

NEWASIA
ASIAJOINT

Butt - Welding Pipe Fittings Forged Fittings

ASME/KS/JIS CATALOG



NEWASIA
ASIAJOINT

Homepage : <http://www.ajs.co.kr>

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NEWASIA promises to leap forward for upcoming 50 years.

Thank you for your deep interest and support on NEWASIA.

Since its foundation in 1965, NEWASIA has been expanding to the global markets to contribute to the Korean economy 's development .

As a result, NEW ASIA is firmly established as a worldwide leader in the pipe joint fields and is now opening up future visions.

NEW ASIA is trying its best to develop original technologies and renovate the qualities under the belief that “Technology Leads to Competitiveness.”

To make people’s lives more convenient and abundant, all executives and employees of NEW ASIA are endeavoring for global expansion.

NEW ASIA also provides customized products and services by listening to demands of various customers. NEW ASIA is trying its best to win the trusts from the customers.

Dear customers,

NEW ASIA promises to become a sustainable company that lasts for another 100 years and 200 years based on the past 50 years of challenges and achievements. NEW ASIA will also try its best to go beyond “Good Company” and develop into a company loved and respected by the customers. Please keep on supporting NEW ASIA’s new leap forward.

Thank you.

• History



- 1965. 10** Founded Hyundai Engineering
- 1978. 06** Incorporated to Asia Band
- 1981. 04** Established a factory at Yeosu, Gyeonggi-do, Korea (Site : 5,418m² / Building : 609.19m²)
- 1983-87** Acquired Korean Industrial Standards on pipe fitting
(For carbon steel, pressure pipeline, and stainless welding)
- 1989. 08** Listed in KOSDAQ
- 1994. 12** Started mass production of joints and pipe fittings for groove joints
- 1996. 07** Acquired JIS from Japan
- 1997. 03** Acquired marks from Classification Society (KR, ABS, LR, BV)
- 1999. 09** Acquired US UL/FM marks on the pipe fittings for groove joints.
- 2000. 02** Acquired ISO9001 certificate
- 2001. 02** Acquired New Construction Technology No.267 (Ring Joint 350A~2000A)
- 2002. 11** Acquired an excellent product certificate from Public Procurement Service
- 2005. 12** Changed the name to AJS
- 2006. 11** Acquired certificates (NEP) on new products
- 2007. 04** Acquired ANSI/NSF 61 (STS Fitting)
- 2008. 03** Acquired ASME certificate
- 2009. 04** Acquired site/building for the factory at Cheoin-gu, Yongin-si, Korea
- 2011. 11** Acquired KC marks on weld fitting, groove joint, and pipe fitting
- 2014. 05** Appointed Lee Sang Heon as CEO
- 2015. 02** Acquired CP marks on joint and joint fitting
- 2017. 04** Registered Yongin factory (Manufacturing of stainless pipe for semiconductor /hygienic use/general piping)
- 2017. 07** Changed the name to New Asia Joint
- 2017. 12** Acquired Sanitation and Safety Certificate (KC) (Stainless steel pipe for general piping)
- 2017. 12** Acquired Korean Industrial Standards (KSD3576 / KSD3585 / KSD3595)
- 2018. 09** Registered patent on steel pipe valve
- 2018. 10** Developed one-stop non-welding sprinkler piping system
- 2019. 03** Developed an expansion joint system (Thermal & Seismic Expansion Joint)
- 2020. 06** Selected as a technological innovation company (Inno-Biz)
- 2021. 01** Acquired ISO14001 certificate
- 2021. 02** Acquired marks from Classification Society (FranceBV , GermanyGL/DNV)
- 2021. 02** Selected as a technological innovation company (Main-Biz)
- 2021. 12** Registered as a partner of DSME(fitting for ships)
- 2022. 03** Changed the name to NEWASIA
- 2022. 05** Selected as the Green New Deal company

Since
1965

Company Introduction

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○ Business Items

Butt Welding Fitting

Material	Product Name	Production Range	Applicable Specifications
		Mold Type	
Carbon Steel	Elbow	~24 "	KS , JIS , ASTM , JPI
	Tee	~24 "	
	Reducer	~24 "	
Alloy Steel	Cap		
Stainless Steel			

Nomenclature

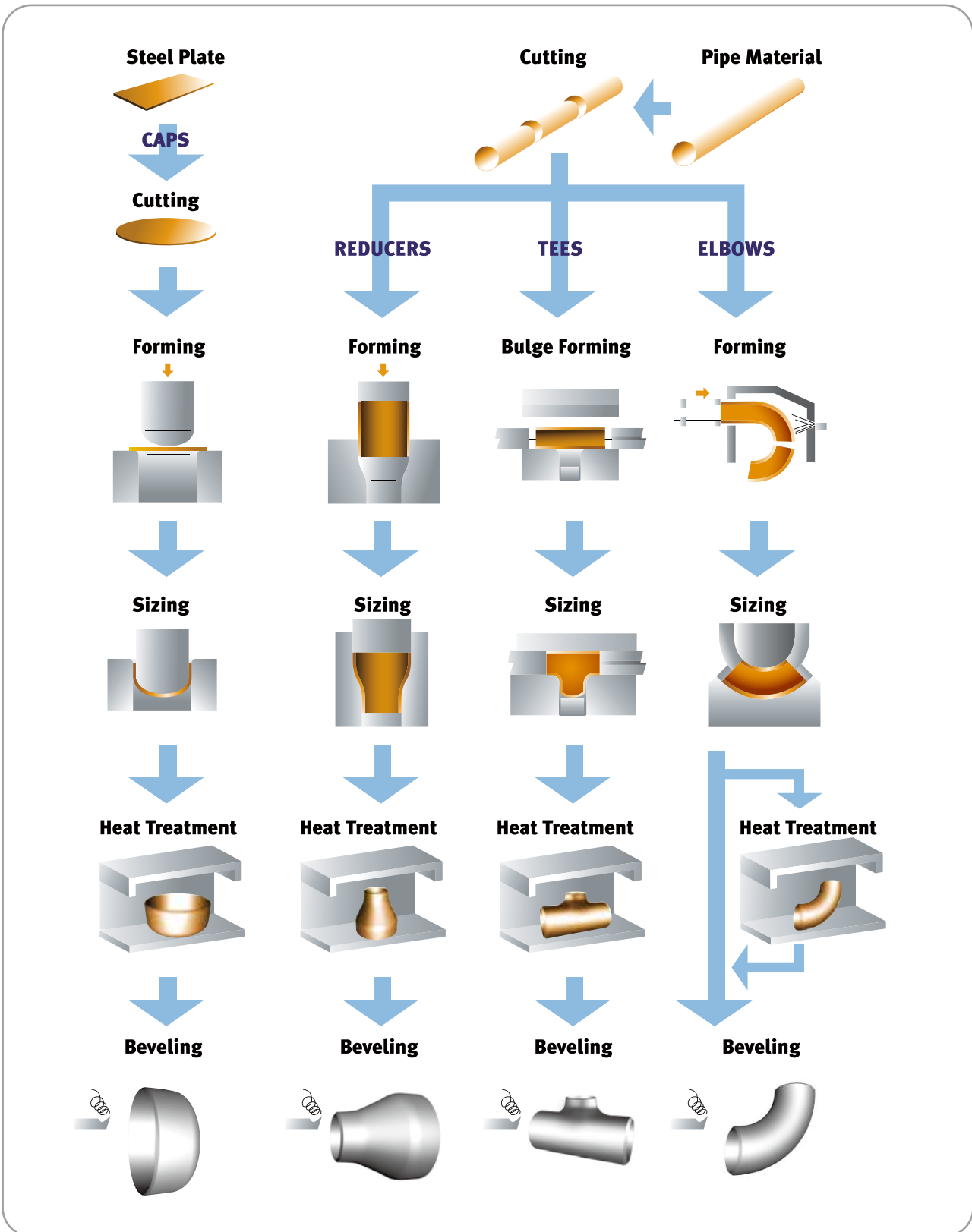
ASTM : Amecrian Society for Testing Materials
ASME : American Society of Mechanical Engineers
KS : Korean Industrial Standards
JIS : Japanese Indusrtial Standards

○ Material

Material Classification			Comparison as nations	
Middle	Small		ASTM (U.S.A)	
			Designation	Identification
Carbon Steel	Ambient and Higher Temperature Service		A234	WPB
				WPC
	Low Temperature Service		A420	WPL3
				WPL6
				WPL9
Alloy Steel	Low Alloy		A234	WP1
				WP12
				WP11
				WP22
				WP5
				WP9
				WP91
	High Alloy : Stainless Steel	Austenitic Stainless Steel	A403	WP304
				WP316
				WP317
				WP321
				WP347

Applicable Code / Standard : ASTM partA, 2022 Edition.

