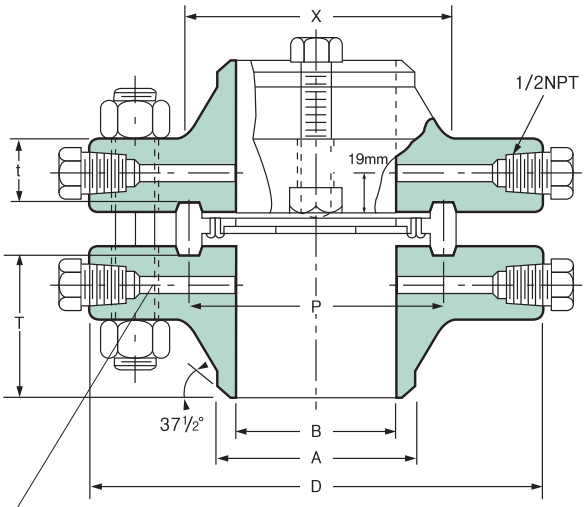
(5) Bot lengths for raised face flanges include allowance for orifice and gasket thickness of 0.25" (6mm) for NPS 3-12(#900), 1-12(#1500) and 0.38" (9mm) for NPS 14-24(#900, #1500). Bolt lengths for ring type joint flanges include. Allowance of 0.62 in (15mm) for NPS 3-10(#900). NPS 1-6(#1500) and 0.75 in (19mm) for NPS 12 (#900)

# CLASS 2500 ORIFICE FLANGES

WELDING NECK (RAISED FACE)




WELDING NECK (RING-TYPE JOINT)




Ø6.4 Drill for size 2 1/2″ and under
Ø9.5 Drill for size 3″
Ø12.7 Drill for size 4″ and Over

## ASME B16.36 FORGED FLANGES

Unit : mm

| NOMINAL PIPE SIZE | Outside diam. Of flange | Thikness of Flange | Diam. Of Hub at Base | Diam. Of Hub at Raised Face | Diam. Of Hub at Bevel | LENGTH – THRU HUB | Ring No |
|---|---|---|---|---|---|---|---|
| | O | t | X | G | A | T | |
| 1 | 160 | 38.1 | 57 | 50.8 | 33.5 | 92 | R18 |
| 1 1/2 | 205 | 44.5 | 79 | 73.0 | 48.3 | 111 | R23 |
| 2 | 235 | 50.8 | 95 | 92.1 | 60.3 | 127 | R26 |
| 2 1/2 | 265 | 57.2 | 114 | 104.8 | 73.0 | 143 | R28 |
| 3 | 305 | 66.7 | 133 | 127.0 | 88.9 | 168 | R32 |
| 4 | 355 | 76.2 | 165 | 157.2 | 114.3 | 190 | R38 |
| 6 | 485 | 108.0 | 235 | 215.9 | 168.3 | 273 | R47 |
| 8 | 550 | 127.0 | 305 | 269.9 | 219.1 | 318 | R51 |
| 10 | 675 | 165.1 | 375 | 323.8 | 273.0 | 419 | R55 |
| 12 | 760 | 184.2 | 441 | 381.0 | 323.8 | 464 | R60 |

| NOMINAL PIPE SIZE | Pitch Diameter | Groove Depth | Groove Width | DRILLING TEMPLATE | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Diam. Of Bolt Circle | Number of Holes | STUD BOLT | Diam. Of Holes | LENGTH OF STUD BOLT | |
| | P | E | F | C | | | | RF | RTJ |
| 1 | 60.33 | 6.35 | 8.74 | 108 | 4 | 7/8 | 25.4 | 150 | 160 |
| 1 1/2 | 82.55 | 7.92 | 11.91 | 146 | 4 | 1 1/8 | 31.8 | 180 | 190 |
| 2 | 101.60 | 7.92 | 11.91 | 171.4 | 8 | 1 | 28.6 | 185 | 195 |
| 2 1/2 | 111.13 | 9.53 | 13.49 | 196.8 | 8 | 1 1/8 | 31.8 | 205 | 215 |
| 3 | 127.00 | 9.53 | 13.49 | 228.6 | 8 | 1 1/4 | 34.9 | 230 | 240 |
| 4 | 157.18 | 11.13 | 16.66 | 273 | 8 | 1 1/2 | 41.3 | 260 | 275 |
| 6 | 228.60 | 12.70 | 19.84 | 368.3 | 8 | 2 | 54 | 350 | 370 |
| 8 | 279.40 | 14.27 | 23.01 | 438.2 | 12 | 2 | 54 | 385 | 405 |
| 10 | 342.90 | 17.48 | 30.18 | 539.8 | 12 | 2 1/2 | 66.7 | 490 | 515 |
| 12 | 406.40 | 17.48 | 33.32 | 619.1 | 12 | 2 3/4 | 73 | 540 | 570 |

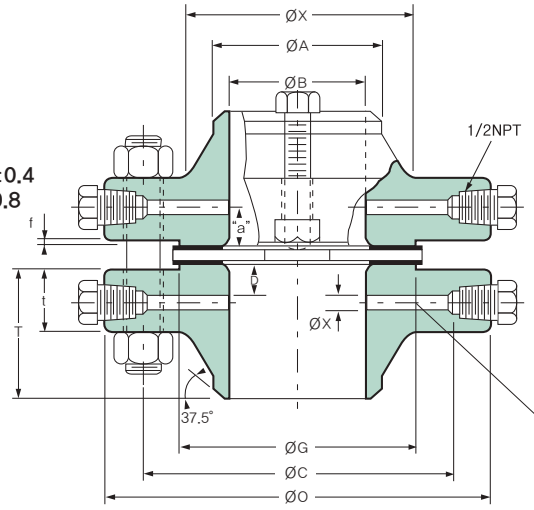


# SAMIL P&F ORIFICE FLANGES

- Class 150 Flanges
- Class 300 Flanges
- Class 600 Flanges
- Class 900 Flanges
- Class 1500 Flanges

# CLASS 150 FLANGES

"a" LOCATION
24 = GASKET 1.5T (D3)
23 = GASKET 3.0T (D2)
22 = GASKET 4.5T (D1)
*Tolerance : 3 ″ and under = ±0.4
4 ″ and over = ±0.8




150# : f = 2
300# : f = 2
600# : f = 2(3 ″ and under)
f = 7(4 ″ and over)
900#, 1500#, 2500# : f = 7

Ø6.4 Drill for size 2 1/2 ″ and under
Ø9.5 Drill for size 3 ″
Ø12.7 Drill for size 4 ″ and Over

| INCH | Ø | TOLERANCE | D1 | RANGE | D2 | RANGE | D3 | RAMGE | REMARK |
|---|---|---|---|---|---|---|---|---|---|
| ~2 1/2" | 6.4 | ±0.4 | 18.8 | 18.4~19.2 | 19.8 | 19.4~20.2 | 20.8 | 20.4~21.2 | Measure the inside diameter |
| 3" | 9.5 | ±0.4 | 17.25 | 16.85~17.65 | 18.25 | 17.85~18.65 | 19.25 | 18.85~19.65 | |
| 4"~ | 12.7 | ±0.8 | 15.65 | 14.85~16.45 | 16.65 | 15.85~17.45 | 17.65 | 16.85~18.45 | |

## CLASS 150

Unit : mm

| Nominal Pipe Size | Outside Diameter | Thick – ness | Raise of Face | Hub Length | Hub Dia. Base | Point Of Weld. | Tap Hole Size | Bolt Circle | Hole Of Dia. | Hole Of No. | Bolt Size & Length | Jack Bolt & Length | Appx. Weht (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | O | t | G | T | X | A | | B.C.D | | | | | |
| 1/2 | 89 | 38.1 | 35.1 | 74.7 | 30.2 | 21.3 | 6.4 | 60.5 | 15.7 | 4 | 1/2″ X130 | 1/2″ X75 | 4.5 |
| 3/4 | 98.6 | 38.1 | 42.9 | 77.7 | 38.1 | 26.7 | 6.4 | 69.9 | 15.7 | 4 | 1/2″ X130 | 1/2″ X75 | 4.5 |
| 1 | 108 | 38.1 | 50.8 | 79.5 | 49.3 | 33.5 | 6.4 | 79.2 | 15.7 | 4 | 1/2″ X130 | 1/2″ X75 | 8.2 |
| 1 1/2 | 127 | 38.1 | 73.2 | 82.6 | 65 | 48.3 | 6.4 | 98.6 | 15.7 | 4 | 1/2″ X130 | 1/2″ X75 | 11.3 |
| 2 | 152.4 | 38.1 | 91.9 | 82.6 | 77.7 | 60.5 | 6.4 | 120.7 | 19.1 | 4 | 5/8″ X140 | 5/8″ X75 | 12.3 |
| 2 1/2 | 177.8 | 38.1 | 104.6 | 85.6 | 90.4 | 73.2 | 6.4 | 139.7 | 19.1 | 4 | 5/8″ X140 | 5/8″ X75 | 15.9 |
| 3 | 190.5 | 38.1 | 127 | 85.6 | 108.0 | 88.9 | 9.5 | 152.4 | 19.1 | 4 | 5/8″ X140 | 5/8″ X75 | 19.5 |
| 4 | 228.6 | 38.1 | 157.2 | 90.4 | 134.9 | 114.3 | 12.7 | 190.5 | 19.1 | 8 | 5/8″ X140 | 5/8″ X75 | 30 |
| 6 | 279.4 | 38.1 | 215.9 | 100.1 | 192.1 | 168.4 | 12.7 | 241.3 | 22.4 | 8 | 3/4″ X145 | 3/4″ X75 | 48.1 |
| 8 | 342.9 | 38.1 | 269.7 | 111.3 | 246.1 | 219.2 | 12.7 | 298.5 | 22.4 | 8 | 3/4″ X145 | 3/4″ X75 | 68.1 |
| 10 | 406.4 | 38.1 | 323.9 | 109.5 | 304.8 | 273.1 | 12.7 | 362 | 25.4 | 12 | 7/8″ X160 | 7/8″ X115 | 98 |
| 12 | 482.6 | 38.1 | 381 | 120.7 | 365.3 | 323.9 | 12.7 | 431.8 | 25.4 | 12 | 7/8″ X160 | 7/8″ X115 | 148.4 |
| 14 | 533.4 | 38.1 | 412.8 | 130 | 400.1 | 355.6 | 12.7 | 476.3 | 28.4 | 12 | 1″ X160 | 1″ X115 | 203.3 |
| 16 | 596.9 | 38.1 | 469.9 | 128.5 | 457.2 | 406.4 | 12.7 | 539.8 | 28.4 | 16 | 1″ X160 | 1″ X115 | 270.5 |
| 18 | 635 | 39.6 | 533.4 | 139.7 | 505.0 | 457.2 | 12.7 | 577.9 | 31.8 | 16 | 1 1/8″ X180 | 1″ X115 | 336.3 |
| 20 | 698.5 | 42.9 | 584.2 | 144.5 | 558.8 | 508 | 12.7 | 635 | 31.8 | 20 | 1 1/8″ X185 | 1″ X115 | 402.6 |
| 24 | 812.8 | 47.8 | 692.2 | 152.4 | 663.4 | 609.6 | 12.7 | 749.3 | 35.1 | 20 | 1 1/4″ X200 | 1″ X115 | 595.1 |

Notes :
(1) For the 'Bore(B)" of welding neck flanges other than standard wall thikness, Refer to page 70–71

# CLASS 300, 600 FLANGES

## CLASS 300

Unit : mm

| Nominal Pipe Size | Outside Diameter | Thick – ness | Raise of Face | Hub Length | Hub Dia. Base | Point Of Weld. | Tap Hole Size | Bolt Circle | Hole Of Dia. | Hole Of No. | Bolt Size & Length | Jack Bolt & Length | Appx. Weht (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | t | G | T | X | A | | B.C.D | | | | | |
| 1/2 | 95 | 38.6 | 35.1 | 77 | 38 | 21.3 | 6.4 | 66.7 | 15.9 | 4 | 1/2″ X 130 | 1/2″ X 75 | 4.5 |
| 3/4 | 115 | 38.6 | 42.9 | 81 | 48 | 26.7 | 6.4 | 82.6 | 17.5 | 4 | 5/8″ X 140 | 1/2″ X 75 | 4.5 |
| 1 | 125 | 38.6 | 50.8 | 83 | 54 | 33.5 | 6.4 | 88.9 | 17.5 | 4 | 5/8″ X 140 | 5/8″ X 75 | 8.2 |
| 1 1/2 | 155 | 38.6 | 73 | 86 | 70 | 48.3 | 6.4 | 114.3 | 20.6 | 4 | 3/4″ X 145 | 5/8″ X 75 | 11.3 |
| 2 | 165 | 38.6 | 92.1 | 86 | 84 | 60.3 | 6.4 | 127 | 17.5 | 8 | 5/8″ X 140 | 5/8″ X 75 | 12.3 |
| 2 1/2 | 190 | 38.6 | 104.8 | 89 | 100 | 73 | 6.4 | 149.2 | 20.6 | 8 | 3/4″ X 145 | 5/8″ X 75 | 15.9 |
| 3 | 210 | 38.6 | 127 | 89 | 117 | 88.9 | 9.5 | 168.3 | 20.6 | 8 | 3/4″ X 145 | 3/4″ X 75 | 19.5 |
| 4 | 255 | 38.6 | 157.2 | 92 | 146 | 114.3 | 12.7 | 200 | 20.6 | 8 | 3/4″ X 145 | 3/4″ X 75 | 30 |
| 6 | 320 | 38.6 | 215.9 | 100 | 206 | 168.3 | 12.7 | 269.9 | 22.2 | 12 | 3/4″ X 145 | 3/4″ X 75 | 48.1 |
| 8 | 380 | 41.7 | 269.9 | 112 | 260 | 219.1 | 12.7 | 330.2 | 25.4 | 12 | 7/8″ X 160 | 3/4″ X 75 | 68.1 |
| 10 | 445 | 48.1 | 323.8 | 118 | 321 | 273 | 12.7 | 387.4 | 28.6 | 16 | 1″ X 185 | 1″ X 115 | 98 |
| 12 | 520 | 51.3 | 381 | 131 | 375 | 323.8 | 12.7 | 450.8 | 31.8 | 16 | 1 1/8″ X 200 | 1″ X 115 | 148.4 |
| 14 | 585 | 54.4 | 412.8 | 143 | 425 | 355.6 | 12.7 | 514.4 | 31.8 | 20 | 1 1/8″ X 210 | 1″ X 115 | 203.3 |
| 16 | 650 | 57.6 | 469.9 | 146 | 483 | 406.4 | 12.7 | 571.5 | 34.9 | 20 | 1 1/4″ X 220 | 1″ X 115 | 270.5 |
| 18 | 710 | 60.8 | 533.4 | 159 | 533 | 457 | 12.7 | 628.6 | 34.9 | 24 | 1 1/4″ X 230 | 1″ X 115 | 336.3 |
| 20 | 775 | 64 | 584.2 | 162 | 587 | 508 | 12.7 | 685.8 | 34.9 | 24 | 1 1/4″ X 240 | 1″ X 115 | 402.6 |
| 24 | 915 | 70.3 | 692.2 | 169 | 702 | 610 | 12.7 | 812.8 | 41.3 | 24 | 1 1/2″ X 270 | 1″ X 140 | 595.1 |

## CLASS 600

Unit : mm

| Nominal Pipe Size | Outside Diameter | Thick – ness | Raise of Face | Hub Length | Hub Dia. Base | Point Of Weld. | Tap Hole Size | Bolt Circle | Hole Of Dia. | Hole Of No. | Bolt Size & Length | Jack Bolt & Length | Appx. Weht (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | t | G | T | X | A | | B.C.D | | | | | |
| 1/2 | 95 | 38.6 | 35.1 | 77 | 38 | 21.3 | 6.4 | 66.7 | 15.9 | 4 | 1/2″ X 130 | 1/2″ X 75 | 4.5 |
| 3/4 | 115 | 38.6 | 42.9 | 81 | 48 | 26.7 | 6.4 | 82.6 | 17.5 | 4 | 5/8″ X 140 | 1/2″ X 75 | 4.5 |
| 1 | 125 | 38.6 | 50.8 | 83 | 54 | 33.5 | 6.4 | 88.9 | 17.5 | 4 | 5/8″ X 140 | 5/8″ X 75 | 8.2 |
| 1 1/2 | 155 | 38.6 | 73 | 86 | 70 | 48.3 | 6.4 | 114.3 | 20.6 | 4 | 3/4″ X 145 | 5/8″ X 75 | 11.3 |
| 2 | 165 | 38.6 | 92.1 | 86 | 84 | 60.3 | 6.4 | 127 | 17.5 | 8 | 5/8″ X 140 | 5/8″ X 75 | 12.3 |
| 2 1/2 | 190 | 38.6 | 104.8 | 89 | 100 | 73 | 6.4 | 149.2 | 20.6 | 8 | 3/4″ X 145 | 5/8″ X 75 | 15.9 |
| 3 | 210 | 38.6 | 127 | 89 | 117 | 88.9 | 9.5 | 168.3 | 20.6 | 8 | 3/4″ X 145 | 3/4″ X 75 | 19.5 |
| 4 | 275 | 45.1 | 157.2 | 109 | 152 | 114.3 | 12.7 | 215.9 | 25.4 | 8 | 7/8″ X 165 | 3/4″ X 100 | 46.8 |
| 6 | 355 | 54.7 | 215.9 | 124 | 222 | 168.3 | 12.7 | 292.1 | 28.6 | 12 | 1″ X 195 | 1″ X 110 | 88.5 |
| 8 | 420 | 62.6 | 269.9 | 140 | 273 | 219.1 | 12.7 | 349.2 | 31.8 | 12 | 1 1/8″ X 220 | 1″ X 120 | 96.7 |
| 10 | 510 | 70.5 | 323.8 | 159 | 343 | 273 | 12.7 | 431.8 | 34.9 | 16 | 1 1/4″ X 250 | 1″ X 140 | 206.1 |
| 12 | 560 | 73.7 | 381 | 163 | 400 | 323.8 | 12.7 | 489 | 34.9 | 20 | 1 1/4″ X 255 | 1″ X 140 | 251 |
| 14 | 605 | 76.9 | 412.8 | 172 | 432 | 355.6 | 12.7 | 527 | 38.1 | 20 | 1 3/8″ X 270 | 1″ X 150 | 370 |
| 16 | 685 | 83.2 | 469.9 | 185 | 495 | 406.4 | 12.7 | 603.2 | 41.3 | 20 | 1 1/2″ X 295 | 1″ X 155 | 505.2 |
| 18 | 745 | 89.6 | 533.4 | 191 | 546 | 457.2 | 12.7 | 654 | 44.5 | 20 | 1 5/8″ X 320 | 1″ X 165 | 592.8 |
| 20 | 815 | 95.9 | 584.2 | 197 | 610 | 508 | 12.7 | 723.9 | 44.5 | 24 | 1 5/8″ X 330 | 1″ X 180 | 736.2 |
| 24 | 940 | 108.6 | 692.2 | 210 | 718 | 609.6 | 12.7 | 838.2 | 50.8 | 24 | 1 7/8″ X 375 | 1″ X 195 | 1053 |

# CLASS 900, 1500 FLANGES

## CLASS 900

Unit : mm

| Nominal Pipe Size | Outside Diameter | Thick – ness | Raise of Face | Hub Length | Hub Dia. Base | Point Of Weld. | Tap Hole Size | Bolt Circle | Hole Of Dia. | Hole Of No. | Bolt Size & Length | Jack Bolt & Length | Appx. Weht (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | t | G | T | X | A | | B.C.D | | | | | |
| 1/2 | 120 | 45.1 | 35.1 | 83 | 38 | 21.3 | 6.4 | 82.6 | 22.3 | 4 | 3/4″ X 160 | 5/8″ X 100 | 9 |
| 3/4 | 130 | 45.1 | 42.9 | 90 | 44 | 26.7 | 6.4 | 88.9 | 22.3 | 4 | 3/4″ X 160 | 5/8″ X 100 | 10.5 |
| 1 | 150 | 45.1 | 50.8 | 90 | 52 | 33.5 | 6.4 | 101.6 | 25.4 | 4 | 7/8″ X 165 | 5/8″ X 100 | 11.8 |
| 1 1/2 | 180 | 45.1 | 73 | 96 | 70 | 48.3 | 6.4 | 123.8 | 28.6 | 4 | 1″ X 175 | 5/8″ X 100 | 20.4 |
| 2 | 215 | 45.1 | 92.1 | 109 | 105 | 60.3 | 6.4 | 165.1 | 25.4 | 8 | 7/8″ X 165 | 5/8″ X 100 | 29.5 |
| 2 1/2 | 245 | 48.3 | 104.8 | 112 | 124 | 73 | 6.4 | 190.5 | 28.6 | 8 | 1″ X 180 | 5/8″ X 105 | 35.8 |
| 3 | 240 | 45.1 | 127 | 109 | 127 | 88.9 | 9.5 | 190.5 | 25.4 | 8 | 7/8″ X 165 | 3/4″ X 100 | 44.5 |
| 4 | 290 | 51.5 | 157.2 | 121 | 159 | 114.3 | 12.7 | 235 | 31.8 | 8 | 1 1/8″ X 200 | 3/4″ X 110 | 58.6 |
| 6 | 380 | 62.6 | 215.9 | 147 | 235 | 168.3 | 12.7 | 317.5 | 31.8 | 12 | 1 1/8″ X 220 | 1″ X 120 | 119.3 |
| 8 | 470 | 70.5 | 269.9 | 169 | 298 | 219.1 | 12.7 | 393.7 | 38.1 | 12 | 1 3/8″ X 255 | 1″ X 140 | 202.1 |
| 10 | 545 | 76.9 | 323.8 | 191 | 368 | 273 | 12.7 | 469.9 | 38.1 | 16 | 1 3/8″ X 270 | 1″ X 150 | 287.8 |
| 12 | 610 | 86.4 | 381 | 207 | 419 | 323.8 | 12.7 | 533.4 | 38.1 | 20 | 1 3/8″ X 290 | 1″ X 155 | 395.8 |
| 14 | 640 | 92.8 | 412.8 | 220 | 451 | 355.6 | 12.7 | 558.8 | 41.3 | 20 | 1 1/2″ X 315 | 1″ X 165 | 505.2 |
| 16 | 705 | 95.9 | 469.9 | 223 | 508 | 406.4 | 12.7 | 616 | 44.5 | 20 | 1 5/8″ X 330 | 1″ X 180 | 592.8 |
| 18 | 785 | 108.6 | 533.4 | 236 | 565 | 457.2 | 12.7 | 685.8 | 50.8 | 20 | 1 7/8″ X 375 | 1″ X 195 | 1053.8 |
| 20 | 855 | 115 | 584.2 | 255 | 622 | 508 | 12.7 | 749.3 | 54 | 20 | 2″ X 390 | 1″ X 205 | 1453 |
| 24 | 1040 | 146.7 | 692.2 | 299 | 749 | 609.6 | 12.7 | 901.7 | 66.7 | 20 | 2 1/2″ X 500 | 1″ X 250 | 1763 |

## CLASS 1500

Unit : mm

| Nominal Pipe Size | Outside Diameter | Thick – ness | Raise of Face | Hub Length | Hub Dia. Base | Point Of Weld. | Tap Hole Size | Bolt Circle | Hole Of Dia. | Hole Of No. | Bolt Size & Length | Jack Bolt & Length | Appx. Weht (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | t | G | T | X | A | | B.C.D | | | | | |
| 1 | 150 | 45.1 | 50.8 | 90 | 52 | 33.5 | 6.4 | 101.6 | 25.4 | 4 | 7/8″ X 165 | 5/8″ X 100 | 12.9 |
| 1 1/2 | 180 | 45.1 | 73 | 96 | 70 | 48.3 | 6.4 | 123.8 | 28.6 | 4 | 1″ X 175 | 5/8″ X 100 | 19.3 |
| 2 | 215 | 45.1 | 92.1 | 109 | 105 | 60.3 | 6.4 | 165.1 | 25.4 | 8 | 7/8″ X 165 | 5/8″ X 100 | 27.6 |
| 2 1/2 | 245 | 48.3 | 104.8 | 112 | 124 | 73 | 6.4 | 190.5 | 28.6 | 8 | 1″ X 180 | 5/8″ X 105 | 41.5 |
| 3 | 265 | 54.7 | 127 | 124 | 133 | 88.9 | 9.5 | 203.2 | 31.8 | 8 | 1 1/8″ X 205 | 5/8″ X 115 | 55.6 |
| 4 | 310 | 61 | 157.2 | 131 | 162 | 114.3 | 12.7 | 241.3 | 34.9 | 8 | 1 1/4″ X 225 | 3/4″ X 125 | 78.5 |
| 6 | 395 | 89.6 | 215.9 | 178 | 229 | 168.3 | 12.7 | 317.5 | 38.1 | 12 | 1 3/8″ X 295 | 1″ X 160 | 185.5 |
| 8 | 485 | 99.1 | 269.9 | 220 | 292 | 219.1 | 12.7 | 393.7 | 44.5 | 12 | 1 5/8″ X 330 | 1″ X 180 | 305.7 |
| 10 | 585 | 115 | 323.8 | 261 | 368 | 273 | 12.7 | 482.6 | 50.8 | 12 | 1 7/8″ X 385 | 1″ X 200 | 503.5 |
| 12 | 675 | 130.9 | 381 | 290 | 451 | 323.8 | 12.7 | 571.6 | 54 | 16 | 2″ X 425 | 1″ X 220 | 757.5 |
| 14 | 750 | 140.4 | 412.8 | 305 | 495 | 355.6 | 12.7 | 635 | 60.3 | 16 | 2 1/4″ X 465 | 1″ X 230 | 1036.6 |
| 16 | 825 | 153.1 | 469.9 | 318 | 552 | 406.4 | 12.7 | 704.8 | 66.7 | 16 | 2 1/2″ X 515 | 1″ X 255 | 1416.6 |
| 18 | 915 | 169 | 533.4 | 334 | 597 | 457.2 | 12.7 | 774.7 | 73 | 16 | 2 3/4″ X 565 | 1″ X 275 | 1843.5 |
| 20 | 985 | 184.8 | 584.2 | 363 | 641 | 508 | 12.7 | 831.8 | 79.4 | 16 | 3″ X 615 | 1 1/2″ X 300 | 2329.2 |
| 24 | 1170 | 210.2 | 692.2 | 413 | 762 | 609.6 | 12.7 | 990.6 | 92.1 | 16 | 3 1/2″ X 705 | 1 1/2″ X 335 | 3766.3 |

# CODE SPECIFICATION

- REDUCING FLANGES
- THREAD
- FLANGES FACINGS
- COMPARISION OF HARDNESS NUMBER
- TOLERANCE
- STANDARD FINISH
- WELDING ENDS
- ASME ORIFICE FLANGE(ASME B16.36-2006) FORGED-FLANGES
- PIPE & FITTINGS WALL THICKNESS SCHEDULES DIMENSION
- ASTM MATERIAL CHEMICAL COMPOSITION & MECHANICAL REQUIREMENTS
- APPLICABLE ASTM SPECIFICATIONS
- SPECIAL MATERIAL

# REDUCING FLANGES

## THREADED AND SLIP-ON TYPES

**HUB -** For hub diameter (X) and height of hub above the back of the flange (N) refer to the list of standard flange specification of the same type and pressure and use the dimensions of a flange **one nominal pipe size smaller** than the nominal pipe size from which the reduction is being made.

**FLANGE O.D., DRILLING TEMPLATE AND THICKNESS -** Outside diameter, drilling template and flange thickness Q(see note on FACINGS) agree with the dimensions of a standard flange of the nominal pipe size from which the reduction is being made.

**FACING -** Facing dimensions also agree with the dimensions of a standard flange of the nominal pipe size from which the reduction is being made.
150 lb. and 300 lb. forged steel Threaded, Slip-On, Welding Neck and Blind flanges are furnished with American Standard 1/16" raised face, which is included in flange thickness. Q. 400 lb., 600 lb., 900 lb., 1500 lb. and 2500 lb. flanges are supplied with American Standard 1/4" raised face which is not included in flange thickness (Q)

**BORE OR TAPPING -** The bore or tapping is machined to accept a pipe of the nominal pipe size to which the reduction is being made. For reduction to sizes smaller than shown, BLIND FLANGES are tapped or bored to specified nominal pipe size.

## EXAMPLE :

### THREADED

**A.** The size designation is NPS 6 x 2 1/2 - Class 300 reducing threaded flange. This flange has the folling dimension : following dimensions :
NPS 2 1/2 = taper pipe thread tapping (ASME B1.20. 1)
320 mm = diameter of regular NPS 6 Class 300 threaded flange
35 mm= thickness of regular NPS 6 Class 300 threaded flange
178 mm = diameter of hub for regular NPS 5 Class 300 threaded flange. Hub diameter may be one size small to reduce machining. In this example a hub diameter of NPS 2 1/2 would be the smallest acceptable.
15.5 mm = height of hub for regular NPS 5 Class 300 threaded flange.

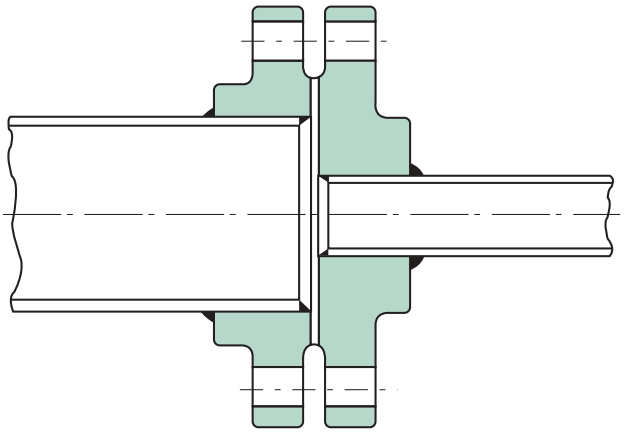
**B.** The size designation is NPS 6 x 2 - Class 300 reducing threaded flange. Use regular NPS 6 Class 300 blind flange tapped with NPS 2 tapper pipe thread(ASME B1.20. 1)

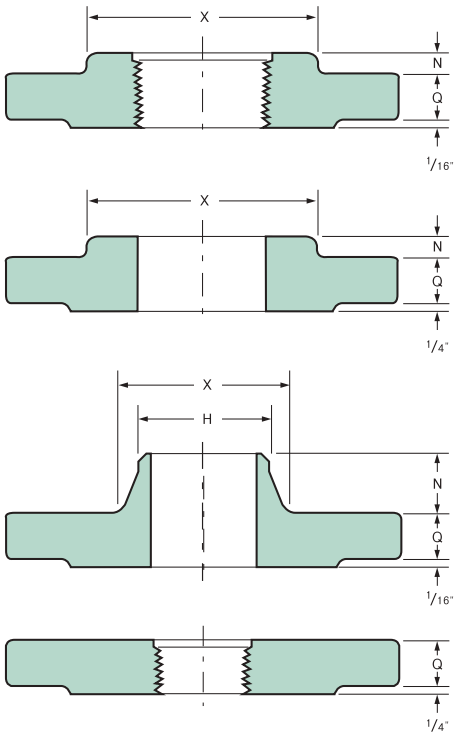
## WELDING NECK TYPES

On Reducing Welding Neck Flanges, which are made only on special order, the hub dimensions agree with the hub dimensions of standard flanges of the size to which reduction is being made. Other flange dimensions, including the drilling template, agree with the standard dimensions of the size from which the reduction is being made.

# REDUCING FLANGES

## THREADED-SLIP-ON-WELDING NECK






In ordering Reducing Flanges :
specify (1) nominal pipe size of the tapping or bore to which the reduction is being made, (2) the outside diameter of the flange from which the reduction is being made and (3) pressure rating.

EXAMPLE :
A 300 lb. Reducing flange for rducing from a 6" (152.4mm) to a 3" (76.2mm) nominal pipe size should be designated as a 3" x 121/2" –300 lb. Reducing Flange. whether Threaded, Slip–on, or Welding Neck type is desired must also be specified.

## ASME B16.5 FORGED FLANGES

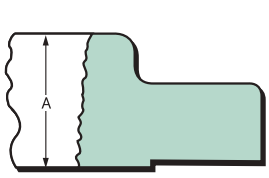
Dimensions in mm

| Nominal Pipe size to Which Reduction made tobe is to be Specified by Purchaser | Nominal Flange | OUTSIDE DIAMETER OF FLANGE FROM WHICH REDUCTION IS BEING MADE | | | | | | | Smallest SizeBore or Tapping Requiring Hub Flange |
|---|---|---|---|---|---|---|---|---|---|
| | | 150 lb. Standard | 300 lb. Standard | 400 lb. Standard | 600 lb. Standard | 900 lb. Standard | 1500 lb. Standard | 2500 lb. Standard | |
| | 3/4 | 98.4 | 117.5 | 117.5 | 117.5 | 130.2 | 130.2 | 139.7 | 12.7 |
| | 1 | 108.0 | 123.8 | 123.8 | 123.8 | 149.2 | 149.2 | 158.8 | 12.7 |
| | 1 3/4 | 117.5 | 133.4 | 133.4 | 133.4 | 158.8 | 158.8 | 184.2 | 12.7 |
| | 1 1/2 | 127.5 | 155.6 | 155.6 | 155.6 | 177.8 | 177.8 | 203.2 | 12.7 |
| | 2 | 152.4 | 165.1 | 165.1 | 165.1 | 215.9 | 215.9 | 235.0 | 25.4 |
| | 2 1/2 | 177.8 | 190.5 | 190.5 | 190.5 | 244.5 | 244.5 | 266.7 | 31.8 |
| | 3 | 190.5 | 200.6 | 209.6 | 209.6 | 266.7 | 266.7 | 304.8 | 31.8 |
| | 3 1/2 | 215.9 | 228.6 | 228.6 | 228.6 | – | – | – | 38.1 |
| | 4 | 228.6 | 254.0 | 254.0 | 273.1 | 292.1 | 311.2 | 355.6 | 38.1 |
| | 5 | 254.0 | 279.4 | 279.4 | 330.2 | 349.3 | 374.7 | 419.1 | 38.1 |
| | 6 | 279.4 | 317.5 | 317.5 | 355.6 | 381.0 | 393.7 | 482.6 | 63.5 |
| | 8 | 342.9 | 381.0 | 381.0 | 419.1 | 469.9 | 482.6 | 552.5 | 76.2 |
| | 10 | 406.4 | 444.5 | 444.5 | 508.0 | 546.1 | 584.2 | 673.1 | 88.9 |
| | 12 | 482.6 | 520.7 | 520.7 | 558.8 | 609.6 | 673.1 | 762.0 | 88.9 |
| | 14 | 533.4 | 584.2 | 584.2 | 603.3 | 641.4 | – | – | 88.9 |
| | 16 | 596.9 | 647.7 | 647.7 | 685.8 | 704.9 | – | – | 101.6 |
| | 18 | 635.0 | 711.2 | 711.2 | 743.0 | 787.4 | – | – | 101.6 |
| | 20 | 698.5 | 774.7 | 774.7 | 812.8 | 857.3 | – | – | 101.6 |
| | 24 | 812.8 | 914.4 | 914.4 | 939.8 | 1041.1 | – | – | 101.6 |

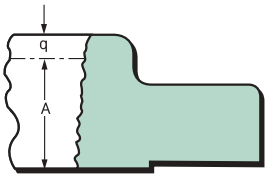
Notes :

For reductions to sizes smaller than shown, blind flanges are tapped or bored for specified nominal pipe size

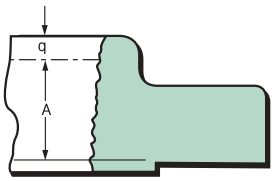
# THREAD AND STANDARDS FOR ASME FLANGES(ASME B2.1)



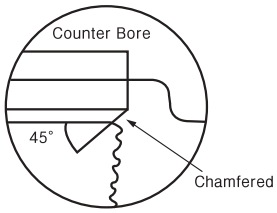

Class 150Standard
with 1.6mm Raised Face

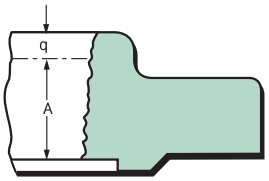



Class 300Standard
with 1.6mm Raised Face

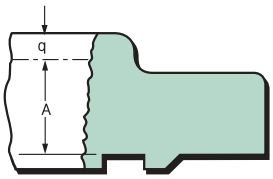



Class 400Standard
and Heavier
with 6.35mm Raised or Male Face

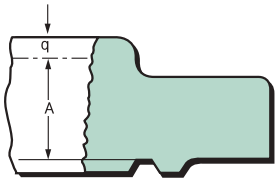



All Standards
with Female Face




All Standards
with Groove Face




All Standards
with Ring Joint Face

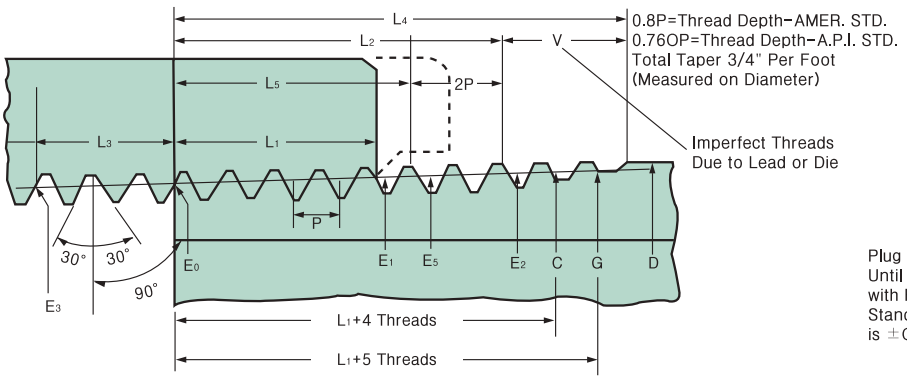
## ASME B16.5 FORGED FLANGES

Unit : mm

| Nominal Pipe Size | A-THREAD LENGTHS | | | | | | |
|---|---|---|---|---|---|---|---|
| | Class 150 | Class 300 | Class 400 | Class 600 | Class 900 | Class 1500 | Class 2500 |
| 1/2 | 15.9 | 15.9 | 15.9 | 15.9 | 22.2 | 22.2 | 28.6 |
| 3/4 | 15.9 | 15.9 | 15.9 | 15.9 | 25.4 | 25.4 | 31.8 |
| 1 | 17.5 | 17.5 | 17.5 | 17.5 | 28.6 | 28.6 | 34.9 |
| 1 1/4 | 20.7 | 20.7 | 20.7 | 20.7 | 30.2 | 30.1 | 38.1 |
| 1 1/2 | 22.2 | 22.2 | 22.2 | 22.2 | 31.8 | 31.8 | 44.5 |
| 2 | 25.4 | 28.6 | 28.6 | 28.6 | 38.1 | 38.1 | 50.8 |
| 2 1/2 | 28.6 | 31.8 | 31.8 | 31.8 | 47.6 | 47.6 | 57.2 |
| 3 | 30.1 | 31.8 | 34.9 | 34.9 | 41.3 | 50.8 | 63.5 |
| 3 1/2 | 31.8 | 36.5 | 39.7 | 39.7 | – | – | – |
| 4 | 33.4 | 36.5 | 36.5 | 41.3 | 47.6 | 57.2 | 69.9 |
| 5 | 36.5 | 42.9 | 42.9 | 47.6 | 54.0 | 63.5 | 76.2 |
| 6 | 39.7 | 46.1 | 46.1 | 50.8 | 57.2 | 69.9 | 82.6 |
| 8 | 44.5 | 50.8 | 50.8 | 60.3 | 63.5 | 76.2 | 95.3 |
| 10 | 49.2 | 55.6 | 55.6 | 65.1 | 71.5 | 84.2 | 108.0 |
| 12 | 55.6 | 60.3 | 60.3 | 69.9 | 76.2 | 92.1 | 120.7 |
| 14 | 57.2 | 63.5 | 63.5 | 73.0 | 82.6 | – | – |
| 16 | 63.5 | 68.3 | 68.3 | 77.8 | 85.7 | – | – |
| 18 | 68.3 | 69.9 | 69.9 | 79.4 | 88.9 | – | – |
| 20 | 69.9 | 73.0 | 73.0 | 82.6 | 92.1 | – | – |
| 24 | 82.6 | 82.6 | 82.6 | 92.1 | 101.6 | – | – |

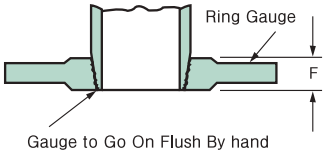
Notes :

(1) Except flanges with small Male/Female Face(on pipe end), threaded flanges, have an American National Standard taper pipe thread conforming to ASME B2.1
(2) The thread is concentric with the axis of the flange and variations in alignment do not exceed 0.16(1.6mm)in, per foot(0.5 percent)
(3) Class 150 flanges are made without counterbore. The threads are chamfered approximately to the major diameter of the thread at the back of the flange at an angle of approximately 45degrees with he axis of the thread. The chamfer is concentric with the thread and include in the measurement of the thread length.
(4) Class 300 and higher pressure flanges are made with a counterbore at the back of the flange. The threads are chamfered to the diameter of the counterbore at an angle of approximately 45 degrees with the axis of the thread. The counterbore and chhamger are concentric with the thread.
(5) The minimum length of effective thread in reducing flanges is at least equal to dimension Q of the corresponding class of threaded flanges as shown in the above tables. Threads do not necessarily extend to the face to the flange.

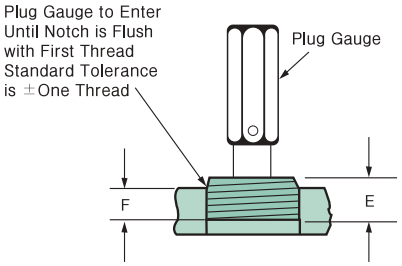



C=Straight Pipe Thread Pitch Dia. for Looknut Connections

G=Minimum Pitch Dia. Straight Female Looknut Thread




F=Thickness of Working Ring Gauge



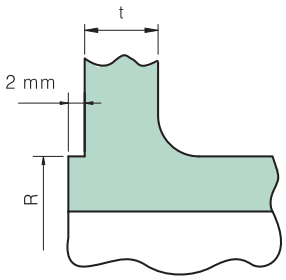

# ASME B16.36 FORGED FLANGES

Unit : mm

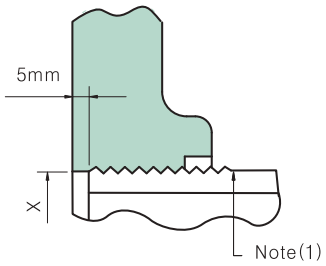
| Nominal Pipe Size | Outside Diameter of Pipe | Threads Per inch | Pitch of Thread | Pitch Diameter at Beginning of External Threads | Handtight Engagement | | Efective Thread External | | Wrench Make-up Length for internal Threaded | | Ove all Length External Threads |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Length | Pitch Diameter | Length | Pitch Diameter | Length | Pitch Diameter | |
| | D | H | P | $E_0$ | $L_1$ | $E_1$ | $L_2$ | $E_2$ | $L_3$ | $E_3$ | L |
| 1/2 | 21 | 14 | 1.8 | 19.3 | 8.1 | 19.8 | 13.6 | 20.1 | 5.4 | 18.9 | 19.9 |
| 3/4 | 27 | 14 | 1.8 | 24.6 | 8.6 | 25.1 | 13.9 | 25.4 | 5.4 | 24.2 | 20.2 |
| 1 | 33 | 11 1/2 | 2.2 | 30.8 | 10.2 | 31.5 | 17.3 | 31.9 | 6.6 | 30.4 | 25.0 |
| 1 1/4 | 42 | 11 1/2 | 2.2 | 39.6 | 10.7 | 40.2 | 18.0 | 40.7 | 6.6 | 39.1 | 25.6 |
| 1 1/2 | 48 | 11 1/2 | 2.2 | 45.6 | 10.7 | 46.3 | 18.4 | 46.8 | 6.6 | 45.2 | 26.0 |
| 2 | 60 | 11 1/2 | 2.2 | 57.6 | 11.1 | 58.3 | 19.2 | 58.8 | 6.6 | 57.2 | 26.9 |
| 2 1/2 | 73 | 8 | 3.2 | 69.1 | 17.3 | 70.2 | 28.9 | 70.9 | 6.4 | 68.7 | 39.9 |
| 3 | 89 | 8 | 3.2 | 84.9 | 19.5 | 86.1 | 30.5 | 86.8 | 6.4 | 84.5 | 41.5 |
| 3 1/2 | 102 | 8 | 3.2 | 97.5 | 20.9 | 98.8 | 31.8 | 99.5 | 6.4 | 97.1 | 42.8 |
| 4 | 114 | 8 | 3.2 | 110.1 | 21.4 | 111.4 | 33.0 | 112.2 | 6.4 | 109.7 | 44.0 |
| 4 1/2 | 127 | 8 | 3.2 | 122.7 | 22.2 | 124.1 | 34.3 | 123.0 | – | – | – |
| 5 | 141 | 8 | 3.2 | 136.9 | 23.8 | 138.4 | 35.7 | 139.2 | 6.4 | 136.5 | 46.7 |
| 6 | 168 | 8 | 3.2 | 163.7 | 24.3 | 165.3 | 38.4 | 166.1 | 6.4 | 163.3 | 49.4 |
| 7 | 194 | 8 | 3.2 | 189.0 | 25.4 | 190.6 | 41.0 | 189.3 | – | – | – |
| 8 | 219 | 8 | 3.2 | 214.2 | 27.0 | 215.9 | 43.5 | 216.9 | 6.4 | 213.8 | 54.5 |
| 9 | 244 | 8 | 3.2 | 239.5 | 28.7 | 241.2 | 46.0 | 239.8 | – | – | – |
| 10 | 273 | 8 | 3.2 | 267.9 | 30.7 | 269.8 | 48.9 | 270.9 | 6.4 | 267.5 | 59.9 |
| 11 | 298 | 8 | 3.2 | 293.1 | 32.6 | 295.1 | 51.4 | 293.5 | – | – | – |
| 12 | 324 | 8 | 3.2 | 318.2 | 34.5 | 320.5 | 54.0 | 321.7 | 6.4 | 317.9 | 65.0 |
| 14 | 356 | 8 | 3.2 | 349.9 | 39.7 | 352.4 | 57.2 | 353.5 | 6.4 | 349.5 | 68.2 |
| 15 | 381 | 8 | 3.2 | 375.1 | 42.8 | 377.8 | 59.7 | 375.6 | – | – | – |
| 16 | 406 | 8 | 3.2 | 400.4 | 46.0 | 403.2 | 62.2 | 404.3 | 6.4 | 400.0 | 73.2 |
| 17 | 432 | 8 | 3.2 | 425.6 | 48.3 | 428.6 | 64.8 | 426.1 | – | – | – |
| 18 | 457 | 8 | 3.2 | 450.9 | 50.8 | 454.0 | 67.3 | 455.1 | 6.4 | 450.5 | 78.3 |
| 20 | 508 | 8 | 3.2 | 501.3 | 54.0 | 504.7 | 72.4 | 505.9 | 6.4 | 500.9 | 83.4 |
| 22 | 559 | 8 | 3.2 | 551.8 | 57.2 | 555.4 | 77.5 | 552.4 | – | – | – |
| 24 | 610 | 8 | 3.2 | 602.3 | 60.3 | 606.1 | 82.6 | 607.5 | 6.4 | 601.9 | 93.6 |

# FLANGES FACINGS

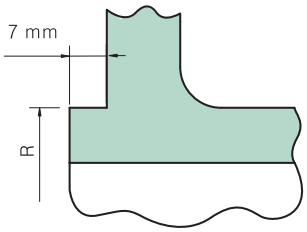
2mm raised face retgularly furnished on Classes 150 and 300 unless otherwise ordered



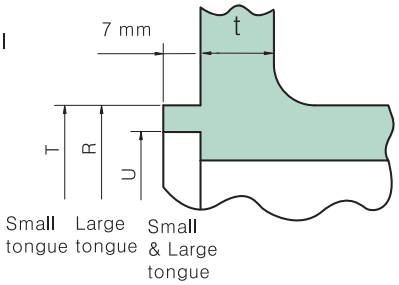

Small female face (on end of pipe)



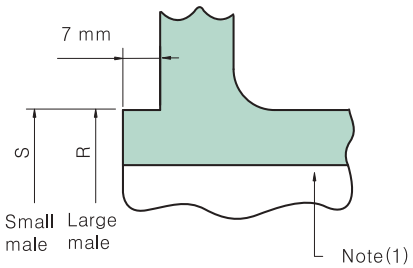

7mm raised face regularly furnished on Classes 400 and higher unless otherwise ordered



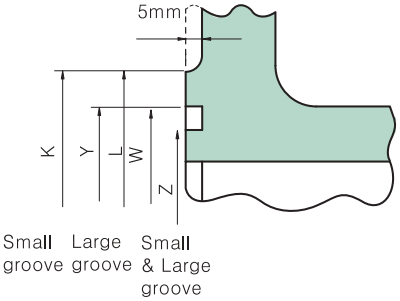

Large or small tongue face [Note (2)]



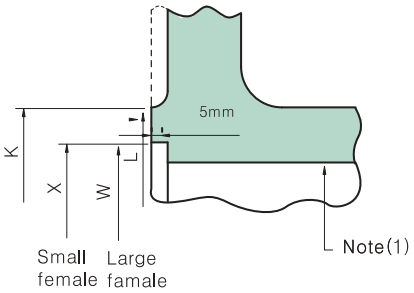

Large or smalle male face [Note (2)]



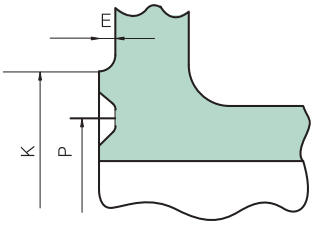

Large or small groove face [Note (2)]



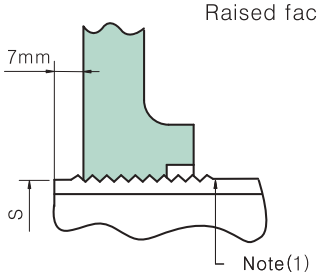

Large or small female face [Note (2)]



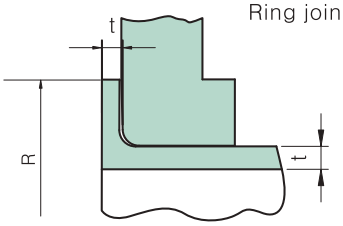

Ring joint face



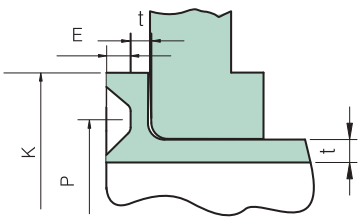

Small male face (on end of pipe)




Lapped Joint Raised face




Lapped Joint Ring joint




CODE SPEC

# DIMENSION OF FACINGS
# (OTHER THAN RING JOINTS, ALL PRESSURE RATING CLASS)

Unit : mm

| Nominal Pipe Size | OUTSIDE DIAMETER | | | Inside Diameter of Large and Small Tongue | OUTSIDE DIAMETER | | | Inside Diameter of Large and Small Groove | HEIGHT | | Depth of Groove or Female | MIN. OUTSIDE DIAMETER OF RAISED PORTION | | Norminal Pipe Size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Raised Face, Large Male & Large Tongue | Small Male | Small Tongue | | Large Female & Large Groove | Small Female | Small Groove | | Raised Face and 300 ST' DS | Large & Small Male and Tongue Class 400~2500 | | Small Female & Groove | Large Female & Groove | |
| | R | S | T | U | W | X | Y | Z | | | | K | L | |
| 1/2 | 34.9 | 18.3 | 35.1 | 25.4 | 36.5 | 19.9 | 36.5 | 23.8 | 2.0 | 7.0 | 5.0 | 44 | 46 | 1/2 |
| 3/4 | 42.9 | 23.8 | 42.9 | 33.3 | 44.4 | 25.4 | 44.4 | 31.8 | 2.0 | 7.0 | 5.0 | 52 | 54 | 3/4 |
| 1 | 50.8 | 30.2 | 47.8 | 38.1 | 52.4 | 31.8 | 49.2 | 36.5 | 2.0 | 7.0 | 5.0 | 57 | 62 | 1 |
| 1 1/4 | 63.5 | 38.1 | 57.2 | 47.6 | 65.1 | 39.7 | 58.7 | 46.0 | 2.0 | 7.0 | 5.0 | 67 | 75 | 1 1/4 |
| 1 1/2 | 73.0 | 44.4 | 63.5 | 54.0 | 74.6 | 46.0 | 65.1 | 52.4 | 2.0 | 7.0 | 5.0 | 73 | 84 | 1 1/2 |
| 2 | 92.1 | 57.2 | 82.6 | 73.0 | 93.7 | 58.8 | 84.1 | 71.4 | 2.0 | 7.0 | 5.0 | 92 | 103 | 2 |
| 2 1/2 | 104.8 | 68.3 | 95.2 | 85.7 | 106.4 | 69.8 | 96.8 | 84.1 | 2.0 | 7.0 | 5.0 | 105 | 116 | 2 1/2 |
| 3 | 127.0 | 84.1 | 117.5 | 108.0 | 128.6 | 85.7 | 119.1 | 106.4 | 2.0 | 7.0 | 5.0 | 127 | 138 | 3 |
| 3 1/2 | 139.7 | 96.8 | 130.2 | 120.6 | 141.3 | 98.4 | 131.8 | 119.1 | 2.0 | 7.0 | 5.0 | 140 | 151 | 3 1/2 |
| 4 | 157.2 | 109.5 | 144.5 | 131.8 | 158.8 | 111.1 | 146.0 | 130.2 | 2.0 | 7.0 | 5.0 | 157 | 168 | 4 |
| 5 | 185.7 | 136.5 | 173.0 | 160.3 | 187.3 | 138.1 | 174.6 | 158.8 | 2.0 | 7.0 | 5.0 | 186 | 197 | 5 |
| 6 | 215.9 | 161.9 | 203.2 | 190.5 | 217.5 | 163.5 | 204.8 | 188.9 | 2.0 | 7.0 | 5.0 | 216 | 227 | 6 |
| 8 | 269.9 | 212.7 | 254.0 | 238.1 | 271.5 | 214.3 | 255.6 | 236.5 | 2.0 | 7.0 | 5.0 | 270 | 281 | 8 |
| 10 | 323.8 | 266.7 | 304.8 | 285.8 | 325.4 | 268.3 | 306.4 | 284.2 | 2.0 | 7.0 | 5.0 | 324 | 335 | 10 |
| 12 | 381.0 | 317.5 | 362.0 | 342.9 | 382.6 | 319.1 | 363.5 | 341.3 | 2.0 | 7.0 | 5.0 | 381 | 392 | 12 |
| 14 | 412.8 | 349.2 | 393.7 | 374.6 | 414.3 | 350.8 | 395.3 | 373.1 | 2.0 | 7.0 | 5.0 | 413 | 424 | 14 |
| 16 | 469.9 | 400.0 | 447.5 | 425.4 | 471.5 | 401.6 | 449.3 | 423.9 | 2.0 | 7.0 | 5.0 | 470 | 481 | 16 |
| 18 | 533.4 | 450.8 | 511.2 | 489.0 | 535.0 | 452.4 | 512.8 | 487.4 | 2.0 | 7.0 | 5.0 | 533 | 544 | 18 |
| 20 | 584.2 | 501.6 | 558.8 | 533.4 | 585.8 | 503.2 | 560.4 | 531.8 | 2.0 | 7.0 | 5.0 | 584 | 595 | 20 |
| 24 | 692.2 | 603.2 | 666.8 | 641.4 | 693.7 | 604.8 | 668.3 | 639.8 | 2.0 | 7.0 | 5.0 | 692 | 703 | 24 |

Notes :

(1) For small male and female joints, care should be taken in the use of these dimensions to insure that the inside diameter of fitting or pipe is small enough to permit sufficient bearing surface to prevent the crushing of the gasket. This applies particularly on lines where the joint is made on the end of the pipe. Inside diameter of fitting should match inside diameter of pipe as specified by purchaser. Threaded companion flanges for small male and female joints are furnished with plain face and are threaded with American National Standard Locknut Thread (NPSL).
(2) Raised portion of full face may by furnished unless otherwise specified on order.
(3) Large male and female faces and large tongue and groove are not applicable to Class 150 because of potential dimensional conflicts.
(4) Height of raised face is either 2 mm or 7 mm.
(5) Height of large and small male and tongue is 7 mm.
(6) Depth of groove or female is 5 mm.

# COMPARISION OF HARDNESS NUMBER

SAE J417

| Vicker's Hardness | Brinell Hardness HB | | Rockwell Hardness | | | | Rockwell Superficial Hardness Superficial Brale Pentrator | | | Shore Hardness | Tensile Strength |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10-mm Ball, 3000-kg Load | | HRA A-Scale, 60kg Load Brale Penetrator | HRB B-Scale 100-kg Load 1/16"Dia Ball | HRC C-Scale 150-kg Load Brale Penetrator | HRD D-Scale 100-kg Load Brale Penetrator | 15-N Scale 15-kg Load | 30-N Scale 30-kg Load | 45-N Scale 45-kg Load | | (Approximate) in Mpa(KSI) |
| Hv | Standard Ball | Tungsten Carbide Ball | | | | | | | | | |
| 940 | – | – | 85.6 | – | 68.0 | 76.9 | 93.2 | 84.4 | 75.4 | 97 | – |
| 920 | – | – | 85.3 | – | 67.5 | 76.5 | 93.0 | 84.0 | 74.8 | 96 | – |
| 900 | – | – | 85.0 | – | 67.0 | 76.1 | 92.9 | 83.6 | 74.2 | 95 | – |
| 880 | – | 767 | 84.7 | – | 66.4 | 75.7 | 92.7 | 83.1 | 73.6 | 93 | – |
| 860 | – | 757 | 84.4 | – | 65.9 | 75.3 | 92.5 | 82.7 | 73.1 | 92 | – |
| 840 | – | 745 | 84.1 | – | 65.3 | 74.8 | 92.3 | 82.2 | 72.2 | 91 | – |
| 820 | – | 733 | 83.8 | – | 64.7 | 74.3 | 92.1 | 81.7 | 71.8 | 90 | – |
| 800 | – | 722 | 83.4 | – | 64.0 | 73.8 | 91.8 | 81.1 | 71.0 | 88 | – |
| 780 | – | 710 | 83.0 | – | 63.3 | 73.3 | 91.5 | 80.4 | 70.2 | 87 | – |
| 760 | – | 698 | 82.6 | – | 62.5 | 72.6 | 91.2 | 79.7 | 69.4 | 86 | – |
| 740 | – | 684 | 82.2 | – | 61.8 | 72.1 | 91.0 | 79.1 | 68.6 | 84 | – |
| 720 | – | 670 | 81.8 | – | 61.0 | 71.5 | 90.7 | 78.4 | 67.7 | 83 | – |
| 700 | – | 656 | 81.3 | – | 60.1 | 70.8 | 90.3 | 77.6 | 66.7 | 81 | – |
| 690 | – | 647 | 81.1 | – | 59.7 | 70.5 | 90.1 | 77.2 | 66.2 | – | – |
| 680 | – | 638 | 80.8 | – | 59.2 | 70.1 | 89.8 | 76.8 | 65.7 | 80 | – |
| 670 | – | 630 | 80.6 | – | 58.8 | 69.8 | 89.7 | 76.4 | 65.3 | – | – |
| 660 | – | 620 | 80.3 | – | 58.3 | 69.4 | 89.5 | 75.9 | 64.7 | 79 | – |
| 650 | – | 611 | 80.0 | – | 57.8 | 69.0 | 89.2 | 75.5 | 64.1 | – | – |
| 640 | – | 601 | 79.8 | – | 57.3 | 68.7 | 89.0 | 75.1 | 63.5 | 77 | – |
| 630 | – | 591 | 79.5 | – | 56.8 | 68.3 | 88.8 | 74.6 | 63.0 | – | – |
| 620 | – | 582 | 79.2 | – | 56.3 | 67.9 | 88.5 | 74.2 | 62.4 | 75 | – |
| 610 | – | 573 | 78.9 | – | 55.7 | 67.5 | 88.2 | 73.6 | 61.7 | – | – |
| 600 | – | 564 | 78.6 | – | 55.2 | 67.0 | 88.0 | 73.2 | 61.2 | 74 | – |
| 590 | – | 554 | 78.4 | – | 54.7 | 66.7 | 87.8 | 72.7 | 60.5 | – | 2055(298) |
| 580 | – | 545 | 78.0 | – | 54.1 | 66.2 | 87.5 | 72.1 | 59.9 | 72 | 2020(293) |
| 570 | – | 535 | 77.8 | – | 53.6 | 65.8 | 87.2 | 71.7 | 59.3 | – | 1985(570) |
| 560 | – | 525 | 77.4 | – | 53.0 | 65.4 | 86.9 | 71.2 | 58.6 | 71 | 1950(283) |
| 550 | 505 | 517 | 77.0 | – | 52.3 | 64.8 | 86.6 | 70.5 | 57.8 | – | 1905(276) |
| 540 | 496 | 507 | 76.7 | – | 51.7 | 64.4 | 86.3 | 70.0 | 57.0 | 69 | 1860(270) |
| 530 | 488 | 497 | 76.4 | – | 51.1 | 63.9 | 86.0 | 69.5 | 56.2 | – | 1825(265) |
| 520 | 480 | 488 | 76.1 | – | 50.5 | 63.5 | 85.7 | 69.0 | 55.6 | 67 | 1795(260) |
| 510 | 473 | 479 | 75.7 | – | 49.8 | 62.9 | 85.4 | 68.3 | 54.7 | – | 1750(254) |
| 500 | 465 | 471 | 75.3 | – | 49.1 | 62.2 | 85.0 | 67.7 | 53.9 | 66 | 1705(247) |
| 490 | 456 | 460 | 74.9 | – | 48.4 | 61.6 | 84.7 | 67.1 | 53.1 | – | 1660(241) |
| 480 | 448 | 452 | 74.5 | – | 47.7 | 61.3 | 84.3 | 66.4 | 52.2 | 64 | 1620(235) |
| 470 | 441 | 442 | 74.1 | – | 46.9 | 60.7 | 83.9 | 65.7 | 51.3 | – | 1570(228) |
| 460 | 433 | 433 | 73.6 | – | 46.1 | 60.1 | 83.6 | 64.9 | 50.4 | 62 | 1530(222) |
| 450 | 425 | 425 | 73.3 | – | 45.3 | 59.4 | 83.2 | 64.3 | 49.4 | – | 1495(217) |
| 440 | 415 | 415 | 72.8 | – | 44.5 | 58.8 | 82.8 | 63.5 | 48.4 | 59 | 1460(212) |
| 430 | 405 | 405 | 72.3 | – | 43.6 | 58.2 | 82.3 | 62.7 | 47.4 | – | 1410(205) |
| 420 | 397 | 397 | 71.8 | – | 42.7 | 57.5 | 81.8 | 61.9 | 46.4 | 57 | 1370(199) |

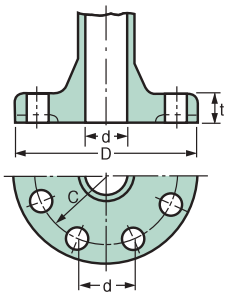
## SAE J417

| Vicker's Hardness | Brinell Hardness HB | | Rockwell Hardness | | | | Rockwell Superficial Hardness Superficial Brale Pentrator | | | Shore Hardness | Tensile Strength |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10-mm Ball, 3000-kg Load | | HRA A-Scale, 60kg Load Brale Penetrator | HRB B-Scale 100-kg Load 1/16"Dia Ball | HRC C-Scale 150-kg Load Brale Penetrator | HRD D-Scale 100-kg Load Brale Penetrator | 15-N Scale 15-kg Load | 30-N Scale 30-kg Load | 45-N Scale 45-kg Load | | (Approximate) in Mpa(KSI) |
| Hv | Standard Ball | Tungsten Carbide Ball | | | | | | | | | |
| 410 | 388 | 388 | 71.4 | – | 41.8 | 56.8 | 81.4 | 61.1 | 45.3 | – | 1330(193) |
| 400 | 379 | 379 | 70.8 | – | 40.8 | 56.0 | 81.0 | 60.2 | 44.1 | 55 | 1290(187) |
| 390 | 369 | 369 | 70.3 | – | 39.8 | 55.2 | 80.3 | 59.3 | 42.9 | – | 1240(180) |
| 380 | 360 | 360 | 69.8 | 110.0 | 38.8 | 54.4 | 79.8 | 58.4 | 41.7 | 52 | 1205(175) |
| 370 | 350 | 350 | 69.2 | – | 37.7 | 53.6 | 79.2 | 57.4 | 40.4 | – | 1170(170) |
| 360 | 341 | 341 | 68.7 | 109.0 | 36.6 | 52.8 | 78.6 | 56.4 | 39.1 | 50 | 1130(164) |
| 350 | 331 | 331 | 68.1 | – | 35.5 | 51.9 | 78.0 | 55.4 | 37.8 | – | 1095(159) |
| 340 | 322 | 322 | 67.6 | 108.0 | 34.4 | 51.1 | 77.4 | 54.4 | 35.5 | 47 | 1070(155) |
| 330 | 313 | 313 | 67.0 | – | 33.3 | 50.2 | 76.8 | 53.6 | 35.2 | – | 1035(150) |
| 320 | 303 | 303 | 66.4 | 107.0 | 32.2 | 49.4 | 76.2 | 52.3 | 33.9 | 45 | 1005(146) |
| 310 | 294 | 294 | 65.8 | – | 31.0 | 48.4 | 75.6 | 51.3 | 32.5 | – | 980(142) |
| 300 | 284 | 284 | 65.2 | 105.5 | 29.8 | 47.5 | 74.9 | 50.2 | 31.1 | 42 | 950(138) |
| 295 | 280 | 280 | 64.8 | – | 29.2 | 47.1 | 74.6 | 49.7 | 30.4 | – | 935(136) |
| 290 | 275 | 275 | 64.5 | 104.5 | 28.5 | 46.5 | 74.2 | 49.0 | 29.5 | 41 | 915(133) |
| 285 | 270 | 270 | 64.2 | – | 27.8 | 46.0 | 73.8 | 48.4 | 28.7 | – | 905(131) |
| 280 | 265 | 265 | 63.8 | 103.5 | 27.1 | 45.3 | 73.4 | 47.8 | 27.9 | 40 | 890(129) |
| 275 | 261 | 261 | 63.5 | – | 26.4 | 44.9 | 73.0 | 47.2 | 27.1 | – | 875(127) |
| 270 | 256 | 256 | 63.1 | 102.0 | 25.6 | 44.3 | 72.6 | 46.4 | 26.2 | 38 | 855(124) |
| 265 | 252 | 252 | 62.7 | – | 24.8 | 43.7 | 72.1 | 45.7 | 25.2 | – | 840(122) |
| 260 | 247 | 247 | 62.4 | 101.0 | 24.0 | 43.1 | 71.6 | 45.0 | 24.3 | 37 | 825(120) |
| 255 | 243 | 243 | 62.0 | – | 23.1 | 42.2 | 71.1 | 44.2 | 23.2 | – | 805(117) |
| 250 | 238 | 238 | 61.6 | 99.5 | 22.2 | 41.7 | 70.6 | 43.4 | 22.2 | 36 | 795(115) |
| 245 | 233 | 233 | 61.2 | – | 21.3 | 41.1 | 70.1 | 42.5 | 21.1 | – | 780(113) |
| 240 | 228 | 228 | 60.7 | 98.1 | 20.3 | 40.3 | 69.6 | 41.7 | 19.9 | 34 | 765(111) |
| 230 | 219 | 219 | – | 96.7 | 18.0 | – | – | – | – | 33 | 730(106) |
| 220 | 209 | 209 | – | 95.0 | 15.7 | – | – | – | – | 32 | 695(101) |
| 210 | 200 | 200 | – | 93.4 | 13.4 | – | – | – | – | 30 | 670(97) |
| 200 | 190 | 190 | – | 91.5 | 11.0 | – | – | – | – | 29 | 635(92) |
| 190 | 181 | 181 | – | 89.5 | 8.5 | – | – | – | – | 28 | 605(88) |
| 180 | 171 | 171 | – | 87.1 | 6.0 | – | – | – | – | 26 | 580(84) |
| 170 | 162 | 162 | – | 85.0 | 3.0 | – | – | – | – | 25 | 545(79) |
| 160 | 152 | 152 | – | 81.7 | 0.0 | – | – | – | – | 24 | 515(75) |
| 150 | 143 | 143 | – | 78.7 | – | – | – | – | – | 22 | 490(71) |
| 140 | 133 | 133 | – | 75.0 | – | – | – | – | – | 21 | 455(66) |
| 130 | 124 | 124 | – | 71.2 | – | – | – | – | – | 20 | 425(62) |
| 120 | 114 | 114 | – | 66.7 | – | – | – | – | – | – | 390(57) |
| 110 | 105 | 105 | – | 62.3 | – | – | – | – | – | – | – |
| 100 | 95 | 95 | – | 56.2 | – | – | – | – | – | – | – |
| 95 | 90 | 90 | – | 52.0 | – | – | – | – | – | – | – |
| 90 | 86 | 86 | – | 48.0 | – | – | – | – | – | – | – |
| 85 | 81 | 81 | – | 41.0 | – | – | – | – | – | – | – |

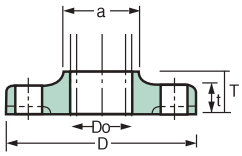
# TOLERANCE

## ASME B16.5-2009ED FORGED FLANGES (REVERSION OF ASME B16.5-2009)

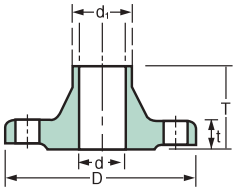
SOLID FLANGE




SLIP-ON FLANGE

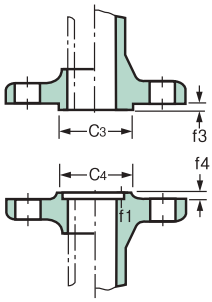



WELDING NECK FLANGE

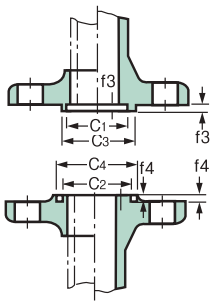



TYPE OF GASKET SURFACE

MALE & FEMALE TYPE




TONGUE & GROOVE TYPE




## WELDING NECK

| Place | Range | Tolerance(mm) |
|---|---|---|
| Outside Diameter | When O.D is 24" or Less | ±1.6*(±0.063in) |
| | When O.D is Over 24" | ±3.2*(±0.125in) |
| Inside Diameter | 10" and Smaller | ±1.0(±0.03in) |
| | 12" thru 18" | ±1.5(±0.06in) |
| | 20" and Larger | +3.0(+0.12in) −1.5(−0.06in) |
| Diameter of Contact Face | 2.0mm Raised Face (Outside) | ±1.0(±0.03in) |
| | 7.0mm Raised Face (Outside) | ±0.5(±0.02in) |
| | Tongue, goove, female (Inside & Outside) | ±0.5(±0.02in) |
| Diameter of Hub at Base | When Hub Base is 24" or Smaller | ±1.6*(±0.063in) |
| | When Hub Base is Over 24" | ±3.2*(±0.125in) |
| Diameter of Hub at Welding Point | When O.D is 5" or Less | +2.0(+0.09in) −1.0(−0.03in) |
| | When O.D is Over 6" | +4.0(+0.16in) −1.0(−0.03in) |
| Drilling | Bolt Circle Diameter | ±1.5(±0.06in) |
| | Bolt to Bolt Hole | ±0.8(±0.03in) |
| | Eccentricity of Bolt Circle with Respect to Facing | NPS≤2 1/2" 0.8(0.03in) Max. NPS≥3" 1.5(0.06in) Max. |
| | Eccentricity of Bolt circle with Respect to Bore | 0.8 Max. * (0.03in) |
| | Eccentricity of Facing with Respect to Bore | 0.8 Max. * (0.03in) |
| Thickness | When O.D is 18" or Less | +3.0(+0.12in) −0.0(−0.0in) |
| | When O.D is Over 20" | +5.0(+0.12in) −0.0(−0.0in) |
| Length Thru Hub | When O.D is 4" or Less | ±1.5(±0.06in) |
| | 5" thru 10" | +1.5(+0.06in) −3.0(−0.12in) |
| | When O.D is Over 12" | +3.0(+0.12in) −5.0(−0.18in) |
| Perpendicularity of the face with the bore | 5" and smaller | 1deg |
| | 6" and larger | 0.5deg |

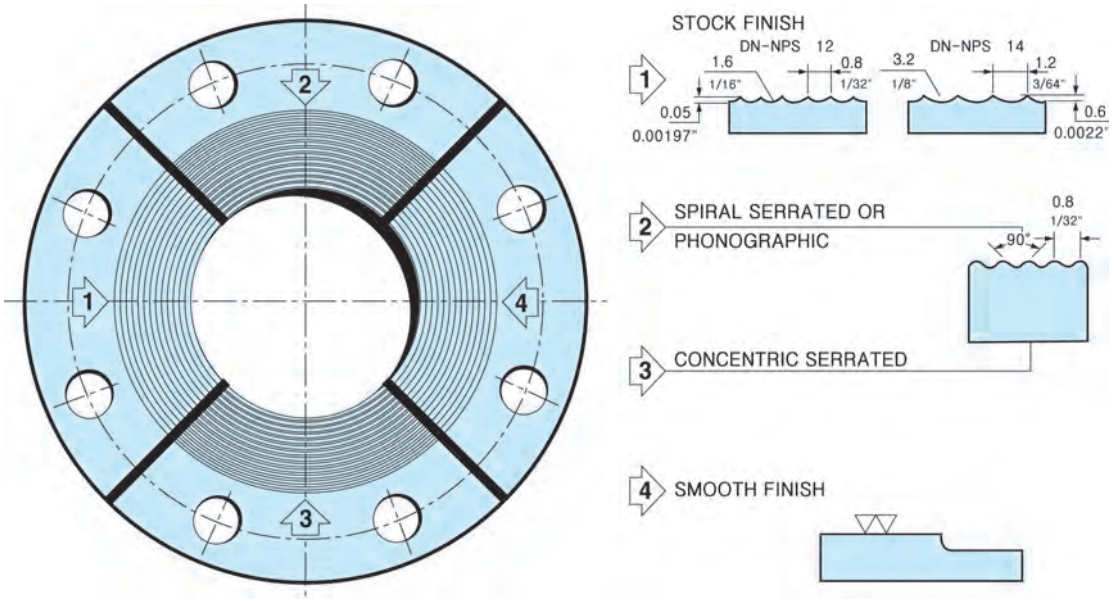
## THREAD, SOCKET-WELDING, SLIP-ON, LAP JOINT AND BLIND

| Place | | Range | Tolerance(mm) |
|---|---|---|---|
| Outside Diameter | | When O.D is 24" or Less | ±1.6*(±0.063in) |
| | | When O.D is Over 24" | ±3.2*(±0.125in) |
| Inside Diameter | Counter-bores Threaded | When O.D is 10" or Less | ±1.0(±0.03in) −0.0(−0.0in) |
| | | When O.D is Over 12" | +1.5(+0.06in) −0.0(−0.0in) |
| | Counter-bores Socket Welding | 1/2≤NPS≤3 | ±0.25(±0.01in) |
| | Lap joint Slip-on Socket Welding | When O.D is 10" or Less | ±1.0(±0.03in) −0.0(−0.0in) |
| | | When O.D is Over 12" | +1.5(+0.06in) −0.0(−0.0in) |
| Diameter of Contact Face | | 2.0mm Raised Face(Outside) | ±1.0(±0.03in) |
| | | 7.0mm Raised Face(Outside) | ±0.5(±0.02in) |
| | | Tongue, goove, female (Inside & Outside) | ±0.5(±0.02in) |
| Diameter of Hub at Base | | When Hub Base is 24" or Smaller | ±1.6*(±0.063in) |
| | | When Hub Base is Over 24" | ±3.2*(±0.125in) |
| Drilling | | Bolt Circle Diameter | ±1.5(±0.06in) |
| | | Bolt to Bolt Hole | ±0.8(±0.03in) |
| | | Eccentricity of Bolt circle with Respect to Facing | NPS≤2 1/2 ±0.8(0.03in) Max. NPS≥3" ±1.5(0.03in) Max. |
| | | Eccentricity of Bolt Circle with Respect to Bore | 0.8 Max. * (0.03in) |
| | | Eccentricity of Facing with Respect to Bore | 0.8 Max. * (0.03in) |
| Thickness | | When O.D is 18" or Less | +3.0(+0.12in) −0.0(−0.0in) |
| | | When O.D is Over 20" | +5.0(+0.19in) −0.0(−0.0in) |
| Length Thru Hub | | When O.D is 4" or Less | ±1.5(±0.06in) |
| | | 5" thru 10" | +1.5(+0.06in) −3.0(−0.12in) |
| | | When O.D. is Over 12" | +3.0(+0.12in) −5.0(−0.18in) |

Notes :

*This tolerance is not covered in ASME B 16.5, but maker's option.

# STANDARD FINISHES FOR FACE OF FLANGE(ASME B16.5)




## STOCK FINISH :

The most widely used of any gasket finish, because practically, is suitable for all ordinary service conditions. This is a continuous spiral groove. Flanges sizes 12" (304.8mm) and smaller are produced with a 1/16" round-nosed tool at a feed of 1/32" per revolution. For sizes 14" (355.6mm) and larger, the finish is made with 1/8" round-nosed tool at a feed of 3/64" per revolution.

## SPIRAL SERRATED OR PHONOGRAPHIC :

This finish is produced by using a 90° round-nosed tool.

## CONCENTRIC SERRATED :

This finish is produced by using a 90° round-nosed tool.

## SMOOTH FINISH :

The cutting tool employed shall have an approximate 0.06" radius.
The resultant surface finish shall have a 125μ inch to 250μ inch (ANSI B16.5 para 6.4.5)

### 1. RAISED FACE, AND LARGE MALE AND FEMALE

Either a serrated-concentric or serrated-spiral finish having from 45 to 55 grooves per inch is used. The cutting tool employed has an approximate 0.06 in radius. The resultant surface finish shall have a 125μ inch (3.2μm ) to 250μ inch (6.3μm ) approximate roughness.

### 2. TONGUE AND GROOVE, AND SMALL MALE AND FEMALE

The gasket contact surface does not exceed 125μ in, (3.2μm ) roughness.

### 3. RING JOINT

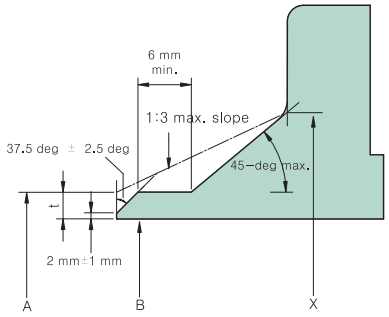
The inside wall surface of gasket groove does not exceed 63μ in, (1.6μ ) roughness.

### 4. BLIND

Blind flanges need not be faced in the center if when this center part is raised its diameter is at least 1 in. smaller than the inside diameter of fittings of the corresponding pressure class. When the center part is depressed, its diameter is not greater than the inside diameter of the corresponding pressure class fittings. Machining of the derpressed center is not required.

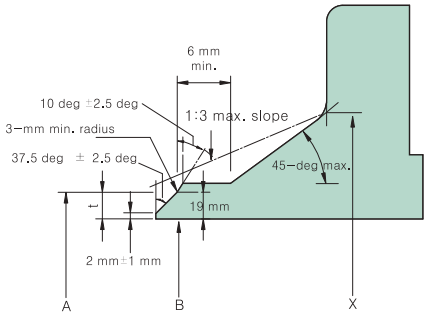
# ASME B16.5 FORGED FLANGES

Bevel for Wall Thickness t
From 5mm to 22mm inclusive




**Welding Ends**
**(Welding Neck Flanges, No Backig Rings)**

Bevel for Wall Thickness t
Greater Than 22 mm




**Welding Ends**
**(Welding Neck Flanges, No Backig Rings)**

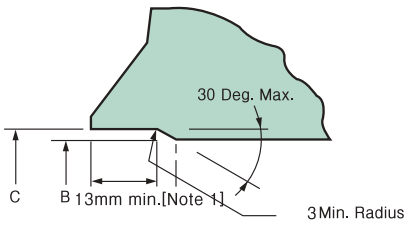
A = nominal outside diameter of pipe B= nominal inside diameter of pipe t = nominal wall thickness of pipe x = diameter of hub
(See dimensional tables)

Notes :

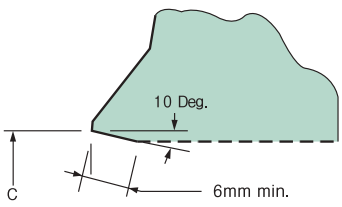
When the thickness of the hub at the bevel is greater than that of the pipe to which the flange is joined and the additional thickness is provided on the outside diameter, a taper weld having a slop not exceeding 1 to 3 may be employed or, alternatively, the greater outside diameter may be tapered, at the same maximum slope or less, from a point on the welding bevel equal to the OD at the mating pipe. Similarly, when the greater thickness is provided on the inside of the flange, it shall be taper-bored from the welding end at a slope not exceeding 1 to 3.

When flanges covered by this standard are intended for services with light wall, higher strength pipe, the thickness of the hub at the bevel may be greater than that of the pipe to which the flange is joined. Under these conditions a single taper hub may be provided and the outside diameter of the hub at the base (Dimension X) may also be modified.

The additional thickness may be provided on either inside or outside or partially on each side, but the total additional thickness shall not exceed one-half times the nominal wall thickness of intened mating pipe.




**INSIDE CONTOUR FOR USE WITH RECTANGULAR BACKING RING**

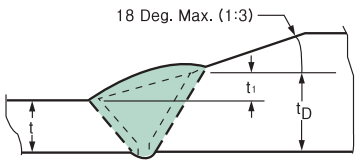



**INSIDE CONTOUR FOR USE WITH TAPER BACKING RING**

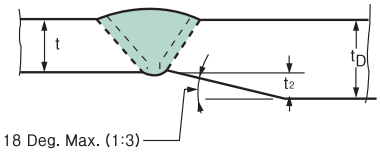
A= nominal outside diameter of welding end, mm
B= nominal inside diameter of pipe(=A-2t).mm
C= A-0.79 - 1.75t - 0.25, mm
t = nominal wall thickness of pipe, mm
0.79mm = minus tolerance on outside diameter of pope to ASTM A106, etc.
1.75t = 87.5% of nominal wall(permitted by ASTM A106etc.) multiplied by to conver into terms of diameter.
0.25mm = plus tolerance on diameter C, mm.

Notes :

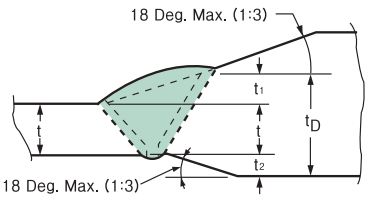
(1) 13mm depth based on use of 19mm wide backing ring




**BEVEL FOR OUTSIDE THICKNESS**




**BEVEL FOR INSIDE THICKNESS**




**BEVEL FOR COMBINED THICKNESS**

Notes :

(1)When the materials joined have equal minimum specified yield strength, there shall be no restriction on the minimum slope.
(2)Neither t1, t2, nor their sum (t1+t2) shall exceed 0.5t.
(3)When the minimum specified yield strength of the sections to be joined are unequal, the valus of $t_D$ shall at least equal t time the ratio of minimum specified yield strength of the pipe to minimum specified yield strength of the flange.

# ASME ORIFICE FLANGE(ASME B16.36-2006)

**ORIFICE FLANGES** are widely used in conjunction with orifice meters for measuring the rate of flow of liquids and gases. They are basically the same as standard welding neck, slip-on and screwed flanges except for the provision of radial, tapped holes in the flange ring for meter connections and additional bolts to act as jack screws to facilitate separating the flanges for inspection or replacement of the orifice plate.

**NOTES:**

## 1. JACK SCREW PROVISION

(1) Locaton

Each flange shall have a machine bolt mounted in a hole drilled on the flange center line at 90 deg. From the pressure taps, for use as a jackscrew. Machine bolt shall be regular, with one heavy hex. nut.

(2) Solt fo Nut

A slot shall be provided in the flange 0.06 in. (2mm) wider than the width across flats of the nut. The depth of the slot shall admit the nut so that there is no interference with the joining of the flanges when bolted together without orifice plate.

(3) Tapped Hole

A tapped hole may be provided and te hex nut omitted when agreed on between the purchaser and the manufacturer.

## 2. PRESSURE TAPS

Each orifice flange is provided with two pressure tap holes extending radially from the outside diameter of the flange to the inside diameter of the flange.

(1) Location

The 0.94 in (24mm) locating dimension for raised face and 0.75 in. (19mm) for ring joint shall be measured at the bore.

(2) Each pressure tap hole shall be equipped with a pipe plug.

## 3. FACING

The finish of contact faces shall conform to the requirements Of ASME B16.5

## 4. FLANGE THREADS

Threaded flanges shall have an American National Standard taper pipe thread conforming to ASME B1.20. 1

(1) The thread shall be concentric with the axis of the flange and variations in alignment shall not exceed 0.06 in./ft.(0.5%)

(2) The flanges are made with counterbores at the back of the flange and the threads shall be chamfered to the diameter of the counterbore at an angle of approximately 45 degrees with the axis of the thread to afford easy entrance in making a joint. The counterbore and chamfer shall be concentric with the thread.

(3) In order to permit the pipe to be inserted to the face of the flange, the threads should have full root diameters through to the face of the flange, or shall have a counterbore at face of the flange.

(4) The gaging notch of the working gage shall come flush with the bottom of the chamfer in all threaded flanges and shall be considered as being the intersection of the chamfer cone and the pitch cone of the thread. This depth of chamfer is approximately equal to one-half($^1$/2) of the pitch of the thread.

(5) The maximum allowable thread variation is one turn large or small from the gaging notch.

## 5. TOLERANCES

Tolerances on all dimensions shall be as shown in ASME B16.5 except for those shown below.

(1) Pressure Tap Location

Tolerance on location of center of pressure tap hole from flange face shall be:

a. Flanges smaller than NPS 4 ±0.02 in (0.5mm)

b. Flanges NPS 4 and larger ±0.03 in. (0.8mm)

(2) Bore diameter

Bore diameter tolerance (welding neck flanges only) is ±0.5% of nominal value.

# PIPE & FITTINGS WALL THICKNESS SCHEDULES DIMENSION

| Nominal Pipe Size (NPS) | | Outside Diameter | | | Nominal Wall Thickness(SS) | | | | Nominal Wall Thickness (Carborn & Low Alloy Steel) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sch5s | Sch10s | Sch40s | Sch80s | Sch5 | Sch10 | Sch20 | Sch30 | STD |
| A | B | MM | IN | | MM | MM | MM | MM | MM | MM | MM | MM | MM |
| 6 | 1/8" | 10.3 | | W.T | – | 1.24 | 1.73 | 2.41 | – | 1.24 | – | 1.45 | 1.73 |
| | | | | I.D | – | 7.82 | 6.84 | 5.48 | – | 7.82 | – | 7.40 | 6.84 |
| 8 | 1/4" | 13.7 | 0.540 | W.T | – | 1.65 | 2.24 | 3.02 | – | 1.65 | – | 1.85 | 2.24 |
| | | | | I.D | – | 10.40 | 9.22 | 7.66 | – | 10.40 | – | 10.0 | 9.22 |
| 10 | 3/8" | 17.1 | 0.675 | W.T | – | 1.65 | 2.31 | 3.20 | – | 1.65 | – | 1.85 | 2.31 |
| | | | | I.D | – | 13.80 | 12.48 | 10.70 | – | 13.80 | – | 13.40 | 12.48 |
| 15 | 1/2" | 21.3 | 0.840 | W.T | 1.65 | 2.11 | 2.77 | 3.73 | 1.65 | 2.11 | – | 2.41 | 2.77 |
| | | | | I.D | 18.00 | 17.08 | 15.76 | 13.84 | 18.00 | 17.08 | – | 16.48 | 15.76 |
| 20 | 3/4" | 26.7 | 1.05 | W.T | 1.65 | 2.11 | 2.87 | 3.91 | 1.65 | 2.11 | – | 2.41 | 2.87 |
| | | | | I.D | 23.40 | 22.48 | 20.96 | 18.88 | 23.40 | 22.48 | – | 21.88 | 20.96 |
| 25 | 1" | 33.4 | 1.32 | W.T | 1.65 | 2.77 | 3.38 | 4.55 | 1.65 | 2.77 | – | 2.90 | 3.38 |
| | | | | I.D | 30.10 | 27.86 | 26.64 | 24.30 | 30.10 | 27.86 | – | 27.60 | 26.64 |
| 32 | 1 1/4" | 42.2 | 1.66 | W.T | 1.65 | 2.77 | 3.56 | 4.85 | 1.65 | 2.77 | – | 2.97 | 3.56 |
| | | | | I.D | 38.90 | 36.66 | 35.08 | 32.50 | 38.90 | 36.66 | – | 36.26 | 35.08 |
| 40 | 1 1/2" | 48.3 | 1.9 | W.T | 1.65 | 2.77 | 3.68 | 5.08 | 1.65 | 2.77 | – | 3.18 | 3.68 |
| | | | | I.D | 45.00 | 42.76 | 40.94 | 38.14 | 45.00 | 42.76 | – | 41.94 | 40.94 |
| 50 | 2" | 60.3 | 2.38 | W.T | 1.65 | 2.77 | 3.91 | 5.54 | 1.65 | 2.77 | – | 3.18 | 3.91 |
| | | | | I.D | 57.00 | 54.76 | 52.48 | 49.22 | 57.00 | 54.76 | – | 53.94 | 52.48 |
| 65 | 2 1/2" | 73.0 | 2.88 | W.T | 2.11 | 3.05 | 5.16 | 7.01 | 2.11 | 3.05 | – | 4.78 | 5.16 |
| | | | | I.D | 68.780 | 66.90 | 62.68 | 58.98 | 68.78 | 66.90 | – | 63.44 | 62.68 |
| 80 | 3" | 88.9 | 3.5 | W.T | 2.11 | 3.05 | 5.49 | 7.62 | 2.11 | 3.05 | – | 4.78 | 5.49 |
| | | | | I.D | 84.68 | 82.80 | 77.92 | 73.66 | 84.68 | 82.80 | – | 79.34 | 77.92 |
| 90 | 3 1/2" | 101.6 | 4 | W.T | 2.11 | 3.05 | 5.74 | 8.08 | 2.11 | 3.05 | – | 4.78 | 5.74 |
| | | | | I.D | 97.38 | 95.50 | 90.12 | 85.44 | 97.38 | 95.50 | – | 92.04 | 90.12 |
| 100 | 4" | 114.3 | 4.5 | W.T | 2.11 | 3.05 | 6.02 | 8.56 | 2.11 | 3.05 | – | 4.78 | 6.02 |
| | | | | I.D | 110.08 | 108.20 | 102.26 | 97.18 | 110.08 | 108.20 | – | 104.74 | 102.26 |
| 125 | 5" | 141.3 | 5.56 | W.T | 2.77 | 3.40 | 6.55 | 9.53 | 2.77 | 3.40 | – | – | 6.55 |
| | | | | I.D | 135.76 | 134.50 | 128.20 | 122.24 | 135.76 | 134.50 | – | – | 128.20 |
| 150 | 6" | 168.3 | 6.62 | W.T | 2.77 | 3.40 | 7.11 | 10.97 | 2.77 | 3.40 | – | – | 7.11 |
| | | | | I.D | 162.76 | 161.50 | 154.08 | 146.36 | 162.76 | 161.50 | – | – | 154.08 |
| 200 | 8" | 219.1 | 8.62 | W.T | 2.77 | 3.76 | 8.18 | 12.70 | 2.77 | 3.76 | 6.35 | 7.04 | 8.18 |
| | | | | I.D | 213.56 | 211.58 | 202.74 | 193.70 | 213.56 | 211.58 | 206.40 | 205.02 | 202.74 |
| 250 | 10" | 273.1 | 10.75 | W.T | 3.40 | 4.19 | 9.27 | 12.70 | 3.40 | 4.19 | 6.35 | 7.80 | 9.27 |
| | | | | I.D | 266.30 | 264.72 | 254.56 | 247.70 | 266.20 | 264.62 | 260.30 | 257.50 | 254.46 |
| 300 | 12" | 323.9 | 12.75 | W.T | 3.96 | 4.57 | 9.53 | 12.70 | 3.96 | 4.57 | 6.35 | 8.38 | 9.53 |
| | | | | I.D | 315.98 | 314.76 | 304.84 | 298.50 | 315.88 | 314.66 | 311.10 | 307.04 | 304.74 |
| 350 | 14" | 355.6 | 14 | W.T | 3.96 | 4.78 | 9.53 | 12.70 | 3.96 | 6.35 | 7.92 | 9.53 | 9.53 |
| | | | | I.D | 347.68 | 346.04 | 336.54 | 330.20 | 347.68 | 342.90 | 339.76 | 336.54 | 336.54 |
| 400 | 16" | 406.4 | 16 | W.T | 4.19 | 4.78 | 9.53 | 12.70 | 4.19 | 6.35 | 7.92 | 9.53 | 9.53 |
| | | | | I.D | 398.02 | 396.84 | 387.34 | 381.00 | 398.02 | 393.70 | 390.56 | 387.34 | 387.34 |
| 450 | 18" | 457 | 18 | W.T | 4.19 | 4.78 | 9.53 | 12.70 | 4.19 | 6.35 | 7.92 | 11.13 | 9.53 |
| | | | | I.D | 448.62 | 447.44 | 437.94 | 431.60 | 448.62 | 444.30 | 441.16 | 434.74 | 437.94 |
| 500 | 20" | 508 | 20 | W.T | 4.78 | 5.54 | 9.53 | 12.70 | 4.78 | 6.35 | 9.53 | 12.70 | 9.53 |
| | | | | I.D | 498.44 | 496.92 | 488.94 | 482.60 | 498.44 | 495.30 | 488.94 | 482.60 | 488.94 |
| 550 | 22" | 559 | 22 | W.T | 4.78 | 5.54 | 9.53 | 12.70 | 4.78 | 6.35 | 9.53 | 12.70 | 9.53 |
| | | | | I.D | 549.44 | 547.92 | 539.94 | 533.60 | 549.44 | 546.30 | 539.94 | 533.60 | 539.94 |
| 600 | 24" | 610 | 24 | W.T | 5.54 | 6.35 | 9.53 | 12.70 | 5.54 | 6.35 | 9.53 | 14.27 | 9.53 |
| | | | | I.D | 598.92 | 597.30 | 590.94 | 584.60 | 598.92 | 597.30 | 590.94 | 581.46 | 590.94 |
| 650 | 26" | 660 | 26 | W.T | – | – | – | – | – | 7.92 | 12.70 | – | 9.53 |
| | | | | I.D | – | – | – | – | – | 644.16 | 634.60 | – | 640.94 |
| 700 | 28" | 711 | 28 | W.T | – | – | – | – | – | 7.92 | 12.70 | 15.88 | 9.53 |
| | | | | I.D | – | – | – | – | – | 695.16 | 685.60 | 679.24 | 691.94 |
| 750 | 30" | 762 | 30 | W.T | 6.35 | 7.92 | 9.53 | 12.70 | 6.35 | 7.92 | 12.70 | 15.88 | 9.53 |
| | | | | I.D | 749.3 | 746.16 | 742.94 | 736.60 | 749.30 | 746.16 | 736.60 | 730.24 | 742.94 |
| 800 | 32" | 813 | 32 | W.T | – | – | – | – | – | 7.92 | 12.70 | 15.88 | 9.53 |
| | | | | I.D | – | – | – | – | – | 797.16 | 787.60 | 781.24 | 793.94 |
| 850 | 34" | 864 | 34 | W.T | – | – | – | – | – | 7.92 | 12.70 | 15.88 | 9.53 |
| | | | | I.D | – | – | – | – | – | 848.16 | 838.60 | 832.24 | 844.94 |
| 900 | 36" | 914 | 36 | W.T | – | – | – | – | – | 7.92 | 12.70 | 15.88 | 9.53 |
| | | | | I.D | – | – | – | – | – | 898.16 | 888.60 | 882.24 | 894.94 |
| 950 | 38" | 965 | 38 | W.T | – | – | – | – | – | – | – | – | 9.53 |
| | | | | I.D | – | – | – | – | – | – | – | – | 945.94 |
| 1000 | 40" | 1016 | 40 | W.T | – | – | – | – | – | – | – | – | 9.53 |
| | | | | I.D | – | – | – | – | – | – | – | – | 996.94 |
| 1050 | 42" | 1067 | 42 | W.T | – | – | – | – | – | – | – | – | 9.53 |
| | | | | I.D | – | – | – | – | – | – | – | – | 1047.94 |
| 1100 | 44" | 1118 | 44 | W.T | – | – | – | – | – | – | – | – | 9.53 |
| | | | | I.D | – | – | – | – | – | – | – | – | 1098.94 |
| 1150 | 46" | 1168 | 46 | W.T | – | – | – | – | – | – | – | – | 9.53 |
| | | | | I.D | – | – | – | – | – | – | – | – | 1148.94 |
| 1200 | 48" | 1219 | 48 | W.T | – | – | – | – | – | – | – | – | 9.53 |
| | | | | I.D | – | – | – | – | – | – | – | – | 1199.94 |

▶Carbon & Low Alloy Steel (B36.10M)

The wall thickness shown represent nominal or average wall diamensions which are subject to a–121/2% mill tolerance.

Note that schdule 40 in. sizes 12" (304.8mm) and larger and that schedule 80 in sizes 10" (254mm) and larger do not agree with schedules 40S and 80S of ASME B36. 19 nor with standard weight and extra strong respectively.

| Nominal Wall Thickness (Carborn & Low Alloy Steel) | | | | | | | | | Outside Diameter | NPS" | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sch40 | Sch60 | XS | Sch80 | Sch100 | Sch120 | Sch140 | Sch160 | XXS | | | |
| MM | MM | MM | MM | MM | MM | MM | MM | MM | MM | A | B |
| 1.73 | – | 2.41 | 2.41 | – | – | – | – | – | 10.3 | 6 | 1/8" |
| 6.84 | – | 5.48 | 5.48 | – | – | – | – | – | | | |
| 2.24 | – | 3.02 | 3.02 | – | – | – | – | – | 13.7 | 8 | 1/4" |
| 9.22 | – | 7.66 | 7.66 | – | – | – | – | – | | | |
| 2.31 | – | 3.20 | 3.20 | – | – | – | – | – | 17.1 | 10 | 3/8" |
| 12.48 | – | 10.70 | 10.70 | – | – | – | – | – | | | |
| 2.77 | – | 3.73 | 3.73 | – | – | – | 4.78 | 7.47 | 21.3 | 15 | 1/2" |
| 15.76 | – | 13.84 | 13.84 | – | – | – | 11.74 | 6.36 | | | |
| 2.87 | – | 3.91 | 3.91 | – | – | – | 5.56 | 7.82 | 26.7 | 20 | 3/4" |
| 20.96 | – | 18.88 | 18.88 | – | – | – | 15.58 | 11.06 | | | |
| 3.38 | – | 4.55 | 4.55 | – | – | – | 6.35 | 9.09 | 33.4 | 25 | 1" |
| 26.64 | – | 24.30 | 24.30 | – | – | – | 20.70 | 15.22 | | | |
| 3.56 | – | 4.85 | 4.85 | – | – | – | 6.35 | 9.7 | 42.2 | 32 | 1 1/4" |
| 35.08 | – | 32.50 | 32.50 | – | – | – | 29.50 | 22.80 | | | |
| 3.68 | – | 5.08 | 5.08 | – | – | – | 7.14 | 10.15 | 48.3 | 40 | 1 1/2" |
| 40.94 | – | 38.14 | 38.14 | – | – | – | 34.02 | 28.00 | | | |
| 3.91 | – | 5.54 | 5.54 | – | – | – | 8.74 | 11.07 | 60.3 | 50 | 2" |
| 52.48 | – | 49.22 | 49.22 | – | – | – | 42.82 | 38.16 | | | |
| 5.16 | – | 7.01 | 7.01 | – | – | – | 9.53 | 14.02 | 73.0 | 65 | 2 1/2" |
| 62.68 | – | 58.98 | 58.98 | – | – | – | 53.94 | 44.96 | | | |
| 5.49 | – | 7.62 | 7.62 | – | – | – | 11.13 | 15.24 | 88.9 | 80 | 3" |
| 77.92 | – | 73.66 | 73.66 | – | – | – | 66.64 | 58.42 | | | |
| 5.74 | – | 8.08 | 8.08 | – | – | – | – | – | 101.6 | 90 | 3 1/2" |
| 90.12 | – | 85.44 | 85.44 | – | – | – | – | – | | | |
| 6.02 | – | 8.56 | 8.56 | – | 11.13 | – | 13.49 | 17.12 | 114.3 | 100 | 4" |
| 102.26 | – | 97.18 | 97.18 | – | 92.04 | – | 87.32 | 80.06 | | | |
| 6.55 | – | 9.53 | 9.53 | – | 12.7 | – | 15.88 | 19.05 | 141.3 | 125 | 5" |
| 128.20 | – | 122.24 | 122.24 | – | 115.90 | – | 109.54 | 103.20 | | | |
| 7.11 | – | 10.97 | 10.97 | – | 14.27 | – | 18.26 | 21.95 | 168.3 | 150 | 6" |
| 154.08 | – | 146.36 | 146.36 | – | 139.76 | – | 131.78 | 124.40 | | | |
| 8.18 | 10.31 | 12.7 | 12.7 | 15.09 | 18.26 | 20.62 | 23.01 | 22.23 | 219.1 | 200 | 8" |
| 202.74 | 198.48 | 193.70 | 193.70 | 188.92 | 182.58 | 177.86 | 173.08 | 174.64 | | | |
| 9.27 | 12.7 | 12.7 | 15.09 | 18.26 | 21.44 | 25.4 | 28.58 | 25.4 | 273.0 | 250 | 10" |
| 254.46 | 247.60 | 247.60 | 242.82 | 236.48 | 230.12 | 222.20 | 215.84 | 222.20 | | | |
| 10.31 | 14.27 | 12.7 | 17.48 | 21.44 | 25.4 | 28.58 | 33.32 | 25.4 | 323.8 | 300 | 12" |
| 303.18 | 295.26 | 298.40 | 288.84 | 280.92 | 273.00 | 266.64 | 257.16 | 273.00 | | | |
| 11.13 | 15.09 | 12.7 | 19.05 | 23.83 | 27.79 | 31.75 | 35.71 | – | 355.6 | 350 | 14" |
| 333.34 | 325.42 | 330.20 | 317.5 | 307.94 | 300.02 | 292.10 | 284.18 | – | | | |
| 12.7 | 16.66 | 12.7 | 21.44 | 26.19 | 30.96 | 36.53 | 40.49 | – | 406.4 | 400 | 16" |
| 381.00 | 373.08 | 381.00 | 363.52 | 354.02 | 344.48 | 333.34 | 325.42 | – | | | |
| 14.27 | 19.05 | 12.7 | 23.83 | 29.36 | 34.93 | 39.67 | 45.24 | – | 457 | 450 | 18" |
| 428.46 | 418.9 | 431.60 | 409.34 | 398.28 | 387.14 | 377.66 | 366.52 | – | | | |
| 15.09 | 20.62 | 12.7 | 26.19 | 32.54 | 38.1 | 44.45 | 50.01 | – | 508 | 500 | 20" |
| 477.82 | 466.76 | 482.60 | 455.62 | 442.92 | 431.8 | 419.10 | 407.98 | – | | | |
| – | 22.23 | 12.7 | 28.58 | 34.93 | 41.28 | 47.63 | 53.98 | – | 559 | 550 | 22" |
| – | 514.54 | 533.60 | 501.84 | 489.14 | 476.44 | 463.74 | 451.04 | – | | | |
| 17.48 | 24.61 | 12.7 | 30.96 | 38.89 | 46.02 | 52.37 | 59.54 | – | 610 | 600 | 24" |
| 575.04 | 560.78 | 584.60 | 548.08 | 532.22 | 517.96 | 505.26 | 490.92 | – | | | |
| – | – | 12.7 | – | – | – | – | – | – | 660 | 650 | 26" |
| – | – | 634.60 | – | – | – | – | – | – | | | |
| – | – | 12.7 | – | – | – | – | – | – | 711 | 700 | 28" |
| – | – | 685.60 | – | – | – | – | – | – | | | |
| – | – | 12.7 | – | – | – | – | – | – | 762 | 750 | 30" |
| – | – | 736.60 | – | – | – | – | – | – | | | |
| 17.48 | – | 12.7 | – | – | – | – | – | – | 813 | 800 | 32" |
| 778.04 | – | 787.60 | – | – | – | – | – | – | | | |
| 17.48 | – | 12.7 | – | – | – | – | – | – | 864 | 850 | 34" |
| 829.04 | – | 838.60 | – | – | – | – | – | – | | | |
| 19.05 | – | 12.7 | – | – | – | – | – | – | 914 | 900 | 36" |
| 875.90 | – | 888.60 | – | – | – | – | – | – | | | |
| – | – | 12.7 | – | – | – | – | – | – | 965 | 950 | 38" |
| – | – | 939.60 | – | – | – | – | – | – | | | |
| – | – | 12.7 | – | – | – | – | – | – | 1016 | 1000 | 40" |
| – | – | 990.60 | – | – | – | – | – | – | | | |
| – | – | 12.7 | – | – | – | – | – | – | 1067 | 1050 | 42" |
| – | – | 1041.60 | – | – | – | – | – | – | | | |
| – | – | 12.7 | – | – | – | – | – | – | 1118 | 1100 | 44" |
| – | – | 1092.60 | – | – | – | – | – | – | | | |
| – | – | 12.7 | – | – | – | – | – | – | 1168 | 1150 | 46" |
| – | – | 1142.60 | – | – | – | – | – | – | | | |
| – | – | 12.7 | – | – | – | – | – | – | 1219 | 1200 | 48" |
| – | – | 1193.60 | – | – | – | – | – | – | | | |

▶ Stainless Steel (B36.19M)

The wall thickness shown represent nominal or average wall diamensions which are subject to a–121/2% mill tolerance.

+Sizes 14" (355.6mm) through 30" (762.0mm) are not at publication date covered in B36 19, and dimansions listed are those commonly used in the industry.

*Schedules 55 and 105 wall thicknesses do not permit threading in accordance with ASME B2 1.

**Note that schdule 40S and schedule 80S in these sizes do not agree with schedule 40 and schedule 80 of ASME B36. 10. and that they are identical to standard weight and extra strong respectively of ASME B36. 10.

# ASTM MATERIAL CHEMICAL COMPOSITION & MECHANICAL REQUIREMENTS

## ATSM 2013 SECTION 1, VOLUME 1.01

| MATE-RIAL | | | Chemical Compsition (%) | | | | | | | | | | | | Mechanical Requirements | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | C | Si | Mn | P | S | Ni | Cr | Mo | Cu | V | Nb | N | Y.S (Mpa) | T.S (Mpa) | E.L (%) | R.A (%) | H.B |
| A 105 | K03504 | Max. | 0.35 | 0.35 | 1.05 | 0.035 | 0.040 | 0.40 | 0.30 | 0.12 | 0.40 | 0.08 | | | | | | | 187 |
| | | Min. | | 0.10 | 0.60 | | | | | | | | | | 250 | 485 | 22 | 30 | |
| A266 GR.1 | K03506 | Max. | 0.30 | 0.35 | 1.05 | 0.025 | 0.025 | | | | | | | | | 585 | | | |
| | | Min. | | 0.15 | 0.40 | | | | | | | | | | 205 | 415 | 23 | 38 | |
| A266 GR.2 | K03506 | Max. | 0.30 | 0.35 | 1.05 | 0.025 | 0.025 | | | | | | | | | 655 | | | |
| | | Min. | | 0.15 | 0.40 | | | | | | | | | | 250 | 485 | 20 | 33 | |
| A266 GR.3 | K05001 | Max. | 0.35 | 0.35 | 1.35 | 0.025 | 0.025 | | | | | | | | | 690 | | | |
| | | Min. | | 0.15 | 0.80 | | | | | | | | | | 260 | 515 | 19 | 30 | |
| A266 GR.4 | K03017 | Max. | 0.30 | 0.35 | 1.35 | 0.025 | 0.025 | | | | | | | | | 655 | | | |
| | | Min. | | 0.15 | 0.80 | | | | | | | | | | 250 | 485 | 20 | 33 | |
| A350 LF.1 | K03009 | Max. | 0.30 | 0.30 | 1.35 | 0.035 | 0.040 | 0.40 | 0.30 | 0.12 | 0.40 | 0.08 | 0.02 | | | 585 | | | 197 |
| | | Min. | | 0.15 | 0.60 | | | | | | | | 0.02 | | 205 | 415 | 25 | 38 | |
| A350 LF.2 | K03011 | Max. | 0.30 | 0.30 | 1.35 | 0.035 | 0.040 | 0.40 | 0.30 | 0.12 | 0.40 | 0.08 | | | | 655 | | | 197 |
| | | Min. | | 0.15 | 0.60 | | | | | | | | | | 250 | 485 | 22 | 30 | |
| A350 LF3 | K32025 | Max. | 0.20 | 0.35 | 0.90 | 0.035 | 0.040 | 3.70 | 0.30 | 0.12 | 0.40 | 0.03 | 0.02 | | | 655 | | | 197 |
| | | Min. | | 0.20 | | | | 3.30 | | | | | | | 260 | 485 | | 35 | |
| A694 | K03014 | Max. | 0.26 | 0.35 | 1.60 | 0.025 | 0.025 | | | | | | | | F42:290<br>F46:315<br>F48:330<br>F50:345<br>F52:360<br>F56:385<br>F60:415<br>F65:450<br>F70:485 | F42:415<br>F46:415<br>F48:425<br>F50:440<br>F52:455<br>F56:470<br>F60:515<br>F65:530<br>F70:565 | F42~F65 :20<br>F70:18 | | |
| | | Min. | | 0.15 | | | | | | | | | | | | | | | |
| A182 F1 | K12822 | Max. | 0.28 | 0.35 | 0.90 | 0.045 | 0.045 | | | 0.65 | | | | | | | | | 192 |
| | | Min. | | 0.15 | 0.60 | | | | | 0.44 | | | | | 275 | 485 | 20 | 30 | 143 |
| A182 F5 | K41545 | Max. | 0.15 | 0.50 | 0.60 | 0.030 | 0.030 | 0.50 | 6.00 | 0.65 | | | | | | | | | 217 |
| | | Min. | | | 0.30 | | | | 4.00 | 0.44 | | | | | 275 | 485 | 20 | 35 | 143 |
| A182 F5a | K42544 | Max. | 0.25 | 0.50 | 0.60 | 0.040 | 0.030 | 0.50 | 6.00 | 0.65 | | | | | | | | | 248 |
| | | Min. | | | | | | | 4.00 | 0.44 | | | | | 450 | 620 | 22 | 50 | 187 |
| A182 F9 | K90941 | Max. | 0.15 | 1.00 | 0.60 | 0.030 | 0.030 | | 10.00 | 1.10 | | | | | | | | | 217 |
| | | Min. | | 0.50 | 0.30 | | | | 8.00 | 0.90 | | | | | 380 | 585 | 20 | 40 | 179 |
| A182 F91 | K90901 | Max. | 0.12 | 0.50 | 0.60 | 0.020 | 0.010 | 0.40 | 9.50 | 1.05 | | 0.25 | 0.10 | 0.07 | | | | | 248 |
| | | Min. | 0.08 | 0.20 | 0.30 | Al 0.02 Ti 0.01 Zr 0.01 | | | 8.00 | 0.85 | | 0.18 | 0.06 | 0.03 | 415 | 620 | 20 | 40 | 190 |
| A182 F11CL1 | K11597 | Max. | 0.15 | 1.00 | 0.60 | 0.030 | 0.030 | | 1.50 | 0.65 | | | | | | | | | 174 |
| | | Min. | 0.05 | 0.50 | 0.30 | | | | 1.00 | 0.44 | | | | | 205 | 415 | 20 | 45 | 121 |
| A182 F11CL2 | K11572 | Max. | 0.20 | 1.00 | 0.80 | 0.040 | 0.040 | | 1.50 | 0.65 | | | | | | | | | 207 |
| | | Min. | 0.10 | 0.50 | 0.30 | | | | 1.00 | 0.44 | | | | | 275 | 485 | 20 | 30 | 143 |
| A182 F11CL3 | K11572 | Max. | 0.20 | 1.00 | 0.80 | 0.040 | 0.040 | | 1.50 | 0.65 | | | | | | | | | 207 |
| | | Min. | 0.10 | 0.50 | 0.30 | | | | 1.00 | 0.44 | | | | | 310 | 515 | 20 | 30 | 156 |
| A182 F12CL1 | K11562 | Max. | 0.15 | 0.50 | 0.60 | 0.045 | 0.045 | | 1.25 | 0.65 | | | | | | | | | 174 |
| | | Min. | 0.05 | | 0.30 | | | | 0.80 | 0.44 | | | | | 220 | 415 | 20 | 45 | 121 |
| A182 F12CL2 | K11564 | Max. | 0.20 | 0.60 | 0.80 | 0.040 | 0.040 | | 1.25 | 0.65 | | | | | | | | | 207 |
| | | Min. | 0.10 | 0.10 | 0.30 | | | | 0.80 | 0.44 | | | | | 275 | 485 | 20 | 30 | 143 |
| A182 F22CL1 | K21590 | Max. | 0.15 | 0.50 | 0.60 | 0.040 | 0.040 | | 2.50 | 1.13 | | | | | | | | | 170 |
| | | Min. | 0.05 | | 0.30 | | | | 2.00 | 0.87 | | | | | 205 | 415 | 20 | 35 | |
| A182 F22CL3 | K21590 | Max. | 0.15 | 0.50 | 0.60 | 0.040 | 0.040 | | 2.50 | 1.13 | | | | | | | | | 207 |
| | | Min. | 0.05 | | 0.30 | | | | 2.00 | 0.87 | | | | | 310 | 515 | 20 | 30 | 156 |
| A182 F22V | K31835 | Max. | 0.15 | 0.10 | 0.60 | 0.015 | 0.010 | 0.25 | 2.50 | 1.10 | 0.20 | 0.35 | 0.07 | | | 780 | | | 237 |
| | | Min. | 0.11 | | 0.30 | B 0.002 Ca 0.015 | | | 2.00 | 0.90 | | 0.25 | Ti 0.030 | | 415 | 620 | 18 | 45 | 174 |
| A182 F304 | S30400 | Max. | 0.08 | 1.00 | 2.00 | 0.045 | 0.030 | 11.00 | 20.00 | | | | | 0.1 | | | | | |
| | | Min. | | | | | | 8.00 | 18.00 | | | | | | 205 | 515[8] | 30 | 50 | |
| A182 F304L | S30403 | Max. | 0.03 | 1.00 | 2.00 | 0.045 | 0.030 | 13.00 | 20.00 | | | | | 0.1 | | | | | |
| | | Min. | | | | | | 8.00 | 18.00 | | | | | | 170 | 485[9] | 30 | 50 | |
| A182 F304H | S30409 | Max. | 0.10 | 1.00 | 2.00 | 0.045 | 0.030 | 11.00 | 20.00 | | | | | | | | | | |
| | | Min. | 0.04 | | | | | 8.00 | 18.00 | | | | | | 205 | 515[8] | 30 | 50 | |
| A182 F310 | S31000 | Max. | 0.25 | 1.00 | 2.00 | 0.045 | 0.030 | 22.00 | 26.00 | | | | | | | | | | |
| | | Min. | | | | | | 19.00 | 24.00 | | | | | | 205 | 515[8] | 30 | 50 | |
| A182 F316 | S31600 | Max. | 0.08 | 1.00 | 2.00 | 0.045 | 0.030 | 14.00 | 18.00 | 3.0 | | | | 0.1 | | | | | |
| | | Min. | | | | | | 10.00 | 16.00 | 2.0 | | | | | 205 | 515[8] | 30 | 50 | |
| A182 F316L | S31603 | Max. | 0.03 | 1.00 | 2.00 | 0.045 | 0.030 | 15.00 | 18.00 | 3.00 | | | | 0.1 | | | | | |
| | | Min. | | | | | | 10.00 | 16.00 | 2.00 | | | | | 170 | 485[9] | 30 | 50 | |
| A182 F316H | S31609 | Max. | 0.10 | 1.00 | 2.00 | 0.045 | 0.030 | 14.00 | 18.00 | 3.00 | | | | | | | | | |
| | | Min. | 0.04 | | | | | 10.00 | 16.00 | 2.00 | | | | | 205 | 515[8] | 30 | 50 | |
| A182 F317 | S31700 | Max. | 0.08 | 1.00 | 2.00 | 0.045 | 0.030 | 15.00 | 20.00 | 4.0 | | | | | | | | | |
| | | Min. | | | | | | 11.00 | 18.00 | 3.0 | | | | | 205 | 515[8] | 30 | 50 | |
| A182 F317L | S31703 | Max. | 0.03 | 1.00 | 2.00 | 0.045 | 0.030 | 15.00 | 20.00 | 4.0 | | | | | | | | | |
| | | Min. | | | | | | 11.00 | 18.00 | 3.0 | | | | | 170 | 485[9] | 30 | 50 | |
| A182 F321 | S32100 | Max. | 0.08 | 1.00 | 2.00 | 0.045 | 0.030 | 12.00 | 19.00 | | | | | | | | | | |
| | | Min. | | | | | | 9.00 | 17.00 | | Ti C%*5~0.7 | | | | 205 | 515[8] | 30 | 50 | |
| A182 F347 | S34700 | Max. | 0.08 | 1.00 | 2.00 | 0.045 | 0.030 | 13.00 | 20.00 | | | 1.10 | | | | | | | |
| | | Min. | | | | | | 9.00 | 17.00 | | | C*10 | | | 205 | 515[8] | 30 | 50 | |
| A182 F6aCL1 | S41000 | Max. | 0.15 | 1.00 | 1.00 | 0.040 | 0.030 | 0.50 | 13.50 | | | | | | | | | | 207 |
| | | Min. | | | | | | | 11.50 | | | | | | 275 | 485 | 18 | 35 | 143 |
| A182 F51 | S31803 | Max. | 0.03 | 1.00 | 2.00 | 0.030 | 0.020 | 6.50 | 23.00 | 3.50 | | | | 0.20 | | | | | |
| | | Min. | | | | | | 4.50 | 21.00 | 2.50 | | | | 0.08 | 450 | 620 | 25 | 45 | |
| A182 F53 | S32750 | Max. | 0.03 | 0.80 | 1.20 | 0.035 | 0.020 | 8.00 | 26.00 | 5.00 | 0.5 | | | 0.32 | | | | | 310 |
| | | Min. | | | | | | 6.00 | 24.00 | 3.0 | | | | 0.24 | 550[10] | 800[10] | 15 | | |

Notes :

(1) All values are maximum unless otherwise stated.
(2) The present grade F5a(0.25 max carbon) previous to 1955 was assigned the identification symbol F5. Identification F5 in 1955 was assigned to the 0.15 max carbon grade to be consistent with ASTM specifications for other products such as pipe, tubing, bolting, welding fittings, and the like.

# APPLICABLE ASTM SPECIFICATIONS

| Material Group No. | GROUP 1 MATERIALS | | | PRODUCT FORMS | | | |
|---|---|---|---|---|---|---|---|
| | Nominal Designation Steel | Forgings | | Castings | | Plates | |
| | | Spec.-Gr. | Notes | Spec.-Gr. | Notes | Spec.-Gr. | Notes |
| 1.1 | C-Si<br>C-MIN-Si<br>3 1/2 Ni | A105<br>A350-LF2<br>A350-LF3 | | A216-WCB | | A515.70<br>A516.70 | |
| 1.2 | C-MIN-Si<br><br>2 1/2 Ni<br>3 1/2 Ni | | | A216-WCC<br>A352-LCC<br>A352-LC2<br>A352-LC3 | | <br><br>A203-B<br>A203-E | |
| 1.3 | C-Si<br><br>C-Mn-si<br>2 1/2 Ni<br>3 1/2 Ni | | | A352-LCB<br>(1) | | A515-65<br><br>A515-65<br>A203-A<br>A203-D | |
| 1.4 | C-Si<br><br>C-Min-Si | A350-LF1<br>CL.1 | | | | A515-60<br><br>A515-60 | |
| 1.5 | C-1/2 Mo | A182-F1 | | | | A204-A<br>A204-B | |
| 1.7 | 1/2Cr-1/2Mo<br>Ni-1/2Cr-1/2Mo<br>3/4Ni-3/4Cr-Mo | A182-F2 | | <br>A217-WC4<br>A217-WC5 | | | |
| 1.9 | 1/4Cr-1/2Mo<br><br>1 1/4Cr-1/2Mo-Si | <br><br>A182-11<br>CL.2 | | A217-WC6 | | <br><br>A378-11<br>CL.2 | |
| 1.10 | 2 1/4Cr-1 Mo | A182-22<br>CL.3 | | A217-WC9 | | A378-11<br>CL.2 | |
| 1.13 | 5 Cr-1/2Mo | A181-F5a | | A217-C5 | | | |
| 1.14 | 9 Cr-1Mo | A182-F9 | | A217-C12 | | | |

| Material Group No. | GROUP 1 MATERIALS | | | PRODUCT FORMS | | | |
|---|---|---|---|---|---|---|---|
| | Nominal Designation Steel | Forgings | | Castings | | Plates | |
| | | Spec.-Gr. | Notes | Spec.-Gr. | Notes | Spec.-Gr. | Notes |
| 2.1 | 18 Cr-8Ni | A182-F304<br>A182-F304H | | A351-CF3<br>A351-CF8 | | A240-304<br>A240-304H | |
| 2.2 | 16 Cr-12 Ni-2 Mo<br><br>18 Cr-13 Ni-3 Mo<br>19 Cr-10 Ni-3 Mo | A182-F316<br>A182-F316H<br>A182-F317 | | A351-CF3M<br>A351-CF8M<br><br>A351-CG8M | | A240-316<br>A240-316H<br>A240-317 | |
| 2.3 | 18Cr-8 Ni<br>16 Cr-12 Ni-2 Mo | A182-F304L<br>A182-F316L | | | | A240-304L<br>A240-316L | |
| 2.4 | 18 Cr-10 Ni-Ti | A182-F321<br>A182-F321H | | | | A240-321<br>A240-321H | |
| 2.5 | 18 Cr-10 Ni-Cb | A182-F347<br>A182-F347H<br>A182-F348<br>A182-F348H | | | | A240-347<br>A240-347H<br>A240-348<br>A240-348H | |
| 2.6 | 23 Cr-12 Ni | | | | | A240-309H | |
| 2.7 | 25 Cr-20 Ni | A182-F310 | | | | A240-310H | |

(3) For Grade F22V, rare earth metals(REM) may be added in place of calcium, subject to agreement betwen the producer and the puchaser, In that case the total amont of REM shall be determined and erported.
(4) Grades F304, F304L, F316, and F316L shall have a nitrogen content of 0.10%
(5) Grade F321 shall have a tianium content of not less than four times the carbon content and not more than 0.70%
(6) Grade F347 shall have a columbium content of not less than ten times the carbon content and not more than 1.10%
(7) Determined by the 0.2% offset method. For ferritic steels only, the 0.5% extension-under-load method may also be used.
(8) For sections over 5 in. (130mm) in thickness, the minium tensile strength shall be 70 ksi(485 Mpa)
(9) For sections over 5 in. (130mm) in thickness, the minium tensile strength shall be 65 ksi(450 Mpa)
(10) For sections over 2 in. (50mm) in thickness, the minium tensile strength shall be 106 ksi(730 Mpa);the minimum yield strength shall be 75 ksi(515 Mpa)

# SPECIAL MATERIAL

## DUPLEX (AUSTENITIC-FERRITIC)

| UNS Design-ation | ASTM PLATE | ASTM FORGING | TRADE NAME | | Chemical Compsition (%) | | | | | | | | | | | | | Mechanical Reuqirements | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | C | Mn | p | s | Si | Ni | Cr | Mo | Cu | N | Fe | Others | Y.S | T.S | E.L(%) | H.B |
| S32304 | A240 TP2304 | | 2304 | MAX | 0.03 | 2.5 | 0.04 | 0.03 | 1.0 | 5.5 | 24.5 | 0.6 | 0.6 | 0.2 | | | | | | 290 |
| | | | | MIN | | | | | | 3.0 | 21.5 | 0.05 | 0.05 | 0.05 | | | 400 | 600 | 25 | |
| S31803 | A240 | F51 | | MAX | 0.03 | 2.0 | 0.03 | 0.02 | 1.0 | 6.5 | 23 | 3.5 | | 0.2 | | | | | | 293 |
| | | | | MIN | | | | | | 4.5 | 21 | 2.5 | | 0.08 | | | 450 | 620 | 25 | |
| S32950 | A240 | F52 | | MAX | 0.03 | 2.0 | 0.035 | 0.01 | 0.6 | 5.2 | 29 | 2.5 | | 0.35 | | | | | | 293 |
| | | | | MIN | | | | | | 3.5 | 26 | 1.0 | | 0.15 | | | 485 | 690 | 15 | |
| S32750 | A240 TP2507 | F53 | SAF2507 | MAX | 0.03 | 1.2 | 0.035 | 0.02 | 0.8 | 8.0 | 26 | 5.0 | | 0.32 | | | | | | 310 |
| | | | | MIN | | | | | | 6.0 | 24 | 3.0 | | 0.24 | | | 550 | 795 | 15 | |
| S32760 | A240 | F55 | Zeron100 | MAX | 0.03 | 1.0 | 0.03 | 0.01 | 1.0 | 8.0 | 26 | 4.0 | 1.0 | 0.3 | | w | | | | 270 |
| | | | | MIN | | | | | | 6.0 | 24 | 3.0 | 0.5 | 0.2 | | 0.5~1.0 | 550 | 750 | 25 | |
| S32205 | A240 TP2205 | F60 | SAF2205 | MAX | 0.03 | 2.0 | 0.03 | 0.02 | 1.0 | 6.5 | 23 | 3.5 | | 0.2 | | | | | | 293 |
| | | | | MIN | | | | | | 4.5 | 22 | 3.0 | | 0.14 | | | 450 | 655 | 25 | |
| S32550 | A240 TP255 | F61 | | MAX | 0.04 | 1.5 | 0.04 | 0.03 | 1.0 | 6.5 | 27 | 3.9 | 2.5 | 0.25 | | | | | | 302 |
| | | | | MIN | | | | | | 4.5 | 24 | 2.9 | 1.5 | 0.1 | | | 550 | 760 | 15 | |

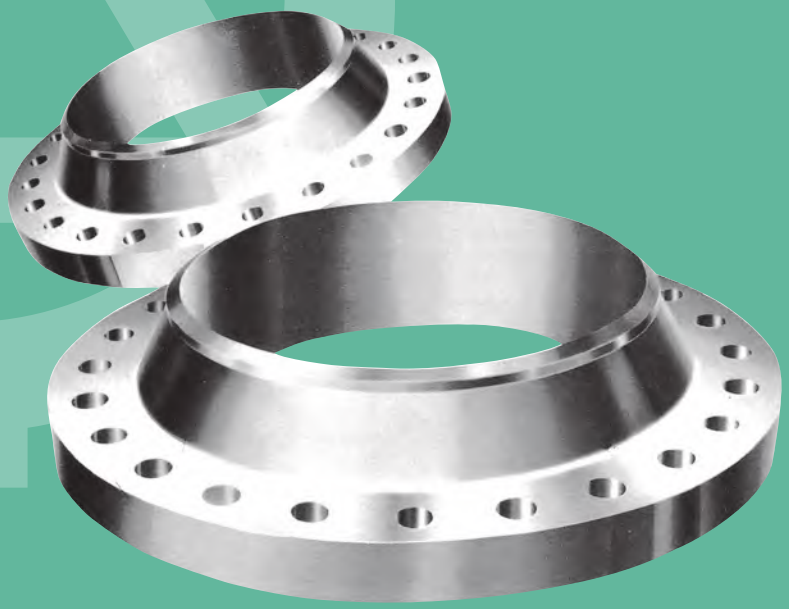
* ASTM SECTION 1, VOLUME .03 A240/240M (12a)

## ALLOY

| UNS Design-ation | ASTM PLATE | ASTM FORGING | TRADE NAME | | Chemical Compsition (%) | | | | | | | | | | | | | Mechanical Reuqirements | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | C | Mn | p | s | Si | Ni | Cr | Mo | Cu | Fe | Others | Others2 | Others3 | Y.S | T.S | E.L(%) | H.B |
| N02200 | SB162 | SB160 | Nickel 200 | MAX | 0.15 | 0.35 | | 0.01 | 0.35 | MIN | | | 0.25 | 0.4 | | | | | | | |
| | | | | MIN | | | | | | 99.0 | | | | | | | | 100 | 380 | 40 | |
| N02201 | SB162 | SB160 | Nickel 201 | MAX | 0.02 | 0.35 | | 0.01 | 0.35 | MIN | | | 0.25 | 0.4 | | | | | | | |
| | | | | MIN | | | | | | 99.0 | | | | | | | | 80 | 345 | 40 | |
| N06600 | SB168 | SB166 | Inconel 600 | MAX | 0.15 | 1.0 | | 0.015 | 0.5 | MIN | 17.0 | | 0.5 | 10.0 | | | | | | | |
| | | | | MIN | | | | | | 72.0 | 14.0 | | | 6.0 | | | | 240 | 550 | 30 | |
| N06601 | SB168 | SB166 | Inconel 601 | MAX | 0.1 | 1.0 | | 0.015 | 0.5 | 63.0 | 25.0 | | 1.0 | REMAIN | Al | | | | | | |
| | | | | MIN | | | | | | 58.0 | 21.0 | | | DER | 1~1.7 | | | 205 | 550 | 30 | |
| N06690 | SB168 | SB166 | Inconel 690 | MAX | 0.05 | 0.5 | | 0.015 | 0.5 | MIN | 31 | | 0.5 | 11.0 | | | | | | | |
| | | | | MIN | | | | | | 58.0 | 27 | | | 7.0 | | | | 240 | 586 | 30 | |
| N08810 N08811 | A240/ SB-409 | SB408 | Inconel 800H/M | MAX | 0.05~0.1 | 1.5 | | 0.015 | 1.0 | 35.0 | 23.0 | | 0.75 | MIN | Ti | Al | | | | | |
| | | | | MIN | 0.06~0.1 | | | | | 30.0 | 19.0 | | | 39.5 | 0.15~0.6 | 0.15~0.6 | | 170 | 450 | 30 | |
| N07718 | SB637 (FORGING) | | Inconel 718 | MAX | 0.08 | 0.35 | 0.015 | 0.015 | 0.35 | 55.0 | 21.0 | 3.3 | 0.3 | REMAIN | Co 1.0 | Ti | Al | | | | MIN |
| | | | | MIN | | | | | | 50.0 | 17.0 | 2.8 | | DER | | 0.65~1.15 | 0.2~0.8 | 1034 | 1275 | 12 | 331 |
| N06617 | SB168 | SB166 | Inconel 617 | MAX | 0.15 | 1.0 | | 0.015 | 1.0 | MIN | 24.0 | 10.0 | 0.5 | 3.0 | Co | Ti 0.6 | BORON | | | | |
| | | | | MIN | 0.05 | | | | | 44.5 | 20.0 | 8.0 | | | 10.0~15.0 | Al 0.8~1.5 | MAX0.006 | 240 | 655 | 35 | |
| N07750 (3) | SB637 (FORGING) | | Inconel X-750 | MAX | 0.08 | 1.0 | | 0.01 | 0.5 | MIN | 17.0 | | 0.5 | 9.0 | Co 1.0 | Ti | Al | | | | MIN |
| | | | | MIN | | | | | | 70.0 | 14.0 | | | 5.0 | | 2.25~2.75 | 0.4~1.0 | 690 | 1170 | 20 | 310 |
| N07080 | SB637 (FORGING) | | Nimonic 80A | MAX | 0.1 | 1.0 | | 0.015 | 1.0 | REMAIN | 21.0 | | | 3.0 | Al | Ti | | | | | |
| | | | | MIN | | | | | | DER | 18.0 | | | | 0.5~1.8 | 1.8~2.7 | | 620 | 930 | 20 | |
| N06625 | SB446 | SB443 | Inconel 625 | MAX | 0.1 | 0.5 | 0.015 | 0.015 | 0.5 | MIN | 23.0 | 10.0 | | 5.0 | Nb+Tantalum | | Al 0.4 | | | | |
| | | | | MIN | | | | | | 58.0 | 20.0 | 8.0 | | | 3.15~4.15 | | Ti0.4(MAX) | 276 | 690 | 30 | |
| N08825 | SB424 | SB425 | Inconel 825 | MAX | 0.05 | 1.0 | | 0.03 | 0.5 | 46.0 | 23.5 | 3.5 | 3.0 | MIN | Al 0.2 | Ti | | | | | |
| | | | | MIN | | | | | | 38.0 | 19.5 | 2.5 | 1.5 | 22.0 | | 0.6~1.2 | | 241 | 586 | 30 | |
| N10276 | SB575 | SB574 | Hastelloy C276 | MAX | 0.01 | 1.0 | 0.04 | 0.03 | 0.08 | REMAIN | 16.5 | 17.0 | | 7.0 | Tungsten | Co 2.5 | V 0.35 | | | | 100 |
| | | | | MIN | | | | | | DER | 14.5 | 15.0 | | 4.0 | 3~4.5 | | | 283 | 690 | 40 | (HRB) |
| N06022 | SB575 | SB574 | Hastelloy C22 | MAX | 0.015 | 0.5 | 0.02 | 0.02 | 0.08 | REMAIN | 22.5 | 14.5 | | 6.0 | Tungsten | Co 2.5 | V 0.35 | | | | 100 |
| | | | | MIN | | | | | | DER | 20.00 | 12.5 | | 2.0 | 2.5~3.5 | | | 310 | 690 | 45 | (HRB) |
| N06455 | SB575 | SB574 | Hastelloy C4 | MAX | 0.015 | 1.0 | 0.04 | 0.03 | 0.08 | REMAIN | 18.0 | 17.0 | | 3.0 | Co 2.0 | Ti 0.7 | | | | | 100 |
| | | | | MIN | | | | | | DER | 14.0 | 14.0 | | | | | | 276 | 690 | 40 | (HRB) |
| N10665 | SB333 | SB335 | Hastelloy B2 | MAX | 0.02 | 1.0 | 0.04 | 0.03 | 0.1 | REMAIN | 1.0 | 30.0 | | 2.0 | Co 1.0 | | | | | | 100 |
| | | | | MIN | | | | | | DER | | 26.0 | | | | | | 350 | 760 | 40 | (HRB) |
| N10675 (4) | SB333 | SB335 | Hastelloy B3 | MAX | 0.01 | 3.0 | 0.03 | 0.01 | 0.1 | MIN | 3.0 | 32.0 | | 3.0 | Co 3.0 | V 0.2 | Al 0.5 | | | | 100 |
| | | | | MIN | | | | | | 65.0 | 1.0 | 27.0 | | 1.0 | | | | 350 | 760 | 40 | (HRB) |
| C71500 | SB171 | SB151 | Cu-Ni 70/30 | MAX | | 1.0 | | | | Ni+Co | | | REMAIN | 1.0 | LEAD(max) | | ZINC 1.0 | 140 | 345 | 30 | |
| | | | | MIN | | | | | | 29~33 | | | DER | 0.4 | 0.05 | | | | | | |
| C70600 | SB171 | SB151 | Cu-Ni 90/10 | MAX | | 1.0 | | | | Ni+Co | | | REMAIN | 1.8 | LEAD(max) | | ZINC 1.0 | 105 | 275 | 30 | |
| | | | | MIN | | | | | | 9~11 | | | DER | 1 | 0.05 | | | | | | |

Notes :

(1) ASME 2011 (Add) SECTION II, PART B
(2) Mechanical testing values are for reference ( Use plate Mechanical test specification) The values in the table can be fluctuated by heat treatment
(3) Columbium + Tantalum 0.7~1.2
(4) Ni + Mo 94.0 ~ 98.0, Cb 0.2 Max, Ti 0.2 Max, Tantalum 0.2 Max, Tungsten 3.0 Max, Zirconium 0.1 Max



# ASME B16.47 SERIES A FLANGES (MSS SP-44)

- MATERIAL SPECIFICATION
- Class 150 Flanges
- Class 300 Flanges
- Class 400 Flanges
- Class 600 Flanges
- Class 900 Flanges
- TOLERANCE (MSS SP-44)

# MATERIAL SPECIFICATIONS



## 1. MATERIALS

(1) The Steel used in the manufacture of these flanges shall be selected by the manufacturer to meet the following requirements.
(2) All materials used for flanges shall be killed steel.
(3) The steel used shall be suitable for filed welding to other flanges fittings or pipe manufactured under ASTM specification A105, A153, A106, A381, A694, A707 or API Standards 5L.

$$CE = C + \frac{Mn}{6} + \frac{V+Cr+Mo}{5} + \frac{Ni+Cu}{15}$$

(4) The steel used shall have a maximum carbon content of 0.35 and a carbon equivalent computed by the following equation.: that should not exceed 0.48%, based on ladle analysis.
If the carbon equivalent factor exceeds 0.48% the acceptance of the flanges shall be based on ageement between purchaser and manufcturer.
(5) The choice and used of alloying elements, combined with the elements within the limits prescribed in Section 1-D to give the required tensile properties prescribed in Section 3.1.4 shall be made by the flange manufacturer and included and reported in the ladle analysis to identify the type of steel.