○ Manufacturing Process



○ Quality Management System



Management Responsibility	Resource Management	Measurement, Analysis and Improvement	Product Realization
1) Human resources and infrastructure	1) Purchasing control	1) Testing and evaluation	1) Customer satisfaction
2) Quality policy and control	2) Receiving inspection of materials	2) Checking of inspection and calibration of testing device	2) Process Planning
3) Internal quality audit	3) Dimension, Chemical and physical properties checks	3) Inspect on heat treatment and welding	3) Product control and inspection
4) Control of quality records	4) Working environment	4) Records keep and control	4) Identification and tracability

○ Specifications

KS : KOREAN INDUSTRIAL STANDARDS

KS B 1543	Steel Butt-Welding Pipe Fittings
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JIS : JAPANESE INDUSTRIAL STANDARDS

JIS B 2311	Steel Butt-Welding Pipe Fittings for Ordinary use
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JIS B 2312	Steel Butt-Welding Pipe Fittings
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JIS B 2313	Steel Plate Butt-Welding Pipe Fittings
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ASME : AMERICAN SOCIETY OF MECHANICAL ENGINEERS

ASME B 16.9	Factory Made Wrought Steel Butt-Welding Fittings
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ASME B 16.11	Forged Steel Fittings, Socket-Welding and Threaded
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ASME B 16.25	Butt-Welding Ends
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ASME B 16.28	Wrought Steel Butt-Welding Short
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ASME B 36.10	Welded and Seamless Wrought Steel Pipe
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ASME B 36.19	Stainless Steel Pipe
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ASTM : AMERICAN SOCIETY FOR TESTING AND MATERIALS

ASTM A 105	Carbon Steel Forgings for Piping Applications
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ASTM A 182	Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service
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ASTM A 234	Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service
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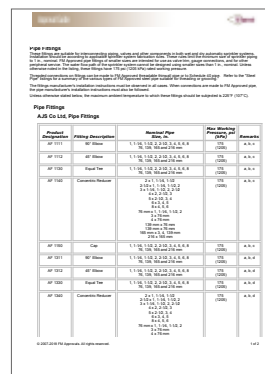
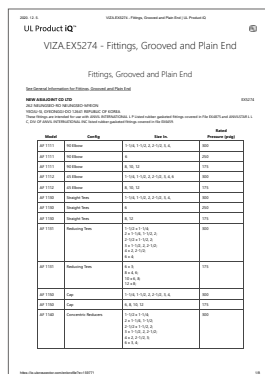
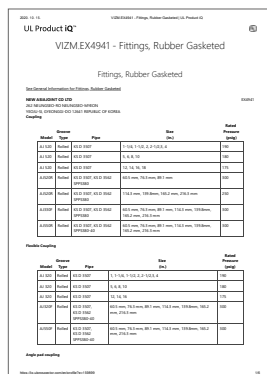
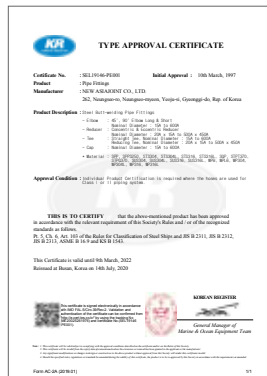
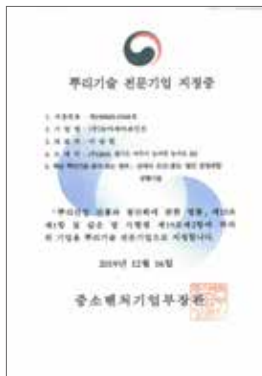
ASTM A 403	Wrought Austenitic Stainless Steel Piping Fittings
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ASTM A 420	Piping Fittings of Wrought Carbon Steel and Alloy Steel for Low-Temperature Service
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Certifications

We are inspecting the products by deploying professional quality control staffs for each manufacturing process in order to guarantee the supply of excellent products.

Our goal is world first quality and receive applaude and satisfaction from customers. We will continue to extend our capability and acquire new certifications and approvals.



○ Products

Wrought Steel Butt-Welding Fittings (Carbon & Alloy Steel)

			
90° Elbow(Long)	Reducer(Concentric)	Reducer(Concentric)	90° Elbow(Short)
			
Reducer(Eccentric)	Reducer(Eccentric)	45° Elbow(Long)	Tee(straight)
			
Tee(Reducing)	Cap		

Stainless Steel Butt-Welding Fittings

		
90° Elbow(Long)	Reducer(Concentric)	Tee(straight)
		
90° Elbow(Short)	Reducer(Eccentric)	Tee(Reducing)
		
45° Elbow(Long)	Cap	

○ Marking

ASME Products

Steel Butt-Welding Fittings

1. Manufacturer identification mark.
2. ASTM material designation-the symbol identifying the type of material from which the products was manufactured.
3. Schedule number or nominal wall thickness designation.
4. Nominal size.
5. Heat number.



KS/JIS Products

Steel Butt-Welding Fittings

1. Manufacturer identification mark.
2. KS or JIS material designation-the symbol identifying the type of material.
3. Symbol denoting "Long(L)" or "Short(S)"
4. Thickness designation or schedule number.
5. Nominal size.
6. KS or JIS mark
7. JIS Cert. No. for JIS items.



Carbon Steel
butt-welding
fittings

ASME

Elbow 90° , 45° – STD, Sch40, X-S, Sch80, Sch160, XX-S	16
Elbow 90° , 45° – Sch20, Sch30, Sch60, Sch100, Sch120, Sch140 ..	18
Tee – STD, Sch40, X-S, Sch80, Sch160, XX-S	20
Tee – STD, Sch20, Sch30, Sch60, Sch100, Sch120, Sch140	30
Reducer – STD, Sch40, X-S, Sch80, Sch160, XX-S	34
Reducer – Sch20, Sch30, Sch60, Sch100, Sch120, Sch140	40
Cap – STD, Sch40, X-S, Sch80, Sch160, XX-S	44

Wrought Steel Butt-Welding Fittings

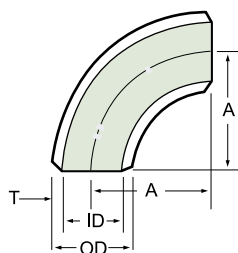
Elbow 90° (Long, Short)

Elbow 45° (Long, Short)