## 2. HEAT TREATMENT

The F42 and higher grades of flanges of all pressure classes and the class 400 and higher classes of Grade F36 flanges shall be normalized or quenched and tempered.

## 3. TEST SPECIMENS

The test speciments may be taken from the forgings or, at the manufactures option, from the billets or forging bar entering into the finished product, provided such test blank has undergone relatively the same forming and the equivalent heat treatment as the finished flange. The dimensions of the test blank must be such as to adequately reflect the heat treatment properties of the hub of the flange. Specimens shall be obtained from the midwall of the thinnest section of the hub of the flange or 19mm (3/4 in.) from the surface of the test blank. The orientation of specimens takes from a flange shall be longitudinal.

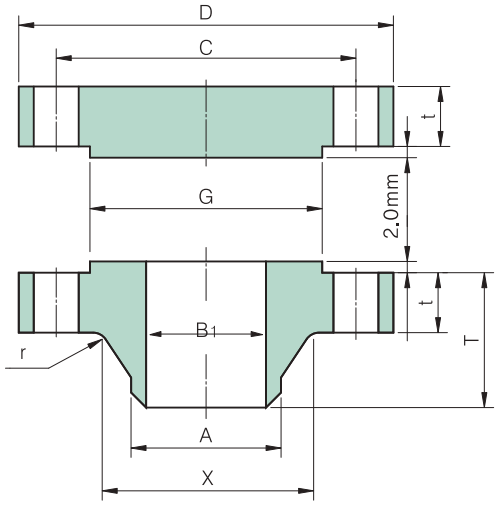
## 4. TENSILE REQUIREMENTS(METRIC & U.S. CUSTOMARY)

| GRADE | YIELD POINT MIN. | | TENSILE STRENGTH MIN. | | ELONGATION IN 50 mm or 2 in. MIN. PERCENT |
|---|---|---|---|---|---|
| | Mpa | ksi | Mpa | ksi | |
| F36 | 248[a] | 36[a] | 414 | 60 | 20 |
| F42 | 290 | 42 | 414 | 60 | 20 |
| F46 | 317 | 46 | 414 | 60 | 20 |
| F48 | 331 | 48 | 427 | 62 | 20 |
| F50 | 345 | 50 | 441 | 64 | 20 |
| F52 | 359 | 52 | 455 | 66 | 20 |
| F56 | 386 | 56 | 469 | 68 | 20 |
| F60 | 414 | 60 | 517 | 75 | 20 |
| F65 | 448 | 65 | 531 | 77 | 18 |
| F70 | 483 | 70 | 552 | 80 | 18 |

(a) Note : except as required in MSS-SP-44, Section 4.2.

# CLASS 150 FLANGES






## ASME B16.47A (MSS SP 44)

Unit : mm

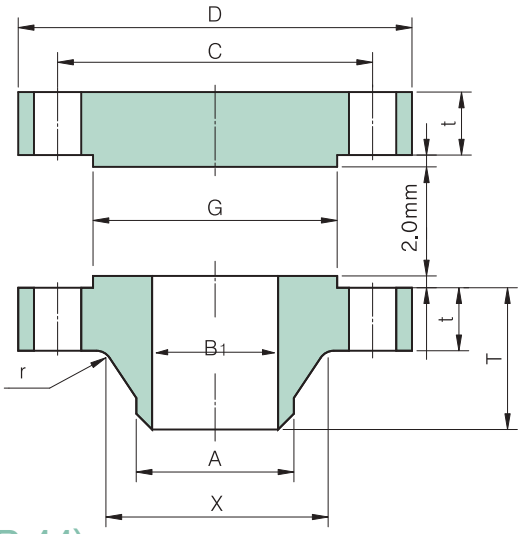
| Nominal Pipe Size (inch) | Outside Dia-meter | Thickness | | Bore wall Thickness | | Length through Hub | O.D of Raised Face | Diameter of Hub Bevel | Diameter of Base of Hub | LENGTH THRU HUB(T) | | | Radius of Fillet | Approximate Weight(kg) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | WNF | Blind | 9.53mm | 12.7mm | | | | | Diameter of Bolt Circle | Number of holes | Diameter of Bolt hole | | | |
| | D | t | t | $B_1$ | | T | G | A | X | C | | | r | WELDING NECK | BLIND |
| 12 | 485 | 30.2 | 30.2 | 304.74 | 298.40 | 113 | 381.0 | 323.8 | 365 | 431.8 | 12 | 25.4 | 10 | 38.9 | 43.7 |
| 14 | 535 | 33.4 | 33.4 | 336.54 | 330.20 | 125 | 412.8 | 355.6 | 400 | 476.3 | 12 | 28.6 | 10 | 51.7 | 59.4 |
| 16 | 595 | 35.0 | 35.0 | 387.34 | 381.00 | 125 | 469.9 | 406.4 | 457 | 539.8 | 16 | 28.6 | 10 | 64.4 | 77.1 |
| 18 | 635 | 38.1 | 38.1 | 437.94 | 431.60 | 138 | 533.4 | 457.0 | 505 | 577.9 | 16 | 31.8 | 10 | 74.8 | 94.8 |
| 20 | 700 | 41.3 | 41.3 | 488.94 | 482.60 | 143 | 584.2 | 508.0 | 559 | 635.0 | 20 | 31.8 | 10 | 89.3 | 123.4 |
| 22 | 750 | 44.5 | 44.5 | 539.94 | 533.60 | 148 | 641.4 | 558.8 | 610 | 692.2 | 20 | 34.9 | 10 | 107.6 | 152 |
| 24 | 815 | 46.1 | 46.1 | 590.94 | 584.60 | 151 | 692.2 | 610.0 | 663 | 749.3 | 20 | 34.9 | 10 | 119.6 | 188.2 |
| 26 | 870 | 66.7 | 66.7 | 641.34 | 635.00 | 119 | 749.0 | 660.4 | 676 | 806.4 | 24 | 34.9 | 10 | 149.3 | 306.2 |
| 28 | 925 | 69.9 | 69.9 | 692.14 | 685.80 | 124 | 800.0 | 711.2 | 727 | 863.6 | 28 | 34.9 | 11 | 169.1 | 361.9 |
| 30 | 985 | 73.1 | 73.1 | 742.94 | 736.60 | 135 | 857.0 | 762.0 | 781 | 914.4 | 28 | 34.9 | 11 | 199.8 | 431.0 |
| 32 | 1060 | 79.4 | 79.4 | 793.74 | 787.40 | 143 | 914.0 | 812.8 | 832 | 977.9 | 28 | 41.3 | 11 | 247.9 | 537.0 |
| 34 | 1110 | 81.0 | 81.0 | 844.54 | 838.20 | 148 | 965.0 | 863.6 | 883 | 1028.7 | 32 | 41.3 | 13 | 264.8 | 599.5 |
| 36 | 1170 | 88.9 | 88.9 | 895.34 | 889.00 | 156 | 1022.0 | 914.4 | 933 | 1085.8 | 32 | 41.3 | 13 | 316.4 | 733.3 |
| 38 | 1240 | 85.8 | 85.8 | 946.14 | 939.80 | 156 | 1073.0 | 965.2 | 991 | 1149.4 | 32 | 41.3 | 13 | 352.4 | 798.7 |
| 40 | 1290 | 88.9 | 88.9 | 996.94 | 990.60 | 162 | 1124.0 | 1016.0 | 1041 | 1200.2 | 36 | 41.3 | 13 | 378.6 | 894 |
| 42 | 1345 | 95.3 | 95.3 | 1047.74 | 1041.40 | 170 | 1194.0 | 1066.8 | 1092 | 1257.3 | 36 | 41.3 | 13 | 431 | 1044.4 |
| 44 | 1405 | 100.1 | 100.1 | 1098.54 | 1092.20 | 176 | 1245.0 | 1117.6 | 1143 | 1314.4 | 40 | 41.3 | 13 | 484 | 1195.3 |
| 46 | 1455 | 101.6 | 101.6 | 1149.34 | 1143.00 | 184 | 1295.0 | 1168.4 | 1197 | 1365.2 | 40 | 41.3 | 13 | 516.5 | 1304.1 |
| 48 | 1510 | 106.4 | 106.4 | 1200.14 | 1193.80 | 191 | 1359.0 | 1219.2 | 1248 | 1422.4 | 44 | 41.3 | 13 | 567.2 | 1469.3 |
| 50 | 1570 | 109.6 | 109.6 | 1250.94 | 1244.60 | 202 | 1410.0 | 1270.0 | 1302 | 1479.6 | 44 | 47.6 | 13 | 616.7 | 1622.7 |
| 52 | 1625 | 114.3 | 114.3 | 1301.74 | 1295.40 | 208 | 1461.0 | 1320.8 | 1353 | 1536.7 | 44 | 47.6 | 13 | 676.9 | 1816.9 |
| 54 | 1685 | 119.1 | 119.1 | 1352.54 | 1346.20 | 214 | 1511.0 | 1371.6 | 1403 | 1593.8 | 44 | 47.6 | 13 | 752.5 | 2039.8 |
| 56 | 1745 | 122.3 | 122.3 | 1403.34 | 1397.00 | 227 | 1575.0 | 1422.4 | 1457 | 1651.0 | 48 | 47.6 | 13 | 827.2 | 2244.6 |
| 58 | 1805 | 127.0 | 127.0 | 1454.14 | 1447.80 | 233 | 1626.0 | 1473.2 | 1508 | 1708.2 | 48 | 47.6 | 13 | 913.6 | 2498.5 |
| 60 | 1855 | 130.2 | 130.2 | 1504.94 | 1498.60 | 238 | 1676.0 | 1524.0 | 1559 | 1759.0 | 52 | 47.6 | 13 | 958.0 | 2700.2 |

Notes :

(1) For the 'Bore' (B1) other than wall thickness 9.53mm and 12.7mm, refer to page 70-71
(2) Class 150 flanges will be furnished with 2mm(0.06") raised face, which is excepted from 'Thickness'(t) and 'Length through Hub' (T).
(3) Flanges dimensions of size 12" through 24" flanges [except 22"] are in accordance with ASME B16.5
(4) Blind flanges mays be made with or without hubs at the manufacturer's option.

# CLASS 300 FLANGES





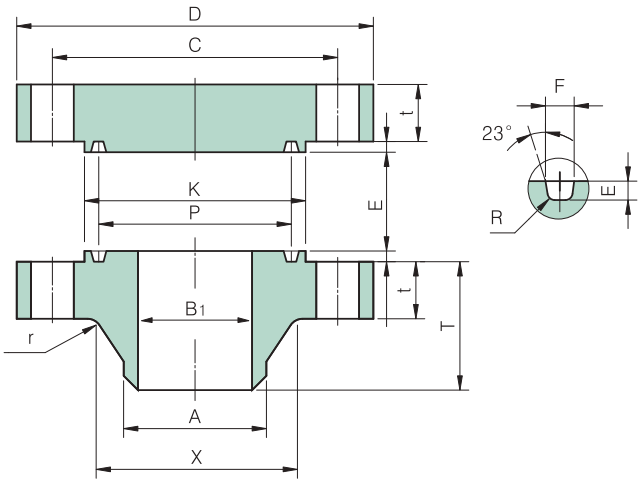

## ASME B16.47A (MSS SP 44)

Unit : mm

| Nominal Pipe Size (inch) | Outside Diameter | Thickness | | Bore wall Thickness | | Length through Hub | O.D of Raised Face | Diameter of Hub Bevel | Diameter of Base of Hub |
|---|---|---|---|---|---|---|---|---|---|
| | | WNF | Blind | 9.53mm | 12.7mm | | | | |
| | D | t | t | $B_1$ | | T | G | A | X |
| 12 | 520 | 49.3 | 49.3 | 304.74 | 298.4 | 129 | 381.0 | 323.8 | 375 |
| 14 | 585 | 52.4 | 52.4 | 336.54 | 330.2 | 141 | 412.8 | 355.6 | 425 |
| 16 | 650 | 55.6 | 55.6 | 387.34 | 381.0 | 144 | 469.9 | 406.4 | 483 |
| 18 | 710 | 58.8 | 58.8 | 437.94 | 431.6 | 157 | 533.4 | 457.0 | 533 |
| 20 | 775 | 62.0 | 62.0 | 488.94 | 482.6 | 160 | 584.2 | 508.0 | 587 |
| 22 | 840 | 65.1 | 65.1 | 539.94 | 533.6 | 164 | 641.5 | 558.8 | 641 |
| 24 | 915 | 68.3 | 68.3 | 590.94 | 584.6 | 167 | 692.2 | 610.0 | 702 |
| 26 | 970 | 77.8 | 82.6 | 641.34 | 635.0 | 183 | 749.0 | 660.4 | 721 |
| 28 | 1035 | 84.2 | 88.9 | 692.14 | 685.8 | 195 | 800.0 | 711.2 | 775 |
| 30 | 1090 | 90.5 | 93.7 | 742.94 | 736.6 | 208 | 857.0 | 762.0 | 827 |
| 32 | 1150 | 96.9 | 98.5 | 793.74 | 787.4 | 221 | 914.0 | 812.8 | 881 |
| 34 | 1205 | 100.1 | 103.2 | 844.54 | 838.2 | 230 | 965.0 | 863.6 | 937 |
| 36 | 1270 | 103.2 | 109.6 | 895.34 | 889.0 | 240 | 1022.0 | 914.4 | 991 |
| 38 | 1170 | 106.4 | 106.4 | 946.14 | 939.8 | 179 | 1029.0 | 965.2 | 994 |
| 40 | 1240 | 112.8 | 112.8 | 996.94 | 990.6 | 192 | 1086.0 | 1016.0 | 1048 |
| 42 | 1290 | 117.5 | 117.5 | 1047.74 | 1041.4 | 198 | 1137.0 | 1066.8 | 1099 |
| 44 | 1355 | 122.3 | 122.3 | 1098.54 | 1092.2 | 205 | 1194.0 | 1117.6 | 1149 |
| 46 | 1415 | 127.0 | 127.0 | 1149.34 | 1143.0 | 214 | 1245.0 | 1168.4 | 1203 |
| 48 | 1465 | 131.8 | 131.8 | 1200.14 | 1193.8 | 222 | 1302.0 | 1219.2 | 1254 |
| 50 | 1530 | 138.2 | 138.2 | 1250.94 | 1244.6 | 230 | 1359.0 | 1270.0 | 1305 |
| 52 | 1580 | 142.9 | 142.9 | 1301.74 | 1295.4 | 237 | 1410.0 | 1320.8 | 1356 |
| 54 | 1660 | 150.9 | 150.9 | 1352.54 | 1346.2 | 251 | 1467.0 | 1371.6 | 1410 |
| 56 | 1710 | 152.4 | 152.4 | 1403.34 | 1397.0 | 259 | 1518.0 | 1422.4 | 1464 |
| 58 | 1760 | 157.2 | 157.2 | 1454.14 | 1447.8 | 265 | 1575.0 | 1473.2 | 1514 |
| 60 | 1810 | 162.0 | 162.0 | 1504.94 | 1498.6 | 271 | 1626.0 | 1524.0 | 1565 |

Notes :

(1) For the 'Bore'(B1) other than wall thickness 9.53mm and 12.7mm, refer to page 70-71
(2) Class 150 flanges will be furnished with 2mm(0.06" ) raised face, which is excepted from 'Thickness'(t) and 'Length through Hub'(T).
(3) Flanges dimensions of size 12" through 24" flanges [except 22" ] are in accordance with ASME B16.5
(4) Blind flanges mays be made with or without hubs at the manufacturer's option.

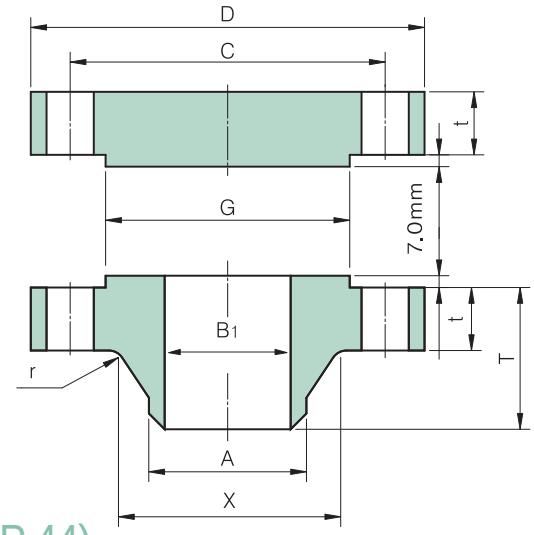



Unit : mm

| Nominal Pipe Size (inch) | Drilling | | | Radius of Fillet | Pitch Diameter | GROOVE DIMENSIONS | | | Diameter of Raised Face | Ring & Groove Number | Approximate Weight(kg) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Diameter of Bolt Circle | Number of holes | Diameter of Bolt hole | | | Width | Depth | Radius | | | | |
| | C | | | r | P | F | E | R | K | | WELDING NECK | BLIND |
| 12 | 450.8 | 16 | 31.8 | 10 | 381.0 | 11.91 | 7.92 | 0.8 | 413 | R57 | 64.4 | 78.9 |
| 14 | 514.4 | 20 | 31.8 | 10 | 419.1 | 11.91 | 7.92 | 0.8 | 457 | R61 | 88.3 | 107.1 |
| 16 | 571.5 | 20 | 34.9 | 10 | 469.9 | 11.91 | 7.92 | 0.8 | 508 | R65 | 112.9 | 139 |
| 18 | 628.6 | 24 | 34.9 | 10 | 533.4 | 11.91 | 7.92 | 0.8 | 575 | R69 | 138.3 | 176.9 |
| 20 | 685.8 | 24 | 34.9 | 10 | 584.2 | 13.49 | 9.53 | 1.5 | 635 | R73 | 167.3 | 223.2 |
| 22 | 743.0 | 24 | 41.3 | 10 | 635.0 | 15.1 | 11.13 | 1.5 | 686 | R81 | 200.6 | 270 |
| 24 | 812.8 | 24 | 41.3 | 10 | 692.15 | 16.66 | 11.13 | 1.5 | 749 | R77 | 235.4 | 342 |
| 26 | 876.3 | 28 | 44.5 | 10 | 749.3 | 19.84 | 12.7 | 1.5 | 810 | R93 | 281.3 | 457.8 |
| 28 | 939.8 | 28 | 44.5 | 11 | 800.1 | 19.84 | 12.7 | 1.5 | 861 | R94 | 341.4 | 564.6 |
| 30 | 997.0 | 28 | 47.6 | 11 | 857.25 | 19.84 | 12.7 | 1.5 | 917 | R95 | 391.6 | 658.8 |
| 32 | 1054.1 | 28 | 50.8 | 11 | 914.4 | 23.01 | 14.27 | 1.5 | 984 | R96 | 453.9 | 769.6 |
| 34 | 1104.9 | 28 | 50.8 | 13 | 965.2 | 23.01 | 14.27 | 1.5 | 1035 | R97 | 507.6 | 889.4 |
| 36 | 1168.4 | 32 | 54.90 | 13 | 1022.35 | 23.01 | 14.27 | 1.5 | 1092 | R98 | 564.5 | 1037.6 |
| 38 | 1092.2 | 32 | 41.3 | 13 | – | – | – | – | – | – | 319.2 | 875.2 |
| 40 | 1155.7 | 32 | 44.5 | 13 | – | – | – | – | – | – | 386.2 | 1039.8 |
| 42 | 1206.5 | 32 | 44.5 | 13 | – | – | – | – | – | – | 420.3 | 1175.6 |
| 44 | 1263.6 | 32 | 47.6 | 13 | – | – | – | – | – | – | 479.8 | 1347.3 |
| 46 | 1320.8 | 28 | 50.8 | 13 | – | – | – | – | – | – | 544.6 | 1530.3 |
| 48 | 1371.6 | 32 | 50.8 | 13 | – | – | – | – | – | – | 580.1 | 1697.8 |
| 50 | 1428.8 | 32 | 54.0 | 13 | – | – | – | – | – | – | 660.4 | 1937.8 |
| 52 | 1479.6 | 32 | 54.0 | 13 | – | – | – | – | – | – | 708.4 | 2141.7 |
| 54 | 1549.4 | 28 | 60.3 | 13 | – | – | – | – | – | – | 862.5 | 2495.5 |
| 56 | 1600.2 | 28 | 60.3 | 13 | – | – | – | – | – | – | 908.8 | 2680.2 |
| 58 | 1651.0 | 32 | 60.3 | 13 | – | – | – | – | – | – | 952.2 | 2920.0 |
| 60 | 1701.8 | 32 | 60.3 | 13 | – | – | – | – | – | – | 1011.7 | 3095.0 |

# CLASS 400 FLANGES





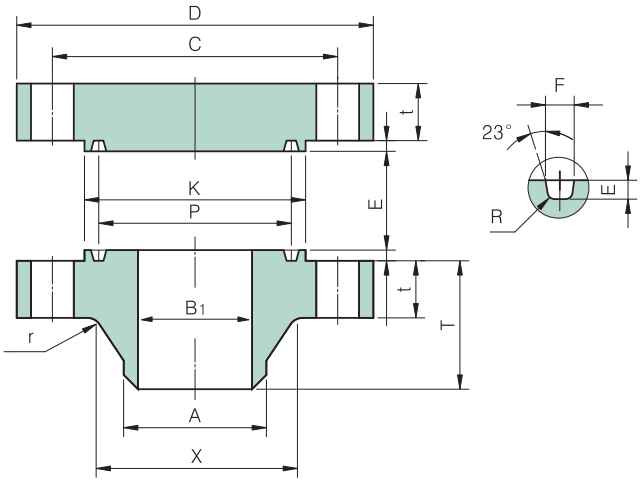

## ASME B16.47A (MSS SP 44)

Unit : mm

| Nominal Pipe Size (inch) | Outside Diameter | Thickness | | Bore wall Thickness | | Length through Hub | O.D of Raised Face | Diameter of Hub Bevel | Diameter of Base of Hub |
|---|---|---|---|---|---|---|---|---|---|
| | | WNF | Blind | 9.53mm | 12.7mm | | | | |
| | D | t | t | $B_1$ | | T | G | A | X |
| 12 | 520 | 57.2 | 57.2 | 304.74 | 298.40 | 137 | 381.0 | 323.8 | 375 |
| 14 | 585 | 60.4 | 60.4 | 336.54 | 330.20 | 149 | 412.8 | 355.6 | 425 |
| 16 | 650 | 63.5 | 63.5 | 387.34 | 381.00 | 152 | 469.9 | 406.4 | 483 |
| 18 | 710 | 66.7 | 66.7 | 437.94 | 431.60 | 165 | 533.4 | 457.0 | 533 |
| 20 | 775 | 69.9 | 69.9 | 488.94 | 482.60 | 168 | 584.2 | 508.0 | 587 |
| 22 | 840 | 73.1 | 73.1 | 539.94 | 533.60 | 164 | 641.5 | 558.8 | 641 |
| 24 | 915 | 76.2 | 76.2 | 590.94 | 584.60 | 175 | 692.2 | 610.0 | 702 |
| 26 | 970 | 88.9 | 98.5 | 641.34 | 635.00 | 194 | 749.0 | 660.4 | 727 |
| 28 | 1035 | 95.3 | 104.8 | 692.14 | 685.80 | 206 | 800.0 | 711.2 | 783 |
| 30 | 1090 | 101.6 | 111.2 | 742.94 | 736.60 | 219 | 857.0 | 762.0 | 837 |
| 32 | 1150 | 108.0 | 115.9 | 793.74 | 787.40 | 232 | 914.0 | 812.8 | 889 |
| 34 | 1205 | 111.2 | 122.3 | 844.54 | 838.20 | 241 | 965.0 | 863.6 | 945 |
| 36 | 1270 | 114.3 | 128.6 | 895.34 | 889.00 | 251 | 1022.0 | 914.4 | 1000 |
| 38 | 1205 | 123.9 | 123.9 | 946.14 | 939.80 | 206 | 1035.0 | 965.2 | 1003 |
| 40 | 1270 | 130.2 | 130.2 | 996.94 | 990.60 | 216 | 1092.0 | 1016.0 | 1054 |
| 42 | 1320 | 133.4 | 133.4 | 1047.74 | 1041.40 | 224 | 1143.0 | 1066.8 | 1108 |
| 44 | 1385 | 139.7 | 139.7 | 1098.54 | 1092.20 | 233 | 1200.0 | 1117.6 | 1159 |
| 46 | 1440 | 146.1 | 146.1 | 1149.34 | 1143.00 | 244 | 1257.0 | 1168.4 | 1213 |
| 48 | 1510 | 152.4 | 152.4 | 1200.14 | 1193.80 | 257 | 1308.0 | 1219.2 | 1267 |
| 50 | 1570 | 157.2 | 158.8 | 1250.94 | 1244.60 | 268 | 1362.0 | 1270.0 | 1321 |
| 52 | 1620 | 162.0 | 163.6 | 1301.74 | 1295.40 | 276 | 1413.0 | 1320.8 | 1372 |
| 54 | 1700 | 169.9 | 171.5 | 1352.54 | 1346.20 | 289 | 1470.0 | 1371.6 | 1426 |
| 56 | 1755 | 174.7 | 176.3 | 1403.34 | 1397.00 | 298 | 1527.0 | 1422.4 | 1480 |
| 58 | 1805 | 177.8 | 181.0 | 1454.14 | 1447.80 | 306 | 1578.0 | 1473.2 | 1530 |
| 60 | 1885 | 185.8 | 189.0 | 1504.94 | 1498.60 | 319 | 1635.0 | 1524.0 | 1584 |

Notes :

(1) For the 'Bore'(B1) other than wall thickness 9.53mm and 12.7mm, refer to page 70-71
(2) Class 400 flanges will be furnished with 2mm(0.06" ) raised face, which is excepted from 'Thickness'(t) and 'Length through Hub'(T).
(3) Flanges dimensions of size 12" through 24" flanges [except 22" ] are in accordance with ASME B16.5
(4) Blind flanges mays be made with or without hubs at the manufacturer's option.

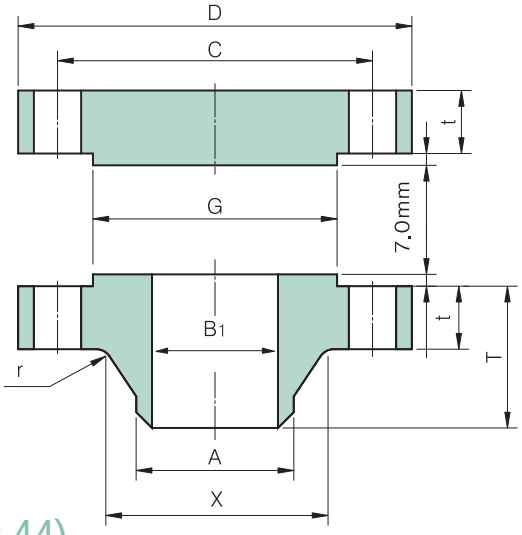



Unit : mm

| Nominal Pipe Size (inch) | Drilling | | | Radius of Fillet | Pitch Diameter | GROOVE DIMENSIONS | | | Diameter of Raised Face | Ring & Groove Number | Approximate Weight(kg) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Diameter of Bolt Circle | Number of holes | Diameter of Bolt hole | | | Width | Depth | Radius | | | | |
| | C | | | r | P | F | E | R | K | | WELDING NECK | BLIND |
| 12 | 450.8 | 16 | 34.9 | 11 | 381.0 | 11.91 | 7.92 | 0.8 | 413 | R57 | 72.57 | 98 |
| 14 | 514.4 | 20 | 34.9 | 11 | 419.1 | 11.91 | 7.92 | 0.8 | 457 | R61 | 105.7 | 131.6 |
| 16 | 571.5 | 20 | 38.1 | 11 | 469.9 | 11.91 | 7.92 | 0.8 | 508 | R65 | 133.3 | 167 |
| 18 | 628.6 | 24 | 38.1 | 11 | 533.4 | 11.91 | 7.92 | 0.8 | 575 | R69 | 158.9 | 206.6 |
| 20 | 685.8 | 24 | 41.3 | 11 | 584.2 | 13.49 | 9.53 | 1.5 | 635 | R73 | 193 | 261 |
| 22 | 743.0 | 24 | 44.5 | 11 | 635.0 | 15.1 | 11.13 | 1.5 | 686 | R81 | 215.6 | 280 |
| 24 | 812.8 | 24 | 47.6 | 11 | 692.15 | 16.66 | 11.13 | 1.5 | 749 | R77 | 281.5 | 395 |
| 26 | 876.3 | 28 | 47.6 | 11 | 749.3 | 19.84 | 12.70 | 1.5 | 810 | R93 | 317.5 | 557.1 |
| 28 | 939.8 | 28 | 50.8 | 13 | 800.1 | 19.84 | 12.70 | 1.5 | 861 | R94 | 378.2 | 673.1 |
| 30 | 997.0 | 28 | 54.0 | 13 | 857.25 | 19.84 | 12.70 | 1.5 | 917 | R95 | 431.8 | 790.3 |
| 32 | 1054.1 | 28 | 54.0 | 13 | 914.4 | 23.01 | 14.27 | 1.5 | 984 | R96 | 502.6 | 922.7 |
| 34 | 1104.9 | 28 | 54.0 | 14 | 965.2 | 23.01 | 14.27 | 1.5 | 1035 | R97 | 560.3 | 1073.5 |
| 36 | 1168.4 | 32 | 54.0 | 14 | 1022.35 | 23.01 | 14.27 | 1.5 | 1092 | R98 | 631.5 | 1249.9 |
| 38 | 1117.6 | 32 | 47.6 | 14 | – | – | – | – | – | – | 430.4 | 1100.0 |
| 40 | 1174.8 | 32 | 50.8 | 14 | – | – | – | – | – | – | 497.5 | 1279.9 |
| 42 | 1225.6 | 32 | 50.8 | 14 | – | – | – | – | – | – | 537.5 | 1421.5 |
| 44 | 1282.7 | 32 | 54.0 | 14 | – | – | – | – | – | – | 614.2 | 1633.9 |
| 46 | 1339.8 | 36 | 54.0 | 14 | – | – | – | – | – | – | 675.6 | 1841.5 |
| 48 | 1403.4 | 28 | 60.3 | 14 | – | – | – | – | – | – | 797.6 | 2120.6 |
| 50 | 1460.5 | 32 | 60.3 | 14 | – | – | – | – | – | – | 876.6 | 2379.4 |
| 52 | 1511.3 | 32 | 60.3 | 14 | – | – | – | – | – | – | 937.6 | 2615.9 |
| 54 | 1581.2 | 28 | 66.7 | 14 | – | – | – | – | – | – | 1119.7 | 3017.3 |
| 56 | 1632.0 | 32 | 66.7 | 14 | – | – | – | – | – | – | 1196.0 | 3293.7 |
| 58 | 1682.8 | 32 | 66.7 | 14 | – | – | – | – | – | – | 1260.3 | 3584.3 |
| 60 | 1752.6 | 32 | 73.0 | 14 | – | – | – | – | – | – | 1459.9 | 4057.1 |

# CLASS 600 FLANGES





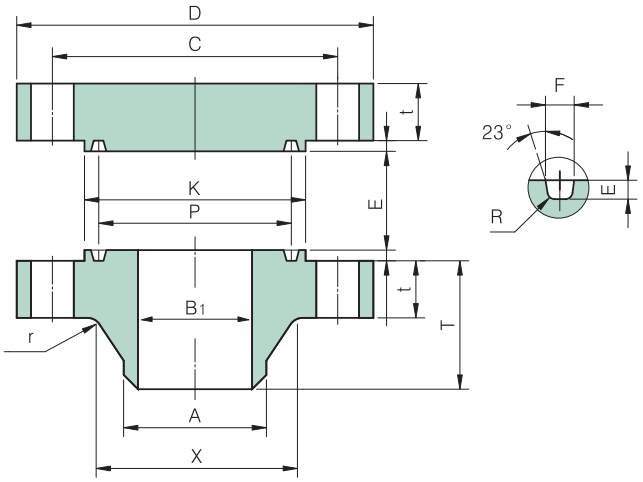

## ASME B16.47A (MSS SP 44)

Unit : mm

| Nominal Pipe Size (inch) | Outside Diameter | Thickness | | Bore wall Thickness | | Length through Hub | O.D of Raised Face | Diameter of Hub Bevel | Diameter of Base of Hub |
|---|---|---|---|---|---|---|---|---|---|
| | | WNF | Blind | 9.53mm | 12.7mm | | | | |
| | D | t | t | $B_1$ | | T | G | A | X |
| 12 | 560 | 66.7 | 66.7 | 304.74 | 298.40 | 156.0 | 381.0 | 323.8 | 400 |
| 14 | 605 | 69.9 | 69.9 | 336.54 | 330.20 | 165.0 | 412.8 | 355.6 | 432 |
| 16 | 685 | 76.2 | 76.2 | 387.34 | 381.00 | 178.0 | 469.9 | 406.4 | 495 |
| 18 | 745 | 82.6 | 82.6 | 437.94 | 431.60 | 184.0 | 533.4 | 457.0 | 546 |
| 20 | 815 | 88.9 | 88.9 | 488.94 | 482.60 | 190.0 | 584.2 | 508.0 | 610 |
| 22 | 870 | 95.3 | 95.3 | 539.94 | 533.60 | 197.0 | 641.4 | 559.0 | 667 |
| 24 | 940 | 101.6 | 101.6 | 590.94 | 584.60 | 203.0 | 692.2 | 610.0 | 718 |
| 26 | 1015 | 108.0 | 125.5 | 641.34 | 635.00 | 222.0 | 749 | 660.4 | 748 |
| 28 | 1075 | 111.2 | 131.8 | 692.14 | 685.80 | 235.0 | 800 | 711.2 | 803 |
| 30 | 1130 | 114.3 | 139.7 | 742.94 | 736.60 | 248.0 | 857 | 762.0 | 862 |
| 32 | 1195 | 117.5 | 147.7 | 793.74 | 787.40 | 260.0 | 914 | 812.8 | 918 |
| 34 | 1245 | 120.7 | 154.0 | 844.54 | 838.20 | 270.0 | 965 | 863.6 | 973 |
| 36 | 1315 | 123.9 | 162.0 | 895.34 | 889.00 | 283.0 | 1022 | 914.4 | 1032 |
| 38 | 1270 | 152.4 | 155.0 | 946.14 | 939.80 | 254.0 | 1054 | 965.2 | 1022 |
| 40 | 1320 | 158.8 | 162.0 | 996.94 | 990.60 | 264.0 | 1111 | 1016.0 | 1073 |
| 42 | 1405 | 168.3 | 171.5 | 1047.74 | 1041.40 | 279.0 | 1168 | 1066.8 | 1127 |
| 44 | 1455 | 173.1 | 177.8 | 1098.54 | 1092.20 | 289.0 | 1226 | 1117.6 | 1181 |
| 46 | 1510 | 179.4 | 185.8 | 1149.34 | 1143.00 | 300.0 | 1276 | 1168.4 | 1235 |
| 48 | 1595 | 189.0 | 195.3 | 1200.14 | 1193.80 | 316.0 | 1334 | 1219.2 | 1289 |
| 50 | 1670 | 196.9 | 203.2 | 1250.94 | 1244.60 | 329.0 | 1384 | 1270.0 | 1343 |
| 52 | 1720 | 203.2 | 209.6 | 1301.74 | 1295.40 | 337.0 | 1435 | 1320.8 | 1394 |
| 54 | 1780 | 209.6 | 217.5 | 1352.54 | 1346.20 | 349.0 | 1492 | 1371.6 | 1448 |
| 56 | 1855 | 217.5 | 225.5 | 1403.34 | 1397.00 | 362.0 | 1543 | 1422.4 | 1502 |
| 58 | 1905 | 222.3 | 231.8 | 1454.14 | 1447.80 | 370.0 | 1600 | 1473.2 | 1553 |
| 60 | 1995 | 233.4 | 242.9 | 1504.94 | 1498.60 | 389.0 | 1657 | 1524.0 | 1610 |

Notes :

(1) For the 'Bore'(B1) other than wall thickness 9.53mm and 12.7mm, refer to page 70-71
(2) Class 400 flanges will be furnished with 2mm(0.06" ) raised face, which is excepted from 'Thickness'(t) and 'Length through Hub'(T).
(3) Flanges dimensions of size 12" through 24" flanges [except 22" ] are in accordance with ASME B16.5
(4) Blind flanges mays be made with or without hubs at the manufacturer's option.

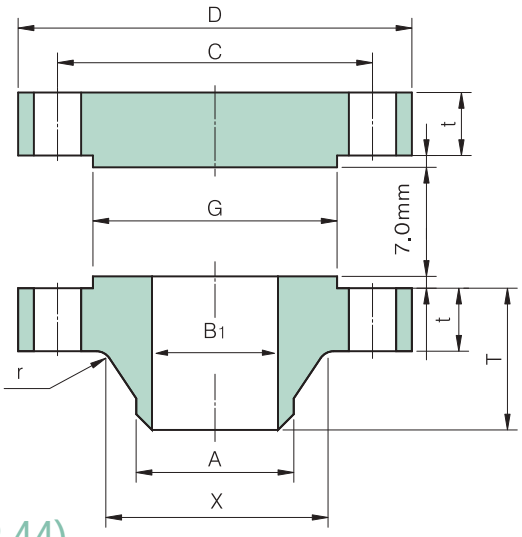



Unit : mm

| Nominal Pipe Size (inch) | Drilling | | | Radius of Fillet | Pitch Diameter | GROOVE DIMENSIONS | | | Diameter of Raised Face | Ring & Groove Number | Approximate Weight(kg) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Diameter of Bolt Circle | Number of holes | Diameter of Bolt hole | | | Width | Depth | Radius | | | | |
| | C | | | r | P | F | E | R | K | | WELDING NECK | BLIND |
| 12 | 489.0 | 20 | 34.9 | 13 | 381.0 | 11.91 | 7.92 | 0.8 | 413 | R57 | 102.5 | 132 |
| 14 | 527.0 | 20 | 38.1 | 13 | 419.1 | 11.91 | 7.92 | 0.8 | 457 | R61 | 121.5 | 158 |
| 16 | 603.2 | 20 | 41.3 | 13 | 469.9 | 11.91 | 7.92 | 0.8 | 508 | R65 | 177 | 224.7 |
| 18 | 654.0 | 20 | 44.5 | 13 | 533.4 | 11.91 | 7.92 | 0.8 | 575 | R69 | 215.7 | 285 |
| 20 | 723.9 | 24 | 44.5 | 13 | 584.2 | 13.49 | 9.53 | 1.5 | 635 | R73 | 267.9 | 365 |
| 22 | 777.8 | 24 | 47.6 | 13 | 635.0 | 15.1 | 11.13 | 1.5 | 686 | R81 | 304.5 | 428 |
| 24 | 838.2 | 24 | 50.8 | 13 | 692.2 | 16.66 | 11.13 | 1.5 | 749 | R77 | 372 | 533.5 |
| 26 | 914.4 | 28 | 50.8 | 13 | 749.3 | 19.84 | 12.70 | 1.5 | 810 | R93 | 441.8 | 765.4 |
| 28 | 965.2 | 28 | 54.0 | 13 | 800.1 | 19.84 | 12.70 | 1.5 | 861 | R94 | 500.2 | 900.3 |
| 30 | 1022.4 | 28 | 54.0 | 13 | 857.25 | 19.84 | 12.70 | 1.5 | 917 | R95 | 565.2 | 1061.2 |
| 32 | 1079.5 | 28 | 60.3 | 13 | 914.4 | 23.01 | 14.27 | 1.5 | 984 | R96 | 635.0 | 1243.7 |
| 34 | 1130.3 | 28 | 60.3 | 14 | 965.2 | 23.01 | 14.27 | 1.5 | 1035 | R97 | 695.2 | 1415.2 |
| 36 | 1193.8 | 28 | 66.7 | 14 | 1022.35 | 23.01 | 14.27 | 1.5 | 1092 | R98 | 788.0 | 1647.8 |
| 38 | 1162.0 | 28 | 60.3 | 14 | – | – | – | – | – | – | 665.1 | 1492.0 |
| 40 | 1212.8 | 32 | 60.3 | 14 | – | – | – | – | – | – | 713.5 | 1677.3 |
| 42 | 1282.7 | 28 | 66.7 | 14 | – | – | – | – | – | – | 887.0 | 2014.4 |
| 44 | 1333.5 | 32 | 66.7 | 14 | – | – | – | – | – | – | 939.4 | 2229.5 |
| 46 | 1390.6 | 32 | 66.7 | 14 | – | – | – | – | – | – | 1036.0 | 2519.1 |
| 48 | 1460.5 | 32 | 73.0 | 14 | – | – | – | – | – | – | 1236.2 | 2934.7 |
| 50 | 1524.0 | 28 | 79.4 | 14 | – | – | – | – | – | – | 1435.7 | 3355.5 |
| 52 | 1574.8 | 32 | 79.4 | 14 | – | – | – | – | – | – | 1503.8 | 3651.2 |
| 54 | 1632.0 | 32 | 79.4 | 14 | – | – | – | – | – | – | 1660.7 | 4074.3 |
| 56 | 1695.4 | 32 | 85.7 | 16 | – | – | – | – | – | – | 1867.2 | 4560.0 |
| 58 | 1746.2 | 32 | 85.7 | 16 | – | – | – | – | – | – | 1975.4 | 4961.0 |
| 60 | 1822.4 | 28 | 92.1 | 17 | – | – | – | – | – | – | 2377.1 | 5723.2 |

# CLASS 900 FLANGES





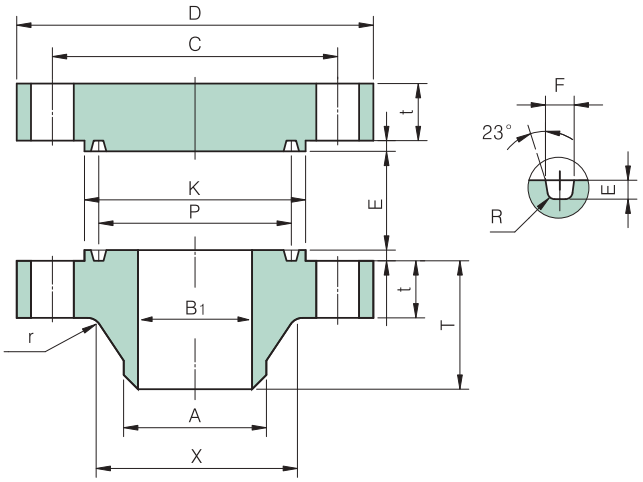

## ASME B16.47A (MSS SP 44)

Unit : mm

| Nominal Pipe Size (inch) | Outside Diameter | Thickness | | Length thru Hub | O.D of Raised Face | Diameter of Hub Bevel | Diameter of Base of Hub | Drilling | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | WNF | Blind | | | | | Diameter of Bolt Circle | Number of holes | Diameter of Bolt hole |
| | D | t | t | T | G | A | X | C | | |
| 12 | 610 | 79.4 | 79.4 | 200 | 381.0 | 323.8 | 419 | 533.4 | 20 | 38.1 |
| 14 | 640 | 85.8 | 85.8 | 213 | 412.8 | 355.6 | 451 | 558.8 | 20 | 41.3 |
| 16 | 705 | 88.9 | 88.9 | 216 | 469.9 | 406.4 | 508 | 616.0 | 20 | 44.5 |
| 18 | 785 | 101.6 | 101.6 | 229 | 533.4 | 457.0 | 565 | 685.8 | 20 | 50.8 |
| 20 | 855 | 108.0 | 108.0 | 248 | 584.2 | 508.0 | 622 | 749.3 | 20 | 54.0 |
| 24 | 1040 | 139.7 | 139.7 | 292 | 692.2 | 610.0 | 749 | 901.7 | 20 | 66.7 |
| 26 | 1085 | 139.7 | 160.4 | 286 | 749 | 660.4 | 775 | 952.5 | 20 | 73.0 |
| 28 | 1170 | 142.9 | 171.5 | 298 | 800 | 711.2 | 832 | 1022.4 | 20 | 79.4 |
| 30 | 1230 | 149.3 | 182.6 | 311 | 857 | 762.0 | 889 | 1085.8 | 20 | 79.4 |
| 32 | 1315 | 158.8 | 193.7 | 330 | 914 | 812.8 | 946 | 1155.7 | 20 | 85.7 |
| 34 | 1395 | 165.1 | 204.8 | 349 | 965 | 863.6 | 1006 | 1225.6 | 20 | 92.1 |
| 36 | 1460 | 171.5 | 214.4 | 362 | 1022 | 914.4 | 1064 | 1289.0 | 20 | 92.1 |
| 38 | 1460 | 190.5 | 215.9 | 352 | 1099 | 965.2 | 1073 | 1289.0 | 20 | 92.1 |
| 40 | 1510 | 196.9 | 223.9 | 364 | 1162 | 1016.0 | 1127 | 1339.8 | 24 | 92.1 |
| 42 | 1560 | 206.4 | 231.8 | 371 | 1213 | 1066.8 | 1176 | 1390.6 | 24 | 92.1 |
| 44 | 1650 | 214.4 | 242.9 | 391 | 1270 | 1117.6 | 1235 | 1463.7 | 24 | 98.4 |
| 46 | 1735 | 225.5 | 255.6 | 411 | 1334 | 1168.4 | 1292 | 1536.7 | 24 | 104.8 |
| 48 | 1785 | 233.4 | 263.6 | 419 | 1384 | 1219.2 | 1343 | 1587.5 | 24 | 104.8 |

Notes :

(1) For the 'Bore'(B1) other than wall thickness 9.53mm and 12.7mm, refer to page 70-71
(2) Class 900 flanges will be furnished with 2mm(0.06") raised face, which is excepted from 'Thickness'(t) and 'Length through Hub'(T).
(3) Flanges dimensions of size 12" through 24" flanges [except 22"] are in accordance with ASME B16.5
(4) Blind flanges mays be made with or without hubs at the manufacturer's option.




Unit : mm

| Nominal Pipe Size (inch) | Radius of Fillet | Bore wall Thickness | | Pitch Diameter | GROOVE DIMENSIONS | | | Diameter of Raised Face | Ring & Groove Number | Approximate Weight(kg) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9.53mm | 12.7mm | | Width | Depth | Radius | | | | |
| | r | $B_1$ | | P | F | E | R | K | | WELDING NECK | BLIND |
| 12 | 11 | 304.74 | 298.40 | 381.0 | 11.91 | 7.92 | 0.8 | 419 | R57 | 157 | 187 |
| 14 | 11 | 336.54 | 330.20 | 419.1 | 16.66 | 11.13 | 1.5 | 467 | R62 | 181.6 | 224 |
| 16 | 11 | 387.34 | 381.00 | 469.9 | 16.66 | 11.13 | 1.5 | 524 | R66 | 224.7 | 272.4 |
| 18 | 11 | 437.94 | 431.60 | 533.4 | 19.88 | 12.70 | 1.5 | 594 | R70 | 308.7 | 385.9 |
| 20 | 11 | 488.94 | 482.60 | 584.2 | 19.97 | 12.70 | 1.5 | 648 | R74 | 376.8 | 488 |
| 24 | 11 | 590.94 | 584.60 | 692.15 | 26.97 | 15.88 | 2.3 | 772 | R78 | 685 | 905 |
| 26 | 11 | 641.34 | 635.00 | 749.3 | 30.18 | 17.48 | 2.3 | 832 | R100 | 795.4 | 1076.1 |
| 28 | 13 | 692.14 | 685.80 | 800.1 | 33.32 | 17.48 | 2.3 | 889 | R101 | 934.8 | 1341.7 |
| 30 | 13 | 742.94 | 736.60 | 857.25 | 33.32 | 17.48 | 2.3 | 946 | R102 | 1066.8 | 1593.0 |
| 32 | 13 | 793.74 | 787.40 | 914.4 | 33.32 | 17.48 | 2.3 | 1003 | R103 | 1275.8 | 1925.7 |
| 34 | 14 | 844.54 | 838.20 | 965.2 | 36.53 | 20.62 | 2.3 | 1067 | R104 | 1480.2 | 2283.2 |
| 36 | 14 | 895.34 | 889.00 | 1022.35 | 36.53 | 20.62 | 2.3 | 1124 | R105 | 1672.6 | 2638.5 |
| 38 | 19 | 946.14 | 939.80 | – | – | – | – | – | – | 1642.2 | 2663.7 |
| 40 | 21 | 996.94 | 990.60 | – | – | – | – | – | – | 1742.7 | 2924.8 |
| 42 | 21 | 1047.74 | 1041.40 | – | – | – | – | – | – | 1891.6 | 3250.5 |
| 44 | 22 | 1098.54 | 1092.20 | – | – | – | – | – | – | 2207.8 | 3798.7 |
| 46 | 22 | 1149.34 | 1143.00 | – | – | – | – | – | – | 2553.5 | 4405.1 |
| 48 | 24 | 1200.14 | 1193.80 | – | – | – | – | – | – | 2736.5 | 4832.5 |

## FORGED FLANGES TOLERNACE

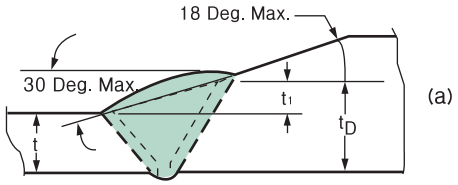
| Place | | Range | SIZE | Tolerance (mm) |
|---|---|---|---|---|
| Outside Diameter | D | | NPS≤24 | ±1.6*(±0.06in) |
| | | | NPS≥26 | ±3.2*(±0.125in) |
| Inside Diameter | $B_1$ | | 12≤NPS≤18 | ±1.5(±0.06in) |
| | | | NPS≥20 | ±3.0(±0.12in)<br>−1.5(−0.06in) |
| Facing outside Diameter | G | 2.0mm Raised Face | 12≤NPS≤24 | ±1.0(±0.03in) |
| | | | NPS≥26 | ±2.0(±0.08in) |
| | | 7.0mm Raised Face | 12≤NPS≤24 | ±0.5(±0.02in) |
| | | | NPS≥26 | ±1.0(±0.04in) |
| Diameter of Hub at Base | X | | All | ±3.2*(±0.125in) |
| Diameter of Hub at Welding Point | A | | 12≤NPS≤24 | +4.0(+0.16in)<br>−1.0(−0.03in) |
| | | | NPS≥26 | +5.0(+0.21in)<br>−1.5(−0.06in) |
| Drilling | Bolt Circle Diameter | | | ±1.5(±0.06in) |
| | Bolt to Bolt Hole | | | ±0.8(±0.03in) |
| | Eccentricity of Bolt Circle with Respect to Facing | | 12≤NPS≤24 | ±1.5(±0.06in) |
| | | | NPS≥26 | ±2.0(±0.09in) |
| Thickness | t | NPS≤18 | | +3.0(+0.12in)<br>−0.0(−0.00in) |
| | | NPS≤20 | | +5.0(+0.19in)<br>−0.0(−0.00in) |
| Length Thru Hub | T | | 12≤NPS≤24 | +3.0(+0.12in)<br>−5.0(−0.18in) |
| | | | NPS≥26 | ±5.0(0.19in) |

Notes :

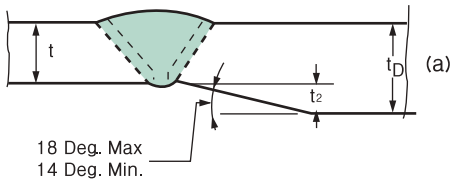
Sizes NPS 10 and smaller
Tolerances for these sizes shall be as specified in ASME B 16.5. The listing of decimal tolerances does not imply method of measurement.

*This tolerance is not covered MSS SP-44, but maker's option.

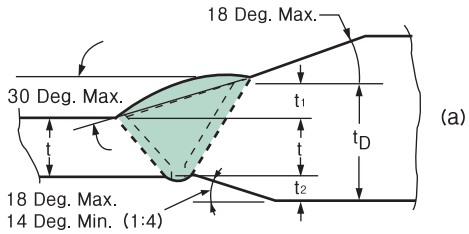
# FIGURE 1Acceptable Desingns for unequal Wall Thickness(1)




BEVEL FOR OUTSIDE THICKNESS




BEVEL FOR INSIDE THICKNESS




BEVEL FOR COMBINED THICKNESS

Notes :

When the minimum specified yield strengths of the sections to be joined are unequal, the deposited weld metal shall have mechanical properties at least equal to those of the section having the higher strength, and the minimum thickness, tD, shall at least equal t times the ratio of minimum specified yield strength of pipe and flange, but no to exceed 1.5t.

(a) Neither t1, t2, nor t1 + t2 shall exceed 0.5t.

(1) Supplementary Footnote : See ASME B31 Piping codes for additional fabrication details.

Figure 2 Bevel Detail for wall Thickness (T) 22mm (0.88 in.)[a] or less

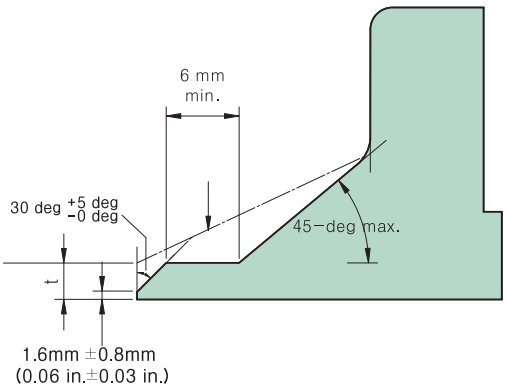
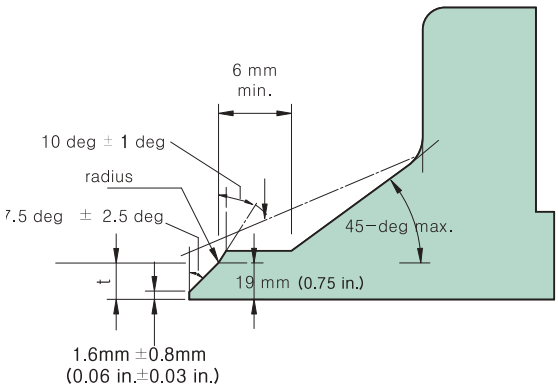
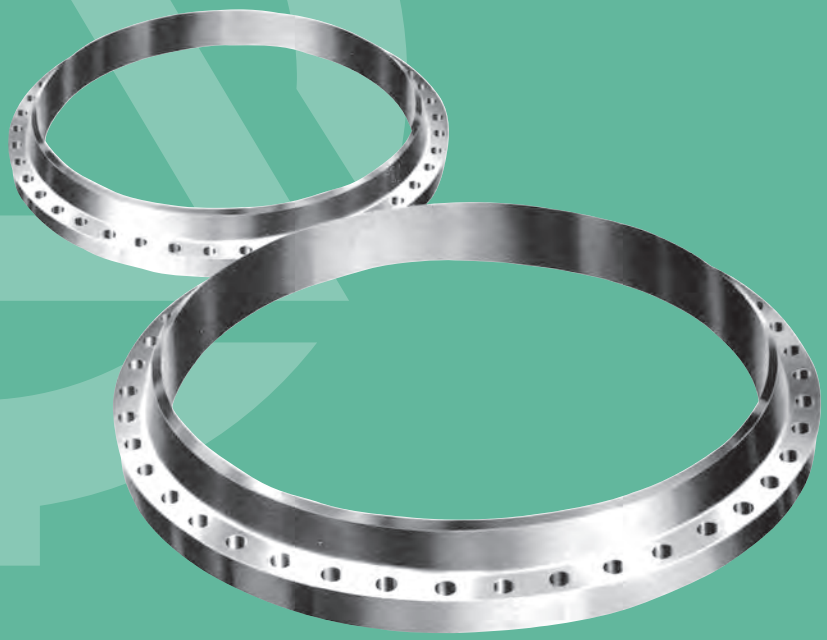



Figure 2 Bevel Detail for wall Thickness (T) 22mm (0.88 in.)[a] or less




Notes :

(a)Flange size NPS 24 and smaller may be furnished with 37-1/2° bevel at option of manufacturer.

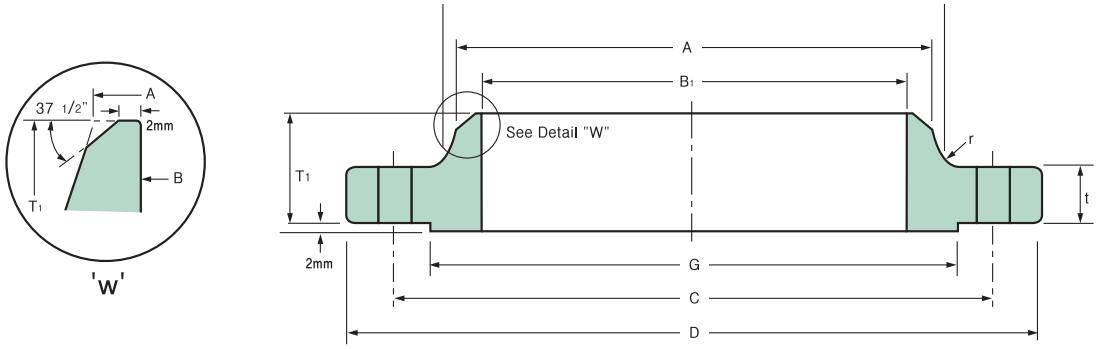


# ASME B 16.47 SERIES B FLANGES (API 605)

- Class 75 Flanges
- Class 150 Flanges
- Class 300 Flanges
- Class 400 Flanges
- Class 600 Flanges
- Class 900 Flanges
- FINISH & TOLERANCE
- WELDING ENDS

# CLASS 75 / 150 FLANGES






## CLASS 75

Unit : mm

| Nominal pipe size | Outside Diam. | O.D Raised Face | Diam.of Hub at Base | Diam.of Hub at Bevel | BORE | | | Length Thru Hub | THICKNESS | | Radius at Base of Hub | DRILLING | | | Approximate Weight(kg) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Wall thickness | | | | Welding Neck | Blind | | Bolt Circle Diam. | Num. of Holes | Diam.of Holes | | |
| | | | | | 6.35mm | 9.53mm | 12.7mm | | | | | | | | | |
| | D | G | X | A | B1 | | | T1 | t | t | r | C | | | Welding Neck | Blind |
| 26 | 760 | 705 | 676 | 661.9 | 649.2 | 642.84 | 636.5 | 57 | 31.9 | 31.9 | 8 | 723.9 | 36 | 19.1 | 39.0 | 117.1 |
| 28 | 815 | 756 | 727 | 712.7 | 700 | 693.64 | 687.3 | 60 | 31.9 | 31.9 | 8 | 774.7 | 40 | 19.1 | 44.0 | 134.8 |
| 30 | 865 | 806 | 778 | 763.5 | 750.8 | 744.44 | 738.1 | 64 | 31.9 | 31.9 | 8 | 825.5 | 44 | 19.1 | 47.9 | 152.0 |
| 32 | 915 | 857 | 829 | 814.3 | 801.6 | 795.24 | 788.9 | 68 | 33.5 | 35.0 | 8 | 876.3 | 48 | 19.1 | 53.4 | 178.4 |
| 34 | 965 | 908 | 879 | 865.1 | 852.4 | 846.04 | 839.7 | 72 | 33.5 | 36.6 | 8 | 927.1 | 52 | 19.1 | 57.4 | 216.0 |
| 36 | 1035 | 965 | 935 | 915.9 | 903.2 | 896.84 | 890.5 | 84 | 35.0 | 40.9 | 10 | 992.2 | 40 | 22.2 | 76.7 | 276.6 |
| 38 | 1085 | 1016 | 986 | 966.7 | 954 | 947.64 | 941.3 | 87 | 36.6 | 43.0 | 10 | 1043.0 | 40 | 22.2 | 84.0 | 319.6 |
| 40 | 1135 | 1067 | 1037 | 1017.5 | 1004.8 | 998.44 | 992.1 | 91 | 36.6 | 43.0 | 10 | 1093.8 | 44 | 22.2 | 89.4 | 349.8 |
| 42 | 1185 | 1118 | 1087 | 1068.3 | 1055.6 | 1049.24 | 1042.9 | 94 | 38.2 | 46.3 | 10 | 1144.6 | 48 | 22.2 | 96.4 | 409.5 |
| 44 | 1250 | 1175 | 1140 | 1119.1 | 1106.4 | 1100.04 | 1093.7 | 103 | 41.4 | 47.7 | 10 | 1203.3 | 36 | 25.4 | 120.1 | 469.7 |
| 46 | 1300 | 1226 | 1191 | 1169.9 | 1157.2 | 1150.84 | 1144.5 | 106 | 43.0 | 49.3 | 10 | 1254.1 | 40 | 25.4 | 128.8 | 524.4 |
| 48 | 1355 | 1276 | 1241 | 1220.7 | 1208 | 1201.64 | 1195.3 | 110 | 44.6 | 52.5 | 10 | 1304.9 | 44 | 25.4 | 141.4 | 605.2 |
| 50 | 1405 | 1327 | 1294 | 1271.5 | 1258.8 | 1252.44 | 1246.1 | 114 | 46.2 | 54.1 | 10 | 1355.7 | 44 | 25.4 | 153.2 | 670.7 |
| 52 | 1455 | 1378 | 1345 | 1322.3 | 1309.6 | 1303.24 | 1296.9 | 119 | 46.2 | 55.7 | 10 | 1409.7 | 48 | 25.4 | 161.2 | 739.8 |
| 54 | 1510 | 1429 | 1397 | 1373.1 | 1360.4 | 1354.04 | 1347.7 | 124 | 47.8 | 58.9 | 10 | 1460.5 | 48 | 25.4 | 178.3 | 841.9 |
| 56 | 1575 | 1486 | 1451 | 1423.9 | 1411.2 | 1404.84 | 1398.5 | 133 | 49.3 | 60.4 | 11 | 1520.8 | 40 | 28.6 | 209.7 | 938.8 |
| 58 | 1625 | 1537 | 1502 | 1474.7 | 1462 | 1455.64 | 1449.3 | 137 | 50.9 | 62.0 | 11 | 1571.6 | 44 | 28.6 | 222.4 | 1024.8 |
| 60 | 1675 | 1588 | 1553 | 1525.5 | 1512.8 | 1506.44 | 1500.1 | 143 | 54.1 | 65.2 | 11 | 1622.4 | 44 | 28.6 | 241.0 | 1144.4 |

## CLASS 150

Unit : mm

| Nominal pipe size | Outside Diam. | O.D Raised Face | Diam.of Hub at Base | Diam.of Hub at Bevel | BORE | | | Length Thru Hub | THICKNESS | | Radius at Base of Hub | DRILLING | | | Approximate Weight(kg) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Wall thickness | | | | Welding Neck | Blind | | Bolt Circle Diam. | Num. of Holes | Diam.of Holes | | |
| | | | | | 6.35mm | 9.53mm | 12.7mm | | | | | | | | | |
| | D | G | X | A | B1 | | | T1 | t | t | r | C | | | Welding Neck | Blind |
| 26 | 785 | 711 | 684 | 661.9 | 649.2 | 642.84 | 636.5 | 87 | 39.8 | 43.0 | 10 | 744.5 | 36 | 22.2 | 62.6 | 164.9 |
| 28 | 835 | 762 | 735 | 712.7 | 700 | 693.64 | 687.3 | 94 | 43.0 | 46.2 | 10 | 795.3 | 40 | 22.2 | 71.9 | 200.1 |
| 30 | 885 | 813 | 787 | 763.5 | 750.8 | 744.44 | 738.1 | 98 | 43.0 | 49.3 | 10 | 846.1 | 44 | 22.2 | 78 | 239.6 |
| 32 | 940 | 864 | 840 | 814.3 | 801.6 | 795.24 | 788.9 | 106 | 44.6 | 52.5 | 10 | 900.1 | 48 | 22.2 | 90.3 | 287.6 |
| 34 | 1005 | 921 | 892 | 865.1 | 852.4 | 846.04 | 839.7 | 109 | 47.7 | 55.7 | 10 | 957.3 | 40 | 25.4 | 109.1 | 348.5 |
| 36 | 1055 | 972 | 945 | 915.9 | 903.2 | 896.84 | 890.5 | 116 | 50.9 | 57.3 | 10 | 1009.6 | 44 | 25.4 | 122.6 | 394.8 |
| 38 | 1125 | 1022 | 997 | 968.2 | 955.5 | 949.14 | 942.8 | 122 | 52.5 | 62.0 | 10 | 1070.0 | 40 | 28.6 | 147.7 | 484.2 |
| 40 | 1175 | 1080 | 1049 | 1019 | 1006.3 | 999.94 | 993.6 | 127 | 54.1 | 65.2 | 10 | 1120.8 | 44 | 28.6 | 158.3 | 554.9 |
| 42 | 1225 | 1130 | 1102 | 1069.8 | 1057.1 | 1050.74 | 1044.4 | 132 | 57.3 | 66.8 | 11 | 1171.6 | 48 | 28.6 | 174 | 617.6 |
| 44 | 1275 | 1181 | 1153 | 1120.6 | 1107.9 | 1101.54 | 1095.2 | 135 | 58.9 | 70.0 | 11 | 1222.4 | 52 | 28.6 | 185.3 | 700.4 |
| 46 | 1340 | 1235 | 1205 | 1171.4 | 1158.7 | 1152.34 | 1146 | 143 | 60.4 | 73.1 | 11 | 1284.3 | 40 | 31.8 | 217.4 | 809.8 |
| 48 | 1390 | 1289 | 1257 | 1222.2 | 1209.5 | 1203.14 | 1196.8 | 148 | 63.6 | 76.3 | 11 | 1335.1 | 44 | 31.8 | 235.7 | 908.5 |
| 50 | 1445 | 1340 | 1308 | 1273 | 1260.3 | 1253.94 | 1247.6 | 152 | 66.8 | 79.5 | 11 | 1385.9 | 48 | 31.8 | 259.1 | 1021.8 |
| 52 | 1495 | 1391 | 1360 | 1323.8 | 1311.1 | 1304.74 | 1298.4 | 156 | 68.4 | 82.7 | 11 | 1436.7 | 52 | 31.8 | 274.6 | 1136.6 |
| 54 | 1550 | 1441 | 1413 | 1374.6 | 1361.9 | 1355.54 | 1349.2 | 160 | 70.0 | 85.8 | 11 | 1492.2 | 56 | 31.8 | 297.9 | 1266.5 |
| 56 | 1600 | 1492 | 1465 | 1425.4 | 1412.7 | 1406.34 | 1400 | 165 | 71.6 | 89.0 | 14 | 1543.0 | 60 | 31.8 | 315.5 | 1398.9 |
| 58 | 1675 | 1543 | 1516 | 1476.2 | 1463.5 | 1457.14 | 1450.8 | 173 | 73.1 | 91.9 | 14 | 1611.3 | 48 | 34.9 | 375.2 | 1585.9 |
| 60 | 1725 | 1600 | 1570 | 1527 | 1514.3 | 1507.94 | 1501.6 | 178 | 74.7 | 95.4 | 14 | 1662.1 | 52 | 34.9 | 397.8 | 1744.5 |

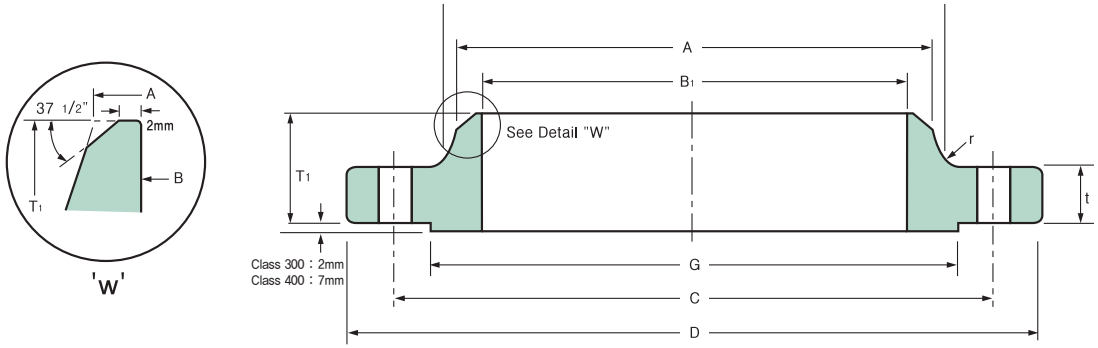
Notes :

(1) 'Bore'(B1) of flanges is shall be specified by the purchaser.

(2) The flange Thickness(t) & Length through Hub(T1) does not include the raised face thickness.

# CLASS 300 / 400 FLANGES






## CLASS 300

Unit : mm

| Nominal pipe size | Outside Diam. | O.D Raised Face | Diam.of Hub at Base | Diam.of Hub at Bevel | BORE | | | Length Thru Hub | THICKNESS | | Radius at Base of Hub | DRILLING | | | Approximate Weight(kg) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Wall thickness | | | | Welding Neck | Blind | | Bolt Circle Diam. | Num. of Holes | Diam.of Holes | | |
| | | | | | 6.35mm | 9.53mm | 12.7mm | | | | | | | | | |
| | D | G | X | A | B1 | | | T1 | t | t | r | C | | | Welding Neck | Blind |
| 26 | 865 | 737 | 702 | 665.2 | 652.5 | 646.14 | 639.8 | 143 | 87.4 | 87.4 | 14 | 803.3 | 32 | 34.9 | 183.2 | 388.9 |
| 28 | 920 | 787 | 756 | 716 | 703.3 | 696.94 | 690.6 | 148 | 87.4 | 87.4 | 14 | 857.2 | 36 | 34.9 | 201.5 | 440.1 |
| 30 | 990 | 845 | 813 | 768.4 | 755.7 | 749.34 | 743 | 156 | 92.1 | 92.1 | 14 | 920.8 | 36 | 38.1 | 244.3 | 535.7 |
| 32 | 1055 | 902 | 864 | 819.2 | 806.5 | 800.14 | 793.8 | 167 | 101.6 | 101.6 | 16 | 977.9 | 32 | 41.3 | 302.2 | 673.0 |
| 34 | 1110 | 953 | 918 | 870 | 857.3 | 850.94 | 844.6 | 171 | 101.6 | 101.6 | 16 | 1031.9 | 36 | 41.3 | 325.7 | 744.5 |
| 36 | 1170 | 1010 | 965 | 920.8 | 908.1 | 901.74 | 895.4 | 179 | 101.6 | 101.6 | 16 | 1089.0 | 32 | 44.5 | 360.0 | 830.4 |
| 38 | 1220 | 1060 | 1016 | 971.6 | 958.9 | 952.54 | 946.2 | 191 | 109.6 | 109.6 | 16 | 1139.8 | 36 | 44.5 | 401.8 | 971.4 |
| 40 | 1275 | 1114 | 1067 | 1022.4 | 1009.7 | 1003.34 | 997 | 197 | 114.3 | 114.3 | 16 | 1190.6 | 40 | 44.5 | 442.1 | 1105.1 |
| 42 | 1335 | 1168 | 1118 | 1074.7 | 1062 | 1055.64 | 1049.3 | 203 | 117.5 | 117.5 | 16 | 1244.6 | 36 | 47.6 | 490.9 | 1248.8 |
| 44 | 1385 | 1219 | 1173 | 1125.5 | 1112.8 | 1106.44 | 1100.1 | 213 | 125.5 | 125.5 | 16 | 1295.4 | 40 | 47.6 | 540.8 | 1432.4 |
| 46 | 1460 | 1270 | 1229 | 1176.3 | 1163.6 | 1157.24 | 1150.9 | 221 | 127.0 | 128.6 | 16 | 1365.2 | 36 | 50.8 | 633.4 | 1636.3 |
| 48 | 1510 | 1327 | 1278 | 1227.1 | 1214.4 | 1208.04 | 1201.7 | 222 | 127.0 | 133.4 | 16 | 1416.0 | 40 | 50.8 | 650.9 | 1812.1 |
| 50 | 1560 | 1378 | 1330 | 1277.9 | 1265.2 | 1258.84 | 1252.5 | 233 | 136.6 | 138.2 | 16 | 1466.8 | 44 | 50.8 | 677.1 | 2000.2 |
| 52 | 1615 | 1429 | 1383 | 1328.7 | 1316 | 1309.64 | 1303.3 | 241 | 141.3 | 142.6 | 16 | 1517.6 | 48 | 50.8 | 774.8 | 2209.4 |
| 54 | 1675 | 1480 | 1435 | 1379.5 | 1366.8 | 1360.44 | 1354.1 | 238 | 135.0 | 147.7 | 16 | 1578.0 | 48 | 50.8 | 803.7 | 2469.1 |
| 56 | 1765 | 1537 | 1494 | 1430.3 | 1417.6 | 1411.24 | 1404.9 | 267 | 152.4 | 155.4 | 17 | 1651.0 | 36 | 60.3 | 1070.5 | 2888.4 |
| 58 | 1825 | 1594 | 1548 | 1481.1 | 1468.4 | 1462.04 | 1455.7 | 273 | 152.4 | 160.4 | 17 | 1712.9 | 40 | 60.3 | 1137.2 | 3181.2 |
| 60 | 1880 | 1651 | 1599 | 1557.3 | 1544.6 | 1538.24 | 1531.9 | 270 | 149.3 | 165.1 | 17 | 1763.7 | 40 | 60.3 | 1071.2 | 3483.2 |

## CLASS 400

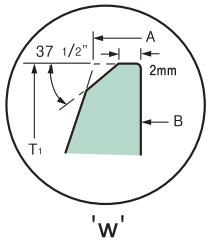
Unit : mm

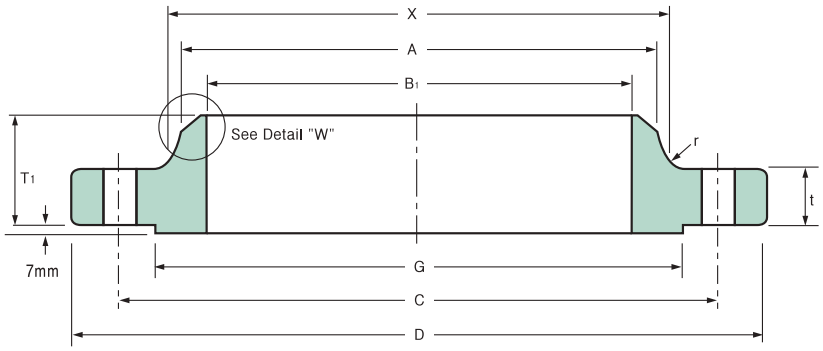
| Nominal pipe size | Outside Diam. | O.D Raised Face | Diam.of Hub at Base | Diam.of Hub at Bevel | BORE | | | Length Thru Hub | THICKNESS | | Radius at Base of Hub | DRILLING | | | Approximate Weight(kg) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Wall thickness | | | | Welding Neck | Blind | | Bolt Circle Diam. | Num. of Holes | Diam.of Holes | | |
| | | | | | 6.35mm | 9.53mm | 12.7mm | | | | | | | | | |
| | D | G | X | A | B1 | | | T1 | t | t | r | C | | | Welding Neck | Blind |
| 26 | 850 | 711 | 689 | 660.4 | 647.7 | 641.34 | 635 | 149 | 88.9 | 88.9 | 11 | 781.0 | 28 | 38.1 | 176.4 | 395.5 |
| 28 | 915 | 762 | 740 | 711.2 | 698.5 | 692.14 | 685.8 | 159 | 95.3 | 95.3 | 13 | 838.2 | 24 | 41.3 | 218.4 | 492.9 |
| 30 | 970 | 819 | 794 | 762 | 749.3 | 742.94 | 736.6 | 170 | 101.6 | 101.6 | 13 | 895.4 | 28 | 41.3 | 251.6 | 588.4 |
| 32 | 1035 | 873 | 845 | 812.8 | 800.1 | 793.74 | 787.4 | 179 | 108.0 | 108.0 | 13 | 952.5 | 28 | 44.5 | 299.1 | 709.3 |
| 34 | 1085 | 927 | 899 | 863.6 | 850.9 | 844.54 | 838.2 | 187 | 111.2 | 111.2 | 14 | 1003.3 | 32 | 44.5 | 323.4 | 800.7 |
| 36 | 1155 | 981 | 952 | 914.4 | 901.7 | 895.34 | 889 | 200 | 119.1 | 119.1 | 14 | 1066.8 | 28 | 47.6 | 400.3 | 974.5 |

Notes :

(1) 'Bore' (B1) of flanges is shall be specified by the purchaser.
(2) The flange Thickness(t) & Length through Hub(T1) does not include the raised face thickness.

# CLASS 600 / 900 FLANGES






## CLASS 600

Unit : mm

| Nominal pipe size | Outside Diam. | O.D Raised Face | Diam.of Hub at Base | Diam.of Hub at Bevel | BORE | | | Length Thru Hub | THICKNESS | | Radius at Base of Hub | DRILLING | | | Approximate Weight(kg) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Wall thickness | | | | Welding Neck | Blind | | Bolt Circle Diam. | Num. of Holes | Diam.of Holes | | |
| | | | | | 6.35mm | 9.53mm | 12.7mm | | | | | | | | Welding Neck | Blind |
| | D | G | X | A | $B_1$ | | | $T_1$ | t | t | r | C | | | | |
| 26 | 890 | 727 | 698 | 660.4 | 647.7 | 641.34 | 635 | 181 | 111.2 | 111.3 | 13 | 806.4 | 28 | 44.5 | 259.1 | 528.3 |
| 28 | 950 | 784 | 752 | 711.2 | 698.5 | 692.14 | 685.8 | 190 | 115.9 | 115.9 | 13 | 863.6 | 28 | 47.6 | 299.4 | 626.1 |
| 30 | 1020 | 841 | 806 | 762 | 749.3 | 742.94 | 736.6 | 205 | 125.5 | 127.0 | 13 | 927.1 | 28 | 50.8 | 371.8 | 788.6 |
| 32 | 1085 | 895 | 860 | 812.8 | 800.1 | 793.74 | 787.4 | 216 | 130.2 | 134.9 | 13 | 984.2 | 28 | 54.0 | 431.8 | 945.8 |
| 34 | 1160 | 953 | 914 | 863.6 | 850.9 | 844.54 | 838.2 | 233 | 141.3 | 144.2 | 14 | 1054.1 | 24 | 60.3 | 542.6 | 1157.9 |
| 36 | 1215 | 1010 | 968 | 914.4 | 901.7 | 895.34 | 889 | 243 | 146.1 | 150.9 | 14 | 1104.9 | 28 | 60.3 | 593.3 | 1322.7 |

## CLASS 900

Unit : mm

| Nominal pipe size | Outside Diam. | O.D Raised Face | Diam.of Hub at Base | Diam.of Hub at Bevel | BORE | | | Length Thru Hub | THICKNESS | | Radius at Base of Hub | DRILLING | | | Approximate Weight(kg) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Wall thickness | | | | Welding Neck | Blind | | Bolt Circle Diam. | Num. of Holes | Diam.of Holes | | |
| | | | | | 6.35mm | 9.53mm | 12.7mm | | | | | | | | Welding Neck | Blind |
| | D | G | X | A | $B_1$ | | | $T_1$ | t | t | r | C | | | | |
| 26 | 1020 | 762 | 743 | 660.4 | 647.7 | 641.34 | 635 | 259 | 135.0 | 154.0 | 11 | 901.7 | 20 | 66.7 | 532.5 | 928.4 |
| 28 | 1105 | 819 | 797 | 711.2 | 698.5 | 692.14 | 685.8 | 276 | 147.7 | 166.7 | 13 | 971.6 | 20 | 73.0 | 673.5 | 1174.3 |
| 30 | 1180 | 876 | 851 | 762 | 749.3 | 742.94 | 736.6 | 289 | 155.6 | 176.1 | 13 | 1035.0 | 20 | 79.4 | 793.3 | 1408 |
| 32 | 1240 | 927 | 908 | 812.8 | 800.1 | 793.74 | 787.4 | 303 | 160.4 | 186.0 | 13 | 1092.2 | 20 | 79.4 | 899.5 | 1655.8 |
| 34 | 1315 | 991 | 962 | 863.6 | 850.9 | 844.54 | 838.2 | 319 | 171.5 | 195.0 | 14 | 1155.7 | 20 | 85.7 | 1061.8 | 1944.7 |
| 36 | 1345 | 1029 | 1016 | 914.4 | 901.7 | 895.34 | 889 | 325 | 173.1 | 201.7 | 14 | 1200.2 | 24 | 79.4 | 1070.4 | 2107.2 |

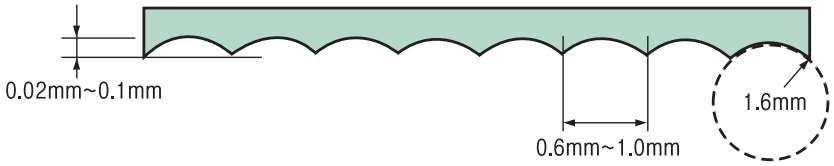
Notes :

(1) 'Bore' (B1) of flanges is shall be specified by the purchaser.
(2) The flange Thickness(t) & Length through Hub(T1) does not include the raised face thickness.

# API 605 FORGED FLANGES

## 1. Standard Finishes for Contact Face of Flanges

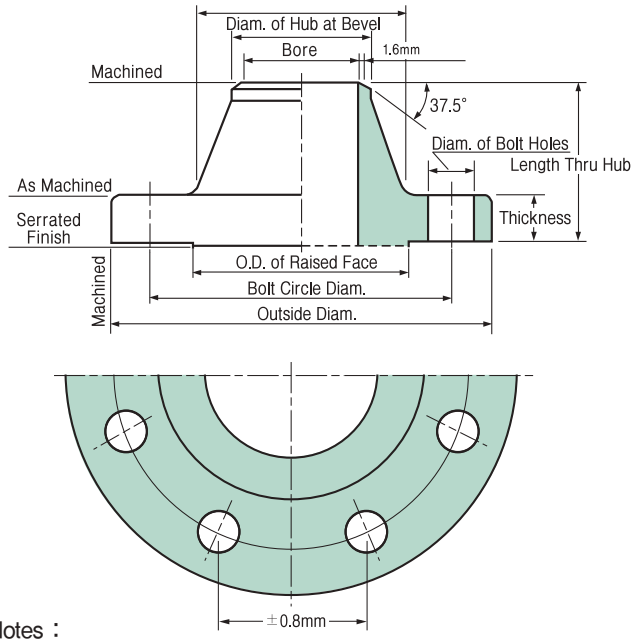
The flange face shall have a serrated finish consistig of 20 to 40 grooves per inch, 0.002inch to 0.005 inch deep,
cut spirally or concentrically with a round-nose tool.




**Diam. at Base of Hub**

| Range | Tolerance (mm) |
|---|---|
| Outside diameter of Raised Face | ±0.8 (±0.03in) |
| Flange Thickness | +4.8 (+0.19in) −0.0 (−0.00in) |
| Length Thru Hub | ±3.2 (±0.12in) |
| Diameter of Hub at Bevel | +4.0 (+0.16in) −0.8 (−0.03in) |
| Bolt Circle Diameter | ±1.6 (±0.06in) |
| Center to Center of adjacent bolt holes | ±0.8 (±0.03in) |
| Bore | ±3.0 (±0.12in) −1.6 (−0.06in) |
| Outside diameter | ±3.0 (±0.12in)* |
| Diameter of Base of Hub | ±3.0 (±0.12in)* |

## 2. Dimensional Tolerances for API 605 Flange




Notes :

(1) Flanges shall have bearing surfaces for bolting that are parallel to the flange face within 1 degree. Any back facing or spot facing required to accomplish parallelism between the flange face and nut bearing surface on the back of the flange shall not reduce the flange thickness.
(2) Tolerances for the welding end of a welding neck flange shall be in coformance with ASME B12.25
(3) Other tolerances than specified the table shall be in accordances with ASME B16.5
(4) The flange shall be either back-faced or spot-faced at the bolt-holes on the flange back if the nut bearing surface at the back of the flange is not parallel with the flange face within the tolerances listed in Note (1), if the fillet at the hub interferes with the nut bearing surface of if the flange thickness exceeds the minimum required thickness by more than 0.19 inch(4.8mm) The nut bearing surface is the spot-facing diameter at the bolt-holes as given in MSS SP-9, Spot-facing shall be in accordance with MSS SP-9
(5) Tolerances marked * are not covered in ASME B16.47 SER.B

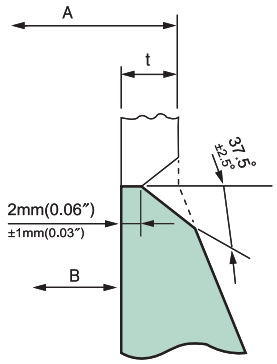
# ASME B16.47-2006 TOLERANCE

| Place | Range | Tolerance (mm) |
|---|---|---|
| Outside Diameter | | ±3.2* (±0.125in*) |
| inside Diameter | | +3.0 (+0.12in) −2.0 (−0.06in) |
| Facing | Outside diameter of Raised Face | ±2.0 (±0.08in) |
| | 2.0mm Raised Face | ±0.5 (±0.02in) |
| | 7.0mm Raised Face | ±2.0 (±0.08in) |
| Diameter of Hub at Base | | ±3.2* (±0.125in*) |
| Diameter of Hub at Welding Point | | +5.0 (+0.19in) −2.0 (−0.06in) |
| Drilling | | ±1.5 (±0.16in) |
| | | ±0.8 (±0.03in) |
| | | ±1.5 (±0.06in) |
| Thickness | t ≤25mm (1.0in) | +3.0 (+0.12in) −0.0 (−0.00in) |
| | 25mm (1.0in) 〈 t ≤ 50mm (2.0in) | +5.0 (+0.19in) −0.0 (−0.00in) |
| | 50mm (2.0in)〈 t≤ 75mm (3.0in) | +8.0 (+0.31in) −0.0 (−0.00in) |
| | t 〉 75mm (3.0in) | +10.0 (+0.38in) −0.0 (−0.00in) |
| Length Thru Bub | | +3.0 (+0.12in) −5.0 (−0.19in) |

# ASME B16.47 FORGED FLANGES

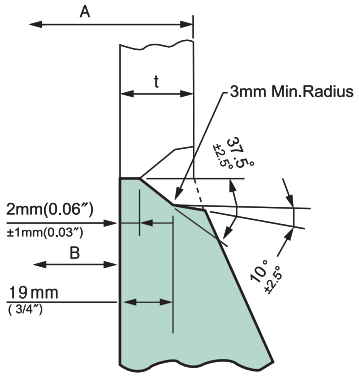


### BEVEL FOR WALL THICKNESSES (t)
From 5mm (0.19in) to 22mm (0.88in) inclusive




A=Nominal Outside Diameter of Pipe
B=Nominal Inside Diameter of Pipe
t =Nominal Wall Thickness of Pipe

### BEVEL FOR WALL THICKNESSES (t)
Greater Than 22mm (0.88in)

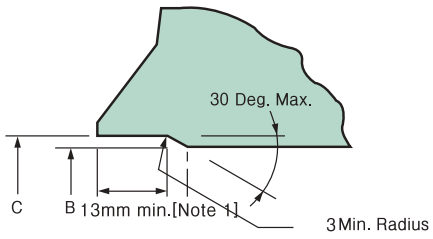



Notes :

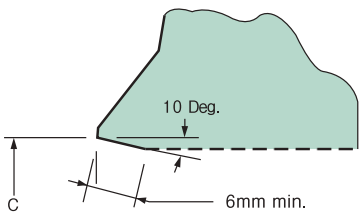
When the thickness of the hub at the bevel is greater than that of the pipe to which the flange is joined and the additional thickness is provided on the outside diameter, a taper weld having a slop not exceeding 1 to 3 may be employed or, alternatively, the greater outside diameter may be tapered, at the same maximum slope or less, from a point on the welding bevel equal to the OD at the mating pipe. Similarly, when the greater thickness is provided on the inside of the flange, it shall be taper–bored from the welding end at a slope not exceeding 1 to 3.

When flanges covered by this standard are intended for services with light wall, higher strength pipe, the thickness of the hub at the bevel may be greater than that of the pipe to which the flange is joined. Under these conditions a single taper hub may be provided and the outside diameter of the hub at the base (Dimension X) may also be modified.

The additional thickness may be provided on either inside or outside or partially on each side, but the total additional thickness shall not exceed one–half times the nominal wall thickness of intened mating pipe.



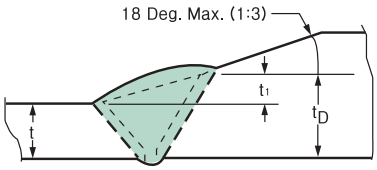

### INSIDE CONTOUR FOR USE WITH RECTANGULAR BACKING RING



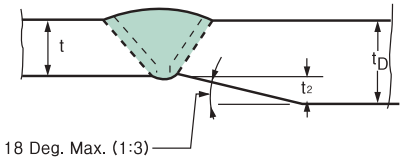

### INSIDE CONTOUR FOR USE WITH TAPER BACKING RING

A= nominal outside diameter of welding end, mm
B= nominal inside diameter of pipe(=A–2t).mm
C= A–0.79 – 1.75t – 0.25, mm
t = nominal wall thickness of pipe, mm
0.79mm = minus tolerance on outside diameter of pope to ASTM A106, etc.
1.75t = 87.5% of nominal wall(permitted by ASTM A106etc.) multiplied by to conver into terms of diameter.
0.25mm = plus tolerance on diameter C, mm.

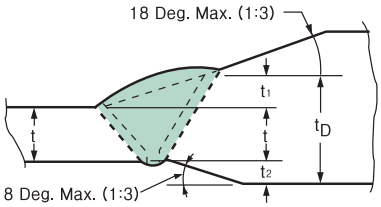
Note(1) 13mm depth based on use of 19mm wide backing ring




### BEVEL FOR OUTSIDE THICKNESS



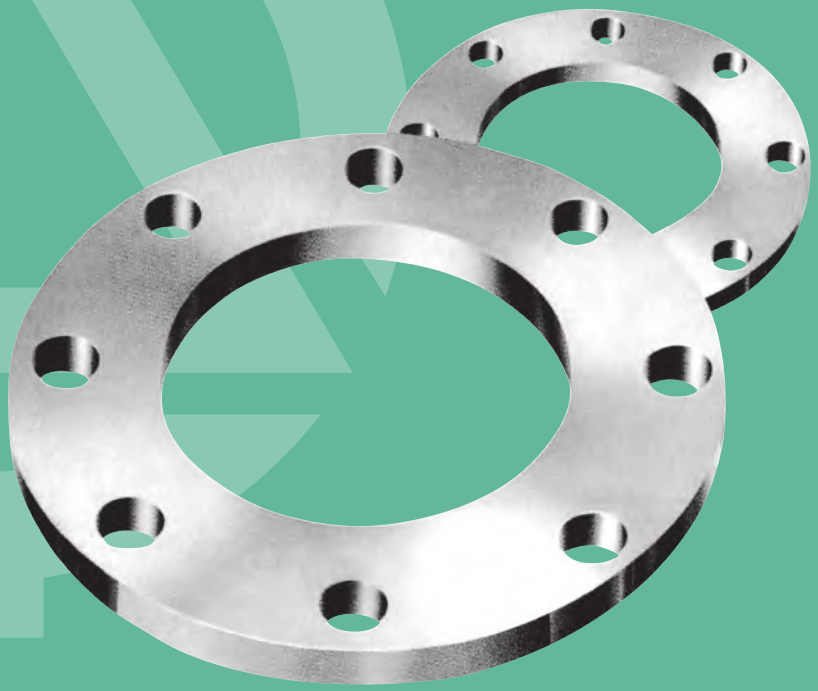

### BEVEL FOR INSIDE THICKNESS




### BEVEL FOR COMBINED THICKNESS

Notes :

(1) When the materials joined have equal minimum specified yield strength, there shall be no restriction on the minimum slope.
(2) Neither t1, t2, nor their sum (t1+t2) shall exceed 0.5t.
(3) When the minimum specified yield strength of the sections to be joined are unequal, the valus of $t_D$ shall at least equal t time the ratio of minimum specified yield strength of the pipe to minimum specified yield strength of the flange.



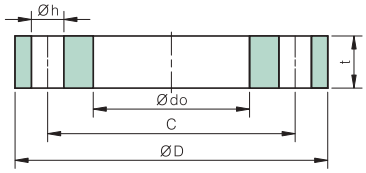
# KS & JIS FLANGES

- KS & JIS PIPE DIMENSION
- Class 5K Flanges
- Class 10K Flanges
- Class 16K Flanges
- Class 20K Flanges
- Class 30K Flanges
- Class 40K Flanges
- Class 63K Flanges
- FACING 1
- FACING 2
- TOLERANCE
- JIS MATERIAL CHEMICAL COMPOSITION & MECHANICAL REQUIREMENTS

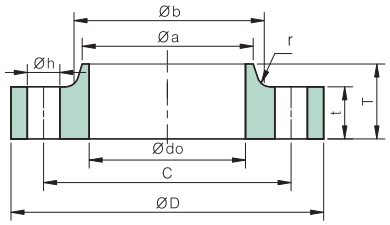
www.samilpnf.co.kr

# KS & JIS PIPE DIMENSIONS

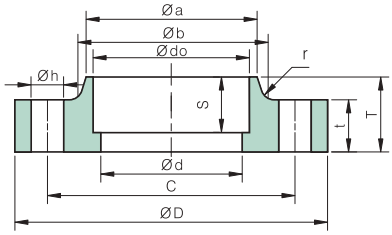
| NOMINAL PIPE SIZE | | O*D | SGP | STAINLESS STEEL | | | | | | | CARBON STEEL | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [A] | [B] | | | 5S | 10S | 20S | 40 | 80 | 120 | 160 | 10 | 20 | 30 | 40 | 60 | 80 | 100 | 120 | 140 | 160 |
| 6 | 1/8 | 10.5 | 6.5 | 8.5 | 8.1 | 7.5 | 7.1 | 5.7 | | | | | | 7.1 | 6.1 | 5.7 | | | | |
| 8 | 1/4 | 13.8 | 9.2 | 11.4 | 10.5 | 9.8 | 9.4 | 7.8 | | | | | | 9.4 | 9.0 | 7.8 | | | | |
| 10 | 3/8 | 17.3 | 12.7 | 14.9 | 14.0 | 13.3 | 12.7 | 10.9 | | | | | | 12.7 | 11.7 | 10.9 | | | | |
| 15 | 1/2 | 21.7 | 16.1 | 18.4 | 17.5 | 16.7 | 16.1 | 14.3 | | 12.3 | | | | 16.1 | 15.3 | 14.3 | | | | 12.3 |
| 20 | 3/4 | 27.2 | 21.6 | 23.9 | 23.0 | 22.2 | 21.4 | 19.4 | | 16.2 | | | | 21.4 | 20.4 | 19.4 | | | | 16.2 |
| 25 | 1 | 34.0 | 27.6 | 30.7 | 28.4 | 28.0 | 27.2 | 25.0 | | 21.2 | | | | 27.2 | 26.2 | 25.0 | | | | 21.2 |
| 32 | 1 1/4 | 42.7 | 35.7 | 39.4 | 37.1 | 36.7 | 35.5 | 32.9 | | 29.9 | | | | 35.5 | 33.7 | 32.9 | | | | 29.9 |
| 40 | 1 1/2 | 48.6 | 41.6 | 45.3 | 43.0 | 42.6 | 41.2 | 38.4 | | 34.4 | | | | 41.2 | 39.6 | 38.4 | | | | 34.4 |
| 50 | 2 | 60.5 | 52.9 | 57.2 | 54.9 | 53.5 | 52.7 | 49.5 | | 43.1 | | 54.1 | | 52.7 | 50.7 | 49.5 | | | | 43.1 |
| 65 | 2 1/2 | 76.3 | 67.9 | 72.1 | 70.3 | 69.3 | 65.9 | 62.3 | | 57.3 | | 67.3 | | 65.9 | 64.3 | 62.3 | | | | 57.3 |
| 80 | 3 | 89.1 | 80.7 | 84.9 | 83.1 | 81.1 | 78.1 | 73.9 | | 66.9 | | 80.1 | | 78.1 | 75.9 | 73.9 | | | | 66.9 |
| 90 | 3 1/2 | 101.6 | 93.2 | 97.4 | 95.6 | 93.6 | 90.2 | 85.4 | | 76.2 | | 92.6 | | 90.2 | 87.6 | 85.4 | | | | 76.2 |
| 100 | 4 | 114.3 | 105.3 | 110.1 | 108.3 | 106.3 | 102.3 | 97.1 | 92.1 | 87.3 | | 104.5 | | 102.3 | 100.1 | 97.1 | | 92.1 | | 87.3 |
| 125 | 5 | 139.8 | 130.8 | 134.2 | 133.0 | 129.8 | 126.6 | 120.8 | 114.4 | 108.0 | | 129.6 | | 126.6 | 123.6 | 120.8 | | 114.4 | | 108.0 |
| 150 | 6 | 165.2 | 155.2 | 159.6 | 158.4 | 155.2 | 151.0 | 143.2 | 136.6 | 128.8 | | 154.2 | | 151.0 | 146.6 | 143.2 | | 136.6 | | 128.8 |
| 175 | 7 | 190.7 | 180.1 | | | | | | | | | | | | | | | | | |
| 200 | 8 | 216.3 | 204.7 | 210.7 | 208.3 | 203.3 | 199.9 | 190.9 | 179.9 | 170.3 | | 203.5 | 202.3 | 199.9 | 195.7 | 190.9 | 186.1 | 179.9 | 175.1 | 170.3 |
| 225 | 9 | 241.8 | 229.2 | | | | | | | | | | | | | | | | | |
| 250 | 10 | 267.4 | 254.2 | 260.6 | 259.4 | 254.4 | 248.8 | 237.2 | 224.6 | 210.2 | | 254.6 | 251.8 | 248.8 | 242.0 | 237.2 | 231.0 | 224.6 | 216.6 | 210.2 |
| 300 | 12 | 318.5 | 304.7 | 310.5 | 309.5 | 305.5 | 297.9 | 283.7 | 267.7 | 251.9 | | 305.7 | 301.7 | 297.9 | 289.9 | 283.7 | 275.7 | 267.7 | 261.3 | 251.9 |
| 350 | 14 | 355.6 | 339.8 | | | | | | | | 342.8 | 339.8 | 336.6 | 333.4 | 325.4 | 317.6 | 308.0 | 300.0 | 292.0 | 284.2 |
| 400 | 16 | 406.4 | 390.6 | | | | | | | | 393.6 | 390.6 | 387.4 | 381.0 | 373.0 | 363.6 | 354.0 | 344.6 | 333.4 | 325.4 |
| 450 | 18 | 457.2 | 441.4 | | | | | | | | 444.4 | 441.4 | 435.0 | 428.6 | 419.2 | 409.6 | 398.4 | 387.4 | 377.8 | 366.8 |
| 500 | 20 | 508.0 | 492.2 | | | | | | | | 495.2 | 489.0 | 482.6 | 477.8 | 466.8 | 455.6 | 443.0 | 431.8 | 419.2 | 408.0 |



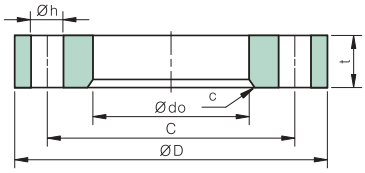

SOP of nominal size
10A to 1500A



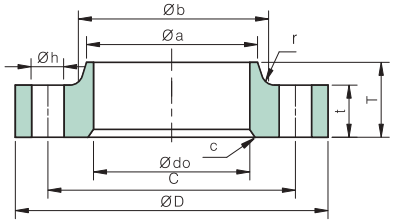

SOH of nominal size
450A to 1500A




SW of nominal size
10A to 80A




LJ of nominal size
15A to 400A




LJ of nominal size
450A to 600A



## JIS B 2220-2004 (KS B 1503-2007)

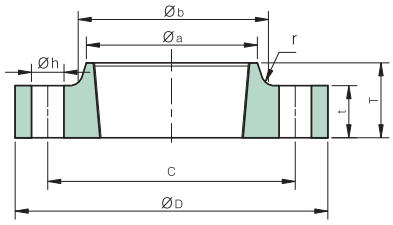
Unit : mm

| Nominal Size | Outside Diam. of Applicable Pipe | Outside Diam. of Flange | Inside Diam. of Flange | | | | Thickness of Flange | | Total Length of Flange | | Diametr of hub | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Small Diameter | | Large Diameter | |
| | | | SOP,SOH SW | LJ | SW,WN | IT | Except for BL | BL | SOH,SW LJ,TR | WN | SOH,SW LJ,TR | WN | SOH,SW LJ,TR | WN,IT |
| A | | D | do | do | d(2) | d | t | t | T | T | a | a | b | b(3) |
| 10 | 17.3 | 75 | 17.8 | – | 12.7 | 10 | 9 | 9 | 13 | 24 | 23 | 17.3 | 26 | 26 |
| 15 | 21.7 | 80 | 22.2 | 23.4 | 16.1 | 15 | 9 | 9 | 13 | 25 | 27 | 21.7 | 30 | 31 |
| 20 | 27.2 | 85 | 27.7 | 28.9 | 21.6 | 20 | 10 | 10 | 15 | 28 | 33 | 27.2 | 36 | 38 |
| 25 | 34.0 | 95 | 34.5 | 35.6 | 27.6 | 25 | 10 | 10 | 17 | 30 | 41 | 34.0 | 44 | 46 |
| 32 | 42.7 | 115 | 43.2 | 44.3 | 35.7 | 32 | 12 | 12 | 19 | 33 | 50 | 42.7 | 53 | 55 |
| 40 | 48.6 | 120 | 49.1 | 50.4 | 41.6 | 40 | 12 | 12 | 20 | 34 | 56 | 48.6 | 60 | 62 |
| 50 | 60.5 | 130 | 61.1 | 62.7 | 52.9 | 50 | 14 | 14 | 24 | 36 | 69 | 60.5 | 73 | 73 |
| 65 | 76.3 | 155 | 77.1 | 78.7 | 67.9 | 65 | 14 | 14 | 27 | 39 | 86 | 76.3 | 91 | 91 |
| 80 | 89.1 | 180 | 90.0 | 91.6 | 80.7 | 80 | 14 | 14 | 30 | 41 | 99 | 89.1 | 105 | 105 |
| 90 | 101.6 | 190 | 102.6 | 104.1 | 93.2 | 90 | 14 | 14 | – | 41 | – | 101.6 | – | 117 |
| 100 | 114.3 | 200 | 115.4 | 116.9 | 105.3 | 100 | 16 | 16 | 36 | 41 | 127 | 114.3 | 130 | 128 |
| 125 | 139.8 | 235 | 141.2 | 143.0 | 130.8 | 125 | 16 | 16 | 40 | 43 | 154 | 139.8 | 161 | 156 |
| 150 | 165.2 | 265 | 166.6 | 168.4 | 155.2 | 150 | 18 | 18 | 40 | 49 | 182 | 165.2 | 189 | 184 |
| 175 | 190.7 | 300 | 192.1 | – | 180.1 | 175 | 18 | 18 | – | 49 | – | 190.7 | – | 209 |
| 200 | 216.3 | 320 | 218.0 | 219.5 | 204.7 | 200 | 20 | 20 | – | 53 | – | 216.3 | – | 235 |
| 225 | 241.8 | 345 | 243.7 | – | 229.4 | 225 | 20 | 20 | – | 54 | – | 241.8 | – | 261 |
| 250 | 267.4 | 385 | 269.5 | 271.7 | 254.2 | 250 | 22 | 22 | – | 61 | – | 267.4 | – | 290 |
| 300 | 318.5 | 430 | 321.0 | 322.8 | 304.7 | 300 | 22 | 22 | – | 62 | – | 318.5 | – | 342 |
| 350 | 355.6 | 480 | 358.1 | 360.2 | 339.8 | 340 | 24 | 24 | – | 73 | – | 355.6 | – | 385 |
| 400 | 406.4 | 540 | 409.0 | 411.2 | 390.6 | 400 | 24 | 24 | – | 76 | – | 406.4 | – | 438 |
| 450 | 457.2 | 605 | 460.0 | 462.3 | 441.4 | 450 | 24 | 24 | 40 | 79 | 495 | 457.2 | 500 | 491 |
| 500 | 508.0 | 655 | 511.0 | 514.4 | 492.2 | 500 | 24 | 24 | 40 | 79 | 546 | 508.0 | 552 | 541 |
| 550 | 558.8 | 720 | 562.0 | 565.2 | 543.0 | 550 | 26 | 26 | 42 | 81 | 597 | 558.8 | 603 | 593 |
| 600 | 609.6 | 770 | 613.0 | 616.0 | 593.8 | 600 | 26 | 26 | 44 | 81 | 648 | 609.6 | 654 | 643 |
| 650 | 660.4 | 825 | 664.0 | – | 644.6 | 650 | 26 | 28 | 48 | 85 | 702 | 660.4 | 708 | 698 |
| 700 | 711.2 | 875 | 715.0 | – | 695.4 | 700 | 26 | 30 | 48 | 94 | 751 | 711.2 | 758 | 748 |
| 750 | 762.0 | 945 | 766.0 | – | 746.2 | 750 | 28 | 32 | 52 | 100 | 802 | 762.0 | 810 | 802 |
| 800 | 812.8 | 995 | 817.0 | – | 797.0 | 800 | 28 | 34 | 52 | 100 | 854 | 812.8 | 862 | 852 |
| 850 | 863.6 | 1045 | 868.0 | – | 847.8 | 850 | 28 | 36 | 54 | 108 | 904 | 863.6 | 912 | 902 |
| 900 | 914.4 | 1095 | 919.0 | – | 898.6 | 900 | 30 | 36 | 56 | 108 | 956 | 914.4 | 964 | 952 |
| 1000 | 1016.0 | 1195 | 1021.0 | – | 1000.2 | 1000 | 32 | 40 | 60 | 116 | 1058 | 1016.0 | 1066 | 1052 |
| 1100 | 1117.6 | 1305 | 1122.0 | – | 1098.6 | 1100 | 32 | 44 | 71 | 136 | 1158 | 1117.6 | 1170 | 1162 |
| 1200 | 1219.2 | 1420 | 1224.0 | – | 1200.2 | 1200 | 34 | 48 | 77 | 155 | 1260 | 1219.2 | 1272 | 1272 |
| 1350 | 1371.6 | 1575 | 1376.0 | – | 1346.2 | 1350 | 34 | 54 | 80 | 164 | 1414 | 1371.6 | 1426 | 1427 |
| 1500 | 1524.0 | 1730 | 1529.0 | – | 1498.6 | 1500 | 36 | 58 | 86 | 172 | 1568 | 1524.0 | 1580 | 1582 |

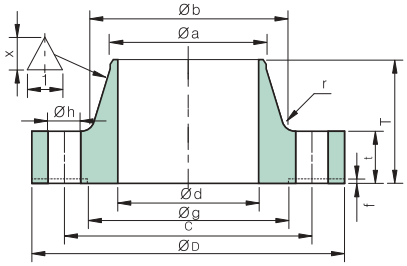
Notes :

(1) The facing of flanges shall conform to JIS B2202-2004

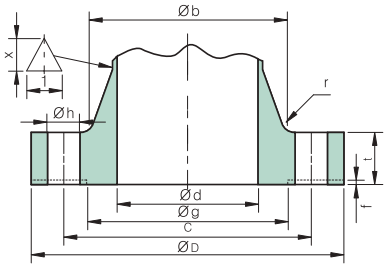
(2) Adjustment shall be made according to the inside diameter of the steel pipes to be joined with.



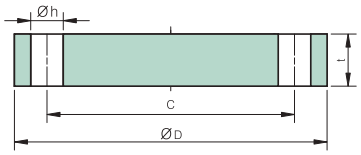

TR of nominal size 10A to 150A




WN of nominal size 10A to 1500A




IT of nominal size 10A to 1500A



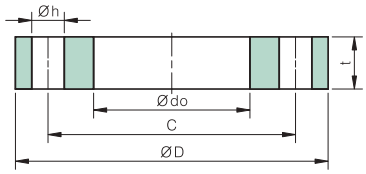

BL of nominal size 10A to 1500A

Unit : mm

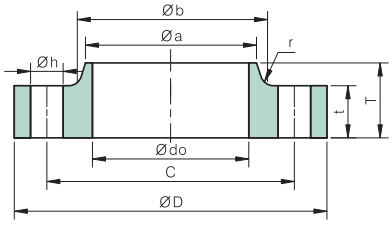
| Nominal Size | Depth of Socket | Norminal designation of thread | Chamfering(4) | Radius of Fillet | | Raised face | | Diameter of Bolt | | | Normal Bolt Size | Taper of Hub | | Substitutional dimension of WN(5) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Height | Diameter | | | | | | | | |
| | SW | | LJ | SOH,SW LJ,TR | WN, IT | WN,IT | | Diam. of Bolt Circle | Num. of Bolt Holes | Diam. of Bolt Holes | | WN | IT (Min) | Thickness | Taper of Hub |
| A | S | TR | c | r | r(3) | f | g | c | | h | | x | x | t | x |
| 10 | 10 | Rc 3/8 | – | 4 | 4 | 1 | 39 | 55 | 4 | 12 | M10 | 1.25 | 1.25 | – | – |
| 15 | 10 | Rc 1/2 | 3 | 4 | 4 | 1 | 44 | 60 | 4 | 12 | M10 | 1.25 | 1.25 | – | – |
| 20 | 13 | Rc 3/4 | 3 | 4 | 4 | 1 | 49 | 65 | 4 | 12 | M10 | 1.25 | 1.25 | – | – |
| 25 | 13 | Rc 1 | 3 | 4 | 4 | 1 | 59 | 75 | 4 | 12 | M10 | 1.25 | 1.25 | – | – |
| 32 | 13 | Rc 1 1/4 | 4 | 4 | 4 | 2 | 70 | 90 | 4 | 15 | M12 | 1.25 | 1.25 | – | – |
| 40 | 13 | Rc 1 1/2 | 4 | 4 | 4 | 2 | 75 | 95 | 4 | 15 | M12 | 1.25 | 1.25 | – | – |
| 50 | 16 | Rc 2 | 4 | 4 | 4 | 2 | 85 | 105 | 4 | 15 | M12 | 1.25 | 1.25 | – | – |
| 65 | 16 | Rc 2 1/2 | 5 | 4 | 4 | 2 | 110 | 130 | 4 | 15 | M12 | 1.25 | 1.25 | – | – |
| 80 | 16 | Rc 3 | 5 | 4 | 4 | 2 | 121 | 145 | 4 | 19 | M16 | 1.25 | 1.25 | – | – |
| 90 | – | – | 5 | – | 4 | 2 | 131 | 155 | 4 | 19 | M16 | 1.25 | 1.25 | – | – |
| 100 | – | Rc 4 | 5 | 4 | 4 | 2 | 141 | 165 | 8 | 19 | M16 | 1.25 | 1.25 | – | – |
| 125 | – | Rc 5 | 6 | 4 | 4 | 2 | 176 | 200 | 8 | 19 | M16 | 1.25 | 1.25 | – | – |
| 150 | – | Rc 6 | 6 | 4 | 4 | 2 | 206 | 230 | 8 | 19 | M16 | 1.25 | 1.25 | – | – |
| 175 | – | – | – | – | 4 | 2 | 232 | 260 | 8 | 23 | M20 | 1.25 | 1.25 | – | – |
| 200 | – | – | 6 | – | 4 | 2 | 252 | 280 | 8 | 23 | M20 | 1.25 | 1.25 | – | – |
| 225 | – | – | – | – | 4 | 2 | 277 | 305 | 12 | 23 | M20 | 1.25 | 1.25 | – | – |
| 250 | – | – | 6 | – | 4 | 2 | 317 | 345 | 12 | 23 | M20 | 1.25 | 1.25 | – | – |
| 300 | – | – | 9 | – | 4 | 3 | 360 | 390 | 12 | 23 | M20 | 1.25 | 1.25 | – | – |
| 350 | – | – | 9 | – | 4 | 3 | 403 | 435 | 12 | 25 | M22 | 1.25 | 1.25 | – | – |
| 400 | – | – | 9 | – | 4 | 3 | 463 | 495 | 16 | 25 | M22 | 1.25 | 1.25 | – | – |
| 450 | – | – | 9 | 5 | 5 | 3 | 523 | 555 | 16 | 25 | M22 | 1.25 | 1.25 | – | – |
| 500 | – | – | 9 | 5 | 5 | 3 | 573 | 605 | 20 | 25 | M22 | 1.25 | 1.25 | – | – |
| 550 | – | – | 9 | 5 | 5 | 3 | 630 | 665 | 20 | 27 | M24 | 1.25 | 1.25 | – | – |
| 600 | – | – | 9 | 5 | 5 | 3 | 680 | 715 | 20 | 27 | M24 | 1.25 | 1.25 | – | – |
| 650 | – | – | – | 5 | 5 | 3 | 735 | 770 | 24 | 27 | M24 | 1.25 | 1.25 | – | – |
| 700 | – | – | – | 5 | 5 | 3 | 785 | 820 | 24 | 27 | M24 | 1.5 | 1.5 | 36 | 1.25 |
| 750 | – | – | – | 5 | 5 | 3 | 840 | 880 | 24 | 33 | M30 | 1.5 | 1.5 | 38 | 1.25 |
| 800 | – | – | – | 5 | 5 | 3 | 890 | 930 | 24 | 33 | M30 | 1.5 | 1.5 | 38 | 1.25 |
| 850 | – | – | – | 5 | 5 | 3 | 940 | 980 | 24 | 33 | M30 | 1.75 | 1.75 | 38 | 1.50 |
| 900 | – | – | – | 5 | 5 | 3 | 990 | 1030 | 24 | 33 | M30 | 1.75 | 1.75 | 40 | 1.50 |
| 1000 | – | – | – | 5 | 5 | 3 | 1090 | 1130 | 28 | 33 | M30 | 2 | 2 | 50 | 1.50 |
| 1100 | – | – | – | 7 | 8 | 3 | 1200 | 1240 | 28 | 33 | M30 | 2 | 2 | 56 | 1.50 |
| 1200 | – | – | – | 7 | 8 | 3 | 1305 | 1350 | 32 | 33 | M30 | 2 | 2 | 62 | 1.50 |
| 1350 | – | – | – | 7 | 8 | 3 | 1460 | 1505 | 32 | 33 | M30 | 2 | 2 | 62 | 1.50 |
| 1500 | – | – | – | 7 | 10 | 3 | 1615 | 1660 | 36 | 33 | M30 | 2 | 2 | 66 | 1.50 |

(3) With IT flanges, this dimension is shown for reference.
(4) This may be rounded off with the dimension c as a radius.
(5) This dimension may be determined on the agreement between the parties concerned.

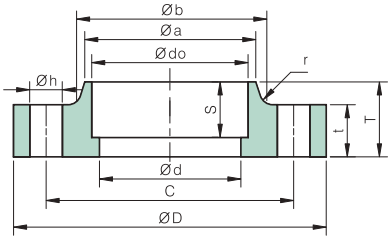
# 10K



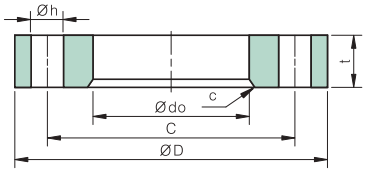

SOP of nominal size
10A to 1500A



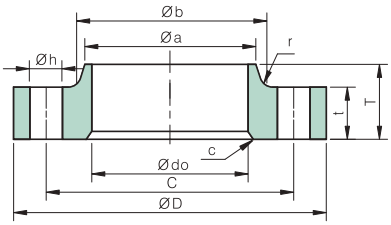

SOH of nominal size
250A to 1500A




SW of nominal size
10A to 80A




LJ of nominal size
15A to 200A




LJ of nominal size
250A to 600A

## JIS B 2220-2004 (KS B 1503-2007)

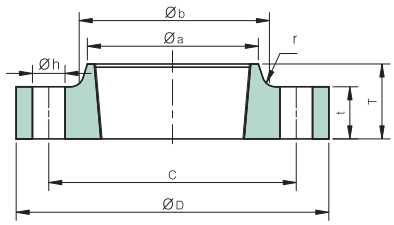
Unit : mm

| Nominal Size | Outside Diam. of Applicable Pipe | Outside Diam. of Flange | Inside Diam. of Flange | | | | Thickness of Flange | | Total Length of Flange | | Diametr of hub | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Small Diameter | | Large Diameter | |
| | | | SOP,SOH SW | LJ | SW,WN | IT | Except for BL | BL | SOH,SW LJ,TR | WN | SOH,SW LJ,TR | WN | SOH,SW LJ,TR | WN,IT |
| A | | D | do | do | d[2] | d | t | t | T | T | a | a | b | b[3] |
| 10 | 17.3 | 90 | 17.8 | – | 12.7 | 10 | 12 | 12 | 16 | 29 | 23 | 17.3 | 26 | 28 |
| 15 | 21.7 | 95 | 22.2 | 23.4 | 16.1 | 15 | 12 | 12 | 16 | 31 | 27 | 21.7 | 30 | 33 |
| 20 | 27.2 | 100 | 27.7 | 28.9 | 21.6 | 20 | 14 | 14 | 20 | 32 | 33 | 27.2 | 36 | 38 |
| 25 | 34.0 | 125 | 34.5 | 35.6 | 27.6 | 25 | 14 | 14 | 20 | 36 | 41 | 34.0 | 44 | 47 |
| 32 | 42.7 | 135 | 43.2 | 44.3 | 35.7 | 32 | 16 | 16 | 22 | 38 | 50 | 42.7 | 53 | 56 |
| 40 | 48.6 | 140 | 49.1 | 50.4 | 41.6 | 40 | 16 | 16 | 24 | 38 | 56 | 48.6 | 60 | 62 |
| 50 | 60.5 | 155 | 61.1 | 62.7 | 52.9 | 50 | 16 | 16 | 24 | 40 | 69 | 60.5 | 73 | 75 |
| 65 | 76.3 | 175 | 77.1 | 78.7 | 67.9 | 65 | 18 | 18 | 27 | 44 | 86 | 76.3 | 91 | 92 |
| 80 | 89.1 | 185 | 90.0 | 91.6 | 80.7 | 80 | 18 | 18 | 30 | 45 | 99 | 89.1 | 105 | 105 |
| 90 | 101.6 | 195 | 102.6 | 104.1 | 93.2 | 90 | 18 | 18 | – | 45 | – | 101.6 | – | 117 |
| 100 | 114.3 | 210 | 115.4 | 116.9 | 105.3 | 100 | 18 | 18 | 36 | 45 | 127 | 114.3 | 130 | 130 |
| 125 | 139.8 | 250 | 141.2 | 143.0 | 130.8 | 125 | 20 | 20 | 40 | 47 | 154 | 139.8 | 161 | 156 |
| 150 | 165.2 | 280 | 166.6 | 168.4 | 155.2 | 150 | 22 | 22 | 40 | 53 | 182 | 165.2 | 189 | 184 |
| 175 | 190.7 | 305 | 192.1 | – | 180.1 | 175 | 22 | 22 | – | 55 | – | 190.7 | – | 210 |
| 200 | 216.3 | 330 | 218.0 | 219.5 | 204.7 | 200 | 22 | 22 | – | 58 | – | 216.3 | – | 238 |
| 225 | 241.8 | 350 | 243.7 | – | 229.4 | 225 | 22 | 22 | – | 58 | – | 241.8 | – | 261 |
| 250 | 267.4 | 400 | 269.5 | 271.7 | 254.2 | 250 | 24 | 24 | 36 | 65 | 288 | 267.4 | 292 | 292 |
| 300 | 318.5 | 445 | 321.0 | 322.8 | 304.7 | 300 | 24 | 24 | 38 | 68 | 340 | 318.5 | 346 | 345 |
| 350 | 355.6 | 490 | 358.1 | 360.2 | 339.8 | 340 | 26 | 26 | 42 | 79 | 380 | 355.6 | 386 | 388 |
| 400 | 406.4 | 560 | 409.0 | 411.2 | 390.6 | 400 | 28 | 28 | 44 | 85 | 436 | 406.4 | 442 | 442 |
| 450 | 457.2 | 620 | 460.0 | 462.3 | 441.4 | 450 | 30 | 30 | 48 | 90 | 496 | 457.2 | 502 | 495 |
| 500 | 508.0 | 675 | 511.0 | 514.4 | 492.2 | 500 | 30 | 30 | 48 | 99 | 548 | 508.0 | 554 | 546 |
| 550 | 558.8 | 745 | 562.0 | 565.2 | 543.0 | 550 | 32 | 34 | 52 | 111 | 604 | 558.8 | 610 | 597 |
| 600 | 609.6 | 795 | 613.0 | 616.0 | 593.8 | 600 | 32 | 36 | 52 | 112 | 656 | 609.6 | 662 | 648 |
| 650 | 660.4 | 845 | 664.0 | – | 644.6 | 650 | 34 | 38 | 56 | 116 | 706 | 660.4 | 712 | 700 |
| 700 | 711.2 | 905 | 715.0 | – | 695.4 | 700 | 34 | 40 | 58 | 132 | 762 | 711.2 | 770 | 754 |
| 750 | 762.0 | 970 | 766.0 | – | 746.2 | 750 | 36 | 44 | 62 | 139 | 816 | 762.0 | 824 | 807 |
| 800 | 812.8 | 1020 | 817.0 | – | 797.0 | 800 | 36 | 46 | 64 | 139 | 868 | 812.8 | 876 | 858 |
| 850 | 863.6 | 1070 | 868.0 | – | 847.8 | 850 | 36 | 48 | 66 | 139 | 920 | 863.6 | 928 | 908 |
| 900 | 914.4 | 1120 | 919.0 | – | 898.6 | 900 | 38 | 50 | 70 | 140 | 971 | 914.4 | 979 | 959 |
| 1000 | 1016.0 | 1235 | 1021.0 | – | 1000.2 | 1000 | 40 | 56 | 74 | 151 | 1073 | 1016.0 | 1081 | 1065 |
| 1100 | 1117.6 | 1345 | 1122.0 | – | 1098.6 | 1100 | 42 | 62 | 95 | 170 | 1175 | 1117.6 | 1185 | 1174 |
| 1200 | 1219.2 | 1465 | 1224.0 | – | 1200.2 | 1200 | 44 | 66 | 101 | 182 | 1278 | 1219.2 | 1290 | 1281 |
| 1350 | 1371.6 | 1630 | 1376.0 | – | 1346.2 | 1350 | 48 | 74 | 110 | 200 | 1432 | 1371.6 | 1450 | 1438 |
| 1500 | 1524.0 | 1795 | 1529.0 | – | 1498.6 | 1500 | 50 | 82 | 123 | 218 | 1585 | 1524.0 | 1605 | 1598 |

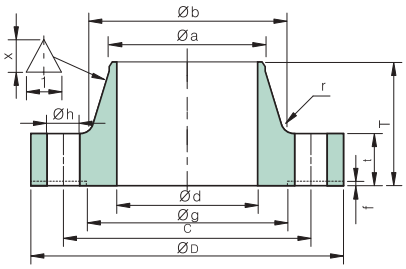
Notes :

(1) The facing of flanges shall conform to JIS B2202-2004

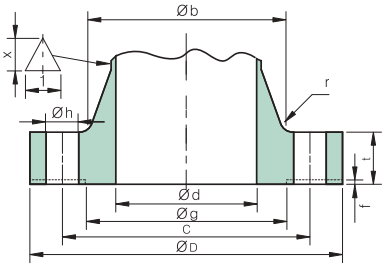
(2) Adjustment shall be made according to the inside diameter of the steel pipes to be joined with.