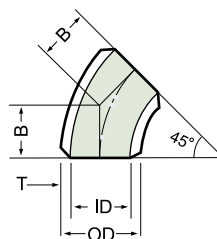
STD, Sch40, X-S, Sch80,
Sch160, XX-S

ASME B16.9

Nominal Pipe Size	Outside Diameter O.D	Center to End			STD		Sch 40	
		Long		Short	T	I.D	T	I.D
		A	B	A				
1/2	0.840	1.50	0.62	-	0.109	0.622	0.109	0.622
3/4	1.050	1.50	0.75	-	0.113	0.824	0.113	0.824
1	1.315	1.50	0.88	1.00	0.133	1.049	0.133	1.049
1 1/4	1.660	1.88	1.00	1.25	0.140	1.380	0.140	1.380
1 1/2	1.900	2.25	1.12	1.50	0.145	1.610	0.145	1.610
2	2.375	3.00	1.38	2.00	0.154	2.067	0.154	2.067
2 1/2	2.875	3.75	1.75	2.50	0.203	2.469	0.203	2.469
3	3.500	4.50	2.00	3.00	0.216	3.068	0.216	3.068
3 1/2	4.000	5.25	2.25	3.50	0.226	3.548	0.226	3.548
4	4.500	6.00	2.50	4.00	0.237	4.026	0.237	4.026
5	5.563	7.50	3.12	5.00	0.258	5.047	0.258	5.047
6	6.625	9.00	3.75	6.00	0.280	6.065	0.280	6.065
8	8.625	12.00	5.00	8.00	0.322	7.981	0.322	7.981
10	10.750	15.00	6.25	10.00	0.365	10.020	0.365	10.020
12	12.750	18.00	7.50	12.00	0.375	12.000	0.406	11.938
14	14.000	21.00	8.75	14.00	0.375	13.250	0.438	13.124
16	16.000	24.00	10.00	16.00	0.375	15.250	0.500	15.000
18	18.000	27.00	11.25	18.00	0.375	17.250	0.562	16.876
20	20.000	30.00	12.50	20.00	0.375	19.250	0.594	18.812
22	22.000	33.00	13.50	22.00	0.375	21.250	*0.594	20.812
24	24.000	36.00	15.00	24.00	0.375	23.250	0.688	22.624
26	26.000	39.00	16.00	*26.00	0.375	25.250	*0.688	24.624
28	28.000	42.00	17.25	*28.00	0.375	27.250	*0.688	26.624
30	30.000	45.00	18.50	*30.00	0.375	29.250	*0.688	28.624
32	32.000	48.00	19.75	*32.00	0.375	31.250	0.688	30.624
34	34.000	51.00	21.00	*34.00	0.375	33.250	0.688	32.624
36	36.000	54.00	22.25	*36.00	0.375	35.250	0.750	34.500
38	38.000	57.00	23.62	*38.00	0.375	37.250	-	-
40	40.000	60.00	24.88	*40.00	0.375	39.250	-	-
42	42.000	63.00	26.00	*42.00	0.375	41.250	-	-
44	44.000	66.00	27.38	*44.00	0.375	43.250	-	-
46	46.000	69.00	28.62	*46.00	0.375	45.250	-	-
48	48.000	72.00	29.88	*48.00	0.375	47.250	-	-
*50	50.000	75.00	31.06	*50.00	0.375	49.250		
*52	52.000	78.00	32.30	*52.00	0.375	51.250		
*54	54.000	81.00	33.55	*54.00	0.375	53.250		
*56	56.000	84.00	34.79	*56.00	0.375	55.250		
*58	58.000	87.00	36.04	*58.00	0.375	57.250		
*60	60.000	90.00	37.28	*60.00	0.375	59.250		



90° Elbow



45° Elbow

Unit : inch

X-S		Sch 80		Sch 160		XX-S		Nominal Pipe Size
T	I.D	T	I.D	T	I.D	T	I.D	
0.147	0.546	0.147	0.546	0.188	0.464	0.294	0.252	1/2
0.154	0.742	0.154	0.742	0.219	0.612	0.308	0.434	3/4
0.179	0.957	0.179	0.957	0.250	0.815	0.358	0.599	1
0.191	1.278	0.191	1.278	0.250	1.160	0.382	0.896	1 1/4
0.200	1.500	0.200	1.500	0.281	1.338	0.400	1.100	1 1/2
0.218	1.939	0.218	1.939	0.344	1.687	0.436	1.503	2
0.276	2.323	0.276	2.323	0.375	2.125	0.552	1.771	2 1/2
0.300	2.900	0.300	2.900	0.438	2.624	0.600	2.300	3
0.318	3.364	0.318	3.364	-	-	-	-	3 1/2
0.337	3.826	0.337	3.826	0.531	3.438	0.674	3.152	4
0.375	4.813	0.375	4.813	0.625	4.313	0.750	4.063	5
0.432	5.761	0.432	5.761	0.719	5.187	0.864	4.897	6
0.500	7.625	0.500	7.625	0.906	6.813	0.875	6.875	8
0.500	9.750	0.594	9.562	1.125	8.500	1.000	8.750	10
0.500	11.750	0.688	11.374	1.312	10.126	1.000	10.750	12
0.500	13.000	0.750	12.500	1.406	11.188	-	-	14
0.500	15.000	0.844	14.312	1.594	12.812	-	-	16
0.500	17.000	0.938	16.124	1.781	14.438	-	-	18
0.500	19.000	1.031	17.938	1.969	16.062	-	-	20
0.500	21.000	1.125	19.750	2.125	17.750	-	-	22
0.500	23.000	1.219	21.562	2.344	19.312	-	-	24
0.500	25.000	-	-	-	-	-	-	26
0.500	27.000	-	-	-	-	-	-	28
0.500	29.000	-	-	-	-	-	-	30
0.500	31.000	-	-	-	-	-	-	32
0.500	33.000	-	-	-	-	-	-	34
0.500	35.000	-	-	-	-	-	-	36
0.500	37.000	-	-	-	-	-	-	38
0.500	39.000	-	-	-	-	-	-	40
0.500	41.000	-	-	-	-	-	-	42
0.500	43.000	-	-	-	-	-	-	44
0.500	45.000	-	-	-	-	-	-	46
0.500	47.000	-	-	-	-	-	-	48
0.500	49.000	-	-	-	-	-	-	50"
0.500	51.000	-	-	-	-	-	-	52"
0.500	53.000	-	-	-	-	-	-	54"
0.500	55.000	-	-	-	-	-	-	56"
0.500	57.000	-	-	-	-	-	-	58"
0.500	59.000	-	-	-	-	-	-	60"

ASME

Carbon Steel

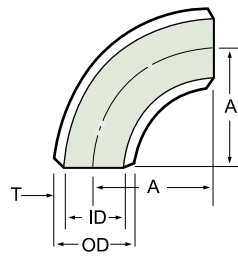
Wrought Steel Butt-Welding Fittings

Elbow 90° (Long, Short)
Elbow 45° (Long, Short)

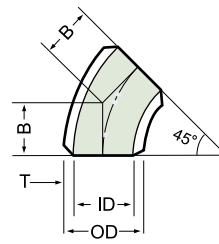
Sch20, Sch30, Sch60, Sch100,
Sch120, Sch140

ASME B16.9

Nominal Pipe Size	Outside Diameter O.D	Center to End			Sch 20		Sch 30	
		Long		Short	T	I.D	T	I.D
		A	B	A				
4	4.500	6.00	2.50	4.00	-	-	-	-
5	5.563	7.50	3.12	5.00	-	-	-	-
6	6.625	9.00	3.75	6.00	-	-	-	-
8	8.625	12.00	5.00	8.00	0.250	8.125	0.277	8.071
10	10.750	15.00	6.25	10.00	0.250	10.250	0.307	10.136
12	12.750	18.00	7.50	12.00	0.250	12.250	0.330	12.090
14	14.000	21.00	8.75	14.00	0.312	13.376	0.375	13.250
16	16.000	24.00	10.00	16.00	0.312	15.376	0.378	15.250
18	18.000	27.00	11.25	18.00	0.312	17.376	0.438	17.124
20	20.000	30.00	12.50	20.00	0.375	19.250	0.500	19.000
22	22.000	33.00	13.50	22.00	0.375	21.250	0.562	21.000
24	24.000	36.00	15.00	24.00	0.375	23.250	-	22.876
26	26.000	39.00	16.00	*26.00	0.500	25.000	0.625	-
28	28.000	42.00	17.25	*28.00	0.500	27.000	0.625	26.750
30	30.000	45.00	18.50	*30.00	0.500	29.000	0.625	28.750
32	32.000	48.00	19.75	*32.00	0.500	31.000	0.625	30.750
34	34.000	51.00	21.00	*34.00	0.500	33.000	0.625	32.750
36	36.000	54.00	22.25	*36.00	0.500	35.000	0.625	34.750