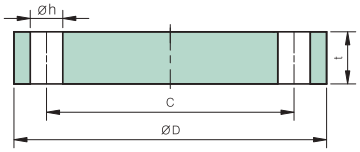

TR of nominal size 10A to 150A




WN of nominal size 10A to 1500A




IT of nominal size 10A to 1500A



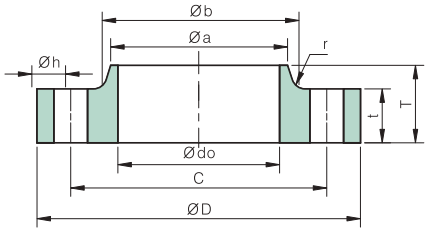

BL of nominal size 10A to 1500A

Unit : mm

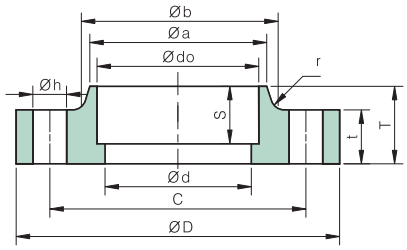
| Nominal Size | Depth of Socket | Norminal designation of thread | Chamfering(4) | Radius of Fillet | | Raised face | | Diameter of Bolt | | | Normal Bolt Size | Taper of Hub | | Substitutional dimension of WN(5) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Height | Diameter | | | | | | | | |
| | SW | | LJ | SOH, SW,LJ,TR | WN, IT | WN,IT | | Diam. of Bolt Circle | Num. of Bolt Holes | Diam. of Bolt Holes | | WN | IT (Min) | Thickness | Taper of Hub |
| A | S | TR | c | r | r(3) | f | g | c | | h | | x | x | t | x |
| 10 | 10 | Rc 3/8 | – | 4 | 4 | 1 | 46 | 65 | 4 | 15 | M12 | 1.25 | 1.25 | – | – |
| 15 | 10 | Rc 1/2 | 3 | 4 | 4 | 1 | 51 | 70 | 4 | 15 | M12 | 1.25 | 1.25 | – | – |
| 20 | 13 | Rc 3/4 | 3 | 4 | 4 | 1 | 56 | 75 | 4 | 15 | M12 | 1.25 | 1.25 | – | – |
| 25 | 13 | Rc 1 | 3 | 4 | 4 | 1 | 67 | 90 | 4 | 19 | M16 | 1.25 | 1.25 | – | – |
| 32 | 13 | Rc 1 1/4 | 4 | 4 | 4 | 2 | 76 | 100 | 4 | 19 | M16 | 1.25 | 1.25 | – | – |
| 40 | 13 | Rc 1 1/2 | 4 | 4 | 4 | 2 | 81 | 105 | 4 | 19 | M16 | 1.25 | 1.25 | – | – |
| 50 | 16 | Rc 2 | 4 | 4 | 4 | 2 | 96 | 120 | 4 | 19 | M16 | 1.25 | 1.25 | – | – |
| 65 | 16 | Rc 2 1/2 | 5 | 4 | 4 | 2 | 116 | 140 | 4 | 19 | M16 | 1.25 | 1.25 | – | – |
| 80 | 16 | Rc 3 | 5 | 4 | 5 | 2 | 126 | 150 | 8 | 19 | M16 | 1.25 | 1.25 | – | – |
| 90 | – | – | 5 | – | 5 | 2 | 136 | 160 | 8 | 19 | M16 | 1.25 | 1.25 | – | – |
| 100 | – | Rc 4 | 5 | 4 | 5 | 2 | 151 | 175 | 8 | 19 | M16 | 1.25 | 1.25 | – | – |
| 125 | – | Rc 5 | 6 | 4 | 5 | 2 | 182 | 210 | 8 | 23 | M20 | 1.25 | 1.25 | – | – |
| 150 | – | Rc 6 | 6 | 4 | 5 | 2 | 212 | 240 | 8 | 23 | M20 | 1.25 | 1.25 | – | – |
| 175 | – | – | – | – | 5 | 2 | 237 | 265 | 12 | 23 | M20 | 1.25 | 1.25 | – | – |
| 200 | – | – | 6 | – | 5 | 2 | 262 | 290 | 12 | 23 | M20 | 1.25 | 1.25 | – | – |
| 225 | – | – | – | – | 5 | 2 | 282 | 310 | 12 | 23 | M20 | 1.25 | 1.25 | – | – |
| 250 | – | – | 6 | 6 | 6 | 2 | 324 | 355 | 12 | 25 | M22 | 1.25 | 1.25 | – | – |
| 300 | – | – | 9 | 6 | 6 | 3 | 368 | 400 | 16 | 25 | M22 | 1.25 | 1.25 | – | – |
| 350 | – | – | 9 | 6 | 6 | 3 | 413 | 445 | 16 | 25 | M22 | 1.25 | 1.25 | – | – |
| 400 | – | – | 9 | 6 | 6 | 3 | 475 | 510 | 16 | 27 | M24 | 1.25 | 1.25 | – | – |
| 450 | – | – | 9 | 6 | 6 | 3 | 530 | 565 | 20 | 27 | M24 | 1.25 | 1.25 | – | – |
| 500 | – | – | 9 | 6 | 6 | 3 | 585 | 620 | 20 | 27 | M24 | 1.5 | 1.5 | 40 | 1.25 |
| 550 | – | – | 9 | 6 | 6 | 3 | 640 | 680 | 20 | 33 | M30 | 1.75 | 1.75 | 42 | 1.5 |
| 600 | – | – | 9 | 6 | 6 | 3 | 690 | 730 | 24 | 33 | M30 | 1.75 | 1.75 | 42 | 1.5 |
| 650 | – | – | – | 6 | 6 | 3 | 740 | 780 | 24 | 33 | M30 | 1.75 | 1.75 | 44 | 1.5 |
| 700 | – | – | – | 6 | 6 | 3 | 800 | 840 | 24 | 33 | M30 | 2 | 2 | 56 | 1.5 |
| 750 | – | – | – | 6 | 6 | 3 | 855 | 900 | 24 | 33 | M30 | 2 | 2 | 60 | 1.5 |
| 800 | – | – | – | 6 | 6 | 3 | 905 | 950 | 28 | 33 | M30 | 2 | 2 | 60 | 1.5 |
| 850 | – | – | – | 6 | 6 | 3 | 955 | 1000 | 28 | 33 | M30 | 2 | 2 | 60 | 1.5 |
| 900 | – | – | – | 6 | 6 | 3 | 1005 | 1050 | 28 | 33 | M30 | 2 | 2 | 62 | 1.5 |
| 1000 | – | – | – | 6 | 6 | 3 | 1110 | 1160 | 28 | 39 | M36 | 2 | 2 | 66 | 1.5 |
| 1100 | – | – | – | 8 | 10 | 3 | 1220 | 1270 | 28 | 39 | M36 | 2 | 2 | 72 | 1.5 |
| 1200 | – | – | – | 8 | 10 | 3 | 1325 | 1380 | 32 | 39 | M36 | 2 | 2 | 76 | 1.5 |
| 1350 | – | – | – | 8 | 10 | 3 | 1480 | 1540 | 36 | 45 | M42 | 2 | 2 | 82 | 1.5 |
| 1500 | – | – | – | 8 | 12 | 3 | 1635 | 1700 | 40 | 45 | M42 | 2 | 2 | 88 | 1.5 |

(3) With IT flanges, this dimension is shown for reference.
(4) This may be rounded off with the dimension c as a radius.
(5) This dimension may be determined on the agreement between the parties concerned.

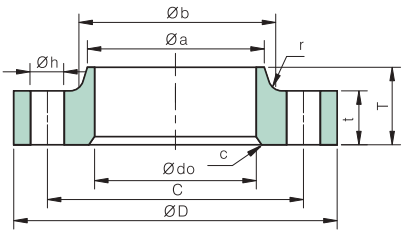
# 16K




SOH of nominal size
10A to 600A




SW of nominal size
10A to 80A




LJ of nominal size
15A to 600A



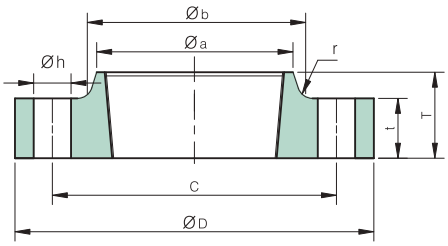
## JIS B 2220-2004 (KS B 1503-2007)

Unit : mm

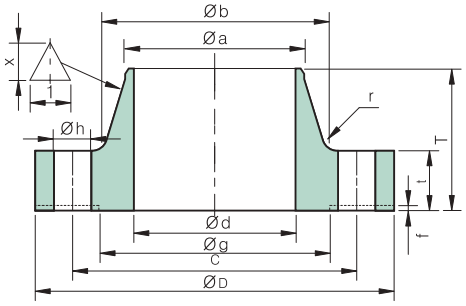
| Nominal Size | Outside Diam. of Applicable Pipe | Outside Diam. of Flange | Inside Diam. of Flange | | | | Thickness of Flange | Total Length of Flange | | | Diametr of hub | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Small Diameter | | Large Diameter | |
| | | | SOH,SW | LJ | SW,WN | IT | SOH,LJ,TR WN,IT,BL | SOH,SW LJ,TR | TR | WN | SOH,SW LJ,TR | WN,IT | SOH,SW LJ,TR | WN,IT |
| A | | D | do | do | d(2) | d | t | t | T | T | a | a | b | b(3) |
| 10 | 17.3 | 90 | 17.8 | – | 12.7 | 10 | 12 | 16 | 16 | 31 | 26 | 17.3 | 28 | 29 |
| 15 | 21.7 | 95 | 22.2 | 23.4 | 16.1 | 15 | 12 | 16 | 16 | 32 | 30 | 21.7 | 32 | 34 |
| 20 | 27.2 | 100 | 27.7 | 28.9 | 21.4 | 20 | 14 | 20 | 20 | 34 | 38 | 27.2 | 42 | 39 |
| 25 | 34.0 | 125 | 34.5 | 35.6 | 27.2 | 25 | 14 | 20 | 20 | 36 | 46 | 34.0 | 50 | 47 |
| 32 | 42.7 | 135 | 43.2 | 44.3 | 35.5 | 32 | 16 | 22 | 22 | 39 | 56 | 42.7 | 60 | 56 |
| 40 | 48.6 | 140 | 49.1 | 50.4 | 41.2 | 40 | 16 | 24 | 24 | 39 | 62 | 48.6 | 66 | 62 |
| 50 | 60.5 | 155 | 61.1 | 62.7 | 52.7 | 50 | 16 | 24 | 24 | 40 | 76 | 60.5 | 80 | 75 |
| 65 | 76.3 | 175 | 77.1 | 78.7 | 65.9 | 65 | 18 | 26 | 27 | 46 | 94 | 76.3 | 98 | 92 |
| 80 | 89.1 | 200 | 90.0 | 91.6 | 78.1 | 80 | 20 | 28 | 30 | 49 | 108 | 89.1 | 112 | 105 |
| 90 | 101.6 | 210 | 102.6 | 104.1 | 90.2 | 90 | 20 | 30 | – | 50 | 120 | 101.6 | 124 | 118 |
| 100 | 114.3 | 225 | 115.4 | 116.9 | 102.3 | 100 | 22 | 34 | 36 | 56 | 134 | 114.3 | 138 | 134 |
| 125 | 139.8 | 270 | 141.2 | 143.0 | 126.6 | 125 | 22 | 34 | 40 | 60 | 164 | 139.8 | 170 | 162 |
| 150 | 165.2 | 305 | 166.6 | 168.4 | 151.0 | 150 | 24 | 38 | 40 | 69 | 196 | 165.2 | 202 | 192 |
| 200 | 216.3 | 350 | 218.0 | 219.5 | 199.9 | 200 | 26 | 40 | – | 73 | 244 | 216.3 | 252 | 244 |
| 250 | 267.4 | 430 | 269.5 | 271.7 | 248.8 | 250 | 28 | 44 | – | 81 | 304 | 267.4 | 312 | 298 |
| 300 | 318.5 | 480 | 321.0 | 322.8 | 297.9 | 300 | 30 | 48 | – | 88 | 354 | 318.5 | 364 | 352 |
| 350 | 355.6 | 540 | 358.1 | 360.2 | 333.4 | 335 | 34 | 52 | – | 104 | 398 | 355.6 | 408 | 398 |
| 400 | 406.4 | 605 | 409.0 | 411.2 | 381.0 | 380 | 38 | 60 | – | 115 | 446 | 406.4 | 456 | 452 |
| 450 | 457.2 | 675 | 460.0 | 462.3 | 431.8 | 430 | 40 | 64 | – | 126 | 504 | 457.2 | 514 | 510 |
| 500 | 508.0 | 730 | 511.0 | 514.4 | 482.6 | 480 | 42 | 68 | – | 128 | 558 | 508.0 | 568 | 561 |
| 550 | 558.8 | 795 | 562.0 | 565.2 | 533.4 | 530 | 44 | 70 | – | 135 | 612 | 558.8 | 622 | 616 |
| 600 | 609.6 | 845 | 613.0 | 616.0 | 584.2 | 580 | 46 | 74 | – | 141 | 666 | 609.6 | 676 | 670 |

Notes :

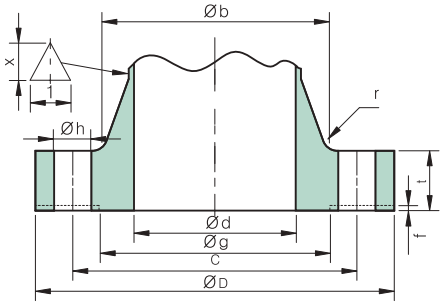
(1) The facing of flanges shall conform to JIS B2202–2004
(2) Adjustment shall be made according to the inside diameter of the steel pipes to be joined with.



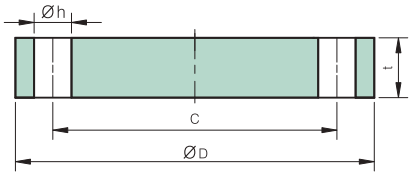

TR of nominal size 10A to 150A




WN of nominal size 10A to 600A




IT of nominal size 10A to 600A




BL of nominal size 10A to 600A

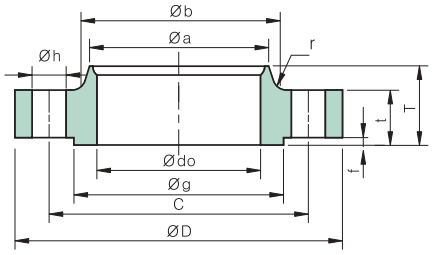


Unit : mm

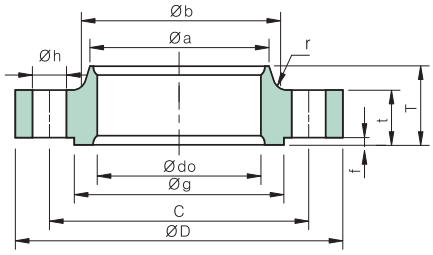
| Nominal Size | Depth of Socket | Norminal designation of thread | Chamfering(4) | Radius of Fillet | Raised face | | Diameter of Bolt | | | Nominal Bolt Size | Taper of Hub | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Height | Diameter | Diam. of Bolt Circle | Num. of Bolt Holes | Diam. of Bolt Holes | | WN | IT |
| | SW | | LJ | SOH,LJ, TR,WN,IT | WN,IT | | | | | | | |
| A | S | TR | c | r | f | g | c | | h | | x | x |
| 10 | 10 | Rc 3/8 | – | 4 | 1 | 46 | 65 | 4 | 15 | M12 | 1.25 | 1.25 |
| 15 | 10 | Rc 1/2 | 3 | 4 | 1 | 51 | 70 | 4 | 15 | M12 | 1.25 | 1.25 |
| 20 | 13 | Rc 3/4 | 3 | 4 | 1 | 56 | 75 | 4 | 15 | M12 | 1.25 | 1.25 |
| 25 | 13 | Rc 1 | 3 | 4 | 1 | 67 | 90 | 4 | 19 | M16 | 1.25 | 1.25 |
| 32 | 13 | Rc 1 1/4 | 4 | 5 | 2 | 76 | 100 | 4 | 19 | M16 | 1.25 | 1.25 |
| 40 | 13 | Rc 1 1/2 | 4 | 5 | 2 | 81 | 105 | 4 | 19 | M16 | 1.25 | 1.25 |
| 50 | 16 | Rc 2 | 4 | 5 | 2 | 96 | 120 | 8 | 19 | M16 | 1.25 | 1.25 |
| 65 | 16 | Rc 2 1/2 | 5 | 5 | 2 | 116 | 140 | 8 | 19 | M16 | 1.25 | 1.25 |
| 80 | 16 | Rc 3 | 5 | 6 | 2 | 132 | 160 | 8 | 23 | M20 | 1.25 | 1.25 |
| 90 | – | – | 5 | 6 | 2 | 145 | 170 | 8 | 23 | M20 | 1.25 | 1.25 |
| 100 | – | Rc 4 | 5 | 6 | 2 | 160 | 185 | 8 | 23 | M20 | 1.25 | 1.25 |
| 125 | – | Rc 5 | 6 | 6 | 2 | 195 | 225 | 8 | 25 | M22 | 1.25 | 1.25 |
| 150 | – | Rc 6 | 6 | 6 | 2 | 230 | 260 | 12 | 25 | M22 | 1.25 | 1.25 |
| 200 | – | – | 6 | 6 | 2 | 275 | 305 | 12 | 25 | M22 | 1.25 | 1.25 |
| 250 | – | – | 6 | 6 | 2 | 345 | 380 | 12 | 27 | M24 | 1.25 | 1.25 |
| 300 | – | – | 9 | 8 | 3 | 395 | 430 | 16 | 27 | M24 | 1.25 | 1.25 |
| 350 | – | – | 9 | 8 | 3 | 440 | 480 | 16 | 33 | M30 X 3 | 1.25 | 1.25 |
| 400 | – | – | 9 | 10 | 3 | 495 | 540 | 16 | 33 | M30 X 3 | 1.25 | 1.25 |
| 450 | – | – | 9 | 10 | 3 | 560 | 605 | 20 | 33 | M30 X 3 | 1.25 | 1.25 |
| 500 | – | – | 9 | 10 | 3 | 615 | 660 | 20 | 33 | M30 X 3 | 1.25 | 1.25 |
| 550 | – | – | 9 | 10 | 3 | 670 | 720 | 20 | 39 | M36 X 3 | 1.25 | 1.25 |
| 600 | – | – | 9 | 10 | 3 | 720 | 770 | 24 | 39 | M36 X 3 | 1.25 | 1.25 |

(3) With IT flanges, this dimension is shown for reference.
(4) This may be rounded off with the dimension c as a radius.

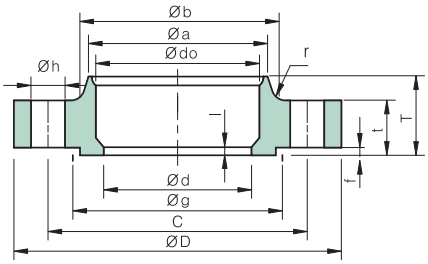
# 20K



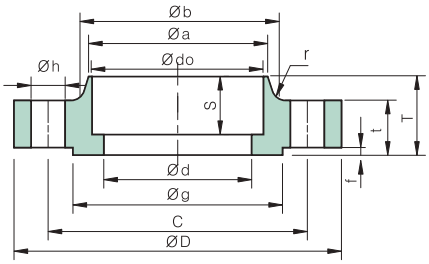

SOH Type A of nominal size
10A to 600A



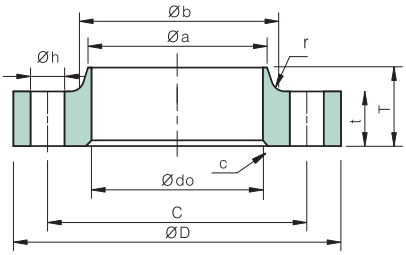

SOH Type B of nominal size
10A to 50A




SOH Type C of nominal size
65A to 600A




SW of nominal size
10A to 80A




LJ of nominal size
15A to 600A

KS & JIS

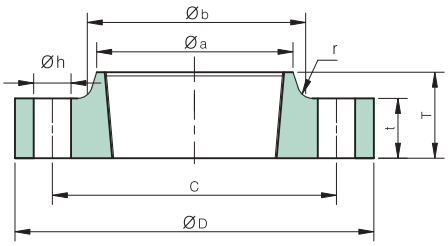
## JIS B 2220-2004 (KS B 1503-2007)

Unit : mm

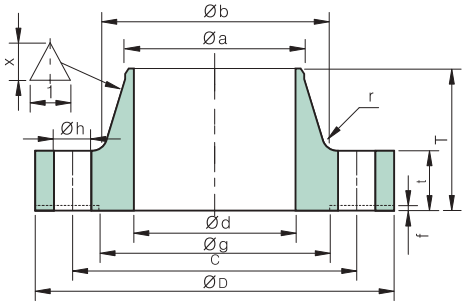
| Nominal Size | Outside Diam. of Applicable Pipe | Outside Diam. of Flange | Inside Diam. of Flange | | | | Thickness of Flange | | Total Length of Flange | | Diametr of hub | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Small Diameter | | Large Diameter | |
| | | | SOH,SW | LJ | SOH, SW,WN | IT | Except for BL | BL | SOH,SW LJ,TR | WN | SOH,SW LJ,TR | WN | SOH,SW LJ,TR | WN,IT |
| A | | D | do | do | d(2) | d | t | t | T | T | a | a | b | b(3) |
| 10 | 17.3 | 90 | 17.8 | – | 12.7 | 10 | 14 | 14 | 20 | 33 | 30 | 17.3 | 32 | 29 |
| 15 | 21.7 | 95 | 22.2 | 23.4 | 16.1 | 15 | 14 | 14 | 20 | 34 | 34 | 21.7 | 36 | 34 |
| 20 | 27.2 | 100 | 27.7 | 28.9 | 21.4 | 20 | 16 | 16 | 22 | 36 | 40 | 27.2 | 42 | 39 |
| 25 | 34.0 | 125 | 34.5 | 35.6 | 27.2 | 25 | 16 | 16 | 24 | 38 | 48 | 34.0 | 50 | 47 |
| 32 | 42.7 | 135 | 43.2 | 44.3 | 35.5 | 32 | 18 | 18 | 26 | 41 | 56 | 42.7 | 60 | 56 |
| 40 | 48.6 | 140 | 49.1 | 50.4 | 41.2 | 40 | 18 | 18 | 26 | 41 | 62 | 48.6 | 66 | 62 |
| 50 | 60.5 | 155 | 61.1 | 62.7 | 52.7 | 50 | 18 | 18 | 26 | 42 | 76 | 60.5 | 80 | 75 |
| 65 | 76.3 | 175 | 77.1 | 65.9 | 78.9 | 65 | 20 | 20 | 30 | 48 | 100 | 76.3 | 104 | 92 |
| 80 | 89.1 | 200 | 90.0 | 91.6 | 78.1 | 80 | 22 | 22 | 34 | 51 | 113 | 89.1 | 117 | 105 |
| 90 | 101.6 | 210 | 102.6 | 104.1 | 90.2 | 90 | 24 | 24 | 36 | 54 | 126 | 101.6 | 130 | 118 |
| 100 | 114.3 | 225 | 115.4 | 116.9 | 102.3 | 100 | 24 | 24 | 36 | 58 | 138 | 114.3 | 142 | 134 |
| 125 | 139.8 | 270 | 141.2 | 143.0 | 126.6 | 125 | 26 | 26 | 40 | 64 | 166 | 139.8 | 172 | 162 |
| 150 | 165.2 | 305 | 166.6 | 168.4 | 151.0 | 150 | 28 | 28 | 42 | 73 | 196 | 165.2 | 202 | 192 |
| 200 | 216.3 | 350 | 218.0 | 219.5 | 199.9 | 200 | 30 | 30 | 46 | 77 | 244 | 216.3 | 252 | 244 |
| 250 | 267.4 | 430 | 269.5 | 271.7 | 248.8 | 250 | 34 | 34 | 52 | 87 | 304 | 267.4 | 312 | 298 |
| 300 | 318.5 | 480 | 321.0 | 322.8 | 297.9 | 300 | 36 | 36 | 56 | 94 | 354 | 318.5 | 364 | 352 |
| 350 | 355.6 | 540 | 358.1 | 360.2 | 333.4 | 335 | 40 | 40 | 62 | 110 | 398 | 355.6 | 408 | 398 |
| 400 | 406.4 | 605 | 409.0 | 411.2 | 381.0 | 380 | 46 | 46 | 70 | 123 | 446 | 406.4 | 456 | 452 |
| 450 | 457.2 | 675 | 460.0 | 462.3 | 431.8 | 430 | 48 | 48 | 78 | 134 | 504 | 457.2 | 514 | 510 |
| 500 | 508.0 | 730 | 511.0 | 514.4 | 482.6 | 480 | 50 | 50 | 84 | 136 | 558 | 508.0 | 568 | 561 |
| 550 | 558.8 | 795 | 562.0 | 565.2 | 533.4 | 530 | 52 | 52 | 90 | 143 | 612 | 558.8 | 622 | 616 |
| 600 | 609.6 | 845 | 613.0 | 616.0 | 584.2 | 580 | 54 | 56 | 96 | 149 | 666 | 609.6 | 676 | 670 |

Notes :

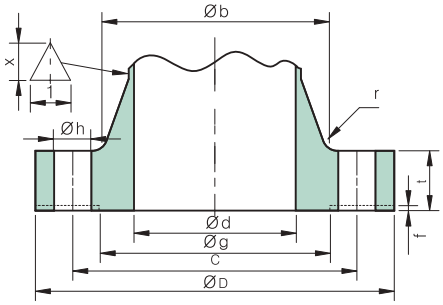
(1) The facing of flanges shall conform to JIS B2202–2004
(2) Adjustment shall be made according to the inside diameter of the steel pipes to be joined with.



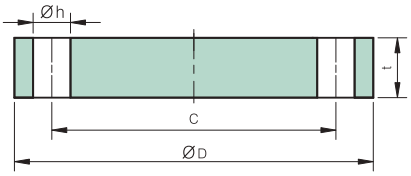

TR of nominal size 10A to 150A




WN of nominal size 10A to 600A




IT of nominal size 10A to 600A



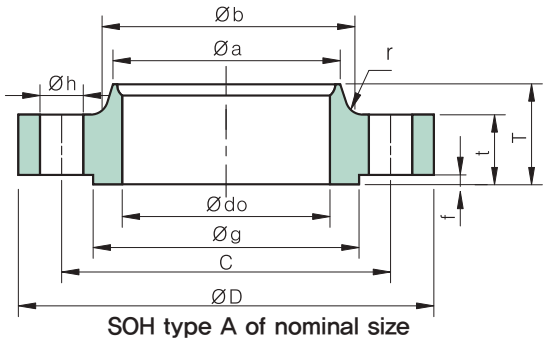

BL of nominal size 10A to 600A



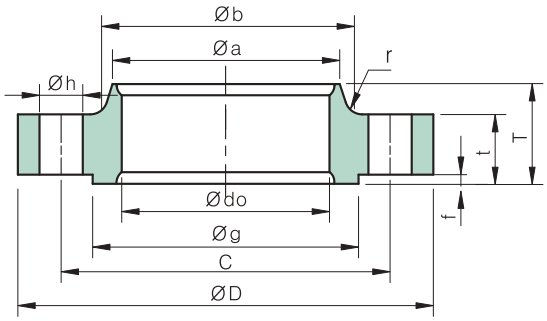
Unit : mm

| Nominal Size | Depth of Socket | Norminal designation of thread | Chamfering(4) | Radius of Fillet | Raised face | | Diameter of Bolt | | | Norminal Bolt Size | Stopper | Taper of Hub | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Height | Diameter | Diam. of Bolt Circle | Num. of Bolt Holes | Diam. of Bolt Holes | | SOH Type-C | WN | IT |
| | SW | | LJ | SOH,SW LJ,TR | SOH,SW,TR,WN,IT,BL | | | | | | | | |
| A | S | TR | c | r | f | g | c | | h | | l | x | x |
| 10 | 10 | Rc 3/8 | – | 4 | 1 | 46 | 65 | 4 | 15 | M12 | – | 1.25 | 1.25 |
| 15 | 10 | Rc 1/2 | 3 | 4 | 1 | 51 | 70 | 4 | 15 | M12 | – | 1.25 | 1.25 |
| 20 | 13 | Rc 3/4 | 3 | 4 | 1 | 56 | 75 | 4 | 15 | M12 | – | 1.25 | 1.25 |
| 25 | 13 | Rc 1 | 3 | 4 | 1 | 67 | 90 | 4 | 19 | M16 | – | 1.25 | 1.25 |
| 32 | 13 | Rc 1 1/4 | 4 | 5 | 2 | 76 | 100 | 4 | 19 | M16 | – | 1.25 | 1.25 |
| 40 | 13 | Rc 1 1/2 | 4 | 5 | 2 | 81 | 105 | 4 | 19 | M16 | – | 1.25 | 1.25 |
| 50 | 16 | Rc 2 | 4 | 5 | 2 | 96 | 120 | 8 | 19 | M16 | – | 1.25 | 1.25 |
| 65 | 16 | Rc 2 1/2 | 5 | 5 | 2 | 116 | 140 | 8 | 19 | M16 | 6 | 1.25 | 1.25 |
| 80 | 16 | Rc 3 | 5 | 6 | 2 | 132 | 160 | 8 | 23 | M20 | 6 | 1.25 | 1.25 |
| 90 | – | – | 5 | 6 | 2 | 145 | 170 | 8 | 23 | M20 | 6 | 1.25 | 1.25 |
| 100 | – | Rc 4 | 5 | 6 | 2 | 160 | 185 | 8 | 23 | M20 | 6 | 1.25 | 1.25 |
| 125 | – | Rc 5 | 6 | 6 | 2 | 195 | 225 | 8 | 25 | M22 | 6 | 1.25 | 1.25 |
| 150 | – | Rc 6 | 6 | 6 | 2 | 230 | 260 | 12 | 25 | M22 | 6 | 1.25 | 1.25 |
| 200 | – | – | 6 | 6 | 2 | 275 | 305 | 12 | 25 | M22 | 6 | 1.25 | 1.25 |
| 250 | – | – | 6 | 6 | 2 | 345 | 380 | 12 | 27 | M24 | 6 | 1.25 | 1.25 |
| 300 | – | – | 9 | 8 | 3 | 395 | 430 | 16 | 27 | M24 | 6 | 1.25 | 1.25 |
| 350 | – | – | 9 | 8 | 3 | 440 | 480 | 16 | 33 | M30 X 3 | 6 | 1.25 | 1.25 |
| 400 | – | – | 9 | 10 | 3 | 495 | 540 | 16 | 33 | M30 X 3 | 7 | 1.25 | 1.25 |
| 450 | – | – | 9 | 10 | 3 | 560 | 605 | 20 | 33 | M30 X 3 | 7 | 1.25 | 1.25 |
| 500 | – | – | 9 | 10 | 3 | 615 | 660 | 20 | 33 | M30 X 3 | 7 | 1.25 | 1.25 |
| 550 | – | – | 9 | 10 | 3 | 670 | 720 | 20 | 39 | M36 X 3 | 7 | 1.25 | 1.25 |
| 600 | – | – | 9 | 10 | 3 | 720 | 770 | 24 | 39 | M36 X 3 | 7 | 1.25 | 1.25 |

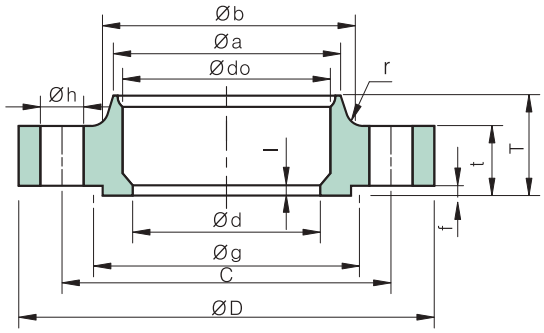
(3) With IT flanges, this dimension is shown for reference.
(4) This may be rounded off with the dimension c as a radius.




SOH type A of nominal size
10A to 400A




SOH type B of nominal size
10A to 50A




SOH type C of nominal size
65A to 400A



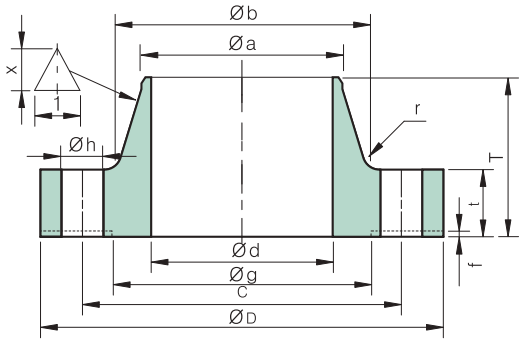
## JIS B 2220-2004 (KS B 1503-2007)

Unit : mm

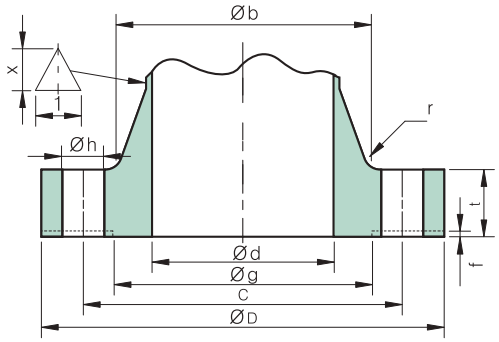
| Nominal Size | Outside Diam. of Applicable Pipe | Outside Diam. of Flange | Inside Diam. of Flange | | | Thickness of Flange | Total Length of Flange | | Diametr of hub | | | | Radius of Fillet | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Small Diameter | | Large Diameter | | | |
| | | | SOH | SOH,WN | IT | SOH,WN IT,BL | SOH | WN | SOH | WN | SOH | WN,IT | SOH | WN,IT |
| A | | D | do | d(2) | d | t | t | T | a | a | b | b(3) | r | r(3) |
| 10 | 17.3 | 110 | 17.8 | – | – | 16 | 24 | – | 30 | – | 34 | – | 4 | – |
| 15 | 21.7 | 115 | 22.2 | 16.1 | 15 | 18 | 26 | 45 | 36 | 21.7 | 40 | 40 | 5 | 6 |
| 20 | 27.2 | 120 | 27.7 | 21.4 | 20 | 18 | 28 | 45 | 42 | 27.2 | 46 | 44 | 5 | 6 |
| 25 | 34.0 | 130 | 34.5 | 27.2 | 25 | 20 | 30 | 48 | 50 | 34.0 | 54 | 52 | 5 | 6 |
| 32 | 42.7 | 140 | 43.2 | 35.5 | 32 | 22 | 32 | 52 | 60 | 42.7 | 64 | 62 | 6 | 6 |
| 40 | 48.6 | 160 | 49.1 | 41.2 | 40 | 22 | 34 | 54 | 66 | 48.6 | 70 | 70 | 6 | 6 |
| 50 | 60.5 | 165 | 61.1 | 52.7 | 50 | 22 | 36 | 57 | 82 | 60.5 | 86 | 84 | 6 | 8 |
| 65 | 76.3 | 200 | 77.1 | 65.9 | 65 | 26 | 40 | 69 | 102 | 76.3 | 106 | 104 | 8 | 8 |
| 80 | 89.1 | 210 | 90.0 | 78.1 | 80 | 28 | 44 | 73 | 115 | 89.1 | 121 | 118 | 8 | 8 |
| 90 | 101.6 | 230 | 102.6 | 90.2 | 90 | 30 | 46 | 74 | 128 | 101.6 | 134 | 130 | 8 | 8 |
| 100 | 114.3 | 240 | 115.4 | 102.3 | 100 | 32 | 48 | 76 | 141 | 114.3 | 147 | 142 | 8 | 8 |
| 125 | 139.8 | 275 | 141.2 | 126.6 | 125 | 36 | 54 | 86 | 166 | 139.8 | 172 | 172 | 8 | 10 |
| 150 | 165.2 | 325 | 166.6 | 151.0 | 150 | 38 | 58 | 95 | 196 | 165.2 | 204 | 202 | 8 | 10 |
| 200 | 216.3 | 370 | 218.0 | 199.9 | 200 | 42 | 64 | 102 | 248 | 216.3 | 256 | 254 | 8 | 10 |
| 250 | 267.4 | 450 | 269.5 | 248.8 | 250 | 48 | 72 | 118 | 306 | 267.4 | 314 | 312 | 10 | 12 |
| 300 | 318.5 | 515 | 321.0 | 297.9 | 300 | 52 | 78 | 127 | 360 | 318.5 | 370 | 366 | 10 | 15 |
| 350 | 355.6 | 560 | 358.1 | 333.4 | 335 | 54 | 84 | 134 | 402 | 355.6 | 412 | 406 | 12 | 15 |
| 400 | 406.4 | 630 | 409.0 | 381.0 | 380 | 60 | 92 | 149 | 456 | 406.4 | 468 | 462 | 15 | 20 |

Notes :

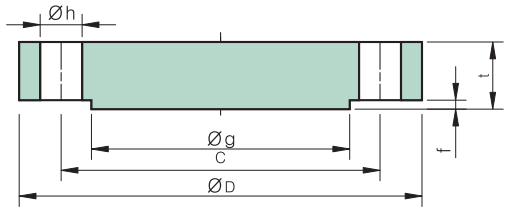
(1) The facing of flanges shall conform to JIS B2202–2004
(2) Adjustment shall be made according to the inside diameter of the steel pipes to be joined with.
(3) With IT flanges, this dimension is shown for reference.




WN of nominal size 15A to 400A




IT of nominal size 15A to 400A



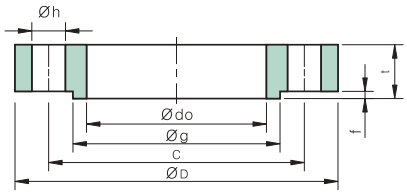

BL of nominal size 10A to 400A



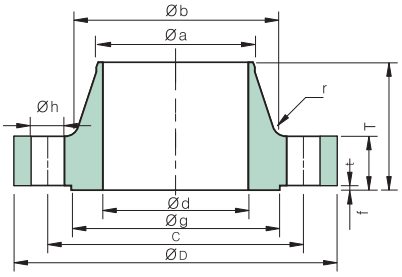
Unit : mm

| Nominal Size | Raised face | | Diameter of Bolt | | | Norminal Bolt Size | Stopper | Taper of Hub | |
|---|---|---|---|---|---|---|---|---|---|
| | Height | Diameter | Diam. of Bolt Circle | Num. of Bolt Holes | Diam. of Bolt Holes | | SOH Type-C | Wn | IT (Min) |
| | SOH,WN,IT,BL | | | | | | | | |
| A | f | g | C | | h | | i | x | x |
| 10 | 1 | 52 | 75 | 4 | 19 | M16 | – | – | – |
| 15 | 1 | 55 | 80 | 4 | 19 | M16 | – | 1.25 | 1.25 |
| 20 | 1 | 60 | 85 | 4 | 19 | M16 | – | 1.25 | 1.25 |
| 25 | 1 | 70 | 95 | 4 | 19 | M16 | – | 1.25 | 1.25 |
| 32 | 2 | 80 | 105 | 4 | 19 | M16 | – | 1.25 | 1.25 |
| 40 | 2 | 90 | 120 | 4 | 23 | M20 | – | 1.25 | 1.25 |
| 50 | 2 | 105 | 130 | 8 | 19 | M16 | – | 1.25 | 1.25 |
| 65 | 2 | 130 | 160 | 8 | 23 | M20 | 6 | 1.25 | 1.25 |
| 80 | 2 | 140 | 170 | 8 | 23 | M20 | 6 | 1.25 | 1.25 |
| 90 | 2 | 150 | 185 | 8 | 25 | M22 | 6 | 1.25 | 1.25 |
| 100 | 2 | 160 | 195 | 8 | 25 | M22 | 6 | 1.25 | 1.25 |
| 125 | 2 | 195 | 230 | 8 | 25 | M22 | 6 | 1.25 | 1.25 |
| 150 | 2 | 235 | 275 | 12 | 27 | M24 | 6 | 1.25 | 1.25 |
| 200 | 2 | 280 | 320 | 12 | 27 | M24 | 6 | 1.25 | 1.25 |
| 250 | 2 | 345 | 390 | 12 | 33 | M30 X 3 | 6 | 1.25 | 1.25 |
| 300 | 3 | 405 | 450 | 16 | 33 | M30 X 3 | 6 | 1.25 | 1.25 |
| 350 | 3 | 450 | 495 | 16 | 33 | M30 X 3 | 6 | 1.25 | 1.25 |
| 400 | 3 | 510 | 560 | 16 | 39 | M36 X 3 | 7 | 1.25 | 1.25 |

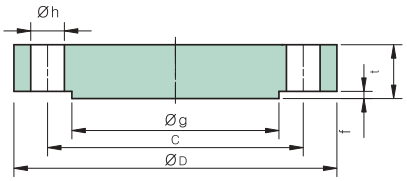
# 40K




SOP of nominal size
10A to 400A




WN of nominal size
10A to 400A



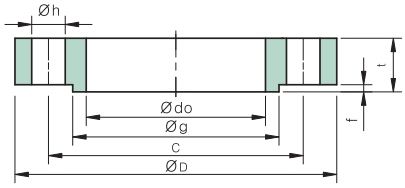

BL of nominal size
10A to 400A



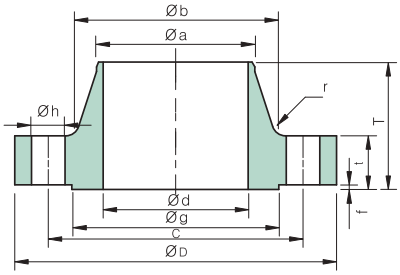
## JIS B 2238-1996

Unit : mm

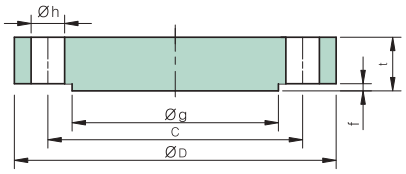
| Nominal Size | Outside Diam. of Applicable Pipe | Outside Diam. of Flange | Thickness of Flange | Inside Diam. of Flange | | Diametr of hub | | Total Length of Flange | Raised face | | Diameter of Bolt | | | Approx Weight(kg) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SOP | WN | | | | Height | Diam -eter | Diam. of Bolt Circle | Num. of Bolt Holes | Diam. of Bolt Hole | SOP | BL | WN |
| A | | D | t | do | d | a | b | T | f | g | C | | h | | | |
| 10 | 17.3 | 110 | 18 | 17.8 | – | 17.3 | 38 | 53 | 1 | 52 | 75 | 4 | 19 | 1.2 | 1.2 | – |
| 15 | 21.7 | 115 | 20 | 22.2 | 15.8 | 21.7 | 40 | 53 | 1 | 55 | 80 | 4 | 19 | 1.3 | 1.4 | 1.5 |
| 20 | 27.2 | 120 | 20 | 27.7 | 21.1 | 27.2 | 45 | 58 | 1 | 60 | 85 | 4 | 19 | 1.5 | 1.6 | 1.7 |
| 25 | 34.0 | 130 | 22 | 34.5 | 26.8 | 34.0 | 54 | 62 | 1 | 70 | 95 | 4 | 19 | 1.9 | 2.1 | 2.2 |
| 32 | 42.7 | 140 | 24 | 43.2 | 35.1 | 42.7 | 62 | 69 | 2 | 80 | 105 | 4 | 19 | 2.4 | 2.7 | 2.8 |
| 40 | 48.6 | 160 | 24 | 49.1 | 40.7 | 48.6 | 72 | 72 | 2 | 90 | 120 | 4 | 23 | 3.1 | 3.5 | 3.5 |
| 50 | 60.5 | 165 | 26 | 61.1 | 52.2 | 60.5 | 88 | 75 | 2 | 105 | 130 | 8 | 19 | 3.3 | 3.9 | 4.1 |
| 65 | 76.3 | 200 | 30 | 77.1 | 65.3 | 76.3 | 108 | 81 | 2 | 130 | 160 | 8 | 23 | 5.5 | 6.6 | 6.9 |
| 80 | 89.1 | 210 | 32 | 90.0 | 76.4 | 89.1 | 119 | 85 | 2 | 140 | 170 | 8 | 23 | 6.4 | 8.0 | 7.9 |
| 90 | 101.6 | 230 | 34 | 102.6 | 89.5 | 101.6 | 130 | 88 | 2 | 150 | 185 | 8 | 25 | 7.9 | 10.1 | 9.4 |
| 100 | 114.3 | 250 | 36 | 115.4 | 101.5 | 114.3 | 146 | 104 | 2 | 165 | 205 | 8 | 25 | 9.9 | 12.9 | 12.3 |
| 125 | 139.8 | 300 | 40 | 141.2 | – | – | – | – | 2 | 200 | 250 | 8 | 27 | 15.9 | 20.8 | – |
| 150 | 165.2 | 355 | 44 | 166.6 | 150.0 | 165.2 | 215 | 120 | 2 | 240 | 295 | 12 | 33 | 23.2 | 30.8 | 30.6 |
| 200 | 216.3 | 405 | 50 | 218.0 | 198.7 | 216.3 | 270 | 135 | 2 | 290 | 345 | 12 | 33 | 32.1 | 46.8 | 41.6 |
| 250 | 267.4 | 475 | 56 | 269.5 | 247.5 | 267.4 | 333 | 154 | 2 | 355 | 410 | 12 | 33 | 48.6 | 73.8 | 68.1 |
| 300 | 318.5 | 540 | 60 | 321.0 | 296.4 | 318.5 | 400 | 159 | 3 | 410 | 470 | 16 | 39 | 61.1 | 99.4 | 96.0 |
| 350 | 355.6 | 585 | 64 | 358.1 | 331.8 | 355.6 | 432 | 168 | 3 | 455 | 515 | 16 | 39 | 75.2 | 126.1 | 115.0 |
| 400 | 406.4 | 645 | 70 | 409.0 | 379.1 | 406.4 | 466 | 181 | 3 | 515 | 570 | 16 | 39 | 97.4 | 170.0 | 143.0 |




SOP of nominal size
10A to 400A




WN of nominal size
10A to 400A




BL of nominal size
10A to 400A

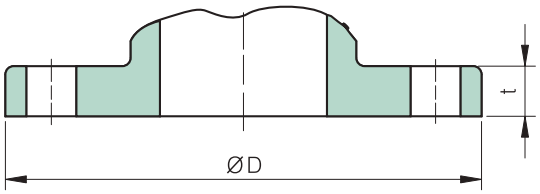


## JIS B 2238-1996

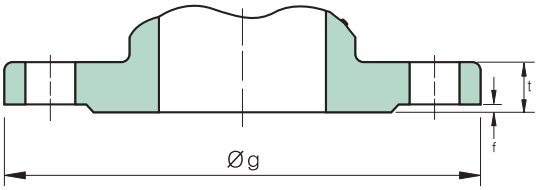
Unit : mm

| Nominal Size | Outside Diam. of Applicable Pipe | Outside Diam. of Flange | Thickness of Flange | Inside Diam. of Flange | | Diametr of hub | | Total Length of Flange | Raised face | | Diameter of Bolt | | | Approx Weight(kg) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SOP | WN | | | | Height | Diam -eter | Diam. of Bolt Circle | Num. of Bolt Holes | Diam. of Bolt Hole | SOP | BL | WN |
| A | | D | t | do | d | a | b | T | f | g | C | | h | | | |
| 10 | 17.3 | 115 | 23 | 17.8 | – | 17.3 | 40 | 61 | 1 | 52 | 80 | 4 | 19 | 1.6 | 1.7 | – |
| 15 | 21.7 | 120 | 23 | 22.2 | 15.8 | 21.7 | 42 | 61 | 1 | 55 | 85 | 4 | 19 | 1.8 | 1.9 | 1.9 |
| 20 | 27.2 | 135 | 25 | 27.7 | 21.1 | 27.2 | 46 | 71 | 1 | 60 | 95 | 4 | 23 | 2.4 | 2.5 | 2.5 |
| 25 | 34.0 | 140 | 27 | 34.5 | 26.8 | 34.0 | 56 | 74 | 1 | 70 | 100 | 4 | 23 | 2.7 | 2.9 | 3.5 |
| 32 | 42.7 | 150 | 30 | 43.2 | 35.1 | 42.7 | 60 | 75 | 2 | 80 | 110 | 4 | 23 | 3.4 | 3.8 | 3.7 |
| 40 | 48.6 | 175 | 32 | 49.1 | 40.7 | 48.6 | 75 | 85 | 2 | 90 | 130 | 4 | 25 | 5.5 | 5.6 | 5.5 |
| 50 | 60.5 | 185 | 34 | 61.1 | 52.2 | 60.5 | 92 | 104 | 2 | 105 | 145 | 8 | 23 | 5.5 | 6.3 | 6.5 |
| 65 | 76.3 | 220 | 38 | 77.1 | 65.3 | 76.3 | 118 | 107 | 2 | 130 | 175 | 8 | 25 | 5.8 | 7.2 | 10.3 |
| 80 | 89.1 | 230 | 40 | 90.0 | 76.4 | 89.1 | 130 | 120 | 2 | 140 | 185 | 8 | 25 | 9.9 | 11.9 | 12.4 |
| 90 | 101.6 | 255 | 42 | 102.6 | 89.5 | 101.6 | 140 | 126 | 2 | 150 | 205 | 8 | 27 | 12.7 | 15.4 | 15.2 |
| 100 | 114.3 | 270 | 44 | 115.4 | 101.5 | 114.3 | 154 | 126 | 2 | 165 | 220 | 8 | 27 | 14.7 | 18.3 | 17.7 |
| 125 | 139.8 | 325 | 50 | 141.2 | – | – | – | – | 2 | 200 | 265 | 8 | 33 | 23.8 | 30.0 | – |
| 150 | 165.2 | 365 | 54 | 166.6 | 150.0 | 165.2 | 230 | 173 | 2 | 240 | 305 | 12 | 33 | 30.9 | 40.2 | 39.4 |
| 200 | 216.3 | 425 | 60 | 218.0 | 198.7 | 216.3 | 280 | 215 | 2 | 290 | 360 | 12 | 33 | 44.6 | 62.3 | 60.1 |
| 250 | 267.4 | 500 | 68 | 269.5 | 247.5 | 267.4 | 348 | 256 | 2 | 355 | 430 | 12 | 39 | 67.1 | 97.7 | 114.0 |
| 300 | 318.5 | 560 | 77 | 321.0 | 296.4 | 318.5 | 402 | 286 | 3 | 410 | 485 | 16 | 39 | 88.9 | 138.1 | 154.0 |
| 350 | 355.6 | 615 | 81 | 358.1 | 331.8 | 355.6 | 438 | 301 | 3 | 455 | 530 | 16 | 46 | 108.5 | 172.9 | 191.0 |
| 400 | 406.4 | 680 | 89 | 409.0 | 379.1 | 406.4 | 490 | 314 | 3 | 515 | 590 | 16 | 46 | 144.2 | 236.5 | 247.0 |

# FACING 1




Full Face(FF)




Raised Face

## KS/JIS FLANGES

Unit : mm

| Nominal Size A | Raised face (RF) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nominal pessure | | | | | | | | | |
| | 5K | | 10K | | 16K | | 20K | | 30K | |
| | g | f | g | f | g | f | g | f | g | f |
| 10 | 39 | 1 | 46 | 1 | 46 | 1 | 46 | 1 | 52 | 1 |
| 15 | 44 | 1 | 51 | 1 | 51 | 1 | 51 | 1 | 55 | 1 |
| 20 | 49 | 1 | 56 | 1 | 56 | 1 | 56 | 1 | 60 | 1 |
| 25 | 59 | 1 | 67 | 1 | 67 | 1 | 67 | 1 | 70 | 1 |
| 32 | 70 | 2 | 76 | 2 | 76 | 2 | 76 | 2 | 80 | 2 |
| 40 | 75 | 2 | 81 | 2 | 81 | 2 | 81 | 2 | 90 | 2 |
| 50 | 85 | 2 | 96 | 2 | 96 | 2 | 96 | 2 | 105 | 2 |
| 65 | 110 | 2 | 116 | 2 | 116 | 2 | 116 | 2 | 130 | 2 |
| 80 | 121 | 2 | 126 | 2 | 132 | 2 | 132 | 2 | 140 | 2 |
| 90 | 131 | 2 | 136 | 2 | 145 | 2 | 145 | 2 | 150 | 2 |
| 100 | 141 | 2 | 151 | 2 | 160 | 2 | 160 | 2 | 160 | 2 |
| 125 | 176 | 2 | 182 | 2 | 195 | 2 | 195 | 2 | 195 | 2 |
| 150 | 206 | 2 | 212 | 2 | 230 | 2 | 230 | 2 | 235 | 2 |
| 175 | 232 | 2 | 237 | 2 | – | – | – | – | – | – |
| 200 | 252 | 2 | 262 | 2 | 275 | 2 | 275 | 2 | 280 | 2 |
| 225 | 277 | 2 | 282 | 2 | – | – | – | – | – | – |
| 250 | 317 | 2 | 324 | 2 | 345 | 2 | 345 | 2 | 345 | 2 |
| 300 | 360 | 3 | 368 | 3 | 395 | 3 | 395 | 3 | 405 | 3 |
| 350 | 403 | 3 | 413 | 3 | 440 | 3 | 440 | 3 | 450 | 3 |
| 400 | 463 | 3 | 475 | 3 | 495 | 3 | 495 | 3 | 510 | 3 |
| 450 | 523 | 3 | 530 | 3 | 560 | 3 | 560 | 3 | – | – |
| 500 | 573 | 3 | 585 | 3 | 615 | 3 | 615 | 3 | – | – |
| 550 | 630 | 3 | 640 | 3 | 670 | 3 | 670 | 3 | – | – |
| 600 | 680 | 3 | 690 | 3 | 720 | 3 | 720 | 3 | – | – |
| 650 | 735 | 3 | 740 | 3 | – | – | – | – | – | – |
| 700 | 785 | 3 | 800 | 3 | – | – | – | – | – | – |
| 750 | 840 | 3 | 855 | 3 | – | – | – | – | – | – |
| 800 | 890 | 3 | 905 | 3 | – | – | – | – | – | – |
| 850 | 940 | 3 | 955 | 3 | – | – | – | – | – | – |
| 900 | 990 | 3 | 1005 | 3 | – | – | – | – | – | – |
| 1000 | 1090 | 3 | 1110 | 3 | – | – | – | – | – | – |
| 1100 | 1200 | 3 | 1220 | 3 | – | – | – | – | – | – |
| 1200 | 1305 | 3 | 1325 | 3 | – | – | – | – | – | – |
| 1350 | 1460 | 3 | 1480 | 3 | – | – | – | – | – | – |
| 1500 | 1615 | 3 | 1635 | 3 | – | – | – | – | – | – |

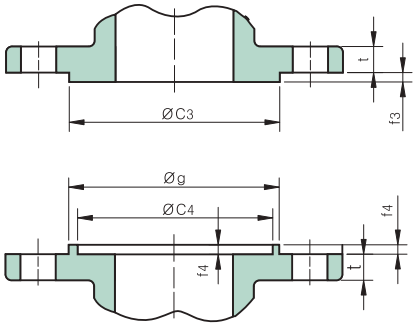
Notes :

(1) Dimension D of full face (FF) shall conform to the outside diameter D of the flange of the attached table 4 to 7.

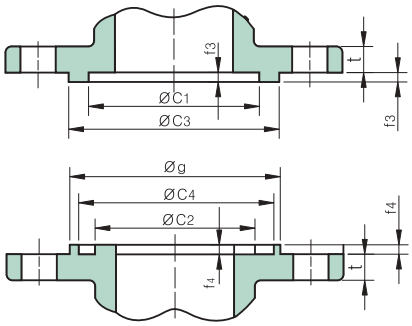
(2) The thickness of the flange t shall conform to the attached tables 4 to 9.

(3) Dimension g in male–female face (MF) and tongue and groove (TG) shall conform to dimension g of raised face (RF).

# FACING 2




Male–female face(MF)



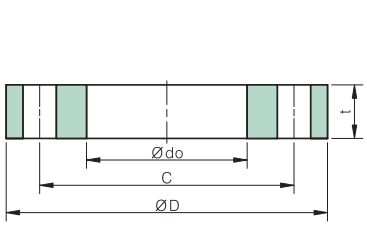

Tongue and groove(TG)

Unit : mm

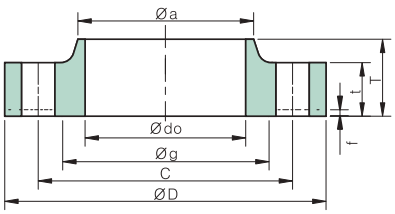
| Nominal Size A | Male · Female face (MF) | | | | Tongue and groove (TG) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Male seat (MF · M) | | Female seat (MF · F) | | Tongue seat (TG · T) | | | Groove seat (TG · G) | | |
| | C | f | C | f | $C_1$ | $C_3$ | $f_3$ | $C_2$ | $C_4$ | $f_4$ |
| 10 | 38 | 6 | 39 | 5 | 28 | 38 | 6 | 27 | 39 | 5 |
| 15 | 42 | 6 | 43 | 5 | 32 | 42 | 6 | 31 | 43 | 5 |
| 20 | 50 | 6 | 51 | 5 | 38 | 50 | 6 | 37 | 51 | 5 |
| 25 | 60 | 6 | 61 | 5 | 45 | 60 | 6 | 44 | 61 | 5 |
| 32 | 70 | 6 | 71 | 5 | 55 | 70 | 6 | 54 | 71 | 5 |
| 40 | 75 | 6 | 76 | 5 | 60 | 75 | 6 | 59 | 76 | 5 |
| 50 | 90 | 6 | 91 | 5 | 70 | 90 | 6 | 69 | 91 | 5 |
| 65 | 110 | 6 | 111 | 5 | 90 | 110 | 6 | 89 | 111 | 5 |
| 80 | 120 | 6 | 121 | 5 | 100 | 120 | 6 | 99 | 121 | 5 |
| 90 | 130 | 6 | 131 | 5 | 110 | 130 | 6 | 109 | 131 | 5 |
| 100 | 145 | 6 | 146 | 5 | 125 | 145 | 6 | 124 | 146 | 5 |
| 125 | 175 | 6 | 176 | 5 | 150 | 175 | 6 | 149 | 176 | 5 |
| 150 | 215 | 6 | 216 | 5 | 190 | 215 | 6 | 189 | 216 | 5 |
| 175 | – | – | – | – | – | – | – | – | – | – |
| 200 | 260 | 6 | 261 | 5 | 230 | 260 | 6 | 229 | 261 | 5 |
| 225 | – | – | – | – | – | – | – | – | – | – |
| 250 | 325 | 6 | 326 | 5 | 295 | 325 | 6 | 294 | 326 | 5 |
| 300 | 375 | 6 | 376 | 5 | 340 | 375 | 6 | 339 | 376 | 5 |
| 350 | 415 | 6 | 416 | 5 | 380 | 415 | 6 | 379 | 416 | 5 |
| 400 | 475 | 6 | 476 | 5 | 440 | 475 | 6 | 439 | 476 | 5 |
| 450 | 523 | 6 | 524 | 5 | 483 | 523 | 6 | 482 | 524 | 5 |
| 500 | 575 | 6 | 576 | 5 | 535 | 575 | 6 | 534 | 576 | 5 |
| 550 | 625 | 6 | 626 | 5 | 585 | 625 | 6 | 584 | 626 | 5 |
| 600 | 675 | 6 | 676 | 5 | 635 | 675 | 6 | 634 | 676 | 5 |
| 650 | 727 | 6 | 728 | 5 | 682 | 727 | 6 | 681 | 728 | 5 |
| 700 | 777 | 6 | 778 | 5 | 732 | 777 | 6 | 731 | 778 | 5 |
| 750 | 832 | 6 | 833 | 5 | 787 | 832 | 6 | 786 | 833 | 5 |
| 800 | 882 | 6 | 883 | 5 | 837 | 882 | 6 | 836 | 883 | 5 |
| 850 | 934 | 6 | 935 | 5 | 889 | 934 | 6 | 888 | 935 | 5 |
| 900 | 987 | 6 | 988 | 5 | 937 | 987 | 6 | 936 | 988 | 5 |
| 1000 | 1092 | 6 | 1094 | 5 | 1042 | 1092 | 6 | 1040 | 1094 | 5 |
| 1100 | 1192 | 6 | 1194 | 5 | 1142 | 1192 | 6 | 1140 | 1194 | 5 |
| 1200 | 1292 | 6 | 1294 | 5 | 1237 | 1292 | 6 | 1235 | 1294 | 5 |
| 1350 | 1442 | 6 | 1444 | 5 | 1387 | 1442 | 6 | 1385 | 1444 | 5 |
| 1500 | 1592 | 6 | 1594 | 5 | 1537 | 1592 | 6 | 1535 | 1594 | 5 |

(4) The female seat(MF · UF) and the groove (TG · UG) for nominal pressure 5K and 10K shall be of the shapes shown by an imaginary line of the figures.

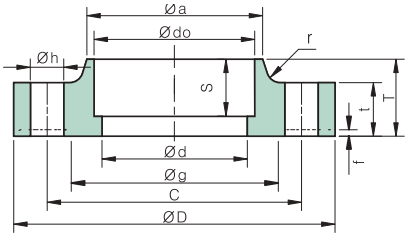
# TOLERANCE FOR PIPE FLANGES



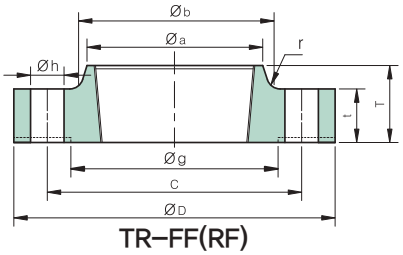

SOP–FF



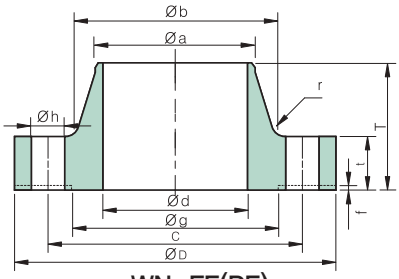

SOH–FF(RF)



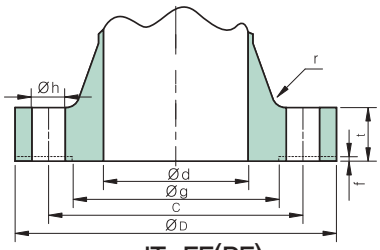

SW–FF(RF)




TR–FF(RF)




WN–FF(RF)

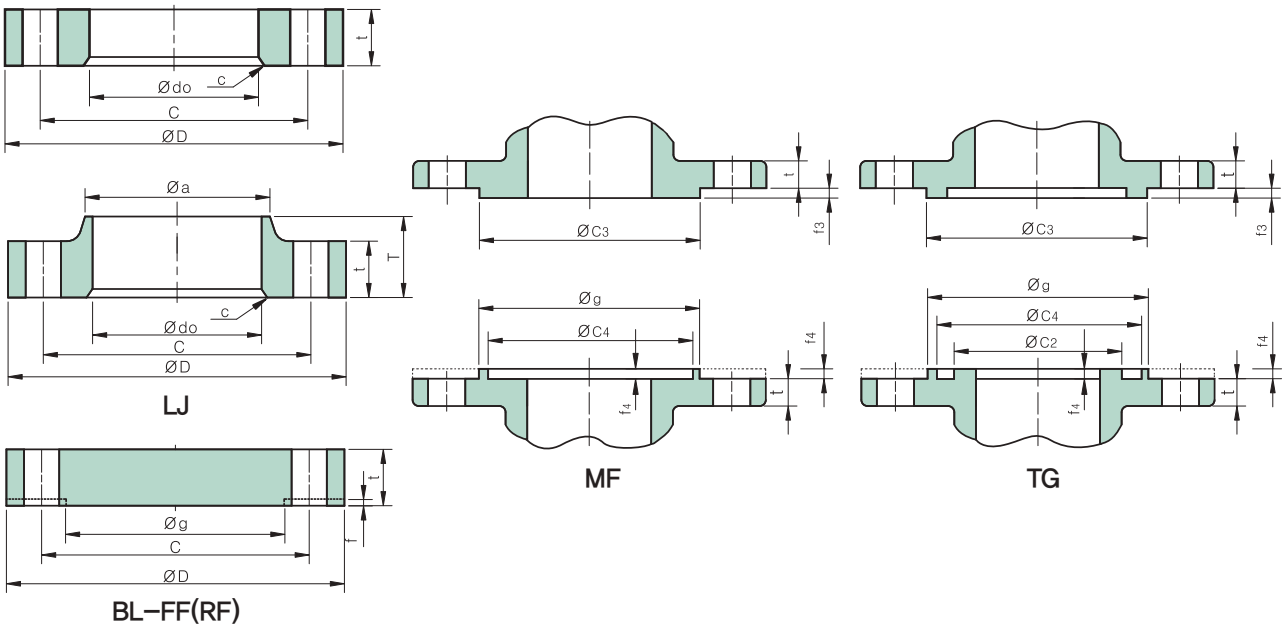



IT–FF(RF)

## DIMENSIONAL TOLERANCE ON FLANGE

Unit : mm

| Dimension | | Type of flange | Gasket face | Dimensional Division | Dimensional tolerance |
|---|---|---|---|---|---|
| Outside diameter of flange | D | Except for IT | – | 600 or less | ±1.5 |
| | | | | Over 600 | ±3 |
| | | IT | – | 1000 or less | Not specified for plus side values −2 |
| | | | | Over 1000 | Not specified for plus side values −3 |
| Diameter of bolt center circle | C | ALL | – | 950 or less | ±0.8 |
| | | | | Over 950 | ±1.5 |
| Pitch of bolt hole | – | ALL | – | – | ±0.8 |
| Inside Diameter | d0 | SOP, SOH SW, LJ | – | 100 or less | +0.5 0 |
| | | | | Over 100 to and incl. 400 | +1 0 |
| | | | | Over 400 to and incl. 600 | +1.5 0 |
| | | | | Over 600 to and incl. 800 | +2 0 |
| | | | | Over 800 to and incl. 1000 | +2.5 0 |
| | | | | Over 1000 | +3 0 |
| Inside Diameter | d | SW, WN | – | 100 or less | 0 −0.5 |
| | | | | Over 100 to and incl. 400 | 0 −1 |
| | | | | Over 400 to and incl. 600 | 0 −1.5 |
| | | | | Over 600 to and incl. 800 | 0 −2 |
| | | | | Over 800 to and incl. 1000 | 0 −2.5 |
| | | | | Over 1000 | 0 −3 |
| Diameter of gasket face | g | SOH, SW, TR WN, IT, BL | RF, MF, TG | 700 or less | ±0.8 |
| | | | | Over 700 | ±1.5 |
| Diameter of gasket face | $C_1$ $C_2$ $C_3$ $C_4$ | Except for LJ | MF, TG | 500 or less | ±0.3 |
| | | | | Over 500 to and incl.1000 | ±0.35 |
| | | | | Over 1000 to and incl.1500 | ±0.4 |
| | | | | Over 1500 | ±0.5 |
| Height of gasket face | f3 f4 | Except for LJ | MF, TG | – | ±0.2 |




Unit : mm

| Dimension | | Type of flange | Gasket face | Dimensional Division | Dimensional tolerance |
|---|---|---|---|---|---|
| Thickness of flange | t (1) (2) | Except for LJ | FF, MF, TG | 20 or less | +1.5 0 |
| | | | | Over 20 to and incl. 50 | +2 0 |
| | | | | Over 50 | +3 0 |
| | | LJ | – | 20 or less | +1.5 0 |
| | | | | Over 20 to and incl. 50 | +2 0 |
| | | | | Over 50 | +3 0 |
| Thickness of flange | t–f (1) (2) | SOH, SW, TR WN, IT, BL | RF | 20 or less | +1.5 0 |
| | | | | Over 20 to and incl. 50 | +2 0 |
| | | | | Over 50 | +3 0 |
| Diameter of hub Small diameter side | a | SOH, SW, LJ TR, WN | – | 220 or less | +2 0 |
| | | | | Over 220 to and incl. 650 | +4 0 |
| | | | | Over 650 | +8 0 |
| Total length of flange | T | SOH, SW, LJ, TR | – | – | ±2 |
| | | WN | – | 200 or less | +2 0 |
| | | | | Over 200 | +3 0 |
| Chamfering | c | LJ | – | 6 or less | +0.8 0 |
| | | | | Over 6 | +1.6 0 |
| Parallelism between gasket face and bolt nut bearing surface | – | Except for LJ | ALL | – | Within 1 degree |

Notes :

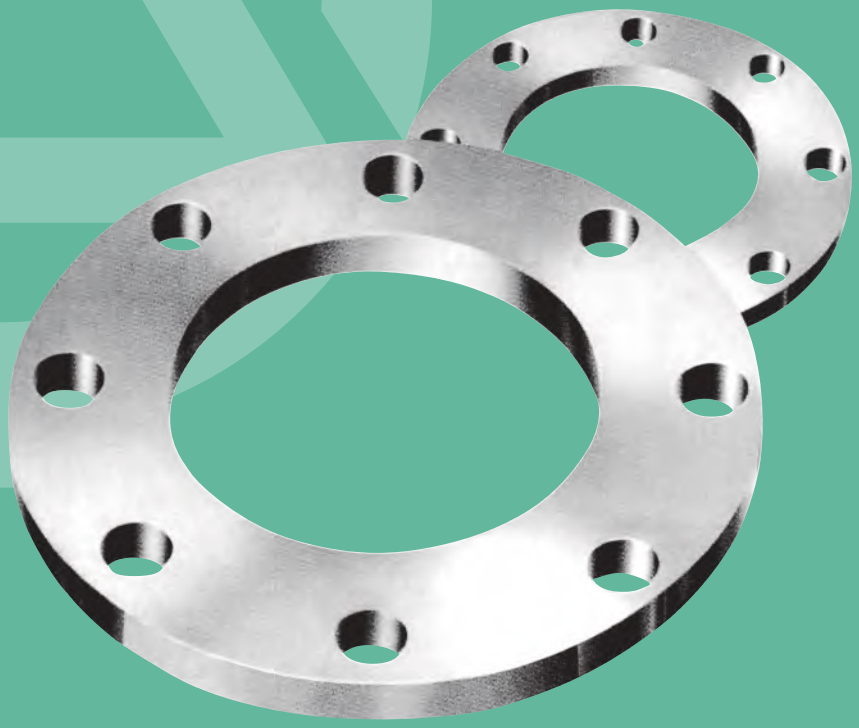
(1) The tolerance on thickness of integral flange (IT) of piping parts with which the dimension between flange facings is limited to a specific value may be set at twice the specified value.

(2) For the spot facing of flanges, if they are so processed, the thickness is permitted in the minus side to 70% of the tolerance on thickness of spot facing given in the table.

# JIS MATERIAL CHEMICAL COMPOSITION & MECHANICAL REQUIREMENTS



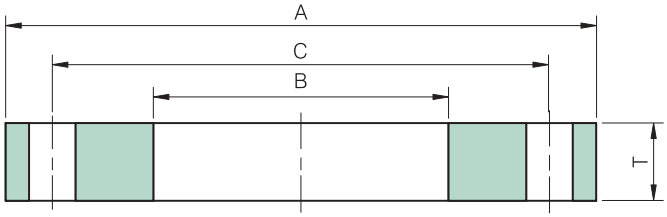
| MATERIAL | | Chemical Comosition (%) | | | | | | | | | | | | Mechanical Requirements | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | C | Si | Mn | P | S | Ni | Cr | Mo | Cu | V | Nb | Sn | Y.S (N/mm²) | T.S (N/mm²) | E.L (%) axial | E.L (%) tangen. | R.A (%) axial | R.A (%) tangen. | H.B |
| SF440A | Max. | 0.60 | 0.50 | 1.20 | 0.030 | 0.035 | | | | | | | | | 540 | | | | | 121 |
| | Min. | | 0.15 | 0.30 | | | | | | | | | | 195 | 440 | 24.0 | 19.0 | 45.0 | 35.0 | |
| SF490A | Max. | 0.60 | 0.50 | 1.20 | 0.030 | 0.035 | | | | | | | | | 590 | | | | | 134 |
| | Min. | | 0.15 | 0.30 | | | | | | | | | | 245 | 490 | 22.0 | 17.0 | 40.0 | 30.0 | |
| SFVC 1 | Max. | 0.30 | 0.35 | 1.35 | 0.030 | 0.030 | | | | | | | | | 560 | | | | | |
| | Min. | | | 0.40 | | | | | | | | | | 205 | 410 | 21.0 | | 38.0 | | |
| SFVC 2A | Max. | 0.35 | 0.35 | 1.10 | 0.030 | 0.030 | | | | | | | | | 640 | | | | | |
| | Min. | | | 0.40 | | | | | | | | | | 245 | 490 | 18.0 | | 33.0 | | |
| SFVC 2B | Max. | 0.30 | 0.35 | 1.35 | 0.030 | 0.030 | | | | | | | | | 640 | | | | | |
| | Min. | | | 0.70 | | | | | | | | | | 245 | 490 | 18.0 | | 38.0 | | |
| SFL 1 | Max. | 0.30 | 0.35 | 1.35 | 0.030 | 0.030 | | | | | | | | | 590 | | | | | |
| | Min. | | | | | | | | | | | | | 225 | 440 | 22.0 | | 38.0 | | |
| SFL 2 | Max. | 0.30 | 0.35 | 1.35 | 0.030 | 0.030 | | | | | | | | | 640 | | | | | |
| | Min. | | | | | | | | | | | | | 245 | 490 | 19.0 | | 30.0 | | |
| S15C | Max. | 0.18 | 0.35 | 0.60 | 0.030 | 0.035 | | | | | | | | | | | | | | 111~167 |
| | Min. | 0.13 | 0.15 | 0.30 | | | | | | | | | | 235 | 370 | 30.0 | | | | |
| S20C | Max. | 0.23 | 0.35 | 0.30 | 0.030 | 0.035 | | | | | | | | | | | | | | 116~174 |
| | Min. | 0.18 | 0.15 | 0.30 | | | | | | | | | | 245 | 400 | 28.0 | | | | |
| S25C | Max. | 0.28 | 0.35 | 0.60 | 0.030 | 0.035 | | | | | | | | | | | | | | 123~138 |
| | Min. | 0.22 | 0.15 | 0.30 | | | | | | | | | | 265 | 440 | 27.0 | | | | |
| S30C | Max. | 0.33 | 0.35 | 0.90 | 0.030 | 0.035 | | | | | | | | | | | | | | 137~197 |
| | Min. | 0.27 | 0.15 | 0.60 | | | | | | | | | | 285 | 470 | 25.0 | | | | |
| S35C | Max. | 0.38 | 0.35 | 0.90 | 0.030 | 0.035 | | | | | | | | | | | | | | 149~207 |
| | Min. | 0.32 | 0.15 | 0.60 | | | | | | | | | | 305 | 510 | 23.0 | | | | |
| S40C | Max. | 0.43 | 0.35 | 0.90 | 0.030 | 0.035 | | | | | | | | | | | | | | 156~217 |
| | Min. | 0.37 | 0.15 | 0.60 | | | | | | | | | | 325 | 540 | 22.0 | | | | |
| S45C | Max. | 0.48 | 0.35 | 0.90 | 0.030 | 0.035 | | | | | | | | | | | | | | 167~229 |
| | Min. | 0.42 | 0.15 | 0.60 | | | | | | | | | | 345 | 570 | 20.0 | | | | |
| SFVA F1 | Max. | 0.30 | 0.35 | 0.90 | 0.030 | 0.030 | | | 0.65 | | | | | | 660 | | | | | |
| | Min. | | | 0.60 | | | | | 0.45 | | | | | 275 | 480 | 18.0 | | 35.0 | | |
| SFVA F5A/B | Max. | 0.15 | 0.50 | 0.60 | 0.030 | 0.030 | | 6.00 | 0.65 | | | | | A: 245 | 410~590 | 18.0 | | 40.0 | | |
| | Min. | | | 0.30 | | | | 4.00 | 0.45 | | | | | B: 275 | 480~660 | 18.0 | | 35.0 | | |
| SFVA F9 | Max. | 0.15 | 1.00 | 0.60 | 0.030 | 0.030 | | 10.00 | 1.10 | | | | | | 760 | | | | | |
| | Min. | | 0.50 | 0.30 | | | | 8.00 | 0.90 | | | | | 380 | 590 | 18.0 | | 40.0 | | |
| SFVA F11A/B | Max. | 0.20 | 1.00 | 0.80 | 0.030 | 0.030 | | 1.50 | 0.65 | | | | | A: 275 | A:480~660 | 18.0 | | 35.0 | | |
| | Min. | | 0.50 | 0.30 | | | | 1.00 | 0.45 | | | | | B: 315 | B:520~690 | 18.0 | | 35.0 | | |
| SFVA F12 | Max. | 0.20 | 0.60 | 0.80 | 0.030 | 0.030 | | 1.25 | 0.65 | | | | | | 660 | | | | | |
| | Min. | | | 0.30 | | | | 0.80 | 0.45 | | | | | 275 | 480 | 18.0 | | 35.0 | | |
| SFVA F22A/B | Max. | 0.15 | 0.50 | 0.60 | 0.030 | 0.030 | | 2.50 | 1.10 | | | | | A: 205 | A:410~590 | 18.0 | | 40.0 | | |
| | Min. | | | 0.630 | | | | 2.00 | 0.90 | | | | | B: 315 | B:520~690 | 18.0 | | 35.0 | | |
| SFL3 | Max. | 0.20 | 0.35 | 0.90 | 0.030 | 0.030 | 3.75 | | | | | | | | 640 | | | | | |
| | Min. | | | | | | 3.25 | | | | | | | 255 | 490 | 19.0 | | 35.0 | | |
| SFVQ 1A | Max. | 0.25 | 0.40 | 1.50 | 0.030 | 0.030 | 1.00 | 0.25 | 0.60 | | 0.05 | | | | 730 | | | | | |
| | Min. | | | 1.20 | | | 0.40 | | 0.45 | | | | | 345 | 550 | 16.0 | | 38.0 | | |
| SFVQ 2A | Max. | 0.27 | 0.40 | 1.00 | 0.030 | 0.030 | 1.00 | 0.45 | 0.70 | | 0.05 | | | | 730 | | | | | |
| | Min. | | | 0.50 | | | 0.50 | 0.25 | 0.55 | | | | | 345 | 550 | 16.0 | | | | |
| SFVQ 3 | Max. | 0.23 | 0.40 | 0.40 | 0.020 | 0.020 | 3.90 | 2.00 | 0.60 | | 0.03 | | | | 790 | | | | | |
| | Min. | | | 0.20 | | | 2.75 | 1.50 | 0.40 | | | | | 490 | 620 | 18.0 | | 48.0 | | |
| SFVQ 2B | Max. | 0.30 | 0.35 | 1.35 | 0.030 | 0.030 | | | | | | | | | 640 | | | | | |
| | Min. | | | 0.70 | | | | | | | | | | 245 | 490 | 18.0 | | 38.0 | | 187 |
| SUS F304 | Max. | 0.08 | 1.00 | 2.00 | 0.040 | 0.030 | 11.00 | 20.00 | | | | | 130under : 205 | | 520 | 43.0 | | 50.0 | | 187 |
| | Min. | | | | | | 8.00 | 18.00 | | | | | 130~200 : 205 | | 480 | 29.0 | | 45.0 | | 187 |
| SUS F304L | Max. | 0.03 | 1.00 | 2.00 | 0.040 | 0.030 | 13.00 | 20.00 | | | | | 130under : 175 | | 480 | 29.0 | | 50.0 | | 187 |
| | Min. | | | | | | 9.00 | 18.00 | | | | | 130~200 : 175 | | 450 | 29.0 | | 45.0 | | 187 |
| SUS F304H | Max. | 0.10 | 1.00 | 2.00 | 0.040 | 0.030 | 12.00 | 20.00 | | | | | 130under : 205 | | 520 | 43.0 | | 50.0 | | 187 |
| | Min. | 0.04 | | | | | 8.00 | 18.00 | | | | | 130~200 : 205 | | 480 | 29.0 | | 45.0 | | 187 |
| SUS F310 | Max. | 0.15 | 1.00 | 2.00 | 0.040 | 0.030 | 22.00 | 26.00 | | | | | 130under : 205 | | 520 | 34.0 | | 50.0 | | 187 |
| | Min. | | | | | | 19.00 | 24.00 | | | | | 130~200 : 205 | | 480 | 29.0 | | 45.0 | | 187 |
| SUS F316 | Max. | 0.08 | 1.00 | 2.00 | 0.040 | 0.030 | 14.00 | 18.00 | 3.00 | | | | 130under : 205 | | 520 | 43.0 | | 50.0 | | 187 |
| | Min. | | | | | | 10.00 | 16.00 | 2.00 | | | | 130~200 : 205 | | 480 | 29.0 | | 45.0 | | 187 |
| SUS F316L | Max. | 0.03 | 1.00 | 2.00 | 0.040 | 0.030 | 15.00 | 18.00 | 3.00 | | | | 130under : 175 | | 480 | 29.0 | | 50.0 | | 187 |
| | Min. | | | | | | 12.00 | 16.00 | 2.00 | | | | 130~200 : 175 | | 450 | 29.0 | | 45.0 | | 187 |
| SUS F316H | Max. | 0.10 | 1.00 | 2.00 | 0.010 | 0.030 | 14.00 | 18.00 | 3.00 | | | | 130under : 205 | | 520 | 43.0 | | 50.0 | | 187 |
| | Min. | 0.04 | | | | | 10.00 | 16.00 | 2.00 | | | | 130~200 : 205 | | 480 | 29.0 | | 45.0 | | 187 |
| SUS F317 | Max. | 0.08 | 1.00 | 2.00 | 0.040 | 0.030 | 15.00 | 20.00 | 4.00 | | | | 130under : 205 | | 520 | 29.0 | | 50.0 | | 187 |
| | Min. | | | | | | 11.00 | 18.00 | 3.00 | | | | 130~200 : 205 | | 480 | 29.0 | | 50.0 | | 187 |
| SUS F317L | Max. | 0.03 | 1.00 | 2.00 | 0.040 | 0.030 | 15.00 | 20.00 | 4.00 | | | | 130under : 175 | | 480 | 29.0 | | 50.0 | | 187 |
| | Min. | | | | | | 11.00 | 18.00 | 3.00 | | | | 130~200 : 175 | | 450 | 29.0 | | 50.0 | | 187 |
| SUS F321 | Max. | 0.08 | 1.00 | 2.00 | 0.040 | 0.030 | 12.00 | | Ti : 5*C%~0.60 | | | | 130under : 205 | | 520 | 43.0 | | 50.0 | | 187 |
| | Min. | | | | | | 9.00 | 17.00 | | | | | 130~200 : 205 | | 480 | 29.0 | | 45.0 | | 187 |
| SUS F347 | Max. | 0.08 | 1.00 | 2.00 | 0.040 | 0.030 | 13.00 | 20.00 | | | Nb : 10*C%~1.00 | | 130under : 205 | | 520 | 43.0 | | 50.0 | | 187 |
| | Min. | | | | | | 9.00 | 17.00 | | | | | 130~200 : 205 | | 480 | 29.0 | | 45.0 | | 187 |
| SUS F410A | Max. | 0.15 | 1.00 | 1.00 | 0.040 | 0.030 | 0.50 | 13.50 | | | | | | | | | | | | 187 |
| | Min. | | | | | | | 11.50 | | | | | | 275 | 480 | 16.0 | | 35.0 | | 143 |



# AWWA FLANGES

- Class B&D SO-RING
- Class E&F SO-RING
- Class D&E SO-HUB
- BLIND THICKNESS
- SPECIFICATIONS

# CLASS B&D SO-RING




## AWWA C207-01 STANDARD STEEL-RING FLANGES CLASS B*(86 PSI) AND CLASS D+(175-150 PSI)

Unit : mm

| Nominal Pipe Size | | Outside Diameter of Flange | Inside Diameter of Flange | Diameter of Bolt Circle | Number of Bolts | Diameter of Bolts | Thickness of Flange | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Class B | Class D |
| in. | mm | A | B | C | | | T | T |
| 4 | 100 | 228.6 | 116.1 | 190.5 | 8 | 15.9 | 15.9 | 15.9 |
| 5 | 125 | 254.0 | 143.8 | 215.9 | 8 | 19.1 | 15.9 | 15.9 |
| 6 | 150 | 279.4 | 170.7 | 241.3 | 8 | 19.1 | 17.5 | 17.5 |
| 8 | 200 | 342.9 | 221.5 | 298.5 | 8 | 19.1 | 17.5 | 17.5 |
| 10 | 250 | 406.4 | 276.4 | 362.0 | 12 | 22.2 | 17.5 | 17.5 |
| 12 | 300 | 482.6 | 327.2 | 431.8 | 12 | 22.2 | 17.5 | 20.6 |
| 14 | 350 | 533.4 | 360.4 | 476.3 | 12 | 25.4 | 17.5 | 23.8 |
| 16 | 400 | 596.9 | 411.2 | 539.8 | 16 | 25.4 | 17.5 | 25.4 |
| 18 | 450 | 635.0 | 462.0 | 577.9 | 16 | 28.6 | 17.5 | 27.0 |
| 20 | 500 | 698.5 | 512.8 | 635.0 | 20 | 28.6 | 17.5 | 28.6 |
| 22 | 550 | 749.3 | 563.6 | 692.2 | 20 | 31.8 | 19.1 | 30.2 |
| 24 | 600 | 812.8 | 614.4 | 749.3 | 20 | 31.8 | 19.1 | 31.8 |
| 26 | 650 | 870.0 | – | 806.5 | 24 | 31.8 | 20.6 | 33.3 |
| 28 | 700 | 927.1 | – | 863.6 | 28 | 31.8 | 22.2 | 33.3 |
| 30 | 750 | 984.3 | – | 914.4 | 28 | 31.8 | 22.2 | 34.9 |
| 32 | 800 | 1060.5 | – | 977.9 | 28 | 38.1 | 23.8 | 38.1 |
| 34 | 850 | 1111.3 | – | 1028.7 | 32 | 38.1 | 23.8 | 38.1 |
| 36 | 900 | 1168.4 | – | 1085.9 | 32 | 38.1 | 25.4 | 41.3 |
| 38 | 950 | 1238.3 | – | 1149.4 | 32 | 38.1 | 25.4 | 41.3 |
| 40 | 1000 | 1289.1 | – | 1200.2 | 36 | 38.1 | 25.4 | 41.3 |
| 42 | 1050 | 1346.2 | – | 1257.3 | 36 | 38.1 | 28.6 | 44.5 |
| 44 | 1100 | 1403.4 | – | 1314.5 | 40 | 38.1 | 28.6 | 44.5 |
| 46 | 1150 | 1454.2 | – | 1365.3 | 40 | 38.1 | 28.6 | 44.5 |
| 48 | 1200 | 1511.3 | – | 1422.4 | 44 | 38.1 | 31.8 | 47.6 |
| 50 | 1250 | 1568.5 | – | 1479.6 | 44 | 44.5 | 31.8 | 50.8 |
| 52 | 1300 | 1625.6 | – | 1536.7 | 44 | 44.5 | 31.8 | 50.8 |
| 54 | 1350 | 1682.8 | – | 1593.9 | 44 | 44.5 | 34.9 | 54.0 |
| 60 | 1500 | 1854.2 | – | 1759.0 | 52 | 44.5 | 38.1 | 57.2 |
| 66 | 1650 | 2032.0 | – | 1930.4 | 52 | 44.5 | 41.3 | 63.5 |
| 72 | 1800 | 2197.1 | – | 2095.5 | 60 | 44.5 | 44.5 | 66.7 |
| 78 | 1950 | 2362.2 | – | 2260.6 | 64 | 50.8 | 50.8 | 69.9 |
| 84 | 2100 | 2533.7 | – | 2425.7 | 64 | 50.8 | 50.8 | 73.0 |
| 90 | 2250 | 2705.1 | – | 2590.8 | 68 | 57.2 | 57.2 | 76.2 |
| 96 | 2400 | 2876.6 | – | 2755.9 | 68 | 57.2 | 57.2 | 82.6 |
| 102 | 2550 | 3048.0 | – | 2908.3 | 72 | 63.5 | 63.5 | 82.6 |
| 108 | 2700 | 3219.5 | – | 3067.1 | 72 | 63.5 | 63.5 | 85.7 |
| 114 | 2850 | 3390.9 | – | 3219.5 | 76 | 69.9 | 69.9 | 88.9 |
| 120 | 3000 | 3562.4 | – | 3371.9 | 76 | 69.9 | 69.9 | 88.9 |
| 126 | 3150 | 3733.8 | – | 3537.0 | 80 | 76.2 | 76.2 | 95.3 |
| 132 | 3300 | 3905.3 | – | 3702.1 | 80 | 76.2 | 76.2 | 98.4 |
| 138 | 3450 | 4076.7 | – | 3860.8 | 84 | 82.6 | 82.6 | 101.6 |
| 144 | 3600 | 4248.2 | – | 4019.6 | 84 | 82.6 | 82.6 | 104.8 |

Notes :

(1) Ring flanges may be overbored or counterbored to accommodate larger outside-diameter pipe than shown as nominal. This is done to allow a clear inside diameter after cement-mortar lining. Wrench clearance between the pipe OD and bolt circle must be maintained as well as sufficient gasket seating area.

(2) Metric conversion: nominal pipe size: in. x 25 = mm; dimensions: in. x 25.4 = mm; psi x 6.895 = kPa

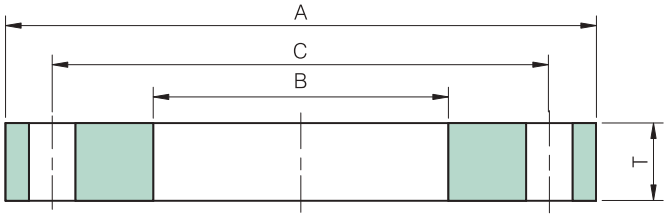
*Pressure rating at atmospheric temperature is 86 psi. These flanges have the same OD and drilling as class 125 cast-iron flanges (ANSI ASME B16.1). In sizes 24 in. and smaller, they also match ANSI/ASME B16.5 150 psi drilling for steel flanges.

+Pressure rating at atmospheric temperature: sizes 4-12 in. inclusive, 175 psi; sizes larger than 12 in., 150 psi. These flanges have the same diameter and drilling as class 125 cast-iron flanges (ANSI/ASME B16.1). In sizes 24 in.and smaller, they also match ANSI/ASME B16.5 150-psi standard for steel flanges.

+The purchaser shall specify the ID of the flange, dimension B, for nominal pipe sizes 26 in. and larger. The diameter of the flange bore shall not exceed the pipe OD by more than 0.19 in.

§ GBolt holes shall be drilled 1/8 in. larger in diameter than the nominal diameter of the bolt except as stated in Sec. 4.2.3.

# CLASS E&F SO-RING




## AWWA C207-01 STANDARD STEEL-RING FLANGES CLASS E*(275 PSI) AND CLASS F**(300 PSI)

Unit : mm

| Nominal Pipe Size | | Outside Diameter of Flange A | | Inside Diameter of Flange B | | Diameter of Bolt Circle C | | Number of Bolts | | Diameter of Bolts | | Thickness of Flange(T) T | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| in. | mm | CLASS E | CLASS F | CLASS E | CLASS F | CLASS E | CLASS F | CLASS E | CLASS F | CLASS E | CLASS F | CLASS E | CLASS F |
| 4 | 100 | 228.6 | 254.0 | 116.1 | 116.1 | 190.5 | 200.2 | 8 | 8 | 15.9 | 19.1 | 28.6 | 28.7 |
| 5 | 125 | 254.0 | 279.4 | 143.8 | 143.8 | 215.9 | 235.0 | 8 | 8 | 19.1 | 19.1 | 30.2 | 30.7 |
| 6 | 150 | 279.4 | 317.5 | 170.7 | 170.9 | 241.3 | 269.7 | 8 | 12 | 19.1 | 19.1 | 33.4 | 33.3 |
| 8 | 200 | 342.9 | 381.0 | 221.5 | 221.7 | 298.5 | 330.2 | 8 | 12 | 19.1 | 22.2 | 38.1 | 33.3 |
| 10 | 250 | 406.4 | 444.5 | 276.4 | 276.4 | 362.0 | 387.4 | 12 | 16 | 22.2 | 25.4 | 39.7 | 38.1 |
| 12 | 300 | 482.6 | 520.7 | 327.2 | 327.2 | 431.8 | 450.9 | 12 | 16 | 22.2 | 28.6 | 44.5 | 41.4 |
| 14 | 350 | 533.4 | 584.2 | 360.4 | 360.4 | 476.3 | 514.4 | 12 | 20 | 25.4 | 28.6 | 47.6 | 49.3 |
| 16 | 400 | 596.9 | 647.2 | 411.2 | 411.2 | 539.8 | 571.5 | 16 | 20 | 25.4 | 31.8 | 50.8 | 54.4 |
| 18 | 450 | 635.0 | 711.2 | 462.0 | 462.0 | 577.9 | 628.7 | 16 | 24 | 28.6 | 31.8 | 54.0 | 57.2 |
| 20 | 500 | 698.5 | 774.7 | 512.8 | 512.8 | 635.0 | 685.8 | 20 | 24 | 28.6 | 31.8 | 60.3 | 59.2 |
| 22 | 550 | 749.3 | 838.2 | 563.6 | 563.6 | 692.2 | 743.0 | 20 | 24 | 31.8 | 31.8 | 63.5 | 63.5 |
| 24 | 600 | 812.8 | 914.4 | 614.4 | 614.4 | 749.3 | 812.8 | 20 | 24 | 31.8 | 38.1 | 66.7 | 68.3 |
| 26 | 650 | 870.0 | 971.6 | – | 666.8 | 806.5 | 876.3 | 24 | 28 | 31.8 | 44.5 | 69.9 | 76.2 |
| 28 | 700 | 927.1 | 1035.1 | – | 717.6 | 863.6 | 939.8 | 28 | 28 | 31.8 | 44.5 | 69.9 | 79.5 |
| 30 | 750 | 984.3 | 1092.2 | – | 768.4 | 914.4 | 997.0 | 28 | 28 | 31.8 | 44.5 | 73.0 | 80.0 |
| 32 | 800 | 1060.5 | 1149.4 | – | 819.2 | 977.9 | 1054.1 | 28 | 28 | 38.1 | 44.5 | 76.2 | 82.6 |
| 34 | 850 | 1111.3 | 1206.5 | – | 870.0 | 1028.7 | 1104.9 | 32 | 28 | 38.1 | 44.5 | 76.2 | 85.9 |
| 36 | 900 | 1168.4 | 1270.0 | – | 920.8 | 1085.9 | 1168.4 | 32 | 32 | 38.1 | 50.8 | 79.4 | 87.9 |
| 38 | 950 | 1238.3 | 1327.2 | – | 971.6 | 1149.4 | 1219.2 | 32 | 32 | 38.1 | 50.8 | 79.4 | 88.9 |
| 40 | 1000 | 1289.1 | 1378.0 | – | 1022.4 | 1200.2 | 1276.4 | 36 | 36 | 38.1 | 50.8 | 82.6 | 92.2 |
| 42 | 1050 | 1346.2 | 1447.8 | – | 1073.2 | 1257.3 | 1339.9 | 36 | 36 | 38.1 | 50.8 | 85.7 | 96.8 |
| 44 | 1100 | 1403.4 | 1505.0 | – | 1124.0 | 1314.5 | 1397.0 | 40 | 36 | 38.1 | 50.8 | 85.7 | 101.6 |
| 46 | 1150 | 1454.2 | 1562.1 | – | 1174.8 | 1365.3 | 1454.2 | 40 | 40 | 38.1 | 50.8 | 87.3 | 104.9 |
| 48 | 1200 | 1511.3 | 1651.0 | – | 1225.6 | 1422.4 | 1543.1 | 44 | 40 | 38.1 | 50.8 | 88.9 | 114.3 |
| 50 | 1250 | 1568.5 | – | – | – | 1479.6 | – | 44 | – | 44.5 | – | 88.9 | – |
| 52 | 1300 | 1625.6 | – | – | – | 1536.7 | – | 44 | – | 44.5 | – | 92.1 | – |
| 54 | 1350 | 1682.8 | – | – | – | 1593.9 | – | 44 | – | 44.5 | – | 95.3 | – |
| 60 | 1500 | 1854.2 | – | – | – | 1759.0 | – | 52 | – | 44.5 | – | 98.4 | – |
| 66 | 1650 | 2032.0 | – | – | – | 1930.4 | – | 52 | – | 44.5 | – | 108.0 | – |
| 72 | 1800 | 2197.1 | – | – | – | 2095.5 | – | 60 | – | 44.5 | – | 111.1 | – |
| 78 | 1950 | 2362.2 | – | – | – | 2260.6 | – | 64 | – | 50.8 | – | 120.7 | – |
| 84 | 2100 | 2533.7 | – | – | – | 2425.7 | – | 64 | – | 50.8 | – | 120.7 | – |
| 90 | 2250 | 2705.1 | – | – | – | 2590.8 | – | 68 | – | 57.2 | – | 130.2 | – |
| 96 | 2400 | 2876.6 | – | – | – | 2755.9 | – | 68 | – | 57.2 | – | 130.2 | – |
| 102 | 2550 | 3048.0 | – | – | – | 2908.3 | – | 72 | – | 63.5 | – | 139.7 | – |
| 108 | 2700 | 3219.5 | – | – | – | 3067.1 | – | 72 | – | 63.5 | – | 139.7 | – |
| 114 | 2850 | 3390.9 | – | – | – | 3219.5 | – | 76 | – | 69.9 | – | 149.2 | – |
| 120 | 3000 | 3562.4 | – | – | – | 3371.9 | – | 76 | – | 69.9 | – | 149.2 | – |
| 126 | 3150 | 3733.8 | – | – | – | 3537.0 | – | 80 | – | 76.2 | – | 158.8 | – |
| 132 | 3300 | 3905.3 | – | – | – | 3702.1 | – | 80 | – | 76.2 | – | 158.8 | – |
| 138 | 3450 | 4076.7 | – | – | – | 3860.8 | – | 84 | – | 82.6 | – | 171.5 | – |
| 144 | 3600 | 4248.2 | – | – | – | 4019.6 | – | 84 | – | 82.6 | – | 171.5 | – |

Notes :

(1) Ring flanges may be overbored or counterbored to accommodate larger outside-diameter pipe than shown as nominal. This is done to allow a clear inside diameter after cement-mortar lining. Wrench clearance between the pipe OD and bolt circle must be maintained as well as sufficient gasket seating area.

(2) Metric conversion: nominal pipe size: in. x 25 = mm; dimensions: in. x 25.4 = mm; psi x 6.895 = kPa

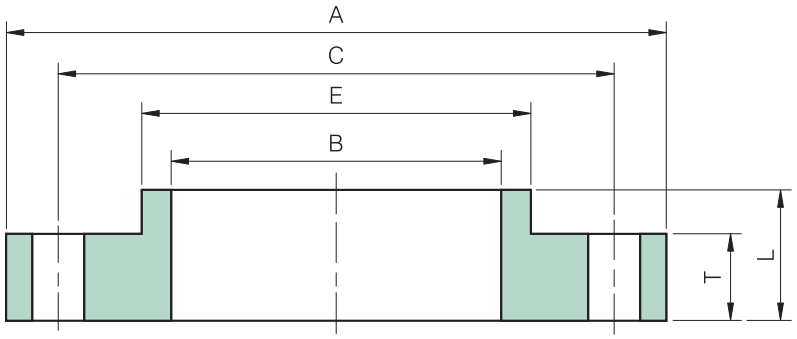
*Pressure rating at atmospheric temperature is 275 psi. These flanges have the same diameter and drilling as ASME B16.1, class 125 cast-iron flanges. In sizes 24 in. and smaller, they also match ASME B16.5, 150 psi standard for steel flanges.

**Pressure rating at atmospheric temperature is 300 psi. These flanges have the same diameter and drilling as ASME B16.2, class 250 cast iron pipe and flanged fittings.

+The purchaser shall specify the ID of the flange, dimension B, for nominal pipe sizes 26 in. and larger. It is recommended that this dimension be 3/it3 in. larger in diameter than the nominal OD of the pipe. (Class E)

§ GBolt holes shall be drilled 1/8 in. larger in diameter than the nominal diameter of the bolt as stated in Sec. 4.2.3.

# CLASS D&E SO-HUB




## AWWA C207-01 STANDARD STEEL-RING FLANGES CLASS D*(175-150 PSI) AND CLASS E**(275 PSI)

Unit : mm

| Nominal Pipe Size | | Outside Diameter of Flange | Inside Diameter of Flange | Diameter of Bolt Circle | Number of Bolts | Diameter of Bolts+ | Thickness of Flange | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | CLASS D | | | CLASS E | | |
| in. | mm | A | B | C | | | T | L | H | T§ | L | H |
| 4 | 100 | 228.6 | 116.1 | 190.5 | 8 | 15.9 | 12.7 | 22.2 | 134.9 | 23.8 | 33.3 | 134.9 |
| 5 | 125 | 254.0 | 143.8 | 215.9 | 8 | 19.1 | 14.3 | 31.8 | 160.3 | 23.8 | 36.5 | 163.5 |
| 6 | 150 | 279.4 | 170.7 | 241.3 | 8 | 19.1 | 14.3 | 31.8 | 192.1 | 25.4 | 39.7 | 192.1 |
| 8 | 200 | 342.9 | 221.5 | 298.5 | 8 | 19.1 | 14.3 | 31.8 | 246.1 | 28.6 | 44.5 | 246.1 |
| 10 | 250 | 406.4 | 276.4 | 362.0 | 12 | 22.2 | 17.5 | 31.8 | 304.8 | 30.2 | 49.2 | 304.8 |
| 12 | 300 | 482.6 | 327.2 | 431.8 | 12 | 22.2 | 17.5 | 31.8 | 365.1 | 31.8 | 55.6 | 365.1 |
| 14 | 350 | 533.4 | 360.4 | 476.3 | 12 | 25.4 | 19.1 | 31.8 | 400.1 | 34.9 | 57.2 | 400.1 |
| 16 | 400 | 596.9 | 411.2 | 539.8 | 16 | 25.4 | 19.1 | 31.8 | 457.2 | 36.5 | 63.5 | 457.2 |
| 18 | 450 | 635.0 | 462.0 | 577.9 | 16 | 28.6 | 19.1 | 31.8 | 504.8 | 39.7 | 68.3 | 504.8 |
| 20 | 500 | 698.5 | 512.8 | 635.0 | 20 | 28.6 | 19.1 | 31.8 | 558.8 | 42.9 | 73.0 | 558.8 |
| 22 | 550 | 749.3 | 563.6 | 692.2 | 20 | 31.8 | 25.4 | 44.5 | 616.0 | 46.0 | 79.4 | 609.6 |
| 24 | 600 | 812.8 | 614.4 | 749.3 | 20 | 31.8 | 25.4 | 44.5 | 663.6 | 47.6 | 82.6 | 663.6 |
| 26 | 650 | 870.0 | 665.2 | 806.5 | 24 | 31.8 | 25.4 | 44.5 | 723.9 | 50.8 | 85.7 | 723.9 |
| 28 | 700 | 927.1 | 716.0 | 863.6 | 28 | 31.8 | 25.4 | 44.5 | 774.7 | 52.4 | 87.3 | 781.1 |
| 30 | 750 | 984.3 | 766.8 | 914.4 | 28 | 31.8 | 25.4 | 44.5 | 825.5 | 54.0 | 88.9 | 831.9 |
| 32 | 800 | 1060.5 | 817.6 | 977.9 | 28 | 38.1 | 28.6 | 44.5 | 882.7 | 57.2 | 92.1 | 889.0 |
| 34 | 850 | 1111.3 | 868.4 | 1028.7 | 32 | 38.1 | 28.6 | 44.5 | 933.5 | 58.7 | 93.7 | 939.8 |
| 36 | 900 | 1168.4 | 919.2 | 1085.9 | 32 | 38.1 | 28.6 | 44.5 | 984.3 | 60.3 | 95.3 | 997.0 |
| 38 | 950 | 1238.3 | 970.0 | 1149.4 | 32 | 38.1 | 28.6 | 44.5 | 1035.1 | 60.3 | 95.3 | 1060.5 |
| 40 | 1000 | 1289.1 | 1020.8 | 1200.2 | 36 | 38.1 | 28.6 | 44.5 | 1092.2 | 63.5 | 98.4 | 1111.3 |
| 42 | 1050 | 1346.2 | 1071.6 | 1257.3 | 36 | 38.1 | 31.8 | 44.5 | 1143.0 | 66.7 | 101.6 | 1168.4 |
| 44 | 1100 | 1403.4 | 1122.4 | 1314.5 | 40 | 38.1 | 31.8 | 57.2 | 1193.8 | 66.7 | 101.6 | 1219.2 |
| 46 | 1150 | 1454.2 | 1173.2 | 1365.3 | 40 | 38.1 | 31.8 | 57.2 | 1244.6 | 68.3 | 103.2 | 1270.0 |
| 48 | 1200 | 1511.3 | 1224.0 | 1422.4 | 44 | 38.1 | 34.9 | 63.5 | 1295.4 | 69.9 | 104.8 | 1327.2 |
| 50 | 1250 | 1568.5 | 1274.8 | 1479.6 | 44 | 44.5 | 34.9 | 63.5 | 1346.2 | 69.9 | 104.8 | 1378.0 |
| 52 | 1300 | 1625.6 | 1325.6 | 1536.7 | 44 | 44.5 | 34.9 | 63.5 | 1397.0 | 73.0 | 108.0 | 1435.1 |
| 54 | 1350 | 1682.8 | 1376.4 | 1593.9 | 44 | 44.5 | 34.9 | 63.5 | 1447.8 | 76.2 | 111.1 | 1492.3 |
| 60 | 1500 | 1854.2 | 1528.8 | 1759.0 | 52 | 44.5 | 38.1 | 69.9 | 1600.2 | 79.4 | 114.3 | 1657.4 |
| 66 | 1650 | 2032.0 | 1681.2 | 1930.4 | 52 | 44.5 | 38.1 | 69.9 | 1752.6 | 85.7 | 123.8 | 1816.1 |
| 72 | 1800 | 2197.1 | 1833.6 | 2095.5 | 60 | 44.5 | 38.1 | 69.9 | 1905.0 | 88.9 | 127.0 | 1993.9 |
| 78 | 1950 | 2362.2 | 1986.0 | 2260.6 | 64 | 50.8 | 44.5 | 76.2 | 2063.8 | 98.4 | 136.5 | 2146.3 |
| 84 | 2100 | 2533.7 | 2138.4 | 2425.7 | 64 | 50.8 | 44.5 | 76.2 | 2222.5 | 98.4 | 136.5 | 2298.7 |
| 90 | 2250 | 2705.1 | 2290.8 | 2590.8 | 68 | 57.2 | 50.8 | 82.6 | 2381.3 | 108.0 | 146.1 | 2457.5 |
| 96 | 2400 | 2876.6 | 2443.2 | 2755.9 | 68 | 57.2 | 50.8 | 82.6 | 2540.0 | 108.0 | 146.1 | 2609.9 |

Notes :

(1) Hub flanges are to be used on pipe that has an OD equal to the nominal pipe size in the first column and shall not be overbored

(2) Metric conversion: nominal pipe size: in. x 25 = mm; dimensions: in. x 25.4 = mm; psi x 6.895 = kPa.

*Pressure rating at atmospheric temperature:sizes 4–12 in. inclusive, 175 psi; sizes larger than 12 in., 150 psi. These Flanges have the diameter and drilling as class 125 cast–iron flanges (ANSI/ASME B16.1). In sizes 24 in. and smaller,they also match ANSI/ASME B16.5 150–psi standard for steel flanges.

**Pressure rating at atmospheric temperature is 275 psi. These flanges have he same diameter and drilling as ASME B16.1, class 125 cast–iron flanges. In sizes 24 in. and smaller, they also match ASME B16.5, 150 psi standard for steel flanges.

+Bolt holes shall be drilled 1/8in. larger in diameter than the nominal diameter of the bolt as stated in Sec.4.2.3.

+Welding neck flanges may be used if desired, at the purchaser's option. (Class E)

§ GThe thickness T of a flange from which the raised face has been removed, shall be no less than Dimension T minus 0.06 in.

# BLIND THICKNESS

## AWWA C207-01 BLIND FLANGE THICKNESS

Unit : mm

| Nominal Pipe Size | | Mating Flange ID | Minimum Thickness* | | | |
|---|---|---|---|---|---|---|
| | | | Class B | Class D+ | Class E | Class F |
| in. | mm | | 86psi | 175–150psi | 275psi | 300psi |
| 4 | 100 | 116 | 15.88 | 15.88 | 28.58 | 28.70 |
| 5 | 125 | 144 | 15.88 | 16.51 | 30.18 | 30.73 |
| 6 | 150 | 171 | 17.48 | 17.59 | 33.35 | 33.27 |
| 8 | 200 | 221 | 17.48 | 20.62 | 38.10 | 33.27 |
| 10 | 250 | 276 | 17.48 | 24.21 | 39.70 | 38.10 |
| 12 | 300 | 327 | 18.26 | 28.37 | 44.45 | 41.40 |
| 14 | 350 | 360 | 20.10 | 28.78 | 47.63 | 49.28 |
| 16 | 400 | 411 | 22.66 | 32.13 | 50.80 | 54.36 |
| 18 | 450 | 462 | 24.13 | 33.81 | 53.98 | 57.15 |
| 20 | 500 | 513 | 26.42 | 36.77 | 60.33 | 59.18 |
| 22 | 550 | 564 | 28.74 | 39.83 | 63.50 | 63.50 |
| 24 | 600 | 648 | 30.89 | 42.18 | 66.68 | 68.53 |
| 26 | 650 | 699 | 33.20 | 45.37 | 69.85 | 76.20 |
| 28 | 700 | 749 | 35.50 | 48.40 | 69.85 | 79.50 |
| 30 | 750 | 800 | 37.53 | 51.00 | 73.03 | 80.42 |
| 32 | 800 | 851 | 40.16 | 54.60 | 76.20 | 84.62 |
| 34 | 850 | 902 | 42.19 | 57.21 | 77.46 | 88.25 |
| 36 | 900 | 956 | 44.48 | 60.20 | 81.51 | 93.25 |
| 38 | 950 | 1006 | 47.06 | 63.66 | 86.20 | 96.90 |
| 40 | 1000 | 1057 | 49.09 | 66.28 | 89.74 | 101.40 |
| 42 | 1050 | 1108 | 51.40 | 69.32 | 93.86 | 105.92 |
| 44 | 1100 | 1159 | 53.70 | 72.36 | 97.97 | 110.19 |
| 46 | 1150 | 1210 | 55.73 | 74.99 | 101.53 | 114.43 |
| 48 | 1200 | 1260 | 58.03 | 78.03 | 105.65 | 121.44 |
| 50 | 1250 | 1314 | 60.38 | 81.17 | 109.90 | – |
| 52 | 1300 | 1365 | 62.69 | 84.21 | 114.02 | – |
| 54 | 1350 | 1416 | 64.99 | 87.25 | 118.14 | – |
| 60 | 1500 | 1568 | 71.63 | 95.97 | 129.95 | – |
| 66 | 1650 | 1724 | 78.53 | 105.06 | 142.26 | – |
| 72 | 1800 | 1876 | 85.17 | 113.80 | 154.08 | – |

Notes :

(1) All flanges are flat faced.
(2) ASTM A–36 steel used (allowable stress 16,000 psi)
(3) ASTM A–307 Grade B bolts (7,000 psi allowable stress) used for class B and D.
(4) ASTM A–193 Grade B7 bolts (25,000 psi allowable stress) used for class E and F.
(5) For diameters over 48 in., designers should consider using dished heads welded to a standard flange.
*Design Method : ASME Boiler & Pressure Vessel Code, Sec. VIII, Div. 1.
+Class D flanges are rated at 175 psi (1,207 kPa) for nominal pipe size≤12 in. (600 mm), and 150 psi (1,034 kPa) for norminal pipe size 12 in.(600 mm)

# AWWA C207-01 SPECIFICATIONS

Steel pipe Flanges for Waterworks Service-Size 4 in. Through 144 in.(100mm through 3.600mm)
-Revision of ANSI/AWWA C207-97

## 1. MATERIALS

(1) Flanges. Flanges shall be made from seamless forgings, cut from plate as a single piece, welded bar rings, or segmented and welded plates.
1). Forgings. forgings shall meet te the minimum requirements of ASTM A105 or A181.
2). Steel plate or bar. steel plate or bar used in the manufacture of flanges shall meet the following requirements.
1. Tensile strength = 50,000 psi (345 MPa)(min)
2. Yield strength = 32,000 psi (221 Mpa)(min)
3. Carbon (max) = 0.29 percen.
4. Phosphorous (max) = 0.04 percent.
5. Sulfur (max) = 0.05 percent.

The following plate designtions will meet the previously listed requirements :
① ASTM A36.
② ASTM A516, grade 60,65, or 70.



## 2. TOLERANCES

The dimensions listed in Tables 2 through 7 (following Sec.6.1)
shall apply prior to attachment and subject to the following tolerances:

| | |
|---|---|
| 2.1 Inside diameter of flange | + 1/16 in. (1.6mm), –0 |
| 2.2 Outside diameter of flange | ± 1/8 in. (3.2 mm) |
| 2.3 Thickness of flanges 18 in. (450 mm) and smaller | + 1/8 in. (3.2 mm), –0 |
| 2.4 Thickness of flanges 20 in. (500 mm) and larger | + 3/16 in. (4.8 mm), –0 |
| 2.5 Length throught hub 18 in. (450 mm) and smaller | + 1/8 in. (3.2 mm) |
| | – 1/32 in. (0.79 mm) |
| 2.6 Length through hub 20 in. (500 mm) and larger | + 3/16 in. (4.8 mm) |
| | – 1/16 in. (1.6mm) |
| 2.7 Bolt–circle diameter | ± 1/16 in. (1.6 mm) |
| 2.8 Bolt–hole spacing | ± 1/32 in. (0.79 mm) |

## 3. FACING

Flanges of all classes shall be flat faced-that is, without projecton or raised face.
Either a serrated concentric or serrated spiral finish having from 24 groovedin.
to 40 groovedin. (0.94 to 2.17 grooves/mm) shall be used.
The cutting tool employed shall have an approximate 0.06 in. (1.52mm) or larger radius.
The resultant surface finish shall have a 250-to 500-pin. (6.35-to 12.7-pm) roughness.

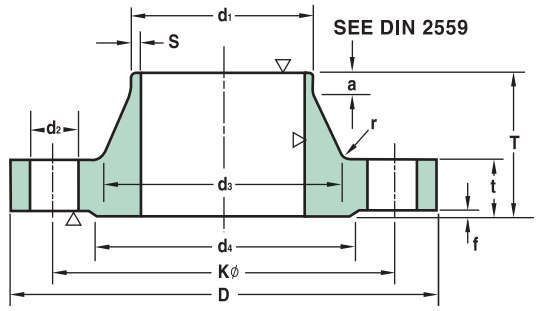


# DIN FLANGES

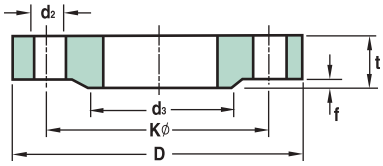
- 6-BAR (DIN 2573, 2527, 2631)
- 10-BAR (DIN 2576, 2527, 2632)
- 16-BAR (DIN 2543, 2527, 2633)
- 25-BAR (DIN 2544, 2527, 2634)
- 40-BAR (DIN 2545, 2527, 2635)

# DIN 6BAR

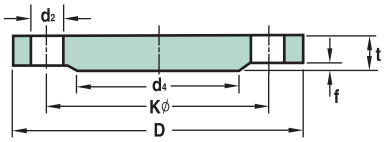
WELDING NECK




SLIP–ON




BLIND




## DIN 2573 SLIP - ON FLANGES
## DIN 2527 BLIND FLANGES
## DIN 2631 WELDING NECK FLANGES

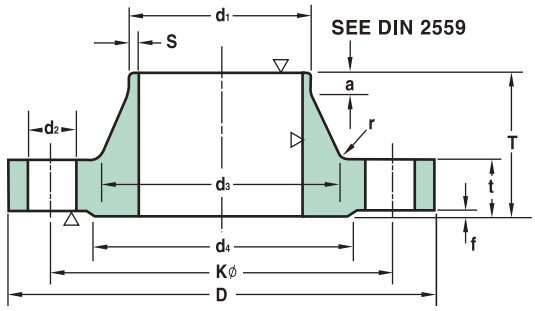
Unit : mm

| SIZE | | | Common Dimension | | | | | | Hub | | | | Radised Face | | Drilling | | | | Approx. Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nomi–nal Bore | $d_1$ | | D | t | | | kø | T | $d_3$ | s | r | a | $d_4$ | f | Num–ber of Bolt | Dia. of Bolt | | $d_2$ | DIN 2573 | DIN 2631 |
| | | * | | Weld–ing Neck | Slip–on | Blind | | | * / ANSI | | | | | | | | | | | |
| 10 | 17.2 | 14 | 75 | 12 | 12 | 12 | 50 | 28 | 22 26 | 1.8 | 4 | 6 | 35 | 2 | 4 | M10 | – | 11 | 0.363 | 0.335 |
| 15 | 21.3 | 20 | 80 | 12 | 12 | 12 | 55 | 30 | 28 30 | 2 | 4 | 6 | 40 | 2 | 4 | M10 | – | 11 | 0.41 | 0.392 |
| 20 | 26.9 | 25 | 90 | 14 | 14 | 14 | 65 | 32 | 35 38 | 2.3 | 4 | 6 | 50 | 2 | 4 | M10 | – | 11 | 0.6 | 0.592 |
| 25 | 33.7 | 30 | 100 | 14 | 14 | 14 | 75 | 35 | 40 42 | 2.6 | 4 | 6 | 60 | 2 | 4 | M10 | – | 11 | 0.74 | 0.747 |
| 32 | 42.4 | 38 | 120 | 14 | 16 | 14 | 90 | 35 | 50 55 | 2.6 | 6 | 6 | 70 | 2 | 4 | M12 | (1/2") | 14 | 1.19 | 1.05 |
| 40 | 48.3 | 44.5 | 130 | 14 | 16 | 14 | 100 | 38 | 58 62 | 2.6 | 6 | 7 | 80 | 3 | 4 | M12 | (1/2") | 14 | 1.39 | 1.18 |
| 50 | 60.3 | 57 | 140 | 14 | 16 | 14 | 110 | 38 | 70 74 | 2.9 | 6 | 8 | 90 | 3 | 4 | M12 | (1/2") | 14 | 1.53 | 1.34 |
| 65 | 76.1 | – | 160 | 14 | 16 | 14 | 130 | 38 | 88 | 2.9 | 6 | 9 | 110 | 2 | 4 | M12 | (1/2") | 14 | 1.89 | 1.67 |
| 80 | 88.9 | – | 190 | 16 | 18 | 16 | 150 | 42 | 102 | 3.2 | 8 | 10 | 128 | 3 | 4 | M16 | (5/8") | 18 | 2.98 | 2.71 |
| 100 | 114.3 | 108 | 210 | 16 | 18 | 16 | 170 | 45 | 122 130 | 3.6 | 8 | 10 | 148 | 3 | 4 | M16 | (5/8") | 18 | 3.46 | 3.24 |
| 125 | 139.7 | 133 | 240 | 18 | 20 | 18 | 200 | 48 | 148 155 | 4 | 8 | 10 | 178 | 3 | 8 | M16 | (5/8") | 18 | 4.6 | 4.49 |
| 150 | 168.3 | 159 | 265 | 18 | 20 | 18 | 225 | 48 | 172 184 | 4.5 | 10 | 12 | 202 | 3 | 8 | M16 | (5/8") | 18 | 5.22 | 5.15 |
| 200 | 219.1 | – | 320 | 20 | 22 | 20 | 280 | 55 | 236 | 5.9 | 10 | 15 | 258 | 3 | 8 | M16 | (5/8") | 18 | 7.15 | 7.78 |
| 250 | 273 | 267 | 375 | 22 | 24 | 22 | 335 | 60 | 282 290 | 6.3 | 12 | 15 | 312 | 3 | 12 | M16 | (5/8") | 18 | 9.61 | 10.8 |
| 300 | 323.9 | – | 440 | 22 | 24 | 22 | 395 | 62 | 342 | 7.1 | 12 | 15 | 365 | 4 | 12 | M20 | (3/4") | 22 | 12.6 | 14.0 |
| 350 | 355.6 | 368 | 490 | 22 | 26 | 22 | 445 | 62 | 385 | 7.1 | 12 | 15 | 415 | 4 | 12 | M20 | (3/4") | 22 | 15.6 | 18.5 |
| 400 | 406.4 | 419 | 540 | 22 | 28 | 22 | 495 | 65 | 438 | 7.1 | 12 | 15 | 465 | 4 | 16 | M20 | (3/4") | 22 | 18.4 | 21.2 |
| 500 | 508 | – | 645 | 24 | 30 | 24 | 600 | 68 | 538 | 7.1 | 12 | 15 | 570 | 4 | 20 | M20 | (3/4") | 22 | 24.5 | 28.6 |
| 600 | 610 | – | 755 | 24 | – | – | 705 | 70 | 640 | 7.1 | 12 | 16 | 670 | 5 | 20 | M24 | (7/8") | 26 | – | 31.5 |
| 700 | 711 | – | 860 | 24 | – | – | 810 | 70 | 740 | 7.1 | 12 | 16 | 775 | 5 | 24 | M24 | (7/8") | 26 | – | 37.4 |
| 800 | 813 | – | 975 | 24 | – | – | 920 | 70 | 842 | 7.1 | 12 | 16 | 880 | 5 | 24 | M27 | (1") | 30 | – | 46.1 |
| 900 | 914 | – | 1075 | 26 | – | – | 1020 | 70 | 942 | 7.1 | 12 | 16 | 980 | 5 | 24 | M27 | (1") | 30 | – | 55.6 |
| 1000 | 1016 | – | 1175 | 26 | – | – | 1120 | 70 | 1045 | 7.1 | 16 | 16 | 1080 | 5 | 28 | M27 | (1") | 30 | – | 61.9 |

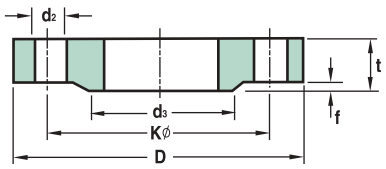
*Dimensions are only used in Germany

# DIN 10BAR

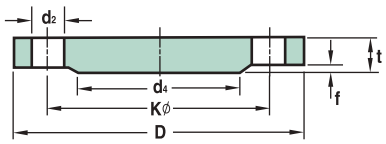
WELDING NECK




SLIP–ON




BLIND




## DIN 2576 SLIP - ON FLANGES
## DIN 2527 BLIND FLANGES
## DIN 2632 WELDING NECK FLANGES

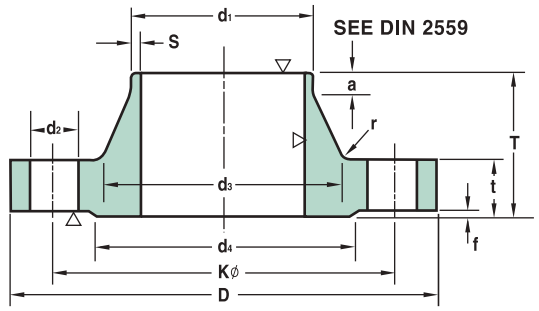
Unit : mm

| SIZE | | | Common Dimension | | | | | | Hub | | | | Radised Face | | Drilling | | | | Approx. Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nomi–nal Bore | d1 | | D | t | | | kø | T | d3 | s | r | a | d4 | f | Num–ber of Bolt | Dia. of Bolt | | d2 | DIN 2576 | DIN 2632 |
| | | * | | Weld–ing Neck | Slip–on | Blind | | | * / ANSI | | | | | | | | | | | |
| 10 | 17.2 | 14 | 90 | 14 | 14 | 14 | 60 | 35 | 25 28 | 1.8 | 4 | 6 | 40 | 2 | 4 | M12 | (1/2") | 14 | 0.605 | 0.58 |
| 15 | 21.3 | 20 | 95 | 14 | 14 | 14 | 65 | 35 | 30 32 | 2 | 4 | 6 | 45 | 2 | 4 | M12 | (1/2") | 14 | 0.669 | 0.648 |
| 20 | 26.9 | 25 | 105 | 16 | 16 | 16 | 75 | 38 | 38 40 | 2.3 | 4 | 6 | 58 | 2 | 4 | M12 | (1/2") | 14 | 0.936 | 0.952 |
| 25 | 33.7 | 30 | 115 | 16 | 16 | 16 | 85 | 38 | 42 45 | 2.6 | 4 | 6 | 68 | 2 | 4 | M12 | (1/2") | 14 | 1.11 | 1.14 |
| 32 | 42.4 | 38 | 140 | 16 | 16 | 16 | 100 | 40 | 52 56 | 2.6 | 6 | 6 | 78 | 2 | 4 | M16 | (5/8") | 18 | 1.62 | 1.69 |
| 40 | 48.3 | 44.5 | 150 | 16 | 16 | 16 | 110 | 42 | 60 64 | 2.6 | 6 | 7 | 88 | 3 | 4 | M16 | (5/8") | 18 | 1.86 | 1.86 |
| 50 | 60.3 | 57 | 165 | 18 | 18 | 18 | 125 | 45 | 72 75 | 2.9 | 6 | 8 | 102 | 3 | 4 | M16 | (5/8") | 18 | 2.47 | 2.53 |
| 65 | 76 | – | 185 | 18 | 18 | 18 | 145 | 45 | 90 | 2.9 | 6 | 10 | 122 | 3 | 4 | M16 | (5/8") | 18 | 3 | 3.06 |
| 80 | 88.9 | – | 200 | 20 | 20 | 20 | 160 | 50 | 105 | 3.2 | 8 | 10 | 138 | 3 | 8 | M16 | (5/8") | 18 | 3.79 | 3.7 |
| 100 | 114.3 | 108 | 220 | 20 | 20 | 20 | 180 | 52 | 125 131 | 3.6 | 8 | 12 | 158 | 3 | 8 | M16 | (5/8") | 18 | 4.03 | 4.62 |
| 125 | 139.7 | 133 | 250 | 22 | 22 | 22 | 210 | 55 | 150 156 | 4 | 8 | 12 | 188 | 3 | 8 | M16 | (5/8") | 18 | 5.46 | 6.3 |
| 150 | 168.3 | 159 | 285 | 22 | 22 | 22 | 240 | 55 | 175 184 | 4.5 | 10 | 12 | 212 | 3 | 8 | M20 | (3/4") | 22 | 6.57 | 7.75 |
| 200 | 219.1 | – | 340 | 24 | 24 | 24 | 295 | 62 | 235 | 5.9 | 10 | 16 | 268 | 3 | 8 | M20 | (3/4") | 22 | 9.31 | 11.3 |
| 250 | 273 | 267 | 395 | 26 | 26 | 26 | 350 | 68 | 285 292 | 6.3 | 12 | 16 | 320 | 3 | 12 | M20 | (3/4") | 22 | 11.9 | 14.7 |
| 300 | 323.9 | – | 445 | 26 | 26 | 26 | 400 | 68 | 344 | 7.1 | 12 | 16 | 370 | 4 | 12 | M20 | (3/4") | 22 | 13.8 | 17.4 |
| 350 | 355.6 | 368 | 505 | 26 | 28 | 26 | 460 | 68 | 385 | 7.1 | 12 | 16 | 430 | 4 | 16 | M20 | (3/4") | 22 | 20.6 | 23.6 |
| 400 | 406.4 | 419 | 565 | 26 | 32 | 26 | 515 | 72 | 440 | 7.1 | 12 | 16 | 482 | 4 | 16 | M24 | (7/8") | 26 | 27.9 | 28.6 |
| 500 | 508 | – | 670 | 28 | 38 | 28 | 620 | 75 | 542 | 7.1 | 12 | 16 | 585 | 4 | 20 | M24 | (7/8") | 26 | 41.1 | 38.1 |
| 600 | 610 | – | 780 | 28 | – | – | 725 | 80 | 642 | 7.1 | 12 | 18 | 685 | 5 | 20 | M27 | (1") | 30 | – | 44.6 |
| 700 | 711 | – | 895 | 30 | – | – | 840 | 80 | 745 | 8 | 12 | 18 | 800 | 5 | 24 | M27 | (1") | 30 | – | 62.4 |
| 800 | 813 | – | 1015 | 32 | – | – | 950 | 90 | 850 | 8 | 12 | 18 | 905 | 5 | 24 | M30 | (1 1/8") | 33 | – | 84.1 |
| 900 | 914 | – | 1115 | 34 | – | – | 1050 | 95 | 950 | 10 | 12 | 20 | 1005 | 5 | 28 | M30 | (1 1/8") | 33 | – | 98.5 |
| 1000 | 1016 | – | 1230 | 34 | – | – | 1160 | 95 | 1052 | 10 | 16 | 20 | 1110 | 5 | 28 | M33 | (1 1/8") | 36 | – | 115 |

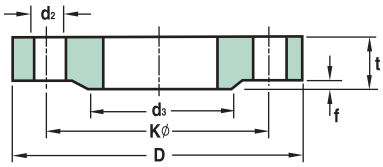
*Dimensions are only used in Germany

# DIN 16BAR

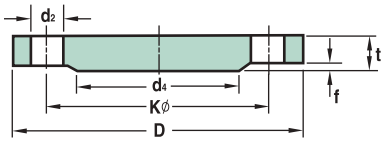
WELDING NECK




SLIP–ON




BLIND




## DIN 2543 SLIP - ON FLANGES
## DIN 2527 BLIND FLANGES
## DIN 2633 WELDING NECK FLANGES

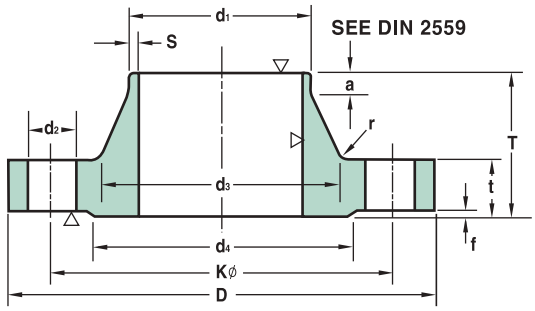
Unit : mm

| SIZE | | | Common Dimension | | | | | | Hub | | | | Radised Face | | Drilling | | | | Approx. Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nomi–nal Bore | $d_1$ | | D | t | | | kø | T | $d_3$ | s | r | a | $d_4$ | f | Num–ber of Bolt | Dia. of Bolt | | $d_2$ | DIN 2543 | DIN 2633 |
| | | * | | Welding Neck | Slip–on | Blind | | | * | | | | | | | | | | | |
| | | | | | | | | | ANSI | | | | | | | | | | | |
| 10 | 17.2 | 14 | 90 | 14 | 14 | 14 | 60 | 35 | 25<br>28 | 1.8 | 4 | 6 | 40 | 2 | 4 | M12 | (1/2") | 14 | 0.63 | 0.58 |
| 15 | 21.3 | 20 | 95 | 14 | 14 | 14 | 65 | 35 | 30<br>32 | 2 | 4 | 6 | 45 | 2 | 4 | M12 | (1/2") | 14 | 0.72 | 0.648 |
| 20 | 26.9 | 25 | 105 | 16 | 16 | 16 | 75 | 38 | 38<br>40 | 2.3 | 4 | 6 | 58 | 2 | 4 | M12 | (1/2") | 14 | 1.01 | 0.952 |
| 25 | 33.7 | 30 | 115 | 16 | 16 | 16 | 85 | 38 | 42<br>45 | 2.6 | 4 | 6 | 68 | 2 | 4 | M12 | (1/2") | 14 | 1.23 | 1.14 |
| 32 | 42.4 | 38 | 140 | 16 | 16 | 16 | 100 | 40 | 52<br>56 | 2.6 | 6 | 6 | 78 | 2 | 4 | M16 | (5/8") | 18 | 1.8 | 1.69 |
| 40 | 48.3 | 44.5 | 150 | 16 | 16 | 16 | 110 | 42 | 60<br>64 | 2.6 | 6 | 7 | 88 | 3 | 4 | M16 | (5/8") | 18 | 2.09 | 1.86 |
| 50 | 60.3 | 57 | 165 | 18 | 18 | 18 | 125 | 45 | 72<br>75 | 2.9 | 6 | 8 | 102 | 3 | 4 | M16 | (5/8") | 18 | 2.88 | 2.53 |
| 65 | 76 | – | 185 | 18 | 18 | 18 | 145 | 45 | 90 | 2.9 | 6 | 10 | 122 | 3 | 4 | M16 | (5/8") | 18 | 3.66 | 3.06 |
| 80 | 88.9 | – | 200 | 20 | 20 | 20 | 160 | 50 | 105 | 3.2 | 8 | 10 | 138 | 3 | 8 | M16 | (5/8") | 18 | 4.77 | 3.7 |
| 100 | 114.3 | 108 | 220 | 20 | 20 | 20 | 180 | 52 | 125<br>131 | 3.6 | 8 | 12 | 158 | 3 | 8 | M16 | (5/8") | 18 | 5.65 | 4.62 |
| 125 | 139.7 | 133 | 250 | 22 | 22 | 22 | 210 | 55 | 150<br>156 | 4 | 8 | 12 | 188 | 3 | 8 | M16 | (5/8") | 18 | 8.42 | 6.3 |
| 150 | 168.3 | 159 | 285 | 22 | 22 | 22 | 240 | 55 | 175<br>184 | 4.5 | 10 | 12 | 212 | 3 | 8 | M20 | (3/4") | 22 | 10.4 | 7.75 |
| 200 | 219.1 | – | 340 | 24 | 24 | 24 | 295 | 62 | 235 | 5.9 | 10 | 16 | 268 | 3 | 12 | M20 | (3/4") | 22 | 16.1 | 11 |
| 250 | 273 | 267 | 405 | 26 | 26 | 26 | 355 | 70 | 285<br>292 | 6.3 | 12 | 16 | 320 | 3 | 12 | M24 | (7/8") | 26 | 24.9 | 15.6 |
| 300 | 323.9 | – | 460 | 28 | 28 | 28 | 410 | 78 | 344 | 7.1 | 12 | 16 | 378 | 4 | 12 | M24 | (7/8") | 26 | 35.1 | 22 |
| 350 | 355.6 | 368 | 520 | 30 | 30 | 30 | 470 | 82 | 390 | 8 | 12 | 16 | 438 | 4 | 16 | M24 | (7/8") | 26 | 47.8 | 28.8 |
| 400 | 406.4 | 419 | 580 | 32 | 32 | 32 | 525 | 85 | 445 | 8 | 12 | 16 | 490 | 4 | 16 | M27 | (1") | 30 | 63.5 | 36.3 |
| 500 | 508 | – | 715 | 34 | 36 | 36 | 650 | 90 | 548 | 8 | 12 | 16 | 610 | 4 | 20 | M30 | (1 1/8") | 33 | 102 | 61.0 |
| 600 | 610 | – | 840 | 36 | 40 | – | 770 | 95 | 652 | 8.8 | 12 | 18 | 725 | 5 | 20 | M33 | (1 1/4") | 36 | – | 75.4 |
| 700 | 711 | – | 910 | 36 | – | – | 840 | 100 | 755 | 8.8 | 12 | 18 | 795 | 5 | 24 | M33 | (1 1/4") | 36 | – | 77.0 |
| 800 | 813 | – | 1025 | 38 | – | – | 950 | 105 | 855 | 10 | 12 | 20 | 900 | 5 | 24 | M36 | (1 3/8") | 39 | – | 101 |
| 900 | 914 | – | 1125 | 40 | – | – | 1050 | 110 | 955 | 10 | 12 | 20 | 1000 | 5 | 28 | M36 | (1 3/8") | 39 | – | 122 |
| 1000 | 1016 | – | 1255 | 42 | – | – | 1170 | 120 | 1058 | 10 | 16 | 22 | 1115 | 5 | 28 | M39 | (1 1/2") | 42 | – | 162 |