90° Elbow



45° Elbow

Unit : inch

Sch 60		Sch 100		Sch 120		Sch 140		Nominal Pipe Size
T	I.D	T	I.D	T	I.D	T	I.D	
-	-	-	-	0.438	3.624	-	-	4
-	-	-	-	0.500	4.563	-	-	5
-	-	-	-	0.562	5.501	-	-	6
0.406	7.813	0.594	7.437	0.719	7.187	0.812	7.001	8
0.500	9.750	0.719	9.312	0.844	9.062	1.000	8.750	10
0.562	11.626	0.844	11.062	1.000	10.750	1.125	10.500	12
0.594	12.812	0.938	12.124	1.094	11.812	1.250	11.500	14
0.656	14.688	1.031	13.938	1.219	13.562	1.438	13.124	16
0.750	16.500	1.156	15.688	1.375	15.250	1.562	14.876	18
0.812	18.376	1.281	17.438	1.500	17.000	1.750	16.500	20
0.875	20.250	1.375	19.250	1.625	18.750	1.875	18.250	22
0.969	22.062	1.531	20.938	1.812	20.376	2.062	19.876	24
-	-	-	-	-	-	-	-	26
-	-	-	-	-	-	-	-	28
-	-	-	-	-	-	-	-	30
-	-	-	-	-	-	-	-	32
-	-	-	-	-	-	-	-	34
-	-	-	-	-	-	-	-	36

ASME

Carbon Steel

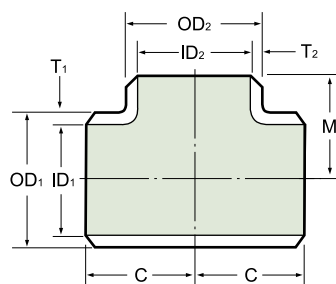
Wrought Steel Butt-Welding Fittings

Straight Tee

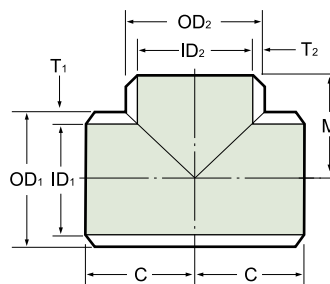
STD, Sch40, X-S, Sch80,
Sch160, XX-S

ASME B16.9

Nominal Pipe Size	Outside Diameter O.D	Center to End		STD		Sch 40	
		Run C	Outlet M	T	I.D	T	I.D
1/2	0.840	1.00	1.00	0.109	0.622	0.109	0.622
3/4	1.050	1.12	1.12	0.113	0.824	0.113	0.824
1	1.315	1.50	1.50	0.133	1.049	0.133	1.049
1 1/4	1.660	1.88	1.88	0.140	1.380	0.140	1.380
1 1/2	1.900	2.25	2.25	0.145	1.610	0.145	1.610
2	2.375	2.50	2.50	0.154	2.067	0.154	2.067
2 1/2	2.875	3.00	3.00	0.203	2.469	0.203	2.469
3	3.500	3.38	3.38	0.216	3.068	0.216	3.068
3 1/2	4.000	3.75	3.75	0.226	3.548	0.226	3.548
4	4.500	4.12	4.12	0.237	4.026	0.237	4.026
5	5.563	4.88	4.88	0.258	5.047	0.258	5.047
6	6.625	5.62	5.62	0.280	6.065	0.280	6.065
8	8.625	7.00	7.00	0.322	7.981	0.322	7.981
10	10.750	8.50	8.50	0.365	10.020	0.365	10.020
12	12.750	10.00	10.00	0.375	12.000	0.406	11.938
14	14.000	11.00	11.00	0.375	13.250	0.438	13.124
16	16.000	12.00	12.00	0.375	15.250	0.500	15.000
18	18.000	13.50	13.50	0.375	17.250	0.562	16.876
20	20.000	15.00	15.00	0.375	19.250	0.594	18.812
22	22.000	16.50	16.50	0.375	21.250	*0.594	*20.812
24	24.000	17.00	17.00	0.375	23.250	0.688	22.624
26	26.000	19.50	19.50	0.375	25.250	*0.688	*24.624
28	28.000	20.50	20.50	0.375	27.250	*0.688	*26.624
30	30.000	22.00	22.00	0.375	29.250	*0.688	*28.624
32	32.000	23.50	23.50	0.375	31.250	0.688	30.624
34	34.000	25.00	25.00	0.375	33.250	0.688	32.624
36	36.000	26.50	26.50	0.375	35.250	0.750	34.500
38	38.000	28.00	28.00	0.375	37.250	-	-
40	40.000	29.50	29.50	0.375	39.250	-	-
42	42.000	30.00	30.00	0.375	41.250	-	-
44	44.000	32.00	32.00	0.375	43.250	-	-
46	46.000	33.50	33.50	0.375	45.250	-	-
48	48.000	35.00	35.00	0.375	47.250	-	-
*50	50.000	37.16	37.16	-	-	-	-
*52	52.000	38.16	38.16	-	-	-	-
*54	54.000	39.16	39.16	-	-	-	-
*56	56.000	40.16	40.16	-	-	-	-
*58	58.000	41.16	41.16	-	-	-	-
*60	60.000	42.16	42.16	-	-	-	-



Straight (I)



Straight (II)

Unit : inch

X-S		Sch 80		Sch 160		XX-S		Nominal Pipe Size
T	I.D	T	I.D	T	I.D	T	I.D	
0.147	0.546	0.147	0.546	0.188	0.464	0.294	0.252	1/2
0.154	0.742	0.154	0.742	0.219	0.612	0.308	0.434	3/4
0.179	0.957	0.179	0.957	0.250	0.815	0.358	0.599	1
0.191	1.278	0.191	1.278	0.250	1.160	0.382	0.896	1 1/4
0.200	1.500	0.200	1.500	0.281	1.338	0.400	1.100	1 1/2
0.218	1.939	0.218	1.939	0.344	1.687	0.436	1.503	2
0.276	2.323	0.276	2.323	0.375	2.125	0.552	1.771	2 1/2
0.300	2.900	0.300	2.900	0.438	2.624	0.600	2.300	3
0.318	3.364	0.318	3.364	-	-	-	-	3 1/2
0.337	3.826	0.337	3.826	0.531	3.438	0.674	3.152	4
0.375	4.813	0.375	4.813	0.625	4.313	0.750	4.063	5
0.432	5.761	0.432	5.761	0.719	5.187	0.864	4.897	6
0.500	7.625	0.500	7.625	0.906	6.813	0.875	6.875	8
0.500	9.750	0.594	9.562	1.125	8.500	1.000	8.750	10
0.500	11.750	0.688	11.374	1.312	10.126	1.000	10.750	12
0.500	13.000	0.750	12.500	1.406	11.188	-	-	14
0.500	15.000	0.844	14.312	1.594	12.812	-	-	16
0.500	17.000	0.938	16.124	1.781	14.438	-	-	18
0.500	19.000	1.031	17.938	1.969	16.062	-	-	20
0.500	21.000	1.125	19.750	2.125	17.750	-	-	22
0.500	23.000	1.219	21.562	2.344	19.312	-	-	24
0.500	25.000	-	-	-	-	-	-	26
0.500	27.000	-	-	-	-	-	-	28
0.500	29.000	-	-	-	-	-	-	30
0.500	31.000	-	-	-	-	-	-	32
0.500	33.000	-	-	-	-	-	-	34
0.500	35.000	-	-	-	-	-	-	36
0.500	37.000	-	-	-	-	-	-	38
0.500	39.000	-	-	-	-	-	-	40
0.500	41.000	-	-	-	-	-	-	42
0.500	43.000	-	-	-	-	-	-	44
0.500	45.000	-	-	-	-	-	-	46
0.500	47.000	-	-	-	-	-	-	48
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-

ASME

Carbon Steel

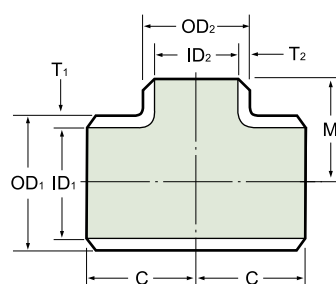
Wrought Steel Butt-Welding Fittings

Reducing Tee

STD, Sch40, X-S, Sch80,
Sch160, XX-S

ASME B16.9

Nominal Pipe Size	Outside Diameter		Center to End		STD		Sch 40	
	OD ₁	OD ₂	Run C	Outlet M	T ₁	T ₂	T ₁	T ₂
1/2 X 1/2 X 3/8	0.840	0.675	1.00	1.00	0.109	0.091	0.109	0.091
1/2 X 1/2 X 1/4	0.840	0.540	1.00	1.00	0.109	0.088	0.109	0.088
3/4 X 3/4 X 1/2	1.050	0.840	1.12	1.12	0.113	0.109	0.113	0.109
3/4 X 3/4 X 3/8	1.050	0.675	1.12	1.12	0.113	0.091	0.113	0.091
1 X 1 X 3/4	1.315	1.050	1.50	1.50	0.133	0.113	0.133	0.113
1 X 1 X 1/2	1.315	0.840	1.50	1.50	0.133	0.109	0.133	0.109
1 1/4 X 1 1/4 X 1	1.660	1.315	1.88	1.88	0.140	0.133	0.140	0.133
1 1/4 X 1 1/4 X 3/4	1.660	1.050	1.88	1.88	0.140	0.113	0.140	0.113
1 1/4 X 1 1/4 X 1/2	1.660	0.840	1.88	1.88	0.140	0.109	0.140	0.109
1 1/2 X 1 1/2 X 1 1/4	1.900	1.660	2.25	2.25	0.145	0.140	0.145	0.140
1 1/2 X 1 1/2 X 1	1.900	1.315	2.25	2.25	0.145	0.133	0.145	0.133
1 1/2 X 1 1/2 X 3/4	1.900	1.050	2.25	2.25	0.145	0.113	0.145	0.113
1 1/2 X 1 1/2 X 1/2	1.900	0.840	2.25	2.25	0.145	0.109	0.145	0.109
2 X 2 X 1 1/2	2.375	1.900	2.50	2.38	0.154	0.145	0.154	0.145
2 X 2 X 1 1/4	2.375	1.660	2.50	2.25	0.154	0.140	0.154	0.140
2 X 2 X 1	2.375	1.315	2.50	2.00	0.154	0.133	0.154	0.133
2 X 2 X 3/4	2.375	1.050	2.50	1.75	0.154	0.113	0.154	0.113
2 1/2 X 2 1/2 X 2	2.875	2.375	3.00	2.75	0.203	0.154	0.203	0.154
2 1/2 X 2 1/2 X 1 1/2	2.875	1.900	3.00	2.62	0.203	0.145	0.203	0.145
2 1/2 X 2 1/2 X 1 1/4	2.875	1.660	3.00	2.50	0.203	0.140	0.203	0.140
2 1/2 X 2 1/2 X 1	2.875	1.315	3.00	2.25	0.203	0.133	0.203	0.133
3 X 3 X 2 1/2	3.500	2.875	3.38	3.25	0.216	0.203	0.216	0.203
3 X 3 X 2	3.500	2.375	3.38	3.00	0.216	0.154	0.216	0.154
3 X 3 X 1 1/2	3.500	1.900	3.38	2.88	0.216	0.145	0.216	0.145
3 X 2 X 1 1/4	3.500	1.660	3.38	2.75	0.216	0.140	0.216	0.140
3 1/2 X 3 1/2 X 3	4.000	3.500	3.75	3.62	0.226	0.216	0.226	0.216
3 1/2 X 3 1/2 X 2 1/2	4.000	2.875	3.75	3.50	0.226	0.203	0.226	0.203
3 1/2 X 3 1/2 X 2	4.000	2.375	3.75	3.25	0.226	0.154	0.226	0.154
3 1/2 X 3 1/2 X 1 1/2	4.000	1.900	3.75	3.12	0.226	0.145	0.226	0.145
4 X 4 X 3 1/2	4.500	4.000	4.12	4.00	0.237	0.226	0.237	0.226
4 X 4 X 3	4.500	3.500	4.12	3.88	0.237	0.216	0.237	0.216
4 X 4 X 2 1/2	4.500	2.875	4.12	3.75	0.237	0.203	0.237	0.203
4 X 4 X 2	4.500	2.375	4.12	3.50	0.237	0.154	0.237	0.154
4 X 4 X 1 1/2	4.500	1.900	4.12	3.38	0.237	0.145	0.237	0.145
5 X 5 X 4	5.563	4.500	4.88	4.62	0.258	0.237	0.258	0.237
5 X 5 X 3 1/2	5.563	4.000	4.88	4.50	0.258	0.226	0.258	0.226
5 X 5 X 3	5.563	3.500	4.88	4.38	0.258	0.216	0.258	0.216
5 X 5 X 2 1/2	5.563	2.875	4.88	4.25	0.258	0.203	0.258	0.203
5 X 5 X 2	5.563	2.375	4.88	4.12	0.258	0.154	0.258	0.154
6 X 6 X 5	6.625	5.563	5.62	5.38	0.280	0.258	0.280	0.258
6 X 6 X 4	6.625	4.500	5.62	5.12	0.280	0.237	0.280	0.237
6 X 6 X 3 1/2	6.625	4.000	5.62	5.00	0.280	0.226	0.280	0.226
6 X 6 X 3	6.625	3.500	5.62	4.88	0.280	0.216	0.280	0.216
6 X 6 X 2 1/2	6.625	2.875	5.62	4.75	0.280	0.203	0.280	0.203



Reducing

Unit : inch

X-S		Sch 80		Sch 160		XX-S		Nominal Pipe Size
T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	
0.147	0.126	0.147	0.126	-	-	-	-	1/2 X 1/2 X 3/8
0.147	0.119	0.147	0.119	-	-	-	-	1/2 X 1/2 X 1/4
0.154	0.147	0.154	0.147	0.219	0.188	0.308	0.294	3/4 X 3/4 X 1/2
0.154	0.126	0.154	0.126	-	-	-	-	3/4 X 3/4 X 3/8
0.179	0.154	0.179	0.154	0.250	0.219	0.358	0.308	1 X 1 X 3/4
0.179	0.147	0.179	0.147	0.250	0.188	0.358	0.294	1 X 1 X 1/2
0.191	0.179	0.191	0.179	0.250	0.250	0.382	0.358	1 1/4 X 1 1/4 X 1
0.191	0.154	0.191	0.154	0.250	0.218	0.382	0.308	1 1/4 X 1 1/4 X 3/4
0.191	0.147	0.191	0.147	0.250	0.188	0.382	0.294	1 1/4 X 1 1/4 X 1/2
0.200	0.191	0.200	0.191	0.281	0.250	0.400	0.382	1 1/2 X 1 1/2 X 1 1/4
0.200	0.179	0.200	0.179	0.281	0.250	0.400	0.358	1 1/2 X 1 1/2 X 1
0.200	0.154	0.200	0.154	0.281	0.218	0.400	0.308	1 1/2 X 1 1/2 X 3/4
0.200	0.147	0.200	0.147	0.281	0.188	0.400	0.294	1 1/2 X 1 1/2 X 1/2
0.218	0.200	0.218	0.200	0.344	0.281	0.436	0.400	2 X 2 X 1 1/2
0.218	0.191	0.218	0.191	0.344	0.250	0.436	0.382	2 X 2 X 1 1/4
0.218	0.179	0.218	0.179	0.344	0.250	0.436	0.358	2 X 2 X 1
0.218	0.154	0.218	0.154	0.344	0.218	0.436	0.308	2 X 2 X 3/4
0.276	0.218	0.276	0.218	0.375	0.344	0.552	0.436	2 1/2 X 2 1/2 X 2
0.276	0.200	0.276	0.200	0.375	0.281	0.552	0.400	2 1/2 X 2 1/2 X 1 1/2
0.276	0.191	0.276	0.191	0.375	0.250	0.552	0.382	2 1/2 X 2 1/2 X 1 1/4
0.276	0.179	0.276	0.179	0.375	0.250	0.552	0.358	2 1/2 X 2 1/2 X 1
0.300	0.276	0.300	0.276	0.438	0.375	0.600	0.552	3 X 3 X 2 1/2
0.300	0.218	0.300	0.218	0.438	0.344	0.600	0.436	3 X 3 X 2
0.300	0.200	0.300	0.200	0.438	0.281	0.600	0.400	3 X 3 X 1 1/2
0.300	0.191	0.300	0.191	0.438	0.250	0.600	0.382	3 X 3 X 1 1/4
0.318	0.300	0.318	0.300	-	-	-	-	3 1/2 X 3 1/2 X 3
0.318	0.276	0.318	0.276	-	-	-	-	3 1/2 X 3 1/2 X 2 1/2
0.318	0.218	0.318	0.218	-	-	-	-	3 1/2 X 3 1/2 X 2
0.318	0.200	0.318	0.200	-	-	-	-	3 1/2 X 3 1/2 X 1 1/2
0.337	0.318	0.337	0.318	-	-	-	-	4 X 4 X 3 1/2
0.337	0.300	0.337	0.300	0.531	0.438	0.674	0.600	4 X 4 X 3
0.337	0.276	0.337	0.276	0.531	0.375	0.674	0.552	4 X 4 X 2 1/2
0.337	0.218	0.337	0.218	0.531	0.344	0.674	0.436	4 X 4 X 2
0.337	0.200	0.337	0.200	0.531	0.281	0.674	0.400	4 X 4 X 1 1/2
0.375	0.337	0.375	0.337	0.625	0.531	0.750	0.674	5 X 5 X 4
0.375	0.318	0.375	0.318	-	-	-	-	5 X 5 X 3 1/2
0.375	0.300	0.375	0.300	0.625	0.438	0.750	0.600	5 X 5 X 3
0.375	0.276	0.375	0.276	0.625	0.375	0.750	0.552	5 X 5 X 2 1/2
0.375	0.218	0.375	0.218	0.625	0.344	0.750	0.436	5 X 5 X 2
0.432	0.375	0.432	0.375	0.719	0.625	0.864	0.750	6 X 6 X 5
0.432	0.337	0.432	0.337	0.719	0.531	0.864	0.674	6 X 6 X 4
0.432	0.318	0.432	0.318	-	-	-	-	6 X 6 X 3 1/2
0.432	0.300	0.432	0.300	0.719	0.438	0.864	0.600	6 X 6 X 3
0.432	0.276	0.432	0.276	0.719	0.375	0.864	0.552	6 X 6 X 2 1/2