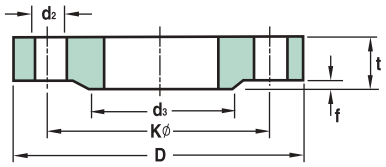
*Dimensions are only used in Germany

# DIN 25BAR

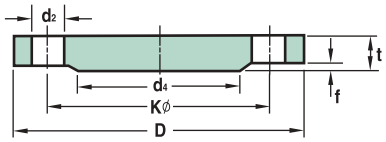
WELDING NECK




SLIP–ON




BLIND




## DIN 2544 SLIP - ON FLANGES
## DIN 2527 BLIND FLANGES
## DIN 2634 WELDING NECK FLANGES

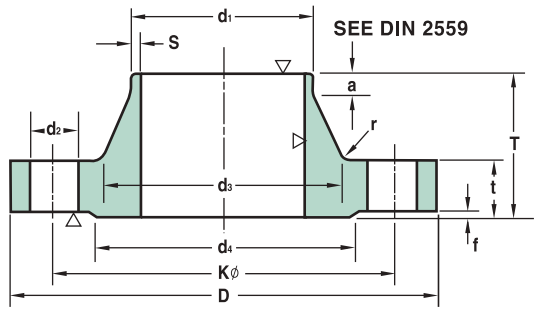
Unit : mm

| SIZE | | | Common Dimension | | | | | | Hub | | | | Radised Face | | Drilling | | | | Approx. Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nomi–nal Bore | $d_1$ | | D | t | | | k ø | T | $d_3$ | s | r | a | $d_4$ | f | Num–ber of Bolt | Dia. of Bolt | | $d_2$ | DIN 2544 | DIN 2634 |
| | | * | | Weld–ing Neck | Slip–on | Blind | | | * / ANSI | | | | | | | | | | | |
| 10 | 17.2 | 14 | 90 | 16 | 16 | 16 | 60 | 35 | 25 / 28 | 1.8 | 4 | 6 | 40 | 2 | 4 | M12 | (1/2") | 14 | 0.72 | 0.661 |
| 15 | 21.3 | 20 | 95 | 16 | 16 | 16 | 65 | 38 | 30 / 32 | 2 | 4 | 6 | 45 | 2 | 4 | M12 | (1/2") | 14 | 0.81 | 0.746 |
| 20 | 26.9 | 25 | 105 | 18 | 18 | 18 | 75 | 40 | 38 / 40 | 2.3 | 4 | 6 | 58 | 2 | 4 | M12 | (1/2") | 14 | 1.24 | 1.06 |
| 25 | 33.7 | 30 | 115 | 18 | 18 | 18 | 85 | 40 | 42 / 46 | 2.6 | 4 | 6 | 68 | 2 | 4 | M12 | (1/2") | 14 | 1.38 | 1.29 |
| 32 | 42.4 | 38 | 140 | 18 | 18 | 18 | 100 | 42 | 52 / 56 | 2.6 | 6 | 6 | 78 | 2 | 4 | M16 | (5/8") | 18 | 2.03 | 1.88 |
| 40 | 48.3 | 44.5 | 150 | 18 | 18 | 18 | 110 | 45 | 60 / 64 | 2.6 | 6 | 7 | 88 | 3 | 4 | M16 | (5/8") | 18 | 2.35 | 2.33 |
| 50 | 60.3 | 57 | 165 | 20 | 20 | 20 | 125 | 48 | 72 / 75 | 2.9 | 6 | 8 | 102 | 3 | 4 | M16 | (5/8") | 18 | 3.2 | 2.82 |
| 65 | 76 | – | 185 | 22 | 22 | 22 | 145 | 52 | 90 | 2.9 | 6 | 10 | 122 | 3 | 8 | M16 | (5/8") | 18 | 4.29 | 3.74 |
| 80 | 88.9 | – | 200 | 24 | 24 | 24 | 160 | 58 | 105 | 3.2 | 8 | 12 | 138 | 3 | 8 | M16 | (5/8") | 18 | 5.88 | 4.75 |
| 100 | 114.3 | 108 | 235 | 24 | 24 | 24 | 190 | 65 | 128 / 134 | 3.6 | 8 | 12 | 162 | 3 | 8 | M20 | (3/4") | 22 | 7.54 | 6.52 |
| 125 | 139.7 | 133 | 270 | 26 | 26 | 26 | 220 | 68 | 155 / 162 | 4 | 8 | 12 | 188 | 3 | 8 | M24 | (7/8") | 26 | 10.8 | 9.07 |
| 150 | 168.3 | 159 | 300 | 28 | 28 | 28 | 250 | 75 | 182 / 192 | 4.5 | 10 | 12 | 218 | 3 | 8 | M24 | (7/8") | 26 | 14.5 | 11.8 |
| 200 | 219.1 | – | 360 | 30 | 30 | 30 | 310 | 80 | 244 | 6.3 | 10 | 16 | 278 | 3 | 12 | M24 | (7/8") | 26 | 22.3 | 17.0 |
| 250 | 273 | 267 | 425 | 32 | 32 | 32 | 370 | 88 | 292 / 298 | 7.1 | 12 | 18 | 335 | 3 | 12 | M27 | (1") | 30 | 33.5 | 24.4 |
| 300 | 323.9 | – | 485 | 34 | 34 | 34 | 430 | 92 | 352 | 8 | 12 | 18 | 395 | 4 | 16 | M27 | (1") | 30 | 46.3 | 31.2 |
| 350 | 355.6 | 368 | 555 | 38 | 38 | 38 | 490 | 100 | 398 | 8 | 12 | 20 | 450 | 4 | 16 | M30 | (1 1/4") | 33 | 68 | 47.2 |
| 400 | 406.4 | 419 | 620 | 40 | 40 | 40 | 550 | 110 | 452 | 8.8 | 12 | 20 | 505 | 4 | 16 | M33 | (1 1/4") | 36 | 89.7 | 61.7 |
| 500 | 508 | – | 730 | 44 | 44 | 45 | 660 | 125 | 558 | 10 | 12 | 20 | 615 | 4 | 20 | M33 | (1 1/4") | 36 | 138 | 89.6 |
| 600 | 610 | – | 845 | 46 | – | – | 770 | 125 | 660 | 11 | 12 | 20 | 720 | 5 | 20 | M36 | (1 3/8") | 39 | – | 104 |
| 700 | 711 | – | 960 | 46 | – | – | 875 | 125 | 760 | 12.5 | 12 | 20 | 820 | 5 | 24 | M39 | (1 1/2") | 42 | – | 136 |
| 800 | 813 | – | 1085 | 50 | – | – | 990 | 135 | 865 | 14.2 | 12 | 22 | 930 | 5 | 24 | M45 | (1 3/4") | 48 | – | 186 |
| 900 | 914 | – | 1185 | 54 | – | – | 1090 | 145 | 968 | 16 | 12 | 24 | 1030 | 5 | 28 | M45 | (1 3/4") | 48 | – | 236 |
| 1000 | 1016 | – | 1320 | 58 | – | – | 1210 | 155 | 1070 | 17.5 | 16 | 24 | 1140 | 5 | 28 | M52 | (2") | 56 | – | 307 |

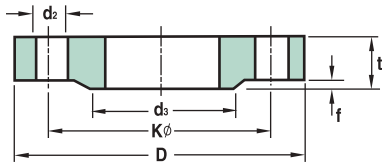
*Dimensions are only used in Germany

# DIN 40BAR

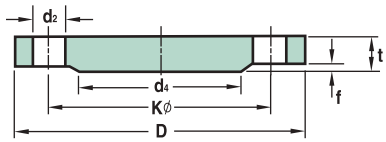
WELDING NECK




SLIP–ON




BLIND




## DIN 2545 SLIP - ON FLANGES
## DIN 2527 BLIND FLANGES
## DIN 2635 WELDING NECK FLANGES

Unit : mm

| SIZE | | | Common Dimension | | | | | | Hub | | | | Radised Face | | Drilling | | | | Approx. Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nomi–nal Bore | $d_1$ | | D | t | | | kø | T | $d_3$ | s | r | a | $d_4$ | f | Num–ber of Bolt | Dia. of Bolt | | $d_2$ | DIN 2545 | DIN 2635 |
| | | * | | Welding Neck | Slip–on | Blind | | | * / ANSI | | | | | | | | | | | |
| 10 | 17.2 | 14 | 90 | 16 | 16 | 16 | 60 | 35 | 25 28 | 1.8 | 4 | 6 | 40 | 2 | 4 | M12 | (1/2") | 14 | 0.72 | 0.661 |
| 15 | 21.3 | 20 | 95 | 16 | 16 | 16 | 65 | 38 | 30 32 | 2 | 4 | 6 | 45 | 2 | 4 | M12 | (1/2") | 14 | 0.81 | 0.746 |
| 20 | 26.9 | 25 | 105 | 18 | 18 | 18 | 75 | 40 | 38 40 | 2.3 | 4 | 6 | 58 | 2 | 4 | M12 | (1/2") | 14 | 1.24 | 1.06 |
| 25 | 33.7 | 30 | 115 | 18 | 18 | 18 | 85 | 40 | 42 46 | 2.6 | 4 | 6 | 68 | 2 | 4 | M12 | (1/2") | 14 | 1.38 | 1.29 |
| 32 | 42.4 | 38 | 140 | 18 | 18 | 18 | 100 | 42 | 52 56 | 2.6 | 6 | 6 | 78 | 2 | 4 | M16 | (5/8") | 18 | 2.03 | 1.88 |
| 40 | 48.3 | 44.5 | 150 | 18 | 18 | 18 | 110 | 45 | 60 64 | 2.6 | 6 | 7 | 88 | 3 | 4 | M16 | (5/8") | 18 | 2.35 | 2.33 |
| 50 | 60.3 | 57 | 165 | 20 | 20 | 20 | 125 | 48 | 72 75 | 2.9 | 6 | 8 | 102 | 3 | 4 | M16 | (5/8") | 18 | 3.2 | 2.82 |
| 65 | 76 | – | 185 | 22 | 22 | 22 | 145 | 52 | 90 | 2.9 | 6 | 10 | 122 | 3 | 8 | M16 | (5/8") | 18 | 4.29 | 3.74 |
| 80 | 88.9 | – | 200 | 24 | 24 | 24 | 160 | 58 | 105 | 3.2 | 8 | 12 | 138 | 3 | 8 | M16 | (5/8") | 18 | 5.88 | 4.75 |
| 100 | 114.3 | 108 | 235 | 24 | 24 | 24 | 190 | 65 | 128 134 | 3.6 | 8 | 12 | 162 | 3 | 8 | M20 | (3/4") | 22 | 7.54 | 6.52 |
| 125 | 139.7 | 133 | 270 | 26 | 26 | 26 | 220 | 68 | 155 162 | 4 | 8 | 12 | 188 | 3 | 8 | M24 | (7/8") | 26 | 10.8 | 9.07 |
| 150 | 168.3 | 159 | 300 | 28 | 28 | 28 | 250 | 75 | 182 192 | 4.5 | 10 | 12 | 218 | 3 | 8 | M24 | (7/8") | 26 | 14.5 | 11.8 |
| 175 | 193.7 | – | 350 | 32 | 32 | 32 | 295 | 82 | 218 | 5.6 | 10 | 15 | 260 | 3 | 12 | M27 | (1") | 30 | 22.1 | 18.2 |
| 200 | 219.1 | – | 375 | 34 | 34 | 34 | 320 | 88 | 244 | 6.3 | 10 | 16 | 285 | 3 | 12 | M27 | (1") | 30 | 27.2 | 21.5 |
| 250 | 273 | 267 | 450 | 38 | 38 | 38 | 385 | 105 | 298 306 | 7.1 | 12 | 18 | 345 | 3 | 12 | M30 | (1 1/8") | 33 | 43.8 | 34.9 |
| 300 | 323.9 | – | 515 | 42 | 42 | 42 | 450 | 115 | 362 | 8 | 12 | 18 | 410 | 4 | 16 | M30 | (1 1/8") | 33 | 63.3 | 49.7 |
| 350 | 355.6 | 368 | 580 | 46 | 46 | 46 | 510 | 125 | 408 | 8.8 | 12 | 20 | 465 | 4 | 16 | M33 | (1 1/4") | 36 | 89.5 | 68.1 |
| 400 | 406.4 | 419 | 660 | 50 | 50 | 50 | 585 | 135 | 462 | 11 | 12 | 20 | 535 | 4 | 16 | M36 | (1 3/8") | 39 | 127 | 96.5 |
| 500 | 508 | – | 755 | 52 | 52 | 56 | 670 | 140 | 562 | 14.2 | 12 | 20 | 615 | 4 | 20 | M39 | (1 1/2") | 42 | 172 | 117 |

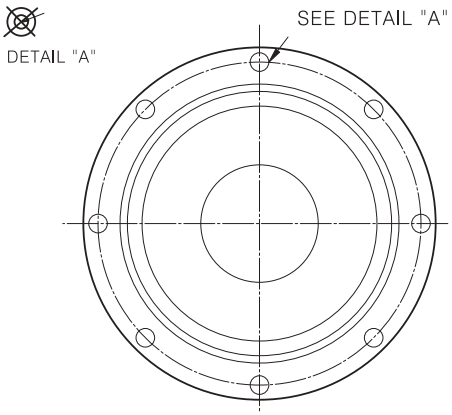
*Dimensions are only used in Germany

# API TYPE FLANGES

- 6B & 6BX - 2000psi
- 6B & 6BX - 3000psi
- 6B & 6BX - 5000psi
- 6BX - 10000psi
- 6BX - 15000psi
- 6BX - 20000psi
- TABLE 1~4

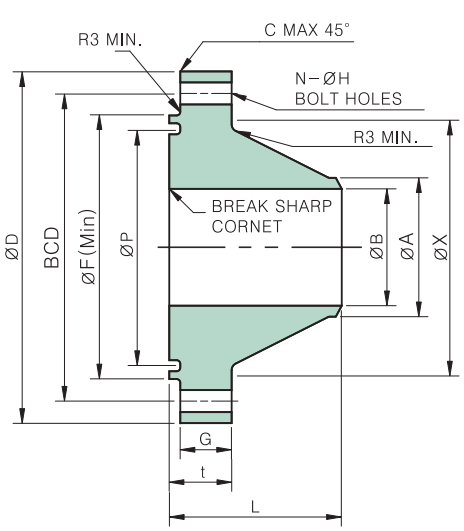
# TYPE 6B & 6BX 2000PSI

BOLT HOLE CENTERLINE LOCATED
WITHIN 0.03 OF THEORETICAL
B.C. AND EQUAL SPACING



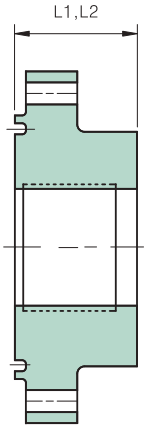

RING GROOVE MUST BE CONCENTRIC
WITH BORE WITHIN 0.010 TOTAL
INDICATOR RUNOUT

*Outside Diametr (D) TOLERANCE
−2 1/16~5 1/8 : ±1.52
−7 1/16~30 : ±3.05
*BOLT HOLE TOLERANCE (H)
−2 1/16~13 5/8: +1.52~−0.51
−16 3/4~30 : +2.29~−0.51
*Neck Diameter Welding Neck(A) TOLERANCE
−2 1/16~4 1/16 : +2.29~−0.76
−5 1/8 ; +2.29~−2.03
−7 1/16~11 : +4.06~−0.76




Welding Neck
Line Pipe Flange

*Large Diameer of Hub(X) TOLERANCE
−26 3/4~30 : +0~−3.05
*Total Thickness(t) TOLERANCE
−±3.05, −0
*Hub Length Welding Neck(L) TOLERANCE
−±1.52




Threaded Flange

*L1:Hub length Threaded
Line Pipe flange

*L2:Hub Length Threaded
Casting flange

*Neck Diameter Welding Neck(A) TOLERANCE
−2 1/16~4 1/16: +2.29~−0.76
−5 1/8 : +2.29~−2.03
−7 1/16~11 : +4.06~−0.76
−26 3/4~30 : +0~3.05

## 2000#

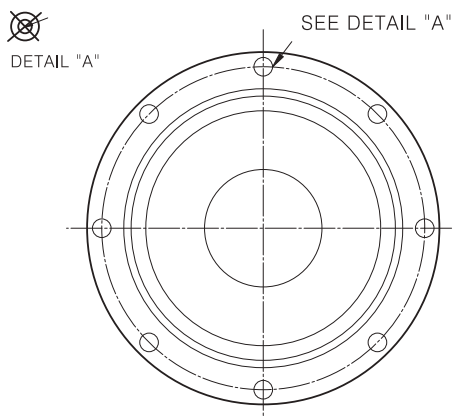
Unit : mm

| Nominal Size & Bore of Flange | Outside Diam. | Max. Chamfer | Max. Bore | Diam of Raised Face | Total Thick. | Basic Thick. | Diam. of Hub | Neck Dia. of W.N | Hub Length of W.N | Hub Length | Hub Length | Pitch of Diam. | Diam. of Bolt Circle | Num. of Bolt | Diam. of Bolt Holes | Ring No. (R or RX) | Ring No. (BX) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | C | B | F | t | G | X | A | L | $L_1$ | $L_2$ | P | | N | H | | |
| 2 1/6 | 165.10 | 3.0 | 53.09 | 107.95 | 33.27 | 25.40 | 84.07 | 60.45 | 81.03 | 44.45 | – | 82.55 | 127.00 | 8 | 19.05 | 23 | – |
| 2 9/16 | 190.50 | 3.0 | 65.79 | 127.00 | 36.58 | 28.45 | 100.08 | 73.15 | 87.38 | 49.28 | – | 101.60 | 149.35 | 8 | 22.35 | 26 | – |
| 3 1/8 | 209.55 | 3.0 | 81.79 | 146.05 | 39.62 | 31.75 | 117.35 | 88.90 | 90.42 | 53.85 | – | 123.83 | 168.15 | 8 | 22.35 | 31 | – |
| 4 1/16 | 273.05 | 3.0 | 108.71 | 174.75 | 45.97 | 38.10 | 152.40 | 114.30 | 109.47 | 61.98 | 88.90 | 149.23 | 215.90 | 8 | 25.40 | 37 | – |
| 5 1/8 | 330.20 | 3.0 | 131.06 | 209.55 | 52.32 | 44.45 | 188.98 | 141.22 | 122.17 | 68.33 | 101.60 | 180.98 | 266.70 | 8 | 28.45 | 41 | – |
| 7 1/16 | 355.60 | 6.4 | 181.86 | 241.30 | 55.63 | 47.75 | 222.25 | 168.40 | 125.48 | 74.68 | 114.30 | 211.15 | 292.10 | 12 | 28.45 | 45 | – |
| 9 | 419.10 | 6.4 | 229.36 | 301.75 | 63.50 | 55.63 | 273.05 | 219.20 | 141.22 | 84.07 | 127.00 | 269.88 | 349.25 | 12 | 31.75 | 49 | – |
| 11 | 508.00 | 6.4 | 280.16 | 355.60 | 71.37 | 63.50 | 342.90 | 273.05 | 160.27 | 93.73 | 133.35 | 323.85 | 431.80 | 16 | 35.05 | 53 | – |
| 13 5/8 | 558.80 | 6.4 | 346.96 | 412.75 | 74.68 | 66.55 | 400.05 | – | – | 100.08 | 100.08 | 381.00 | 488.95 | 20 | 35.05 | 57 | – |
| 16 3/4 | 685.80 | 6.4 | 426.21 | 508.00 | 84.07 | 76.20 | 495.30 | – | – | 114.30 | 114.30 | 469.90 | 603.25 | 20 | 41.15 | 65 | – |
| 21 1/4 | 812.80 | 6.4 | 540.51 | 635.00 | 98.55 | 88.90 | 609.60 | – | – | 136.65 | 136.65 | 584.20 | 723.90 | 24 | 44.45 | 73 | – |
| 26 3/4 | 1041.40 | 6.4 | 680.21 | 804.93 | 126.24 | 104.90 | 835.91 | 742.95 | 318.26 | – | – | 756.87 | 952.50 | 20 | 47.75 | – | 167 |
| 30 | 1122.43 | 6.4 | 762.76 | 908.05 | 134.11 | 111.50 | 931.93 | 833.12 | 337.31 | – | – | 848.61 | 1039.88 | 32 | 44.45 | – | 303 |

*Total Thickness of Flange and Minimum Length of Hub

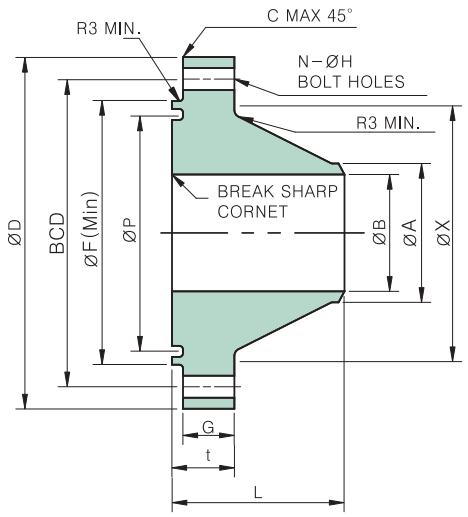
# TYPE 6B & 6BX 3000PSI

BOLT HOLE CENTERLINE LOCATED
WITHIN 0.03 OF THEORETICAL
B.C. AND EQUAL SPACING



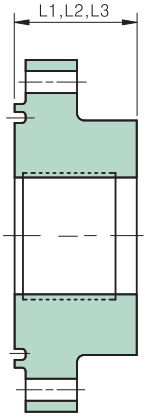

RING GROOVE MUST BE CONCENTRIC
WITH BORE WITHIN 0.010 TOTAL
INDICATOR RUNOUT

*Outside Diametr (D) TOLERANCE
−2 1/16~5 1/8 : ±1.52
−7 1/16~30 : ±3.05
*BOLT HOLE TOLERANCE (H)
−2 1/16~13 5/8: +1.52~−0.51
−16 3/4~30 : +2.29~−0.51
*Neck Diameter Welding Neck(A) TOLERANCE
−2 1/16~4 1/16 : +2.29~−0.76
−5 1/8 ; +2.29~−2.03
−7 1/16~11 : +4.06~−0.76




Welding Neck
Line Pipe Flange

*Large Diameer of Hub(X) TOLERANCE
*Total Thickness(t) TOLERANCE
− ±3.05, −0
*Hub Length Welding Neck(L) TOLERANCE
− ±1.52




*L1:Hub length Threaded
Line Pipe Flange
*L2:Hub Length Threaded
Casting Flange
*L3:Hub Length Tubir
Flange

Threaded Flange

*Neck Diameter Welding Neck(A) TOLERANCE
−2 1/16~4 1/16: +2.29~−0.76
−5 1/8 : +2.29~−2.03
−7 1/16~11 : +4.06~−0.76
−26 3/4~30 : +0~3.05

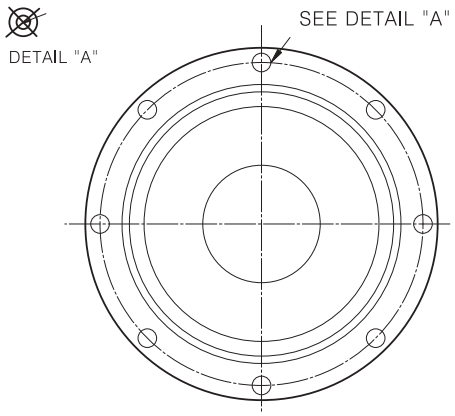
## 3000#

Unit : mm

| Nominal Size & Bore of Flange | Outside Diam. | Max. Chamfer | Max. Bore | Diam of Raised Face | Total Thick. | Basic Thick. | Diam. of Hub | Neck Dia. of W.N | Hub Length of W.N | Hub Length | Hub Length | Hub Length | Pitch of Diam. | Diam. of Bolt Circle | Num. of Bolt | Diam. of Bolt Holes | Ring No. (R or RX) | Ring No. (BX) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | C | B | F | t | G | X | A | L | $L_1$ | $L_2$ | $L_3$ | P | | N | H | | |
| 2 1/6 | 215.90 | 3.0 | 53.09 | 123.95 | 45.97 | 38.10 | 104.65 | 60.45 | 109.47 | 65.02 | – | 65.02 | 95.25 | 165.10 | 8 | 25.40 | 24 | – |
| 2 9/16 | 244.35 | 3.0 | 65.79 | 136.65 | 49.28 | 41.15 | 123.95 | 73.15 | 112.78 | 71.37 | – | 71.37 | 107.95 | 190.50 | 8 | 28.45 | 27 | – |
| 3 1/8 | 241.30 | 3.0 | 81.79 | 155.45 | 45.97 | 38.10 | 127.0 | 88.90 | 109.47 | 61.98 | – | 74.68 | 123.83 | 190.50 | 8 | 25.40 | 31 | – |
| 4 1/16 | 292.10 | 3.0 | 108.71 | 180.85 | 52.32 | 44.45 | 158.75 | 114.30 | 122.17 | 77.72 | 88.90 | 88.90 | 149.23 | 234.95 | 8 | 31.75 | 37 | – |
| 5 1/8 | 349.25 | 3.0 | 131.06 | 215.90 | 58.67 | 50.80 | 190.50 | 141.22 | 134.87 | 87.38 | 101.60 | – | 180.98 | 279.40 | 8 | 35.05 | 41 | – |
| 7 1/16 | 381.00 | 6.4 | 181.86 | 241.30 | 63.50 | 55.63 | 234.95 | 168.40 | 147.57 | 93.73 | 114.30 | – | 211.15 | 317.50 | 12 | 31.75 | 45 | – |
| 9 | 469.90 | 6.4 | 229.36 | 307.85 | 71.37 | 63.50 | 298.45 | 219.20 | 169.93 | 109.47 | 127.00 | – | 269.88 | 393.70 | 12 | 38.10 | 49 | – |
| 11 | 546.10 | 6.4 | 280.16 | 361.95 | 77.72 | 69.85 | 368.30 | 273.05 | 192.02 | 115.82 | 133.35 | – | 323.85 | 469.90 | 16 | 38.10 | 53 | – |
| 13 5/8 | 609.60 | 6.4 | 346.96 | 419.10 | 87.38 | 79.25 | 419.10 | – | – | 125.48 | 125.48 | – | 381.00 | 533.40 | 20 | 38.10 | 57 | – |
| 16 3/4 | 704.85 | 6.4 | 426.21 | 523.75 | 100.08 | 88.90 | 508.00 | – | – | 128.52 | 144.53 | – | 469.90 | 615.95 | 20 | 44.45 | 66 | – |
| 21 1/4 | 857.25 | 6.4 | 527.81 | 647.70 | 120.65 | 107.95 | 622.30 | – | – | 171.45 | 171.45 | – | 584.20 | 749.30 | 20 | 53.85 | 74 | – |
| 26 3/4 | 1101.85 | 6.4 | 680.21 | 831.85 | 161.04 | 139.70 | 869.95 | 776.22 | 353.06 | – | – | – | 761.29 | 1000.25 | 24 | 53.85 | – | 168 |
| 30 | 1185.67 | 6.4 | 762.76 | 922.27 | 167.13 | 144.53 | 970.03 | 871.22 | 370.33 | – | – | – | 848.61 | 1090.68 | 32 | 50.80 | – | 303 |

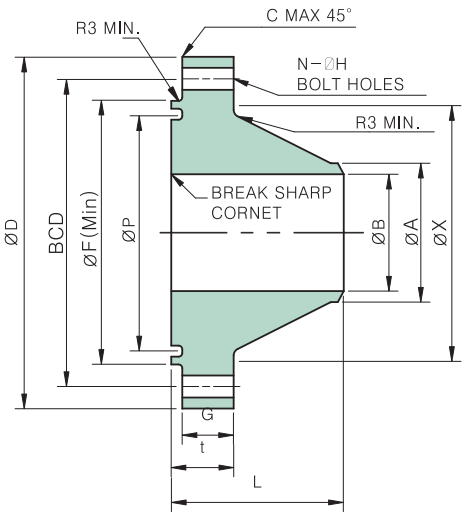
# TYPE 6B & 6BX 5000PSI

BOLT HOLE CENTERLINE LOCATED
WITHIN 0.03 OF THEORETICAL
B.C. AND EQUAL SPACING



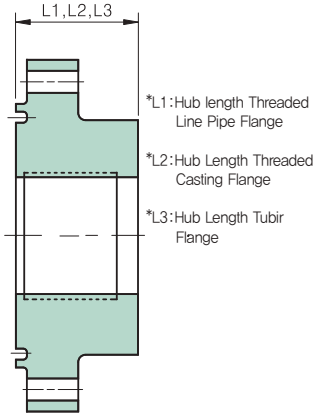

RING GROOVE MUST BE CONCENTRIC
WITH BORE WITHIN 0.010 TOTAL
INDICATOR RUNOUT

*Outside Diametr (D) TOLERANCE
−2 1/16~5 1/8 : ±1.52
−7 1/16~30 : ±3.05
*BOLT HOLE TOLERANCE (H)
−2 1/16~13 5/8: +1.52~−0.51
−16 3/4~30 : +2.29~−0.51
*Neck Diameter Welding Neck(A) TOLERANCE
−2 1/16~4 1/16 : +2.29~−0.76
−5 1/8 ; +2.29~−2.03
−7 1/16~11 : +4.06~−0.76




Welding Neck
Line Pipe Flange

*Large Diameer of Hub(X) TOLERANCE
*Total Thickness(t) TOLERANCE
− ±3.05, −0
*Hub Length Welding Neck(L) TOLERANCE
− ±1.52




Threaded Flange

*Neck Diameter Welding Neck(A) TOLERANCE
−2 1/16~4 1/16: +2.29~−0.76
−5 1/8 : +2.29~−2.03
−7 1/16~11 : +4.06~−0.76
−26 3/4~30 : +0~3.05

## 5000#

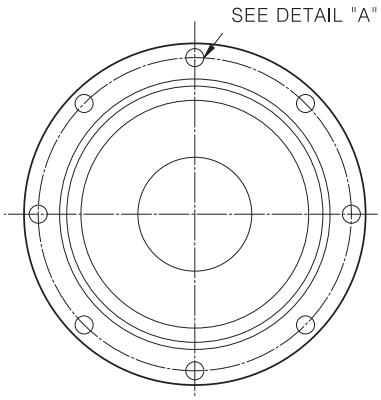
Unit : mm

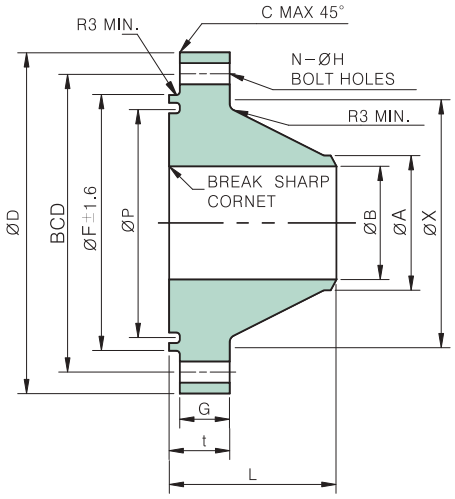
| Nominal Size & Bore of Flange | Outside Diam. | Max. Chamfer | Max. Bore | Diam of Raised Face | Total Thick. | Basic Thick. | Diam. of Hub | Neck Dia. of W.N | Hub Length of W.N | Hub Length | Hub Length | Hub Length | Pitch of Diam. | Diam. of Bolt Circle | Num. of Bolt | Diam. of Bolt Holes | −Ring No. (R or RX) | Ring No. (BX) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | C | B | F | t | G | X | A | L | $L_1$ | $L_2$ | $L_3$ | P | | N | H | | |
| 2 1/6 | 215.90 | 3.0 | 53.09 | 123.95 | 45.97 | 38.10 | 104.65 | 60.45 | 109.47 | 65.02 | − | 65.02 | 95.25 | 165.10 | 8 | 25.40 | 24 | − |
| 2 9/16 | 244.35 | 3.0 | 65.79 | 136.65 | 49.28 | 41.15 | 123.95 | 73.15 | 112.78 | 71.37 | − | 71.37 | 107.95 | 190.50 | 8 | 28.45 | 27 | − |
| 3 1/8 | 266.70 | 3.0 | 81.79 | 168.15 | 55.63 | 47.75 | 133.35 | 88.90 | 125.48 | 81.03 | − | 81.03 | 136.53 | 203.20 | 8 | 31.75 | 35 | − |
| 4 1/16 | 311.15 | 3.0 | 108.71 | 193.55 | 61.98 | 53.85 | 162.05 | 114.30 | 131.83 | 98.55 | 98.55 | 98.55 | 161.93 | 241.30 | 8 | 35.05 | 39 | − |
| 5 1/8 | 374.65 | 3.0 | 131.06 | 228.60 | 81.03 | 73.15 | 196.85 | 141.22 | 163.58 | 112.78 | 112.78 | − | 193.68 | 292.10 | 8 | 41.15 | 44 | − |
| 7 1/16 | 393.70 | 6.4 | 181.86 | 247.65 | 91.95 | 82.55 | 228.60 | 168.40 | 181.10 | 128.52 | 128.52 | − | 211.15 | 317.50 | 12 | 38.10 | 46 | − |
| 9 | 482.60 | 6.4 | 229.36 | 317.50 | 103.12 | 91.95 | 292.10 | 219.20 | 223.77 | 153.92 | 153.92 | − | 269.88 | 393.70 | 12 | 44.45 | 50 | − |
| 11 | 584.20 | 6.4 | 280.16 | 371.60 | 119.13 | 107.95 | 368.30 | 273.05 | 265.18 | 169.93 | 169.93 | − | 323.85 | 482.60 | 12 | 50.80 | 54 | − |
| 13 5/8 | 673.10 | 6.4 | 346.96 | 457.20 | 112.78 | 98.55 | 481.08 | 423.93 | 233.43 | − | − | − | 398.02 | 590.55 | 16 | 44.45 | − | 160 |
| 16 3/4 | 771.65 | 6.4 | 426.21 | 534.92 | 130.30 | 121.92 | 555.75 | 527.05 | 212.85 | − | − | − | 469.38 | 676.15 | 16 | 50.80 | − | 162 |
| 15 3/4 | 904.75 | 6.4 | 477.01 | 627.13 | 165.86 | 147.57 | 674.62 | 598.42 | 324.61 | − | − | − | 550.72 | 803.15 | 20 | 53.85 | − | 163 |
| 21 1/4 | 990.60 | 6.4 | 540.51 | 701.55 | 180.85 | 161.80 | 758.95 | 679.45 | 352.30 | − | − | − | 618.96 | 885.95 | 24 | 53.85 | − | 165 |

# TYPE 6BX 10000PSI

BOLT HOLE CENTERLINE LOCATED
WITHIN 0.03 OF THEORETICAL
B.C. AND EQUAL SPACING

DETAIL "A"




B TO RING GROOVE MUST BE CONCENTRIC
WITHIN 0.010 TOTAL INDICATOR RUNOUT

*Outside Diameter(ØD) TOLERANCE
−1 13/16~5 1/8 : ±1.52
−7 1/16~21 1/4 : ±3.05
*BOLT HOLE TOLERANCE(ØH)
−1 13/16~5 1/8 : +1.52~−0.51
−7 1/16~21 1/4 : +2.29~−0.51

*Total Thickness(t) TOLERANCE
− ±3.05, −0
*Hub Length Welding Neck(L TOLERANCE
− +0., −3.05
*Large diameter of Hub(X) TOLERANCE
− +0, −3.05
*Total Thickness(t) TOLERANCE
− +3.05, −0

## 10000#

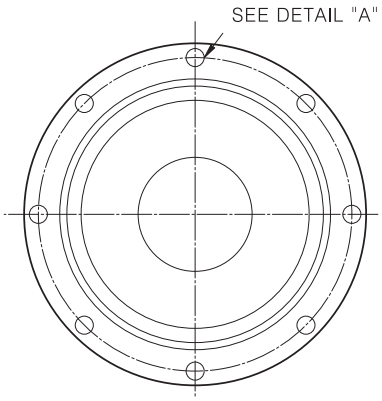
Unit : mm

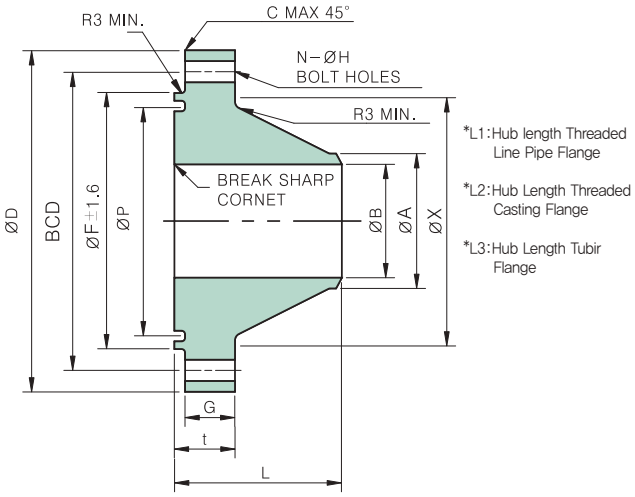
| Nominal Size & Bore of Flange | Outside Diam. | Max. Bore | Max. Chamfer | Diam of Raised Face | Total Thick. | Diam. of Hub | Neck Dia. of W.N | Hub Length of W.N | Pitch of Diam. | Diam. of Bolt Circle | Num. of Bolt | Diam. of Bolt Holes | Ring No. (BX)Ring No. (BX) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | B | C | F | T | X | A | L | P | | N | H | |
| 1 13/16 | 187.45 | 46.74 | 3.0 | 104.65 | 42.16 | 88.90 | 65.02 | 97.03 | 71.86 | 146.05 | 8 | 22.35 | 151 |
| 2 1/16 | 200.15 | 53.09 | 3.0 | 111.25 | 43.94 | 100.08 | 74.68 | 101.85 | 79.91 | 158.75 | 8 | 22.35 | 152 |
| 2 9/16 | 231.65 | 65.79 | 3.0 | 131.83 | 51.31 | 120.65 | 91.95 | 114.81 | 95.73 | 184.15 | 8 | 25.40 | 153 |
| 3 1/16 | 269.75 | 78.49 | 3.0 | 152.40 | 58.42 | 141.99 | 110.24 | 128.27 | 111.30 | 215.90 | 8 | 28.45 | 154 |
| 4 1/16 | 315.98 | 103.89 | 3.0 | 184.91 | 70.36 | 182.63 | 146.05 | 149.86 | 141.76 | 258.83 | 8 | 31.75 | 155 |
| 7 1/16 | 357.12 | 131.06 | 3.0 | 220.73 | 79.25 | 223.77 | 182.63 | 166.62 | 168.20 | 299.97 | 12 | 31.75 | 169 |
| 9 | 479.55 | 180.09 | 6.4 | 301.75 | 103.12 | 301.75 | 254.00 | 204.72 | 230.14 | 403.35 | 12 | 41.15 | 156 |
| 11 | 552.45 | 229.36 | 6.4 | 358.65 | 123.95 | 374.65 | 327.15 | 224.03 | 285.86 | 476.25 | 16 | 41.15 | 157 |
| 13 5/8 | 654.05 | 280.16 | 6.4 | 428.75 | 141.22 | 450.85 | 400.05 | 250.70 | 342.63 | 565.15 | 16 | 47.75 | 158 |
| 16 3/4 | 871.47 | 426.21 | 6.4 | 576.33 | 168.15 | 655.57 | 601.73 | 250.70 | 469.38 | 776.22 | 24 | 50.80 | 162 |
| 18 3/4 | 1039.88 | 477.01 | 6.4 | 696.98 | 223.01 | 752.35 | 674.62 | 384.81 | 561.52 | 925.58 | 24 | 60.45 | 164 |
| 13 5/8 | 1143.00 | 540.51 | 6.4 | 781.05 | 241.30 | 847.85 | 762.00 | 412.75 | 630.44 | 1022.35 | 24 | 66.55 | 166 |

# TYPE 6BX 15000PSI

BOLT HOLE CENTERLINE LOCATED
WITHIN 0.03 OF THEORETICAL
B.C. AND EQUAL SPACING

DETAIL "A"




B TO RING GROOVE MUST BE CONCENTRIC
WITHIN 0.010 TOTAL INDICATOR RUNOUT

*Outside Diameter(ØD) TOLERANCE
–1 13/16~5 1/8 : ±1.52
–7 1/16~21 1/4 : ±3.05
*BOLT HOLE TOLERANCE(ØH)
–1 13/16~5 1/8 : +1.52~–0.51
–7 1/16~21 1/4 : +2.29~–0.51

*Total Thickness(t) TOLERANCE
– ±3.05, –0
*Hub Length Welding Neck(L TOLERANCE
– +0., –3.05
*Large diameter of Hub(X) TOLERANCE
– +0, –3.05
*Total Thickness(t) TOLERANCE
– +3.05, –0

## 15000#

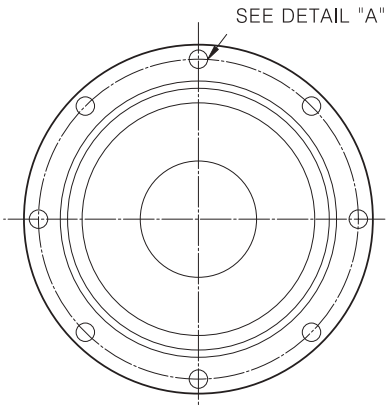
Unit : mm

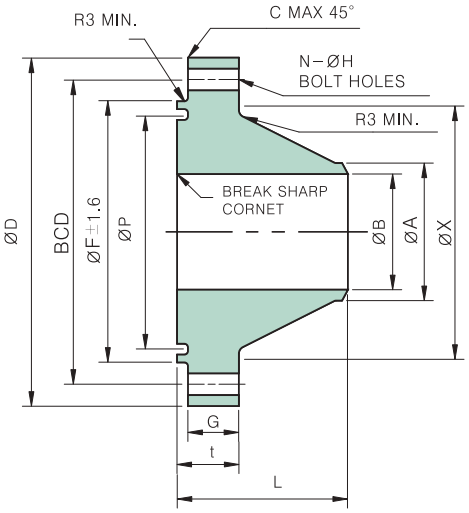
| Nominal Size & Bore of Flange | Outside Diam. | Max. Chamfer | Max. Bore | Diam of Raised Face | Total Thick. | Diam. of Hub | Neck Dia. of W.N | Hub Length of W.N | Pitch of Diam. | Diam. of Bolt Circle | Num. of Bolt | Diam. of Bolt Holes | Ring No. (BX)Ring No. (BX) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | C | B | F | T | X | A | L | P | | N | H | |
| 1 13/16 | 208.03 | 3.0 | 46.74 | 106.43 | 45.21 | 97.54 | 71.37 | 99.31 | 71.86 | 160.27 | 8 | 25.40 | 151 |
| 2 1/16 | 222.25 | 3.0 | 53.09 | 114.30 | 50.80 | 111.25 | 82.55 | 111.00 | 79.91 | 174.75 | 8 | 25.40 | 152 |
| 2 9/16 | 254.00 | 3.0 | 65.79 | 133.35 | 57.15 | 128.52 | 100.08 | 120.65 | 95.73 | 200.15 | 8 | 28.45 | 153 |
| 3 1/16 | 287.27 | 3.0 | 78.49 | 153.92 | 64.26 | 153.92 | 122.17 | 134.11 | 111.30 | 230.12 | 8 | 31.75 | 154 |
| 4 1/16 | 360.43 | 3.0 | 103.89 | 193.55 | 78.49 | 195.33 | 158.75 | 157.99 | 141.76 | 290.58 | 8 | 38.10 | 155 |
| 5 1/8 | 419.10 | 3.0 | 131.06 | 225.55 | 98.55 | 244.35 | 200.15 | 186.69 | 168.20 | 342.90 | 12 | 41.15 | 169 |
| 7 1/16 | 504.95 | 6.4 | 180.09 | 304.80 | 119.13 | 325.37 | 276.35 | 192.02 | 230.14 | 428.75 | 16 | 41.15 | 156 |
| 9 | 647.70 | 6.4 | 229.36 | 381.00 | 146.05 | 431.80 | 349.25 | 276.35 | 285.86 | 552.45 | 16 | 50.80 | 157 |
| 11 | 812.80 | 6.4 | 280.16 | 454.15 | 187.45 | 584.20 | 426.97 | 429.51 | 342.63 | 711.20 | 20 | 53.85 | 158 |
| 13 5/8 | 885.95 | 6.4 | 346.96 | 541.27 | 204.72 | 595.38 | 528.57 | 325.37 | 416.39 | 771.65 | 20 | 60.45 | 159 |
| 18 3/4 | 1162.05 | 6.4 | 477.01 | 722.38 | 255.52 | 812.80 | 730.25 | 417.32 | 561.52 | 1016.00 | 20 | 79.25 | 164 |

# TYPE 6BX 20000PSI

BOLT HOLE CENTERLINE LOCATED
WITHIN 0.03 OF THEORETICAL
B.C. AND EQUAL SPACING

DETAIL "A"




B TO RING GROOVE MUST BE CONCENTRIC
WITHIN 0.010 TOTAL INDICATOR RUNOUT

*Outside Diameter(ØD) TOLERANCE
–1 13/16~5 1/8 : ±1.52
–7 1/16~21 1/4 : ±3.05
*BOLT HOLE TOLERANCE(ØH)
–1 13/16~5 1/8 : +1.52~–0.51
–7 1/16~21 1/4 : +2.29~–0.51

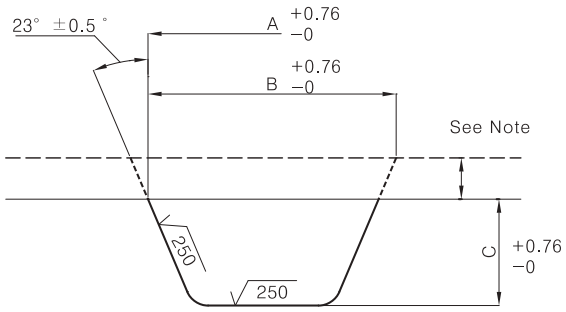
*Total Thickness(t) TOLERANCE
– ±3.05, –0
*Hub Length Welding Neck(L TOLERANCE
– +0., –3.05
*Large diameter of Hub(X) TOLERANCE
– +0, –3.05
*Total Thickness(t) TOLERANCE
– +3.05, –0

## 20000#

Unit : mm

| Nominal Size & Bore of Flange | Outside Diam. | Max. Chamfer | Max. Bore | Diam of Raised Face | Total Thick. | Diam. of Hub | Neck Dia. of W.N | Hub Length of W.N | Pitch of Diam. | Diam. of Bolt Circle | Num. of Bolt | Diam. of Bolt Holes | Ring No. (BX)Ring No. (BX) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | C | B | F | T | X | A | L | P | | N | H | |
| 1 13/16 | 257.05 | 3.0 | 46.74 | 117.35 | 63.50 | 133.35 | 109.47 | 119.13 | 71.86 | 203.20 | 8 | 28.45 | 151 |
| 2 1/16 | 287.27 | 3.0 | 53.09 | 131.83 | 71.37 | 153.92 | 127.00 | 130.05 | 79.91 | 230.12 | 8 | 31.75 | 152 |
| 2 9/16 | 325.37 | 3.0 | 65.78 | 150.88 | 79.25 | 172.97 | 144.53 | 144.27 | 95.73 | 261.87 | 8 | 35.05 | 153 |
| 3 1/16 | 357.12 | 3.0 | 78.49 | 171.45 | 85.85 | 192.02 | 160.27 | 155.70 | 111.30 | 287.27 | 8 | 38.10 | 154 |
| 4 1/16 | 446.02 | 3.0 | 103.89 | 218.95 | 106.43 | 242.82 | 206.25 | 185.93 | 141.76 | 357.12 | 8 | 47.75 | 155 |
| 7 1/16 | 655.57 | 6.4 | 180.09 | 352.55 | 165.10 | 385.83 | 338.07 | 268.22 | 230.14 | 553.97 | 16 | 53.85 | 156 |
| 9 | 804.93 | 6.4 | 229.36 | 441.45 | 204.72 | 481.08 | 428.75 | 319.02 | 285.86 | 685.80 | 16 | 66.55 | 157 |
| 11 | 882.65 | 6.4 | 280.16 | 504.95 | 223.77 | 566.67 | 508.00 | 333.25 | 342.63 | 749.30 | 16 | 73.15 | 158 |
| 13 5/8 | 1162.05 | 6.4 | 346.96 | 614.43 | 292.10 | 693.67 | 628.65 | 431.80 | 416.39 | 1016.00 | 20 | 79.25 | 159 |

# TABLE 1




## TABLE 1. Rough Maching Detail for Corrosion Resistant API Ring Groove

Unit : mm

| (1) | (2) | (3) | (4) |
|---|---|---|---|
| Ring Number | Outside Diameter of Groove | Width of Groove | Width of Groove |
| | A | B | C |
| BX 150 | 81.79 | 18.29 | 9.14 |
| BX 151 | 86.11 | 18.80 | 9.14 |
| BX 152 | 94.49 | 19.56 | 9.65 |
| BX 153 | 111.25 | 21.08 | 10.41 |
| BX 154 | 127.25 | 22.35 | 11.18 |
| BX 155 | 157.00 | 24.64 | 11.94 |
| BX 156 | 250.19 | 30.48 | 14.73 |
| BX 157 | 307.34 | 33.53 | 16.26 |
| BX 158 | 365.51 | 36.07 | 17.78 |
| BX 159 | 440.94 | 39.37 | 19.56 |
| BX 160 | 416.31 | 26.92 | 17.78 |
| BX 162 | 486.66 | 24.89 | 11.94 |
| BX 163 | 571.75 | 32.51 | 21.84 |
| BX 164 | 586.23 | 39.88 | 21.84 |
| BX 165 | 640.84 | 34.29 | 22.61 |
| BX 166 | 656.34 | 41.91 | 22.61 |
| BX 167 | 776.73 | 29.97 | 24.89 |
| BX 168 | 782.57 | 32.77 | 24.89 |
| BX 169 | 185.17 | 23.88 | 13.21 |
| R 20 | 85.34 | 15.75 | 9.91 |
| R 23 | 102.87 | 19.05 | 11.43 |
| R 24 | 115.57 | 19.05 | 11.43 |
| R 25 | 118.62 | 15.75 | 9.91 |
| R 26 | 121.92 | 19.05 | 11.43 |
| R 27 | 128.27 | 19.05 | 11.43 |
| R 31 | 144.02 | 19.05 | 11.43 |
| R 35 | 156.72 | 19.05 | 11.43 |
| R 37 | 169.42 | 19.05 | 11.43 |
| R 39 | 182.12 | 19.05 | 11.43 |
| R 41 | 201.17 | 19.05 | 11.43 |

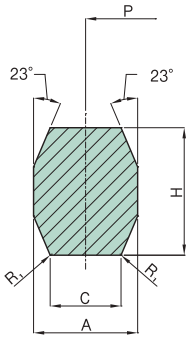
| (1) | (2) | (3) | (4) |
|---|---|---|---|
| Ring Number | Outside Diameter of Groove | Width of Groove | Width of Groove |
| | A | B | C |
| R 44 | 213.87 | 19.05 | 11.43 |
| R 45 | 231.39 | 19.05 | 11.43 |
| R 46 | 232.92 | 20.57 | 13.21 |
| R 47 | 256.79 | 26.92 | 16.26 |
| R 49 | 290.07 | 19.05 | 11.43 |
| R 50 | 294.89 | 23.88 | 14.73 |
| R 53 | 344.17 | 19.05 | 11.43 |
| R 54 | 349.00 | 23.88 | 14.73 |
| R 57 | 401.32 | 19.05 | 11.43 |
| R 63 | 454.41 | 34.04 | 19.56 |
| R 65 | 490.22 | 19.05 | 11.43 |
| R 66 | 495.05 | 23.88 | 14.73 |
| R 69 | 553.72 | 19.05 | 11.43 |
| R 70 | 561.59 | 26.92 | 16.26 |
| R 73 | 606.04 | 20.57 | 13.21 |
| R 74 | 612.39 | 26.92 | 16.26 |
| R 82 | 77.47 | 19.05 | 11.43 |
| R 84 | 83.82 | 19.05 | 11.43 |
| R 85 | 101.35 | 20.57 | 13.21 |
| R 86 | 115.57 | 23.88 | 14.73 |
| R 87 | 124.97 | 23.88 | 14.73 |
| R 88 | 152.15 | 26.92 | 16.26 |
| R 89 | 142.49 | 26.92 | 16.26 |
| R 90 | 186.94 | 30.23 | 17.78 |
| R 91 | 302.01 | 40.39 | 21.08 |
| R 99 | 255.27 | 19.05 | 11.43 |
| R 201 | 59.94 | 12.70 | 7.62 |
| R 205 | 71.12 | 12.70 | 10.67 |
| R 210 | 106.68 | 16.76 | 9.91 |
| R 215 | 150.37 | 19.05 | 11.43 |

Notes :
Allow 1/8 in. or greater for final machining of weld overlay

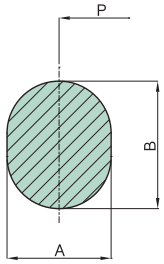
# TABLE 2

TOLERANCES

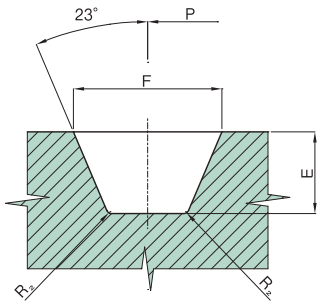
| | |
|---|---|
| A (width of ring) | ±0.203 |
| B&H(height of ring) | ±0.508 |
| C(width of flat on octagonal ring) | ±0.203 |
| E (depth of groove) | +0.508/−0 |
| F (widh of groove) | ±0.203 |
| P(average pith diameter of ring) | ±0.178 |
| (overage pith diameter of groove) | ±0.127 |
| R1(radius in rings) | ±0.508 |
| R2(radius in groove) | max |
| 23° (angle) | ±1/2deg |



a) Octagonal



b) Oval



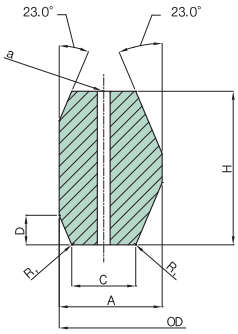
c) Groove

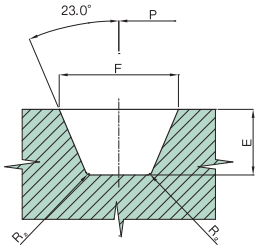
## TABLE 2. Type R Ring Gaskets

Unit : mm

| Nominal Size & Bore of Flange | Pitch Diameter of Ring and Groove | Width of Ring | Height of Ring Oval | Height of Ring Octagnal | Width of Flat of Octagonal Ring | Radius in Octagonal Ringa | Depth of Groove | Width of Groove | Radius in Groove | Approx. Distance Between Made-up Flanges |
|---|---|---|---|---|---|---|---|---|---|---|
| | P | A | B | H | C | $R_1$ | E | F | $R_2$ | S |
| R 20 | 68.28 | 7.95 | 14.22 | 12.70 | 5.23 | 1.52 | 6.35 | 8.74 | 0.76 | 4.06 |
| R 23 | 82.55 | 11.13 | 17.53 | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 24 | 95.25 | 11.13 | 17.53 | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 26 | 101.60 | 11.13 | 17.53 | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 27 | 107.95 | 11.13 | 17.53 | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 31 | 123.83 | 11.13 | 17.53 | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 35 | 136.53 | 11.13 | 17.53 | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 37 | 149.23 | 11.13 | 17.53 | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 39 | 161.93 | 11.13 | 17.53 | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 41 | 180.98 | 11.13 | 17.53 | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 44 | 193.68 | 11.13 | 17.53 | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 45 | 211.15 | 11.13 | 17.53 | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 46 | 211.15 | 12.70 | 19.05 | 17.53 | 8.66 | 1.52 | 9.65 | 13.49 | 1.52 | 4.83 |
| R 47 | 228.60 | 19.05 | 25.40 | 23.88 | 12.32 | 1.52 | 12.70 | 19.84 | 1.52 | 4.06 |
| R 49 | 269.88 | 11.13 | 17.53 | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 50 | 269.88 | 15.88 | 22.35 | 20.57 | 10.49 | 1.52 | 11.18 | 16.66 | 1.52 | 4.06 |
| R 53 | 323.85 | 11.13 | 17.53 | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 54 | 323.85 | 15.88 | 22.35 | 20.57 | 10.49 | 1.52 | 11.18 | 16.66 | 1.52 | 4.06 |
| R 57 | 381.00 | 11.13 | 17.53 | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 63 | 419.10 | 25.40 | 33.27 | 31.75 | 17.30 | 2.29 | 15.75 | 27.00 | 2.29 | 5.59 |
| R 65 | 469.90 | 11.13 | 17.53 | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 66 | 469.90 | 15.88 | 22.35 | 20.57 | 10.49 | 1.52 | 11.18 | 16.66 | 1.52 | 4.06 |
| R 69 | 533.40 | 11.13 | 17.53 | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 70 | 533.40 | 19.05 | 25.40 | 23.88 | 12.32 | 1.52 | 12.70 | 19.84 | 1.52 | 4.83 |
| R 73 | 584.20 | 12.70 | 19.05 | 17.53 | 8.66 | 1.52 | 9.65 | 13.49 | 1.52 | 3.30 |
| R 74 | 584.20 | 19.05 | 25.40 | 23.88 | 12.32 | 1.52 | 12.70 | 19.84 | 1.52 | 4.83 |
| R 82 | 57.15 | 11.13 | – | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 84 | 63.50 | 11.13 | – | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |
| R 85 | 79.38 | 12.70 | – | 17.53 | 8.66 | 1.52 | 9.65 | 13.49 | 1.52 | 3.30 |
| R 86 | 90.50 | 15.88 | – | 20.57 | 10.49 | 1.52 | 11.18 | 16.66 | 1.52 | 4.06 |
| R 87 | 100.03 | 15.88 | – | 20.57 | 10.49 | 1.52 | 11.18 | 16.66 | 1.52 | 4.06 |
| R 88 | 123.83 | 19.05 | – | 23.88 | 12.32 | 1.52 | 12.70 | 19.84 | 1.52 | 4.83 |
| R 89 | 114.30 | 19.05 | – | 23.88 | 12.32 | 1.52 | 12.70 | 19.84 | 1.52 | 4.83 |
| R 90 | 155.58 | 22.23 | – | 26.92 | 14.81 | 1.52 | 14.22 | 23.01 | 1.52 | 4.83 |
| R 91 | 260.35 | 31.75 | – | 38.10 | 22.33 | 2.29 | 17.53 | 33.35 | 2.29 | 4.06 |
| R 99 | 234.95 | 11.13 | – | 16.00 | 7.75 | 1.52 | 7.87 | 11.91 | 0.76 | 4.83 |

# TABLE 3




A* (width of ring) ±0.203/–0
C(width of flat) +0.015,–0
D(height of chamfer) +0/–0.762
E(depth of groove) +0.508/–0
F(widh of groove) ±0.203

H*(height of ring) +0.203/–0
OD(OD of ring) +0.508/–0
P(average pitch diameter of groove) ±0.127
R1(radius in rings) ±0.508
R2(radius in groove) max
23° (angle) ±1/2deg

*A plus tolerancee of 0.008 in. for width a and height H is permitted, provided the variation in width or height of any ring does not exceed 0.004 in. throughtout its entire circumference.

*Note: The pressure passage hole illustrated in the RX ring cross section in rings RX–82 through RX–91 only, centerline of hole shall be located at midpoint of dimension C.Hole diameter shall be 0.06 in. for rings RX–82 through RX–85, 0.09 in. for rings RX–86, and RX–87, and 0.12 in.for rings RX–88 through RX–91.

## TABLE 3 API Type RX Pressure Energized Ring Gaskets

Unit : mm

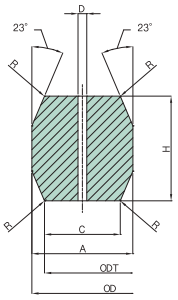
| Ring Number | Pitch Diameter of Ring and Groove | Outside Diameter of Ring | Width of Ring | Width of Flat | Height of Outside Bevel | Height of Ring | Radius in Ring | Depth of Groove | Width of Groove | Radius in Groove | Approx. Distance Between Made–up Flanges |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | OD | A | C | D | H | $R_1$ | E | F | $R_2$ | S |
| RX 20 | 68.3 | 76.2 | 8.7 | 4.6 | 3.2 | 19.1 | 1.5 | 6.4 | 8.7 | 0.8 | 9.7 |
| RX 23 | 82.6 | 93.3 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 24 | 95.3 | 106.0 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 25 | 101.6 | 109.6 | 8.7 | 4.6 | 3.2 | 19.1 | 1.5 | 6.4 | 8.7 | 0.8 | – |
| RX 26 | 101.6 | 111.9 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 27 | 108.0 | 118.3 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 31 | 123.8 | 134.5 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 35 | 136.5 | 147.2 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 37 | 136.5 | 159.9 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 39 | 149.2 | 172.6 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 41 | 181.0 | 191.7 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 44 | 193.7 | 204.4 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 45 | 211.2 | 221.8 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 46 | 211.2 | 222.3 | 13.5 | 6.7 | 4.8 | 28.6 | 1.5 | 9.7 | 13.5 | 1.5 | 11.9 |
| RX 47 | 228.6 | 245.3 | 19.8 | 10.3 | 6.9 | 41.3 | 2.3 | 12.7 | 19.8 | 1.5 | 23.1 |
| RX 49 | 269.9 | 280.6 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 50 | 269.9 | 283.4 | 16.7 | 8.5 | 5.3 | 31.8 | 1.5 | 11.2 | 16.7 | 1.5 | 11.9 |
| RX 53 | 323.9 | 334.6 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 54 | 323.9 | 337.3 | 16.7 | 8.5 | 5.3 | 31.8 | 1.5 | 11.2 | 16.7 | 1.5 | 11.9 |
| RX 57 | 381.0 | 391.7 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 63 | 419.1 | 441.7 | 27.0 | 14.8 | 8.5 | 50.8 | 2.3 | 16.0 | 27.0 | 2.3 | 21.3 |
| RX 65 | 469.9 | 480.6 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 66 | 469.9 | 483.4 | 16.7 | 8.5 | 5.3 | 31.8 | 1.5 | 11.2 | 16.7 | 1.5 | 11.9 |
| RX 69 | 533.4 | 544.1 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 70 | 533.4 | 550.1 | 19.8 | 10.3 | 6.9 | 41.3 | 2.3 | 12.7 | 19.8 | 1.5 | 18.3 |
| RX 73 | 584.2 | 596.1 | 13.5 | 6.7 | 5.3 | 31.8 | 1.5 | 9.7 | 13.5 | 1.5 | 15.0 |
| RX 74 | 584.2 | 600.9 | 19.8 | 10.3 | 6.9 | 41.3 | 2.3 | 12.7 | 19.8 | 1.5 | 18.3 |
| RX 82 | 57.2 | 67.9 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 84 | 63.5 | 74.2 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 85 | 79.4 | 90.1 | 13.5 | 6.7 | 4.2 | 25.4 | 1.5 | 9.7 | 13.5 | 1.5 | 9.7 |
| RX 86 | 90.5 | 103.6 | 15.1 | 8.5 | 4.8 | 28.6 | 1.5 | 11.2 | 16.7 | 1.5 | 9.7 |
| RX 87 | 100.0 | 113.1 | 15.1 | 8.5 | 4.8 | 28.6 | 1.5 | 11.2 | 16.7 | 1.5 | 9.7 |
| RX 88 | 123.8 | 139.3 | 17.5 | 10.3 | 5.3 | 31.8 | 1.5 | 12.7 | 19.8 | 1.5 | 9.7 |
| RX 89 | 114.3 | 129.8 | 18.3 | 10.3 | 5.3 | 31.8 | 1.5 | 12.7 | 19.8 | 1.5 | 9.7 |
| RX 90 | 155.6 | 174.6 | 19.8 | 12.2 | 7.4 | 44.5 | 2.3 | 14.2 | 23.0 | 1.5 | 18.3 |
| RX 91 | 260.4 | 286.9 | 30.2 | 19.8 | 7.5 | 45.2 | 2.3 | 17.5 | 33.4 | 2.3 | 19.1 |
| RX 99 | 235.0 | 245.7 | 11.9 | 6.5 | 4.2 | 25.4 | 1.5 | 7.9 | 11.9 | 0.8 | 11.9 |
| RX 201 | 46.1 | 51.5 | 5.7 | 3.2 | 1.4[a] | 11.3 | 0.5[b] | 4.1 | 5.6 | 0.8 | – |
| RX 205 | 57.2 | 62.3 | 5.6 | 3.0 | 1.8[a] | 11.1 | 0.5[b] | 4.1 | 5.6 | 0.5 | – |
| RX 210 | 88.9 | 97.6 | 9.5 | 5.4 | 3.2[a] | 19.1 | 0.8[b] | 6.4 | 9.5 | 0.8 | – |
| RX 215 | 130.2 | 140.9 | 11.9 | 5.3 | 4.2[a] | 25.4 | 1.5[b] | 7.9 | 11.9 | 0.8 | – |

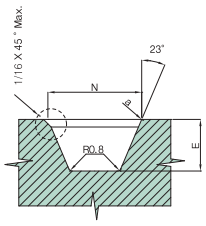
Notes :

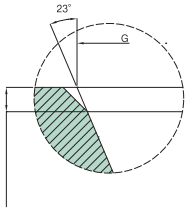
a Tolerance on these dimension is to, +0, –0.015

b Tolerance on these dimension is to +0.2, –0

# TABLE 4




TOLERANCES

A (width of ring) ———— +0.203/–0
C(width of flat)———— +0.152,–0
D(height of chamfer) ———— ±0.508
E(depth of groove) ———— +0.508/–0
G(OD of groove) ———— +0.102/–0

Ha(height of ring) ———— +0.203/0
N(width of groove)———— +0.102/–0
OD(OD of ring) ———— +0/–0.152
ODT(OD of flat) ———— ±0.051
R(radius in ring) ————see note
23° (angle)———— ±1/4°

*A plus tolerancee of 0.008 in. for width a and height H is permitted, provided the variation in width or height of any ring does not exceed 0.004 in. throught out its entire circumference.