ASME

Carbon Steel

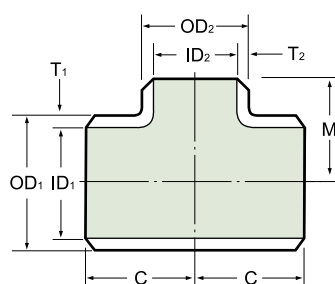
Wrought Steel Butt-Welding Fittings

Reducing Tee

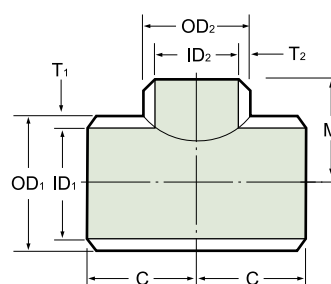
STD, Sch40, X-S, Sch80,
Sch160, XX-S

ASME B16.9

Nominal Pipe Size	Outside Diameter		Center to End		STD		Sch 40	
	OD ₁	OD ₂	Run C	Outlet M	T ₁	T ₂	T ₁	T ₂
8 x 8 x 6	8.625	6.625	7.00	6.62	0.322	0.280	0.322	0.280
8 x 8 x 5	8.625	5.563	7.00	6.38	0.322	0.258	0.322	0.258
8 x 8 x 4	8.625	4.500	7.00	6.12	0.322	0.237	0.322	0.237
8 x 8 x 3 1/2	8.625	4.000	7.00	6.00	0.322	0.226	0.322	0.226
10 x 10 x 8	10.750	8.625	8.50	8.00	0.365	0.322	0.365	0.322
10 x 10 x 6	10.750	6.625	8.50	7.62	0.365	0.280	0.365	0.280
10 x 10 x 5	10.750	5.563	8.50	7.50	0.365	0.258	0.365	0.258
10 x 10 x 4	10.750	4.500	8.50	7.25	0.365	0.237	0.365	0.237
12 x 12 x 10	12.750	10.750	10.00	9.50	0.375	0.365	0.406	0.365
12 x 12 x 8	12.750	8.625	10.00	9.00	0.375	0.322	0.406	0.322
12 x 12 x 6	12.750	6.625	10.00	8.62	0.375	0.280	0.406	0.280
12 x 12 x 5	12.750	5.563	10.00	8.50	0.375	0.258	0.406	0.258
14 x 14 x 12	14.000	12.750	11.00	10.62	0.375	0.375	0.438	0.406
14 x 14 x 10	14.000	10.750	11.00	10.12	0.375	0.365	0.438	0.365
14 x 14 x 8	14.000	8.625	11.00	9.75	0.375	0.322	0.438	0.322
14 x 14 x 6	14.000	6.625	11.00	9.38	0.375	0.280	0.438	0.280
16 x 16 x 14	16.000	14.000	12.00	12.00	0.375	0.375	0.500	0.438
16 x 16 x 12	16.000	12.750	12.00	11.62	0.375	0.375	0.500	0.406
16 x 16 x 10	16.000	10.750	12.00	11.12	0.375	0.365	0.500	0.365
16 x 16 x 8	16.000	8.625	12.00	10.75	0.375	0.322	0.500	0.322
16 x 16 x 6	16.000	6.625	12.00	10.38	0.375	0.280	0.500	0.280
18 x 18 x 16	18.000	16.000	13.50	13.00	0.375	0.375	0.562	0.500
18 x 18 x 14	18.000	14.000	13.50	13.00	0.375	0.375	0.562	0.438
18 x 18 x 12	18.000	12.750	13.50	12.62	0.375	0.375	0.562	0.406
18 x 18 x 10	18.000	10.750	13.50	12.12	0.375	0.365	0.562	0.365
18 x 18 x 8	18.000	8.625	13.50	11.75	0.375	0.322	0.562	0.322
20 x 20 x 18	20.000	18.000	15.00	14.50	0.375	0.375	0.594	0.562
20 x 20 x 16	20.000	16.000	15.00	14.00	0.375	0.375	0.594	0.500
20 x 20 x 14	20.000	14.000	15.00	14.00	0.375	0.375	0.594	0.438
20 x 20 x 12	20.000	12.750	15.00	13.62	0.375	0.375	0.594	0.406
20 x 20 x 10	20.000	10.750	15.00	13.12	0.375	0.365	0.594	0.365
20 x 20 x 8	20.000	8.625	15.00	12.75	0.375	0.322	0.594	0.322
22 x 22 x 20	22.000	20.000	16.50	16.00	0.375	0.375	*0.594	0.594
22 x 22 x 18	22.000	18.000	16.50	15.50	0.375	0.375	*0.594	0.562
22 x 22 x 16	22.000	16.000	16.50	15.00	0.375	0.375	*0.594	0.500
22 x 22 x 14	22.000	14.000	16.50	15.00	0.375	0.375	*0.594	0.438
22 x 22 x 12	22.000	12.750	16.50	14.62	0.375	0.375	*0.594	0.406
22 x 22 x 10	22.000	10.750	16.50	14.12	0.375	0.365	*0.594	0.365
24 x 24 x 22	24.000	22.000	17.00	17.00	0.375	0.375	0.688	0.594
24 x 24 x 20	24.000	20.000	17.00	17.00	0.375	0.375	0.688	0.594
24 x 24 x 18	24.000	18.000	17.00	16.50	0.375	0.375	0.688	0.562
24 x 24 x 16	24.000	16.000	17.00	16.00	0.375	0.375	0.688	0.500
24 x 24 x 14	24.000	14.000	17.00	16.00	0.375	0.375	0.688	0.438
24 x 24 x 12	24.000	12.750	17.00	15.62	0.375	0.375	0.688	0.406
24 x 24 x 10	24.000	10.750	17.00	15.12	0.375	0.365	0.688	0.365



Reducing (I)



Reducing (II)

Unit : inch

X-S		Sch 80		Sch 160		XX-S		Nominal Pipe Size
T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	
0.500	0.432	0.500	0.432	0.906	0.719	0.875	0.864	8 x 8 x 6
0.500	0.375	0.500	0.375	0.906	0.625	0.875	0.750	8 x 8 x 5
0.500	0.318	0.500	0.318	0.906	0.531	0.875	0.674	8 x 8 x 4
0.500	0.300	0.500	0.300	-	-	-	-	8 x 8 x 3 1/2
0.500	0.500	0.594	0.500	1.125	0.906	1.000	0.875	10 x 10 x 8
0.500	0.432	0.594	0.432	1.125	0.719	1.000	0.864	10 x 10 x 6
0.500	0.375	0.594	0.375	1.125	0.625	1.000	0.750	10 x 10 x 5
0.500	0.337	0.594	0.337	1.125	0.531	1.000	0.674	10 x 10 x 4
0.500	0.500	0.688	0.594	1.312	1.125	1.000	1.000	12 x 12 x 10
0.500	0.500	0.688	0.500	1.312	0.906	1.000	0.875	12 x 12 x 8
0.500	0.432	0.688	0.432	1.312	0.719	1.000	0.864	12 x 12 x 6
0.500	0.375	0.688	0.375	1.312	0.625	1.000	0.750	12 x 12 x 5
0.500	0.500	0.750	0.688	1.406	1.312	-	-	14 x 14 x 12
0.500	0.500	0.750	0.594	1.406	1.125	-	-	14 x 14 x 10
0.500	0.500	0.750	0.500	1.406	0.906	-	-	14 x 14 x 8
0.500	0.432	0.750	0.432	1.406	0.719	-	-	14 x 14 x 6
0.500	0.500	0.844	0.750	1.594	1.406	-	-	16 x 16 x 14
0.500	0.500	0.844	0.688	1.594	1.312	-	-	16 x 16 x 12
0.500	0.500	0.844	0.594	1.594	1.125	-	-	16 x 16 x 10
0.500	0.500	0.844	0.500	1.594	0.906	-	-	16 x 16 x 8
0.500	0.432	0.844	0.432	1.594	0.719	-	-	16 x 16 x 6
0.500	0.500	0.938	0.844	1.781	1.594	-	-	18 x 18 x 16
0.500	0.500	0.938	0.750	1.781	1.406	-	-	18 x 18 x 14
0.500	0.500	0.938	0.688	1.781	1.312	-	-	18 x 18 x 12
0.500	0.500	0.938	0.594	1.781	1.125	-	-	18 x 18 x 10
0.500	0.500	0.938	0.500	1.781	0.906	-	-	18 x 18 x 8
0.500	0.500	1.031	0.938	1.969	1.781	-	-	20 x 20 x 18
0.500	0.500	1.031	0.844	1.969	1.594	-	-	20 x 20 x 16
0.500	0.500	1.031	0.750	1.969	1.406	-	-	20 x 20 x 14
0.500	0.500	1.031	0.688	1.969	1.312	-	-	20 x 20 x 12
0.500	0.500	1.031	0.594	1.969	1.125	-	-	20 x 20 x 10
0.500	0.500	1.031	0.500	1.969	0.906	-	-	20 x 20 x 8
0.500	0.500	1.125	1.031	2.125	1.969	-	-	22 x 22 x 20
0.500	0.500	1.125	0.938	2.125	1.781	-	-	22 x 22 x 18
0.500	0.500	1.125	0.844	2.125	1.594	-	-	22 x 22 x 16
0.500	0.500	1.125	0.750	2.125	1.406	-	-	22 x 22 x 14
0.500	0.500	1.125	0.688	2.125	1.312	-	-	22 x 22 x 12
0.500	0.500	1.125	0.594	2.125	1.125	-	-	22 x 22 x 10
0.500	0.500	1.219	1.125	2.344	2.125	-	-	24 x 24 x 22
0.500	0.500	1.219	1.031	2.344	1.969	-	-	24 x 24 x 20
0.500	0.500	1.219	0.938	2.344	1.781	-	-	24 x 24 x 18
0.500	0.500	1.219	0.844	2.344	1.594	-	-	24 x 24 x 16
0.500	0.500	1.219	0.750	2.344	1.406	-	-	24 x 24 x 14
0.500	0.500	1.219	0.688	2.344	1.312	-	-	24 x 24 x 12
0.500	0.500	1.219	0.594	2.344	1.125	-	-	24 x 24 x 10

ASME

Carbon Steel

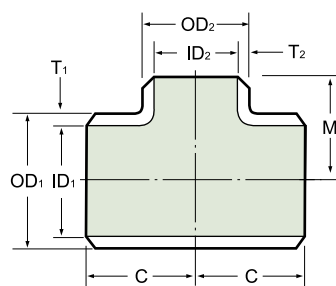
Wrought Steel Butt-Welding Fittings

Reducing Tee STD, Sch40, X-S

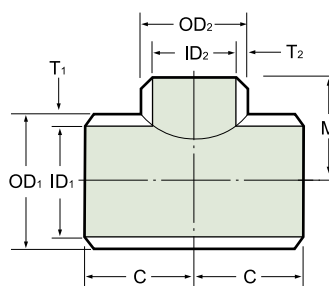
ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter		Center to End		STD		Sch 40		X-S	
	OD ₁	OD ₂	Run C	Outlet M	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂
26 x 26 x 24	26.000	24.000	19.50	19.00	0.375	0.375	*0.688	0.688	0.500	0.500
26 x 26 x 22	26.000	22.000	19.50	18.50	0.375	0.375	*0.688	*0.594	0.500	0.500
26 x 26 x 20	26.000	20.000	19.50	18.00	0.375	0.375	*0.688	0.594	0.500	0.500
26 x 26 x 18	26.000	18.000	19.50	17.50	0.375	0.375	*0.688	0.562	0.500	0.500
26 x 26 x 16	26.000	16.000	19.50	17.00	0.375	0.375	*0.688	0.500	0.500	0.500
26 x 26 x 14	26.000	14.000	19.50	17.00	0.375	0.375	*0.688	0.438	0.500	0.500
26 x 26 x 12	26.000	12.750	19.50	16.62	0.375	0.375	*0.688	0.406	0.500	0.500
28 x 28 x 26	28.000	26.000	20.50	20.50	0.375	0.375	*0.688	*0.688	0.500	0.500
28 x 28 x 24	28.000	24.000	20.50	20.00	0.375	0.375	*0.688	0.688	0.500	0.500
28 x 28 x 22	28.000	22.000	20.50	19.50	0.375	0.375	*0.688	*0.594	0.500	0.500
28 x 28 x 20	28.000	20.000	20.50	19.00	0.375	0.375	*0.688	0.594	0.500	0.500
28 x 28 x 18	28.000	18.000	20.50	18.50	0.375	0.375	*0.688	0.562	0.500	0.500
28 x 28 x 16	28.000	16.000	20.50	18.00	0.375	0.375	*0.688	0.500	0.500	0.500
28 x 28 x 14	28.000	14.000	20.50	18.00	0.375	0.375	*0.688	0.438	0.500	0.500
28 x 28 x 12	28.000	12.750	20.50	17.62	0.375	0.375	*0.688	0.406	0.500	0.500
30 x 30 x 28	30.000	28.000	22.00	21.50	0.375	0.375	*0.688	*0.688	0.500	0.500
30 x 30 x 26	30.000	26.000	22.00	21.50	0.375	0.375	*0.688	*0.688	0.500	0.500
30 x 30 x 24	30.000	24.000	22.00	21.00	0.375	0.375	*0.688	0.688	0.500	0.500
30 x 30 x 22	30.000	22.000	22.00	20.50	0.375	0.375	*0.688	*0.594	0.500	0.500
30 x 30 x 20	30.000	20.000	22.00	20.00	0.375	0.375	*0.688	*0.594	0.500	0.500
30 x 30 x 18	30.000	18.000	22.00	19.50	0.375	0.375	*0.688	0.562	0.500	0.500
30 x 30 x 16	30.000	16.000	22.00	19.00	0.375	0.375	*0.688	0.500	0.500	0.500
30 x 30 x 14	30.000	14.000	22.00	19.00	0.375	0.375	*0.688	0.438	0.500	0.500
30 x 30 x 12	30.000	12.750	22.00	18.62	0.375	0.375	*0.688	0.406	0.500	0.500
30 x 30 x 10	30.000	10.750	22.00	18.12	0.375	0.375	*0.688	0.365	0.500	0.500
32 x 32 x 30	32.000	30.000	23.50	23.00	0.375	0.375	0.688	*0.688	0.500	0.500
32 x 32 x 28	32.000	28.000	23.50	22.50	0.375	0.375	0.688	*0.688	0.500	0.500
32 x 32 x 26	32.000	26.000	23.50	22.50	0.375	0.375	0.688	*0.688	0.500	0.500
32 x 32 x 24	32.000	24.000	23.50	22.00	0.375	0.375	0.688	0.688	0.500	0.500
32 x 32 x 22	32.000	22.000	23.50	21.50	0.375	0.375	0.688	*0.594	0.500	0.500
32 x 32 x 20	32.000	20.000	23.50	21.00	0.375	0.375	0.688	0.594	0.500	0.500
32 x 32 x 18	32.000	18.000	23.50	20.50	0.375	0.375	0.688	0.562	0.500	0.500
32 x 32 x 16	32.000	16.000	23.50	20.00	0.375	0.375	0.688	0.500	0.500	0.500
32 x 32 x 14	32.000	14.000	23.50	20.00	0.375	0.375	0.688	0.438	0.500	0.500