*Radius "R" shall be 8 to 12% of the gasket height "H".

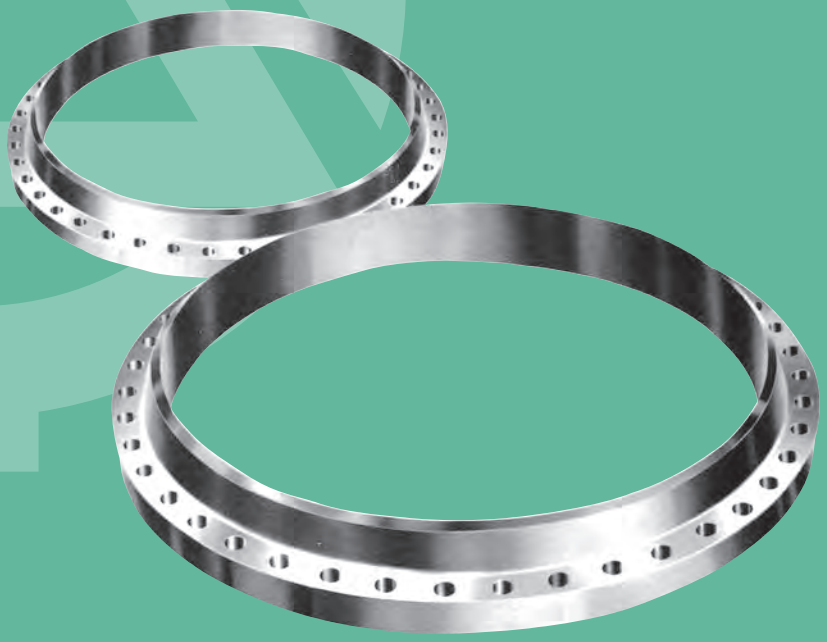
## TABLE 4 API Type BX Pressure Energized Ring Gaskets

Unit : mm

| Ring Number | Number Size | Outside Diameter of Ring | Height of Ring | Width of Ring | Diameter of Flat | Width of Flat | Hole Size | Depth of Groove | Outside Diameter of Groove | Width of Groove |
|---|---|---|---|---|---|---|---|---|---|---|
| | | OD | H | A | ODT | C | D | E | G | N |
| BX 150 | 1 11/16 | 72.19 | 9.30 | 9.30 | 70.87 | 7.98 | 1.52 | 5.59 | 73.48 | 11.43 |
| BX 151 | 1 13/16 | 76.40 | 9.63 | 9.63 | 75.03 | 8.26 | 1.52 | 5.59 | 77.77 | 11.84 |
| BX 152 | 2 1/16 | 84.68 | 10.24 | 10.24 | 83.24 | 8.79 | 1.52 | 5.84 | 86.23 | 12.65 |
| BX 153 | 2 9/16 | 100.94 | 11.38 | 11.38 | 99.31 | 9.78 | 1.52 | 6.86 | 102.77 | 14.07 |
| BX 154 | 3 1/16 | 116.84 | 12.40 | 12.40 | 115.09 | 10.64 | 1.52 | 7.62 | 119.00 | 15.39 |
| 23BX 155 | 4 1/16 | 147.96 | 14.22 | 14.22 | 145.95 | 12.22 | 1.52 | 8.38 | 150.62 | 17.73 |
| BX 156 | 7 1/16 | 237.92 | 18.62 | 18.62 | 235.28 | 15.98 | 3.05 | 11.18 | 241.83 | 23.39 |
| BX 157 | 9 | 294.46 | 20.98 | 20.98 | 291.49 | 18.01 | 3.05 | 12.70 | 299.06 | 26.39 |
| BX 158 | 11 | 352.04 | 23.14 | 23.14 | 348.77 | 19.86 | 3.05 | 14.22 | 357.23 | 29.18 |
| BX 159 | 13 5/8 | 426.72 | 25.70 | 25.70 | 423.09 | 22.07 | 3.05 | 15.75 | 432.64 | 32.49 |
| BX 160 | 13 5/8 | 402.59 | 23.83 | 13.74 | 399.21 | 10.36 | 3.05 | 14.22 | 408.00 | 19.96 |
| BX 161 | 16 5/8 | 491.41 | 28.07 | 16.21 | 487.45 | 12.24 | 3.05 | 17.02 | 497.94 | 23.62 |
| BX 162 | 16 5/8 | 475.49 | 14.22 | 14.22 | 473.48 | 12.22 | 1.52 | 8.38 | 478.33 | 17.91 |
| BX 163 | 18 3/4 | 556.16 | 30.10 | 17.37 | 551.89 | 13.11 | 3.05 | 18.29 | 563.50 | 25.55 |
| BX 164 | 18 3/4 | 570.56 | 30.10 | 24.59 | 566.29 | 20.32 | 3.05 | 18.29 | 577.90 | 32.77 |
| BX 165 | 21 1/4 | 624.71 | 32.03 | 18.49 | 620.19 | 13.97 | 3.05 | 19.05 | 632.56 | 27.20 |
| BX 166 | 21 1/4 | 640.03 | 32.03 | 26.14 | 635.51 | 21.62 | 3.05 | 19.05 | 647.88 | 34.87 |
| BX 167 | 26 3/4 | 759.36 | 35.86 | 13.11 | 754.28 | 8.03 | 1.52 | 21.34 | 768.33 | 22.91 |
| BX 168 | 26 3/4 | 765.25 | 35.86 | 16.05 | 760.17 | 10.97 | 1.52 | 21.34 | 774.22 | 25.86 |
| BX 169 | 5 1/8 | 173.51 | 15.85 | 12.93 | 171.27 | 10.69 | 1.52 | 9.65 | 176.66 | 16.92 |
| BX 170 | 9 | 218.03 | 14.22 | 14.22 | 216.03 | 12.22 | 1.52 | 8.38 | 220.88 | 17.91 |
| BX 171 | 11 | 267.44 | 14.22 | 14.22 | 265.43 | 12.22 | 1.52 | 8.38 | 270.28 | 17.91 |
| BX 172 | 13 5/8 | 333.07 | 14.22 | 14.22 | 331.06 | 12.22 | 1.52 | 8.38 | 335.92 | 17.91 |
| BX 303 | 30 | 852.75 | 37.95 | 16.97 | 847.37 | 11.61 | 1.52 | 22.61 | 862.31 | 27.38 |



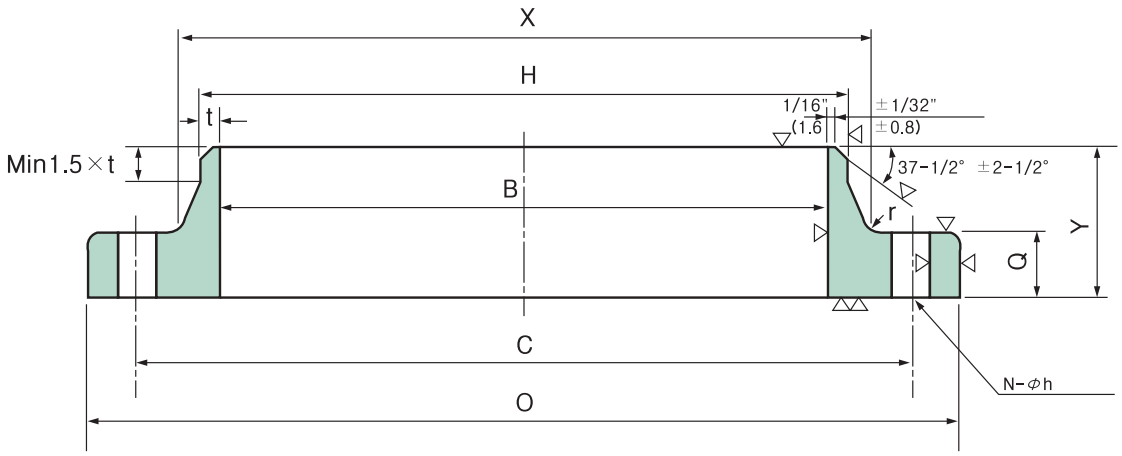
SAMIL P&F Co., Ltd.
삼일피엔에프주식회사



# TAYLOR FLANGES

- Class 125 Flanges
- Class 175 Flanges
- Class 250 Flanges
- Class 350 Flanges

# TAYLOR FLANGES CLASS-125



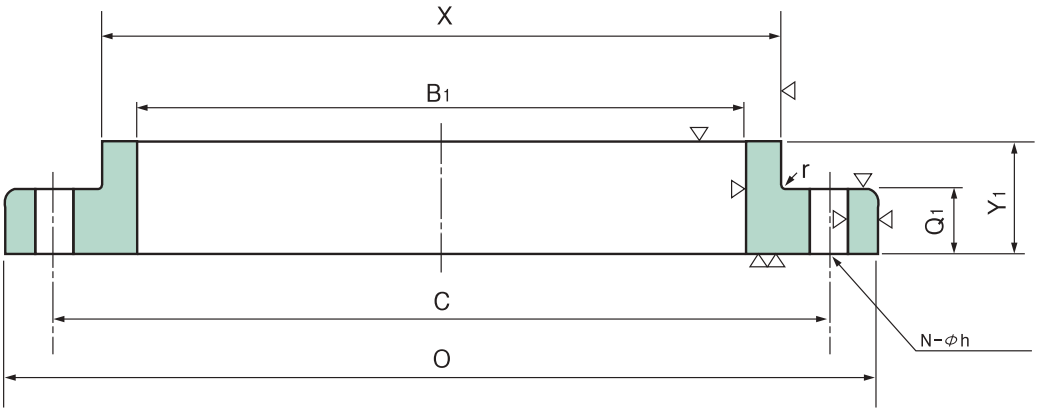

WELDING NECK TYPE

Unit : mm

| Nominal Pipe Size | COMMON DIMENSIONS | | | | Diameter of Hub at Bevel | | THICKNESS | | | | LENGTH THRU HUB | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Outside Diameter of Flange | | Diameter at Base of Hub | | | | Welding Neck | | Slip-On | | Welding Neck | | Slip-On | |
| | O | | X | | H | | Q | | Q1 | | Y | | Y1 | |
| | mm. | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. |
| 26 | 870.0 | 34-1/4 | 723.9 | 28-1/2 | 660.4 | 26 | 50.8 | 2 | 50.8 | 2 | 127.0 | 5 | 85.7 | 3-3/8 |
| 28 | 927.1 | 36-1/2 | 781.1 | 30-3/4 | 711.2 | 28 | 52.4 | 2-1/16 | 52.4 | 2-1/16 | 128.6 | 5-1/16 | 87.3 | 3-7/16 |
| 30 | 984.3 | 38 3/4 | 831.9 | 32-3/4 | 762.0 | 30 | 54.0 | 2-1/8 | 54.0 | 2-1/8 | 130.2 | 5-1/8 | 88.9 | 3-1/2 |
| 32 | 1060.5 | 41-3/4 | 889.0 | 35 | 812.8 | 32 | 57.2 | 2-1/4 | 57.2 | 2-1/4 | 133.4 | 5-1/4 | 92.1 | 3-5/8 |
| 34 | 1111.3 | 43-3/4 | 939.8 | 37 | 863.6 | 34 | 58.8 | 2-5/16 | 58.8 | 2-5/16 | 134.9 | 5-5/16 | 93.7 | 3-11/16 |
| 36 | 1168.4 | 46 | 997.0 | 39-1/4 | 914.4 | 36 | 60.3 | 2-3/8 | 60.3 | 2-3/8 | 136.5 | 5-3/8 | 95.3 | 3-3/4 |
| 38 | 1238.3 | 48-3/4 | 1060.5 | 41-3/4 | 965.2 | 38 | 60.3 | 2-3/8 | 60.3 | 2-3/8 | 136.5 | 5-3/8 | 95.3 | 3-3/4 |
| 40 | 1289.1 | 50-3/4 | 1111.3 | 43-3/4 | 1016.0 | 40 | 63.5 | 2-1/2 | 63.5 | 2-1/2 | 139.7 | 5-1/2 | 98.4 | 3-7/8 |
| 42 | 1346.2 | 53 | 1168.4 | 46 | 1066.8 | 42 | 66.7 | 2-5/8 | 66.7 | 2-5/8 | 142.9 | 5-5/8 | 101.6 | 4 |
| 44 | 1403.4 | 55-1/4 | 1219.2 | 48 | 1117.6 | 44 | 66.7 | 2-5/8 | 66.7 | 2-5/8 | 142.9 | 5-5/8 | 101.6 | 4 |
| 46 | 1454.2 | 57-1/4 | 1270.0 | 50 | 1168.4 | 46 | 68.3 | 2-11/16 | 68.3 | 2-11/16 | 144.5 | 5-11/16 | 103.2 | 4-1/16 |
| 48 | 1511.3 | 59-1/2 | 1327.2 | 52-1/4 | 1219.2 | 48 | 69.9 | 2-3/4 | 69.9 | 2-3/4 | 146.1 | 5-3/4 | 104.8 | 4-1/8 |
| 50 | 1568.5 | 61-3/4 | 1378.0 | 54-1/4 | 1270.0 | 50 | 69.9 | 2-3/4 | 69.9 | 2-3/4 | 146.1 | 5-3/4 | 104.8 | 4-1/8 |
| 52 | 1625.6 | 64 | 1435.1 | 56-1/2 | 1320.8 | 52 | 73.0 | 2-7/8 | 73.0 | 2-7/8 | 149.2 | 5-7/8 | 108.0 | 4-1/4 |
| 54 | 1682.8 | 66-1/4 | 1492.3 | 58-3/4 | 1371.6 | 54 | 76.2 | 3 | 76.2 | 3 | 152.4 | 6 | 111.1 | 4-3/8 |
| 60 | 1854.2 | 73 | 1657.4 | 65-1/4 | 1524.0 | 60 | 79.4 | 3-1/8 | 79.4 | 3-1/8 | 155.6 | 6-1/8 | 114.3 | 4-1/2 |
| 66 | 2032.0 | 80 | 1816.1 | 71-1/2 | 1676.4 | 66 | 85.7 | 3-3/8 | 85.7 | 3-3/8 | 161.9 | 6-3/8 | 123.8 | 4-7/8 |
| 72 | 2197.1 | 86-1/2 | 1993.9 | 78-1/2 | 1828.8 | 72 | 88.9 | 3-1/2 | 88.9 | 3-1/2 | 165.1 | 6-1/2 | 127.0 | 5 |
| 84 | 2533.7 | 99-3/4 | 2298.7 | 90-1/2 | 2133.6 | 84 | 98.4 | 3-7/8 | 98.4 | 3-7/8 | 174.6 | 6-7/8 | 136.5 | 5-3/8 |
| 96 | 2876.6 | 113-1/4 | 2609.9 | 102-3/4 | 2438.4 | 96 | 108.0 | 4-1/4 | 108.0 | 4-1/4 | 184.2 | 7-1/4 | 146.1 | 5-3/4 |

Notes :

Properly there is no Steel Flange Standard of this designation, the term "CLASS 125" being precisely applicable to a Cast Iron Standard under ANSI B16.1.
These flanges are used for connections to cast steel valves, pumps or other equipment, having flanged ends made to Cast Iron Standard dimensions.
These flanges are identical with Class E of AWWA C207 For machining tolerances see ANSI B16.5.

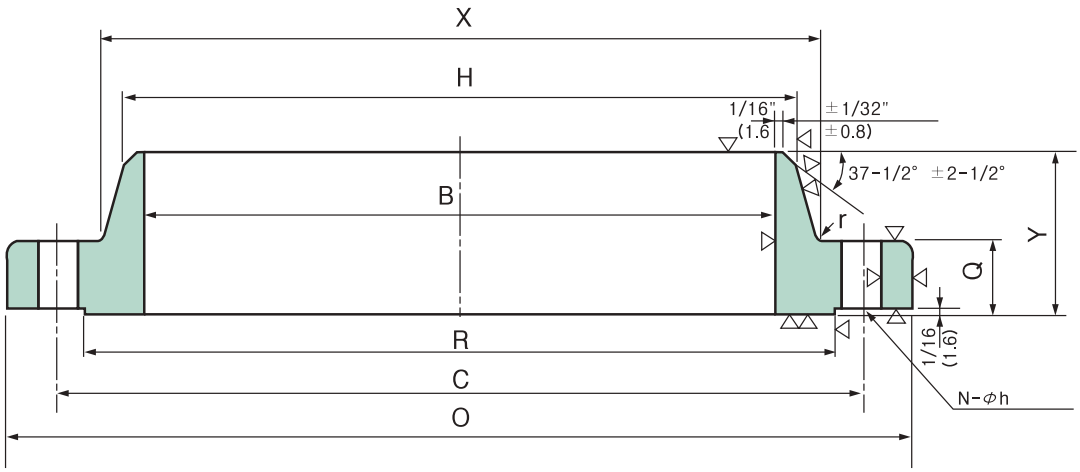



SLIP-ON TYPE

Unit : mm

| Nominal Pipe Size | INSIDE DIAMETER | | | DRILLING TEMPLATE | | | | Fillet Radius | | APPROX WEIGHT | | Nominal Pipe Size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welding Neck | Slip-On | | Bolt Circle Diameter | | Number Of Holes | Diam, of Holes | | | Welding Neck | Slip-On | |
| | B | $B_1$ | | C | | N | h | | | | | |
| | | mm | in | mm | in | | | mm | in | kg | kg | |
| 26 | To be specified by Purchaser | 666.8 | 26-1/4 | 806.5 | 31-3/4 | 24 | 1-3/8 | 9.5 | 3/8 | 118 | 107 | 26 |
| 28 | | 717.6 | 28-1/4 | 863.6 | 34 | 28 | 1-3/8 | 9.5 | 3/8 | 134 | 122 | 28 |
| 30 | | 768.4 | 30-1/4 | 914.4 | 36 | 28 | 1-3/8 | 9.5 | 3/8 | 154 | 138 | 30 |
| 32 | | 819.2 | 32-1/4 | 977.9 | 38-1/2 | 28 | 1-5/8 | 9.5 | 3/8 | 186 | 170 | 32 |
| 34 | | 870.0 | 34-1/4 | 1028.7 | 40-1/2 | 32 | 1-5/8 | 9.5 | 3/8 | 200 | 181 | 34 |
| 36 | | 920.8 | 36-1/4 | 1085.9 | 42-3/4 | 32 | 1-5/8 | 9.5 | 3/8 | 225 | 204 | 36 |
| 38 | | 971.6 | 38-1/4 | 1149.4 | 45-1/4 | 32 | 1-5/8 | 9.5 | 3/8 | 259 | 240 | 38 |
| 40 | | 1022.4 | 40-1/4 | 1200.2 | 47-1/4 | 36 | 1-5/8 | 9.5 | 3/8 | 281 | 259 | 40 |
| 42 | | 1073.2 | 42-1/4 | 1257.3 | 49-1/2 | 36 | 1-5/8 | 9.5 | 3/8 | 322 | 295 | 42 |
| 44 | | 1124.0 | 44-1/4 | 1314.5 | 51-3/4 | 40 | 1-5/8 | 9.5 | 3/8 | 340 | 313 | 44 |
| 46 | | 1174.8 | 46-1/4 | 1365.3 | 53-3/4 | 40 | 1-5/8 | 9.5 | 3/8 | 363 | 331 | 46 |
| 48 | | 1225.6 | 48-1/4 | 1422.4 | 56 | 44 | 1-5/8 | 9.5 | 3/8 | 395 | 363 | 48 |
| 50 | | 1276.4 | 50-1/4 | 1479.6 | 58-1/4 | 44 | 1-7/8 | 11.1 | 7/16 | 408 | 376 | 50 |
| 52 | | 1327.2 | 52-1/4 | 1536.7 | 60-1/2 | 44 | 1-7/8 | 11.1 | 7/16 | 454 | 417 | 52 |
| 54 | | 1378.0 | 54-1/4 | 1593.9 | 62-3/4 | 44 | 1-7/8 | 11.1 | 7/16 | 499 | 465 | 54 |
| 60 | | 1530.4 | 60-1/4 | 1759.0 | 69-1/4 | 52 | 1-7/8 | 11.1 | 7/16 | 612 | 567 | 60 |
| 66 | | 1682.8 | 66-1/4 | 1930.4 | 76 | 52 | 1-7/8 | 11.1 | 7/16 | 805 | 737 | 66 |
| 72 | | 1835.2 | 72-1/4 | 2095.5 | 82-1/2 | 60 | 1-7/8 | 11.1 | 7/16 | 953 | 873 | 72 |
| 84 | | 2140.0 | 84-1/4 | 2425.7 | 95-1/2 | 64 | 2-1/8 | 15.9 | 5/8 | 1281 | 1179 | 84 |
| 96 | | 2444.8 | 96-1/4 | 2755.9 | 108-1/2 | 68 | 2-3/8 | 22.2 | 7/8 | 1724 | 1486 | 96 |

# TAYLOR FLANGES CLASS-175




WELDING NECK TYPE

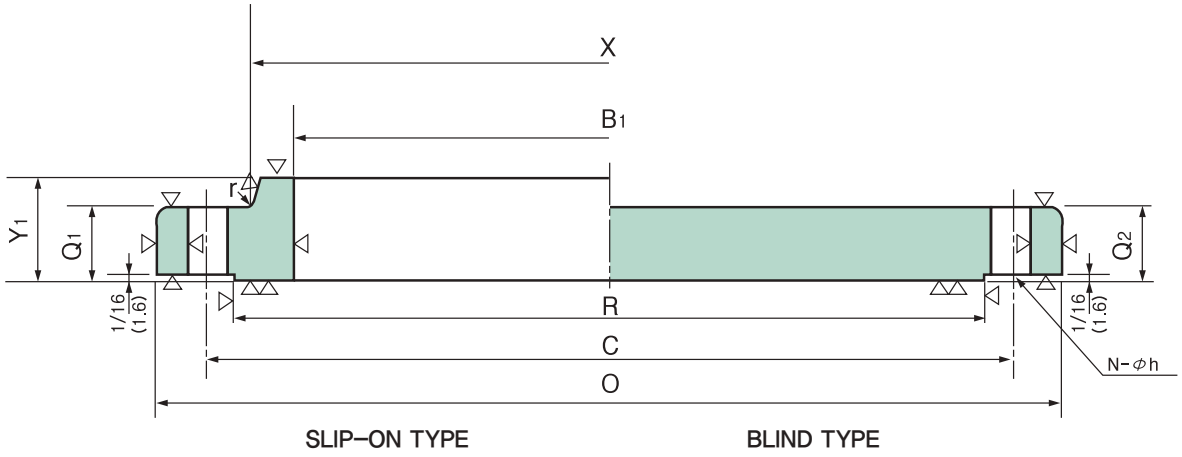
## WELDING NECK, SLIP-ON AND BLIND

Unit : mm

| Nominal Pipe Size | COMMON DIMENSIONS | | | | | | COMMON DIMENSIONS | | | | | | LENGTH THRU HUB | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Outside Diameter of Flange | | O.D Raised Face | | Diameter at Base of Hub | | Welding Neck | | Slip-On | | Blind | | Welding Neck | | Slip-On | |
| | O | | R | | X | | Q | | Q1 | | $Q_2$ | | Y | | $Y_1$ | |
| | mm. | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. |
| 26 | 800.1 | 31-1/2 | 736.6 | 29 | 701.7 | 27-5/8 | 34.9 | 1-3/8 | 34.9 | 1-3/8 | 47.6 | 1-7/8 | 85.7 | 3-3/8 | 69.9 | 2-3/4 |
| 28 | 850.9 | 33-1/2 | 787.4 | 31 | 752.5 | 29-5/8 | 34.9 | 1-3/8 | 34.9 | 1-3/8 | 50.8 | 2 | 85.7 | 3-3/8 | 69.9 | 2-3/4 |
| 30 | 908.1 | 35-3/4 | 844.6 | 33-1/4 | 809.6 | 31-7/8 | 34.9 | 1-3/8 | 34.9 | 1-3/8 | 54.0 | 2-1/8 | 92.1 | 3-5/8 | 69.9 | 2-3/4 |
| 32 | 958.9 | 37-3/4 | 895.4 | 35-1/4 | 860.4 | 33-7/8 | 34.9 | 1-3/8 | 34.9 | 1-3/8 | 57.2 | 2-1/4 | 92.1 | 3-5/8 | 69.9 | 2-3/4 |
| 34 | 1022.4 | 40-1/4 | 949.3 | 37-3/8 | 911.2 | 35-7/8 | 38.1 | 1-1/2 | 44.5 | 1-3/4 | 60.3 | 2-3/8 | 95.3 | 3-3/4 | 85.7 | 3-3/8 |
| 36 | 1073.2 | 42-1/4 | 1000.1 | 39-3/8 | 962.0 | 37-7/8 | 38.1 | 1-1/2 | 44.5 | 1-3/4 | 63.5 | 2-1/2 | 95.3 | 3-3/4 | 85.7 | 3-3/8 |
| 38 | 1124.0 | 44-1/4 | 1050.9 | 41-3/8 | 1012.8 | 39-7/8 | 44.5 | 1-3/4 | 50.8 | 2 | 66.7 | 2-5/8 | 104.8 | 4-1/8 | 95.3 | 3-3/4 |
| 40 | 1174.8 | 46-1/4 | 1101.7 | 43-3/8 | 1063.6 | 41-7/8 | 44.5 | 1-3/4 | 50.8 | 2 | 69.9 | 2-3/4 | 104.8 | 4-1/8 | 101.6 | 4 |
| 42 | 1244.6 | 49 | 1162.1 | 45-3/4 | 1120.8 | 44-1/8 | 50.8 | 2 | 60.3 | 2-3/8 | 73.0 | 2-7/8 | 114.3 | 4-1/2 | 111.1 | 4-3/8 |
| 44 | 1295.4 | 51 | 1212.9 | 47-3/4 | 1171.6 | 46-1/8 | 50.8 | 2 | 60.3 | 2-3/8 | 76.2 | 3 | 114.3 | 4-1/2 | 111.1 | 4-3/8 |
| 46 | 1346.2 | 53 | 1263.7 | 49-3/4 | 1222.4 | 48-1/8 | 50.8 | 2 | 60.3 | 2-3/8 | 79.4 | 3-1/8 | 114.3 | 4-1/2 | 117.5 | 4-5/8 |
| 48 | 1397.0 | 55 | 1314.5 | 51-3/4 | 1273.2 | 50-1/8 | 57.2 | 2-1/4 | 66.7 | 2-5/8 | 85.7 | 3-3/8 | 123.8 | 4-7/8 | 123.8 | 4-7/8 |
| 50 | 1447.8 | 57 | 1365.3 | 53-3/4 | 1324.0 | 52-1/8 | 57.2 | 2-1/4 | 66.7 | 2-5/8 | 85.7 | 3-3/8 | 123.8 | 4-7/8 | 123.8 | 4-7/8 |
| 52 | 1511.3 | 59-1/2 | 1422.4 | 56 | 1378.0 | 54-1/4 | 66.7 | 2-5/8 | 76.2 | 3 | 92.1 | 3-5/8 | 136.5 | 5-3/8 | 136.5 | 5-3/8 |
| 54 | 1562.1 | 61-1/2 | 1473.2 | 58 | 1428.8 | 56-1/4 | 66.7 | 2-5/8 | 76.2 | 3 | 92.1 | 3-5/8 | 136.5 | 5-3/8 | 136.5 | 5-3/8 |
| 60 | 1714.5 | 67-1/2 | 1625.6 | 64 | 1581.2 | 62-1/4 | 69.9 | 2-3/4 | 79.4 | 3-1/8 | 101.6 | 4 | 146.1 | 5-3/4 | 149.2 | 5-7/8 |
| 66 | 1866.9 | 73-1/2 | 1778.0 | 70 | 1739.9 | 68-1/2 | 79.4 | 3-1/8 | 101.6 | 4 | 111.1 | 4-3/8 | 155.6 | 6-1/8 | 174.6 | 6-7/8 |
| 72 | 2032.0 | 80 | 1943.1 | 76-1/2 | 1892.3 | 74-1/2 | 92.1 | 3-5/8 | 127.0 | 5 | 120.7 | 4-3/4 | 168.3 | 6-5/8 | 203.2 | 8 |
| 84 | 2387.6 | 94 | 1289.2 | 90-1/8 | 2235.2 | 88 | 76.2 | 3 | 127.0 | 5 | 139.7 | 5-1/2 | 177.8 | 7 | 215.9 | 8-1/2 |
| 96 | 2692.4 | 106 | 2594.0 | 102-1/8 | 2540.0 | 100 | 88.9 | 3-1/2 | 127.0 | 5 | 155.6 | 6-1/8 | 190.5 | 7-1/2 | 228.6 | 9 |

Notes :

(1) This designation applies to flanges formerly listed as "150lb at 750" F."
(2) Pressure rating;-175psi at -20° F to 650° F; or 150psi at 750° F.
(3) When applied to Welding Neck flanges, these ratings are based on inside diameters of pipe or shell as listed in "Nominal Size" column, and pipe or shell thicknesses ranging from 3/8" to 5/8".




Unit : mm

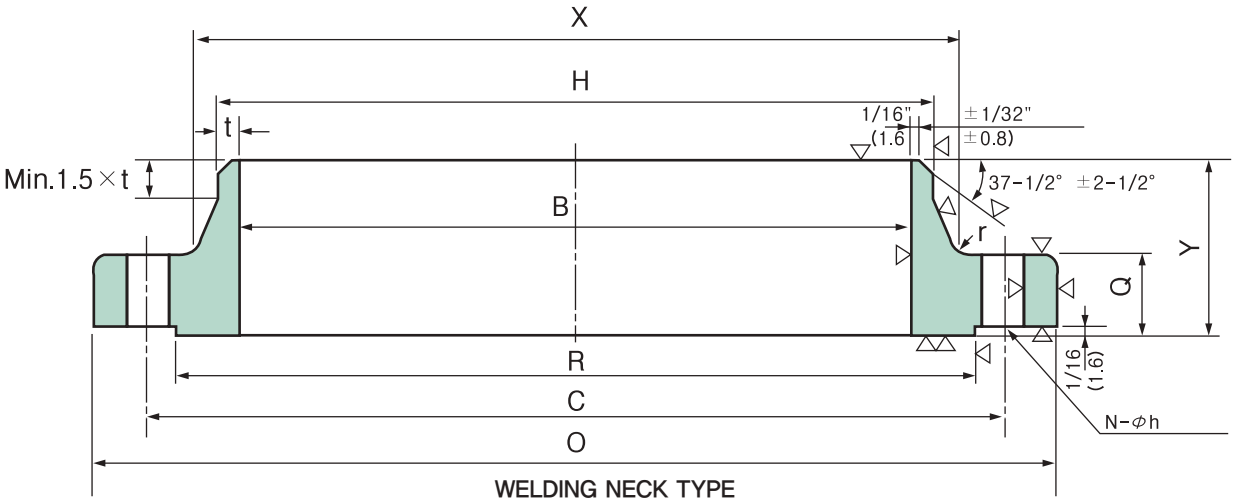
| Diameter of Hub at Bevel | | INSIDE DIAMETER | | | DRILLING TEMPLATE | | | | Fillet Radius | | APPROX WEIGHT | | | Nomi-nal Pipe Size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Welding Neck | Slip-On | | Bolt Circle Diameter | | Number Of Holes | Diam, of Holes | | | Weld-ing Neck | Slip-On | Blind | |
| H | | B | $B_1$ | | C | | N | h | r | | | | | |
| mm. | in. | | mm | in. | mm. | in. | | | mm. | in. | kg | kg | kg | |
| 660.4 | 26 | To be specified by Purchaser | 666.8 | 26-1/4 | 758.8 | 29-7/8 | 28 | 7/8 | 9.5 | 3/8 | 54 | 48 | 184 | 26 |
| 711.2 | 28 | | 717.6 | 28-1/4 | 809.6 | 31-7/8 | 28 | 7/8 | 9.5 | 3/8 | 59 | 52 | 222 | 28 |
| 762.0 | 30 | | 768.4 | 30-1/4 | 866.8 | 34-1/8 | 36 | 7/8 | 9.5 | 3/8 | 68 | 59 | 268 | 30 |
| 812.8 | 32 | | 819.2 | 32-1/4 | 917.6 | 36-1/8 | 36 | 7/8 | 9.5 | 3/8 | 73 | 64 | 318 | 32 |
| 863.6 | 34 | | 870.0 | 34-1/4 | 974.7 | 38-3/8 | 36 | 1 | 9.5 | 3/8 | 88 | 91 | 381 | 34 |
| 914.4 | 36 | | 920.8 | 36-1/4 | 1025.5 | 40-3/8 | 36 | 1 | 9.5 | 3/8 | 93 | 95 | 440 | 36 |
| 965.2 | 38 | | 971.6 | 38-1/4 | 1076.3 | 42-3/8 | 36 | 1 | 9.5 | 3/8 | 111 | 113 | 510 | 38 |
| 1016.0 | 40 | | 1022.4 | 40-1/4 | 1127.1 | 44-3/8 | 40 | 1 | 9.5 | 3/8 | 116 | 122 | 590 | 40 |
| 1066.8 | 42 | | 1073.2 | 42-1/4 | 1190.6 | 46-7/8 | 40 | 1-1/8 | 9.5 | 3/8 | 154 | 166 | 680 | 42 |
| 1117.6 | 44 | | 1124.0 | 44-1/4 | 1241.4 | 48-7/8 | 40 | 1-1/8 | 9.5 | 3/8 | 163 | 172 | 771 | 44 |
| 1168.4 | 46 | | 1174.8 | 46-1/4 | 1292.2 | 50-7/8 | 40 | 1-1/8 | 9.5 | 3/8 | 170 | 186 | 873 | 46 |
| 1219.2 | 48 | | 1225.6 | 48-1/4 | 1343.0 | 52-7/8 | 44 | 1-1/8 | 9.5 | 3/8 | 195 | 209 | 1009 | 48 |
| 1270.0 | 50 | | 1276.4 | 50-1/4 | 1393.8 | 54-7/8 | 44 | 1-1/8 | 9.5 | 3/8 | 204 | 218 | 1089 | 50 |
| 1320.8 | 52 | | 1327.2 | 52-1/4 | 1454.2 | 57-1/4 | 44 | 1-1/4 | 9.5 | 3/8 | 254 | 272 | 1270 | 52 |
| 1371.6 | 54 | | 1378.0 | 54-1/4 | 1505.0 | 59-1/4 | 44 | 1-1/4 | 9.5 | 3/8 | 263 | 281 | 1360 | 54 |
| 1454.0 | 60 | | 1530.4 | 60-1/4 | 1657.4 | 65-1/4 | 48 | 1-1/4 | 9.5 | 3/8 | 308 | 331 | 1814 | 60 |
| 1676.4 | 66 | | 1682.8 | 66-1/4 | 1809.8 | 71-1/4 | 56 | 1-1/4 | 6.4 | 1/4 | 376 | 454 | 2347 | 66 |
| 1828.8 | 72 | | 1835.2 | 72-1/4 | 1974.9 | 77-3/4 | 64 | 1-1/4 | 12.7 | 1/2 | 488 | 635 | 3016 | 72 |
| 2133.6 | 84 | | 2140.0 | 84-1/4 | 2324.1 | 91-1/2 | 72 | 1-3/8 | 12.7 | 1/2 | 703 | 1021 | – | 84 |
| 2438.4 | 96 | | 2444.8 | 96-1/4 | 2628.9 | 103-1/2 | 88 | 1-3/8 | 12.7 | 1/2 | 885 | 1179 | – | 96 |

(4) When applied to Slip-on flanges, ratinges are based on outside diameters of pipe or shell as listed in "Nominal Size" column. Bored slip to over nominal O.D pipe, any larger bore will affect the pressure rating.

(5) These flanges have been designed in accordance with "Modern Flange Design" (Taylor Forge Bulletin 722) and hence they comply in all respects with the current ASME Code.

(6) For machining tolerances see ANSI Standard B16.5.

# TAYLOR FLANGES CLASS-250




## WELDING NECK AND SLIP-ON

Unit : mm

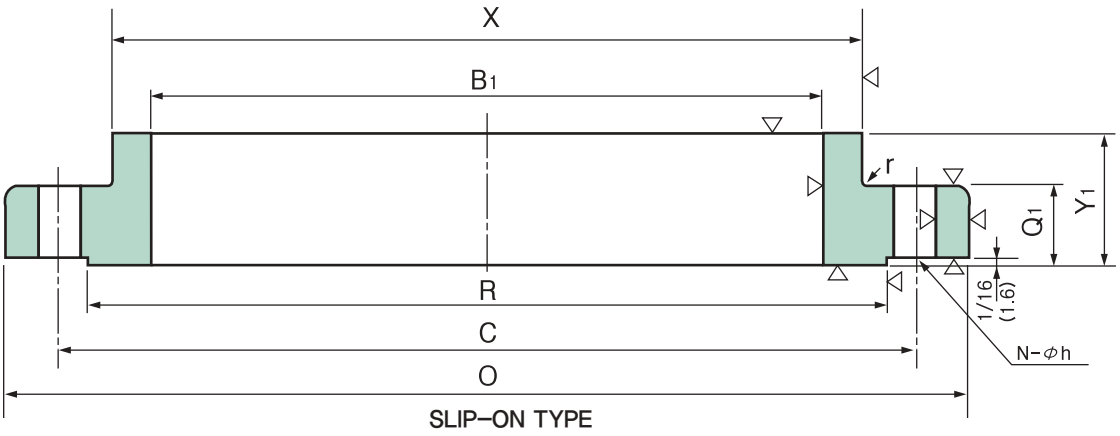
| Nominal Pipe Size | COMMON DIMENSIONS | | | | | | COMMON DIMENSIONS | | | | | | LENGTH THRU HUB | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Outside Diameter of Flange | | O.D Raised Face | | Diameter at Base of Hub | | Welding Neck | | Slip-On | | Blind | | Welding Neck | |
| | O | | R | | X | | Q | | Q1 | | $Q_2$ | | Y | |
| | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. |
| 26 | 971.6 | 38-1/4 | 823.9 | 32-7/16 | 774.7 | 30-1/2 | 71.5 | 2-13/16 | 71.5 | 2-13/16 | 147.7 | 5-13/16 | 120.7 | 4-3/4 |
| 28 | 1035.1 | 40-3/4 | 887.4 | 34-15/16 | 838.2 | 33 | 74.6 | 2-15/16 | 74.6 | 2-15/16 | 150.8 | 5-15/16 | 127.0 | 5 |
| 30 | 1092.2 | 43 | 944.6 | 37-3/16 | 895.4 | 35-1/4 | 76.2 | 3 | 76.2 | 3 | 152.4 | 6 | 127.0 | 5 |
| 32 | 1149.4 | 45-1/4 | 1001.7 | 39-7/16 | 952.5 | 37-1/2 | 79.4 | 3-1/8 | 79.4 | 3-1/8 | 155.6 | 6-1/8 | 130.2 | 5-1/8 |
| 34 | 1206.5 | 47-1/2 | 1052.5 | 41-7/16 | 1003.3 | 39-1/2 | 82.6 | 3-1/4 | 82.6 | 3-1/4 | 158.8 | 6-1/4 | 133.4 | 5-1/4 |
| 36 | 1270.0 | 50 | 1109.7 | 43-11/16 | 1054.1 | 41-1/2 | 85.7 | 3-3/8 | 85.7 | 3-3/8 | 161.9 | 6-3/8 | 136.5 | 5-3/8 |
| 38 | 1327.2 | 52-1/4 | 1160.5 | 45-11/16 | 1104.9 | 43-1/2 | 87.3 | 3-7/16 | 87.3 | 3-7/16 | 163.5 | 6-7/16 | 139.7 | 5-1/2 |
| 40 | 1384.3 | 54-1/2 | 1217.6 | 47-15/16 | 1162.1 | 45-3/4 | 90.5 | 3-9/16 | 90.5 | 3-9/16 | 166.7 | 6-9/16 | 139.7 | 5-1/2 |
| 42 | 1447.8 | 57 | 1281.1 | 50-7/16 | 1212.9 | 47-3/4 | 93.7 | 3-11/16 | 93.7 | 3-11/16 | 176.2 | 6-15/16 | 142.9 | 5-5/8 |
| 44 | 1505.0 | 59-1/4 | 1338.3 | 52-11/16 | 1263.7 | 49-3/4 | 95.3 | 3-3/4 | 95.3 | 3-3/4 | 177.8 | 7 | 146.1 | 5-3/4 |
| 46 | 1562.1 | 61-1/2 | 1395.4 | 54-15/16 | 1314.5 | 51-3/4 | 98.4 | 3-7/8 | 98.4 | 3-7/8 | 181.0 | 7-1/8 | 149.2 | 5-7/8 |
| 48 | 1651.0 | 65 | 1484.3 | 58-7/16 | 1371.6 | 54 | 101.6 | 4 | 101.6 | 4 | 184.2 | 7-1/4 | 152.4 | 6 |

Notes :

Properly there is no Steel Flange Standard of this designation, the term "Class 250" being pecisely applicable to a Cast Iron Standard under ANSI B16b.

They are ordinarily used for flanged connections to cast steel valves and equipment made to Class 250 Cast Iron Standard dimensions and we recommend their use only for such purposes.

For machining tolerances see ANSI Standard B16.5

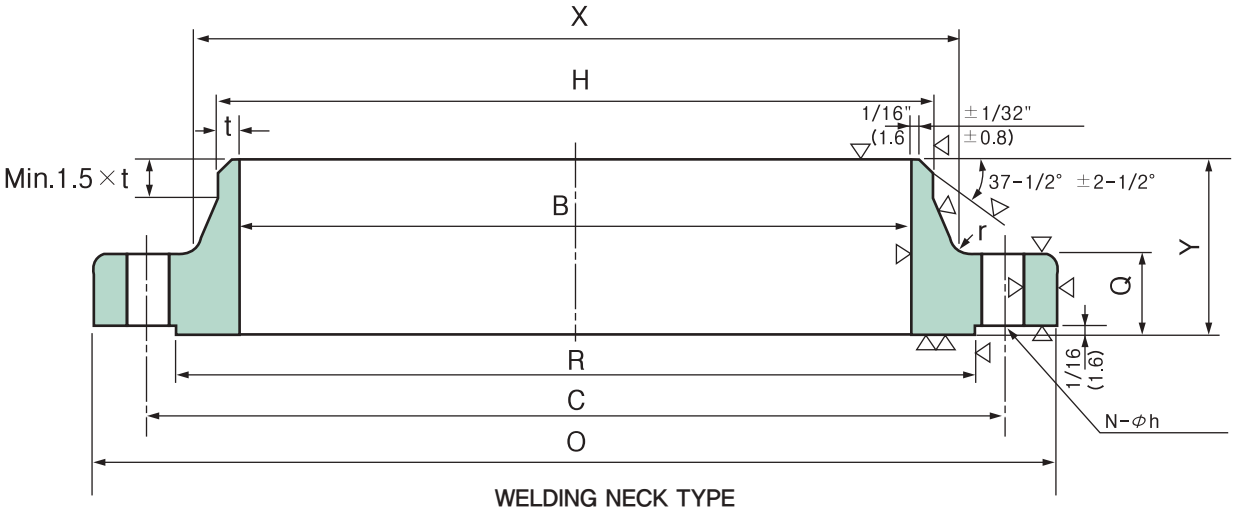



SLIP-ON TYPE

Unit : mm

| Diameter of Hub at Bevel | | INSIDE DIAMETER | | | DRILLING TEMPLATE | | | | Fillet Radius | | APPROX WEIGHT | | Nominal Pipe Size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Welding Neck | Slip-On | | Bolt Circle Diameter | | Number Of Holes | Diam, of Holes | | | Welding Neck | Slip-On | |
| H | | B | $B_1$ | | C | | N | h | r | | | | |
| mm. | in. | | mm | in. | mm. | in. | | | mm. | in. | kg | kg | |
| 660.4 | 26 | To be specified by Purchaser | 666.8 | 26-1/4 | 876.3 | 34-1/2 | 28 | 1-7/8 | 9.5 | 3/8 | 241 | 241 | 26 |
| 711.2 | 28 | | 717.6 | 28-1/4 | 939.8 | 37 | 28 | 1-7/8 | 9.5 | 3/8 | 286 | 291 | 28 |
| 762.0 | 30 | | 768.4 | 30-1/4 | 997.0 | 39-1/4 | 28 | 1-7/8 | 9.5 | 3/8 | 319 | 323 | 30 |
| 812.8 | 32 | | 819.2 | 32-1/4 | 1054.1 | 41-1/2 | 28 | 1-7/8 | 9.5 | 3/8 | 359 | 364 | 32 |
| 863.6 | 34 | | 870.0 | 34-1/4 | 1104.9 | 43-1/2 | 28 | 1-7/8 | 9.5 | 3/8 | 400 | 405 | 34 |
| 914.4 | 36 | | 920.8 | 36-1/4 | 1168.4 | 46 | 32 | 2-1/8 | 9.5 | 3/8 | 441 | 441 | 36 |
| 965.2 | 38 | | 971.6 | 38-1/4 | 1219.2 | 48 | 32 | 2-1/8 | 9.5 | 3/8 | 478 | 478 | 38 |
| 1016.0 | 40 | | 1022.4 | 40-1/4 | 1276.4 | 50-1/4 | 36 | 2-1/8 | 9.5 | 3/8 | 523 | 534 | 40 |
| 1066.8 | 42 | | 1073.2 | 42-1/4 | 1339.9 | 52-3/4 | 36 | 2-1/8 | 15.9 | 5/8 | 603 | 591 | 42 |
| 1117.6 | 44 | | 1124.0 | 44-1/4 | 1397.0 | 55 | 36 | 2-1/8 | 19.1 | 3/4 | 648 | 636 | 44 |
| 1168.4 | 46 | | 1174.8 | 46-1/4 | 1454.2 | 57-1/4 | 40 | 2-1/8 | 22.2 | 7/8 | 694 | 682 | 46 |
| 1219.2 | 48 | | 1225.6 | 48-1/4 | 1543.1 | 60-3/4 | 40 | 2-1/8 | 38.1 | 1-1/2 | 830 | 819 | 48 |

# TAYLOR FLANGES CLASS-350




WELDING NECK TYPE

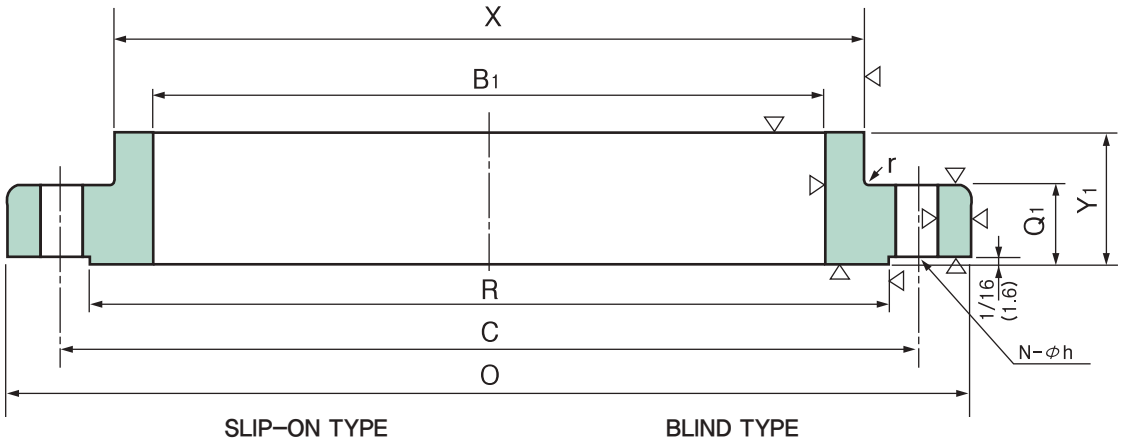
## WELDING NECK, SLIP-ON AND BLIND

Unit : mm

| Nominal Pipe Size | COMMON DIMENSIONS | | | | | | COMMON DIMENSIONS | | | | | | LENGTH THRU HUB | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Outside Diameter of Flange | | O.D Raised Face | | Diameter at Base of Hub | | Welding Neck | | Slip-On | | Blind | | Welding Neck | | Slip-On | |
| | O | | R | | X | | Q | | Q1 | | $Q_2$ | | Y | | $Y_1$ | |
| | mm. | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. |
| 26 | 831.9 | 32-3/4 | 749.3 | 29-1/2 | 708.0 | 27-7/8 | 63.5 | 2-1/2 | 63.5 | 2-1/2 | 69.9 | 2-3/4 | 127.0 | 5 | 114.3 | 4-1/2 |
| 28 | 882.7 | 34-3/4 | 800.1 | 31-1/2 | 758.8 | 29-7/8 | 63.5 | 2-1/2 | 63.5 | 2-1/2 | 73.0 | 2-7/8 | 127.0 | 5 | 114.3 | 4-1/2 |
| 30 | 939.8 | 37 | 857.3 | 33-3/4 | 816.0 | 32-1/8 | 66.7 | 2-5/8 | 66.7 | 2-5/8 | 76.2 | 3 | 133.4 | 5-1/4 | 120.7 | 4-3/4 |
| 32 | 990.6 | 39 | 908.1 | 35-3/4 | 866.8 | 34-1/8 | 69.9 | 2-3/4 | 69.9 | 2-3/4 | 82.6 | 3-1/4 | 139.7 | 5-1/2 | 127.0 | 5 |
| 34 | 1041.4 | 41 | 958.9 | 37-3/4 | 917.6 | 36-1/8 | 73.0 | 2-7/8 | 73.0 | 2-7/8 | 85.7 | 3-3/8 | 146.1 | 5-3/4 | 130.2 | 5-1/8 |
| 36 | 1111.3 | 43-3/4 | 1022.4 | 40-1/4 | 977.9 | 38-1/2 | 79.4 | 3-1/8 | 79.4 | 3-1/8 | 92.1 | 3-5/8 | 155.6 | 6-1/8 | 142.9 | 5-5/8 |
| 38 | 1162.1 | 45-3/4 | 1073.2 | 42-1/4 | 1028.7 | 40-1/2 | 79.4 | 3-1/8 | 79.4 | 3-1/8 | 95.3 | 3-3/4 | 155.6 | 6-1/8 | 142.9 | 5-5/8 |
| 40 | 1212.9 | 47-3/4 | 1124.0 | 44-1/4 | 1079.5 | 42-1/2 | 82.6 | 3-1/4 | 82.6 | 3-1/4 | 101.6 | 4 | 158.8 | 6-1/4 | 149.2 | 5-7/8 |
| 42 | 1270.0 | 50 | 1181.1 | 46-1/2 | 1136.7 | 44-3/4 | 88.9 | 3-1/2 | 88.9 | 3-1/2 | 104.8 | 4-1/8 | 165.1 | 6-1/2 | 155.6 | 6-1/8 |
| 44 | 1339.9 | 52-3/4 | 1241.4 | 48-7/8 | 1187.5 | 46-3/4 | 95.3 | 3-3/4 | 95.3 | 3-3/4 | 111.1 | 4-3/8 | 171.5 | 6-3/4 | 171.5 | 6-3/4 |
| 46 | 1390.7 | 54-3/4 | 1292.2 | 50-7/8 | 1238.3 | 48-3/4 | 108.0 | 4-1/4 | 108.0 | 4-1/4 | 120.7 | 4-3/4 | 184.2 | 7-1/4 | 184.2 | 7-1/4 |
| 48 | 1441.5 | 56-3/4 | 1343.0 | 52-7/8 | 1289.1 | 50-3/4 | 108.0 | 4-1/4 | 108.0 | 4-1/4 | 120.7 | 4-3/4 | 184.2 | 7-1/4 | 184.2 | 7-1/4 |
| 50 | | | | | | | | | | | | | | | | |
| 52 | 1562.1 | 61-1/2 | 1454.2 | 57-1/4 | 1397.0 | 55 | 108.0 | 4-1/4 | | | | | 190.5 | 7-1/2 | | |
| 54 | 1612.9 | 63-1/2 | 1505.0 | 59-1/4 | 1447.8 | 57 | 114.3 | 4-1/2 | 120.7 | 4-3/4 | | | 196.9 | 7-3/4 | 209.6 | 8-1/4 |
| 60 | 1765.3 | 69-1/2 | 1657.4 | 65-1/4 | 1600.2 | 63 | 114.3 | 4-1/2 | 127.0 | 5 | | | 203.2 | 8 | 215.9 | 8-1/2 |
| 66 | 1955.8 | 77 | 1838.3 | 72-3/8 | 1778.0 | 70 | 101.6 | 4 | | | | | 215.9 | 8-1/2 | | |
| 72 | 2108.2 | 83 | 1990.7 | 78-3/8 | 1930.4 | 76 | 101.6 | 4 | | | | | 228.6 | 9 | | |
| 84 | 2451.1 | 96-1/2 | 2324.1 | 91-1/2 | 2260.6 | 89 | 127.0 | 5 | | | | | 254.0 | 10 | | |
| 96 | 2775.0 | 109-1/4 | 2638.4 | 103-7/8 | 2571.8 | 101-1/4 | 158.8 | 6-1/4 | | | | | 285.8 | 11-1/4 | | |

Notes :

(1) Can be furnished. Class 350 flanges in thicknesses over 3 are of ASTM A105 steel.
(2) Pressure rating-350 psi at-20F to 650F, or 300psi at 750F.
(3) This designation applies to flanges formerly listed as "300lb. at 750F" Class 350 flanges are designed in accordance with "Modern Flange Design" (Taylor Forge Bulletin 502) and hence comply in all respects with the current ASME Boiler and Pressure vessel Code.
(4) Sizes are nominal inside diameters of pipe or shell used with Welding Neck flanges, and nominal outside diameters of pipe of shell used with Slip-On flanges.




Unit : mm

| Diameter of Hub at Bevel | | INSIDE DIAMETER | | | DRILLING TEMPLATE | | | | Fillet Radius | | APPROX WEIGHT | | | Nominal Pipe Size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Welding Neck | Slip-On | | Bolt Circle Diameter | | Number Of Holes | Diam. of Holes | | | Welding Neck | Slip-On | Blind | |
| H | | B | $B_1$ | | C | | N | h | r | | | | | |
| mm. | in. | | mm | in. | mm. | in. | | | mm. | in. | kg | kg | kg | |
| 660.4 | 26 | To be specified by Purchaser | 666.8 | 26-1/4 | 777.9 | 30-5/8 | 28 | 1-1/8 | 9.5 | 3/8 | 111 | 102 | 263 | 26 |
| 711.2 | 28 | | 717.6 | 28-1/4 | 828.7 | 32-5/8 | 28 | 1-1/8 | 9.5 | 3/8 | 118 | 113 | 340 | 28 |
| 762.0 | 30 | | 768.4 | 30-1/4 | 885.8 | 34-7/8 | 32 | 1-1/8 | 9.5 | 3/8 | 138 | 134 | 404 | 30 |
| 812.8 | 32 | | 819.2 | 32-1/4 | 936.6 | 36-7/8 | 36 | 1-1/8 | 9.5 | 3/8 | 154 | 147 | 476 | 32 |
| 863.6 | 34 | | 870.0 | 34-1/4 | 987.4 | 38-7/8 | 40 | 1-1/8 | 9.5 | 3/8 | 170 | 161 | 556 | 34 |
| 914.4 | 36 | | 920.8 | 36-1/4 | 1054.1 | 41-1/2 | 40 | 1-1/4 | 9.5 | 3/8 | 218 | 211 | 680 | 36 |
| 965.2 | 38 | | 971.6 | 38-1/4 | 1104.9 | 43-1/2 | 40 | 1-1/4 | 9.5 | 3/8 | 231 | 222 | 771 | 38 |
| 1016.0 | 40 | | 1022.4 | 40-1/4 | 1155.7 | 45-1/2 | 44 | 1-1/4 | 9.5 | 3/8 | 245 | 240 | 896 | 40 |
| 1066.8 | 42 | | 1073.2 | 42-1/4 | 1212.9 | 47-3/4 | 48 | 1-1/4 | 9.5 | 3/8 | 290 | 281 | 1009 | 42 |
| 1117.6 | 44 | | 1124.0 | 44-1/4 | 1276.4 | 50-1/4 | 44 | 1-3/8 | 11.1 | 7/16 | 345 | 345 | 1191 | 44 |
| 1168.4 | 46 | | 1174.8 | 46-1/4 | 1327.2 | 52-1/4 | 48 | 1-3/8 | 11.1 | 7/16 | 399 | 399 | 1338 | 46 |
| 1219.2 | 48 | | 1225.6 | 48-1/4 | 1378.0 | 54-1/4 | 48 | 1-3/8 | 11.1 | 7/16 | 417 | 417 | 1497 | 48 |
| | | | | | | | | | | | | | | 50 |
| 1320.8 | 52 | | 1327.2 | 52-1/4 | 1492.3 | 58-3/4 | 52 | 1-1/2 | 12.7 | 1/2 | 488 | – | – | 52 |
| 1371.6 | 54 | | 1378.0 | 54-1/4 | 1543.1 | 60-3/4 | 52 | 1-1/2 | 12.7 | 1/2 | 544 | 522 | – | 54 |
| 1524.0 | 60 | | 1530.4 | 60-1/4 | 1695.5 | 66-3/4 | 60 | 1-1/2 | 12.7 | 1/2 | 601 | 658 | – | 60 |
| 1676.4 | 66 | | 1682.8 | 66-1/4 | 1879.6 | 74 | 60 | 1-5/8 | 12.7 | 1/2 | 760 | – | – | 66 |
| 1828.8 | 72 | | 1835.2 | 72-1/4 | 2032.0 | 80 | 72 | 1-5/8 | 12.7 | 1/2 | 839 | – | – | 72 |
| 2133.6 | 84 | | 2140.0 | 84-1/4 | 2368.6 | 93-1/4 | 80 | 1-3/4 | 12.7 | 1/2 | 1338 | – | – | 84 |
| 2438.4 | 96 | | 2444.8 | 96-1/4 | 2686.1 | 105-3/4 | 84 | 1-7/8 | 15.9 | 5/8 | 1928 | – | – | 96 |

(5) When applied to Welding Neck flanges, these rating are based on inside diameters of pipe or shell as listed in "Nominal Size" column and pipe or shell thicknesses ranging from 1/2" to 1".
When applied to Slip-On flanges, ratings are based on outside diameters of pipe or shell as listed in "Nominal Size" column. Bored to slip over nominal OD pipe, any larger bore will affect the pressure rating.
These flanges have been designed in accordance with "Modern Flange Design" (Taylor Forge Bulletin 722) and hence they comply in all respects with the current ASME Code.

(6) For machining tolerances see ANSI Standard B16.5.

# MEMO

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# COMPARISION FLANGE BORES OF WELDING NECK FLANGE FOR ANSI WITH JIS

| NOMINAL PIPE SIZE | O.D | | SCH10 | | SCH20 | | SCH30 | | STD | SCH40 | | SCH60 | | XS | SCH80 | | SCH100 | | SCH120 | | SCH140 | | SCH160 | | XXS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | JIS | ANSI | JIS | ANSI | JIS | ANSI | JIS | ANSI | ANSI | JIS | ANSI | JIS | ANSI | ANSI | JIS | ANSI | JIS | ANSI | JIS | ANSI | JIS | ANSI | JIS | ANSI | ANSI |
| 1/2″ | 21.7 | 21.3 | – | 17.08 | – | – | – | 16.48 | 15.76 | 16.1 | 15.76 | 15.3 | – | 13.84 | 14.3 | 13.84 | – | – | – | – | – | – | 12.3 | 11.74 | 6.36 |
| 3/4″ | 27.2 | 26.7 | – | 22.48 | – | – | – | 21.88 | 20.96 | 21.4 | 20.96 | 20.4 | – | 18.88 | 19.4 | 18.88 | – | – | – | – | – | – | 16.2 | 15.58 | 11.06 |
| 1″ | 34.0 | 33.40 | – | 27.86 | – | – | – | 27.60 | 26.64 | 27.2 | 26.64 | 26.2 | – | 24.30 | 25.0 | 24.30 | – | – | – | – | – | – | 21.2 | 20.70 | 15.22 |
| 1 1/4″ | 42.7 | 42.2 | – | 36.66 | – | – | – | 36.26 | 35.08 | 35.5 | 35.08 | 33.7 | – | 32.50 | 32.9 | 32.50 | – | – | – | – | – | – | 29.9 | 29.50 | 22.80 |
| 1 1/2″ | 48.6 | 48.3 | – | 42.76 | – | – | – | 41.94 | 40.94 | 41.2 | 40.94 | 39.6 | – | 38.14 | 38.4 | 38.14 | – | – | – | – | – | – | 34.4 | 34.02 | 28.00 |
| 2″ | 60.5 | 60.3 | – | 54.76 | 54.1 | – | – | 53.94 | 52.48 | 52.7 | 52.48 | 50.7 | – | 49.22 | 49.5 | 49.22 | – | – | – | – | – | – | 43.1 | 42.82 | 38.16 |
| 2 1/2″ | 76.3 | 73.0 | – | 66.90 | 67.3 | – | – | 63.44 | 62.68 | 65.9 | 62.68 | 64.3 | – | 58.98 | 62.3 | 58.98 | – | – | – | – | – | – | 57.3 | 53.94 | 44.96 |
| 3″ | 89.1 | 88.90 | – | 82.80 | 80.1 | – | – | 79.34 | 77.92 | 78.1 | 77.92 | 75.9 | – | 73.66 | 73.9 | 73.66 | – | – | – | – | – | – | 66.9 | 66.64 | 58.42 |
| 3 1/2″ | 101.6 | 101.60 | – | 95.50 | 92.6 | – | – | 92.04 | 90.12 | 90.2 | 90.12 | 87.6 | – | 85.44 | 85.4 | 85.44 | – | – | – | – | – | – | 76.2 | – | – |
| 4″ | 114.3 | 114.30 | – | 108.20 | 104.5 | – | – | 104.74 | 102.26 | 102.3 | 102.26 | 100.1 | – | 97.18 | 97.1 | 97.18 | – | – | 92.1 | 92.04 | – | – | 87.3 | 87.32 | 80.06 |
| 5″ | 139.8 | 141.30 | – | 134.50 | 129.6 | – | – | – | 128.20 | 126.6 | 128.20 | 123.6 | – | 122.24 | 120.8 | 122.24 | – | – | 114.4 | 115.90 | – | – | 108.0 | 109.54 | 103.20 |
| 6″ | 165.2 | 168.3 | – | 161.50 | 154.2 | – | – | – | 154.08 | 151 | 154.08 | 146.6 | – | 146.36 | 143.2 | 146.36 | – | – | 136.6 | 139.76 | – | – | 128.8 | 131.78 | 124.40 |
| 8″ | 216.3 | 219.1 | – | 211.58 | 203.5 | 206.40 | 202.3 | 205.02 | 202.74 | 199.9 | 202.74 | 195.7 | 198.48 | 193.70 | 190.9 | 193.70 | 186.1 | 188.92 | 179.9 | 182.58 | 175.1 | 177.86 | 170.3 | 173.08 | 174.64 |
| 10″ | 267.4 | 273.0 | – | 264.62 | 254.6 | 260.30 | 251.8 | 257.50 | 254.46 | 248.8 | 254.46 | 242.0 | 247.60 | 247.60 | 237.2 | 242.82 | 231.0 | 236.48 | 224.6 | 230.12 | 216.6 | 222.20 | 210.2 | 215.84 | 222.20 |
| 12″ | 318.5 | 323.8 | – | 314.66 | 305.7 | 311.10 | 301.7 | 307.04 | 304.74 | 297.9 | 303.18 | 289.9 | 295.26 | 298.40 | 283.7 | 288.84 | 275.7 | 280.92 | 267.7 | 273.00 | 261.3 | 266.64 | 251.9 | 257.16 | 273.00 |
| 14″ | 355.6 | 355.60 | 342.8 | 342.9 | 339.8 | 339.76 | 336.6 | 336.54 | 336.54 | 333.4 | 333.34 | 325.4 | 325.42 | 330.2 | 317.6 | 317.50 | 308.0 | 307.94 | 300.0 | 300.02 | 292.0 | 292.1 | 284.2 | 284.18 | – |
| 16″ | 406.4 | 406.40 | 393.6 | 393.7 | 390.6 | 390.56 | 387.4 | 387.34 | 387.34 | 381.0 | 381.0 | 373.0 | 373.08 | 381.0 | 363.6 | 363.52 | 354.0 | 354.02 | 344.6 | 344.48 | 333.4 | 333.34 | 325.4 | 325.42 | – |
| 18″ | 457.2 | 457 | 444.4 | 444.30 | 441.4 | 441.16 | 435.0 | 434.74 | 437.94 | 428.6 | 428.46 | 419.2 | 418.9 | 431.60 | 409.6 | 409.34 | 398.4 | 398.28 | 387.4 | 387.14 | 377.8 | 377.66 | 366.8 | 366.52 | – |
| 20″ | 508.0 | 508.0 | 495.2 | 495.3 | 489.0 | 488.94 | 482.6 | 482.60 | 488.94 | 477.8 | 477.82 | 466.8 | 466.76 | 482.6 | 455.6 | 455.62 | 443.0 | 442.92 | 431.8 | 431.80 | 419.2 | 419.10 | 408.0 | 407.98 | – |
| 24″ | – | 610 | – | 597.30 | – | 590.94 | – | 581.46 | 590.94 | 574.6 | 575.04 | – | 560.78 | 584.60 | 547.6 | 548.08 | – | 532.22 | 517.6 | 517.96 | – | 505.26 | 490.6 | 490.92 | – |
| 30″ | – | 762.0 | – | 746.16 | – | 736.6 | – | 730.24 | 742.94 | – | – | – | – | 736.6 | – | – | – | – | – | – | – | – | – | – | – |

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