Reducing (I)



Reducing (II)

ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter		Center to End		STD		Sch 40		X-S	
	OD ₁	OD ₂	Run C	Outlet M	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂
34 x 34 x 32	34.000	32.000	25.00	24.50	0.375	0.375	0.688	0.688	0.500	0.500
34 x 34 x 30	34.000	30.000	25.00	24.00	0.375	0.375	0.688	*0.688	0.500	0.500
34 x 34 x 28	34.000	28.000	25.00	23.50	0.375	0.375	0.688	*0.688	0.500	0.500
34 x 34 x 26	34.000	26.000	25.00	23.50	0.375	0.375	0.688	*0.688	0.500	0.500
34 x 34 x 24	34.000	24.000	25.00	23.00	0.375	0.375	0.688	0.688	0.500	0.500
34 x 34 x 22	34.000	22.000	25.00	22.50	0.375	0.375	0.688	*0.594	0.500	0.500
34 x 34 x 20	34.000	20.000	25.00	22.00	0.375	0.375	0.688	0.594	0.500	0.500
34 x 34 x 18	34.000	18.000	25.00	21.50	0.375	0.375	0.688	0.562	0.500	0.50
34 x 34 x 16	34.000	16.000	25.00	21.00	0.375	0.375	0.688	0.500	0.500	0.500
36 x 36 x 34	36.000	34.000	26.50	26.00	0.375	0.375	0.750	0.688	0.500	0.50
36 x 36 x 32	36.000	32.000	26.50	25.50	0.375	0.375	0.750	0.688	0.500	0.500
36 x 36 x 30	36.000	30.000	26.50	25.00	0.375	0.375	0.750	*0.688	0.500	0.500
36 x 36 x 28	36.000	28.000	26.50	24.50	0.375	0.375	0.750	*0.688	0.500	0.500
36 x 36 x 26	36.000	26.000	26.50	24.50	0.375	0.375	0.750	*0.688	0.500	0.500
36 x 36 x 24	36.000	24.000	26.50	24.00	0.375	0.375	0.750	0.688	0.500	0.500
36 x 36 x 22	36.000	22.000	26.50	23.50	0.375	0.375	0.750	*0.594	0.500	0.500
36 x 36 x 20	36.000	20.000	26.50	23.00	0.375	0.375	0.750	0.594	0.500	0.500
36 x 36 x 18	36.000	18.000	26.50	22.50	0.375	0.375	0.750	0.562	0.500	0.500
36 x 36 x 16	36.000	16.000	26.50	22.00	0.375	0.375	0.750	0.500	0.500	0.500
38 x 38 x 36	38.000	36.000	28.00	28.00	0.375	0.375	-	-	0.500	0.500
38 x 38 x 34	38.000	34.000	28.00	27.50	0.375	0.375	-	-	0.500	0.500
38 x 38 x 32	38.000	32.000	28.00	27.00	0.375	0.375	-	-	0.500	0.500
38 x 38 x 30	38.000	30.000	28.00	26.50	0.375	0.375	-	-	0.500	0.500
38 x 38 x 28	38.000	28.000	28.00	25.50	0.375	0.375	-	-	0.500	0.500
38 x 38 x 26	38.000	26.000	28.00	25.50	0.375	0.375	-	-	0.500	0.500
38 x 38 x 24	38.000	24.000	28.00	25.00	0.375	0.375	-	-	0.500	0.500
38 x 38 x 22	38.000	22.000	28.00	24.50	0.375	0.375	-	-	0.500	0.500
38 x 38 x 20	38.000	20.000	28.00	24.00	0.375	0.375	-	-	0.500	0.500
38 x 38 x 18	38.000	18.000	28.00	23.50	0.375	0.375	-	-	0.500	0.500

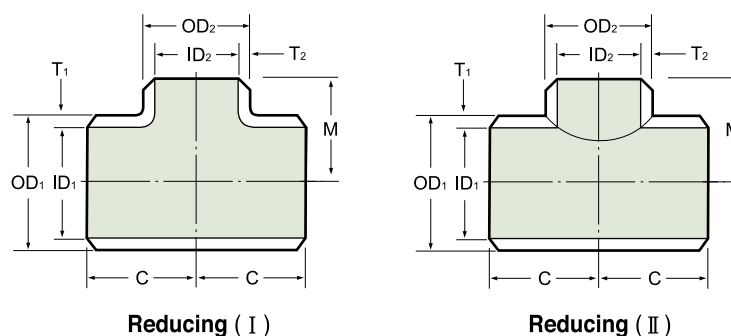
Wrought Steel Butt-Welding Fittings

Reducing Tee STD, X-S

ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter		Center to End		STD		X-S	
	OD ₁	OD ₂	Run C	Outlet M	T ₁	T ₂	T ₁	T ₂
40 x 40 x 38	40.000	38.000	29.50	29.50	0.375	0.375	0.500	0.500
40 x 40 x 36	40.000	36.000	29.50	29.00	0.375	0.375	0.500	0.50
40 x 40 x 34	40.000	34.000	29.50	28.50	0.375	0.375	0.500	0.500
40 x 40 x 32	40.000	32.000	29.50	28.00	0.375	0.375	0.500	0.500
40 x 40 x 30	40.000	30.000	29.50	27.50	0.375	0.375	0.500	0.500
40 x 40 x 28	40.000	28.000	29.50	26.50	0.375	0.375	0.500	0.500
40 x 40 x 26	40.000	26.000	29.50	26.50	0.375	0.375	0.500	0.500
40 x 40 x 24	40.000	24.000	29.50	26.00	0.375	0.375	0.500	0.500
40 x 40 x 22	40.000	22.000	29.50	25.50	0.375	0.375	0.500	0.500
40 x 40 x 20	40.000	20.000	29.50	25.00	0.375	0.375	0.500	0.500
40 x 40 x 18	40.000	18.000	29.50	24.50	0.375	0.375	0.500	0.500
42 x 42 x 40	42.000	40.000	30.00	28.00	0.375	0.375	0.500	0.500
42 x 42 x 38	42.000	38.000	30.00	28.00	0.375	0.375	0.500	0.500
42 x 42 x 36	42.000	36.000	30.00	28.00	0.375	0.375	0.500	0.500
42 x 42 x 34	42.000	34.000	30.00	28.00	0.375	0.375	0.500	0.500
42 x 42 x 32	42.000	32.000	30.00	28.00	0.375	0.375	0.500	0.500
42 x 42 x 30	42.000	30.000	30.00	28.00	0.375	0.375	0.500	0.500
42 x 42 x 28	42.000	28.000	30.00	27.50	0.375	0.375	0.500	0.500
42 x 42 x 26	42.000	26.000	30.00	27.50	0.375	0.375	0.500	0.500
42 x 42 x 24	42.000	24.000	30.00	26.00	0.375	0.375	0.500	0.500
42 x 42 x 22	42.000	22.000	30.00	26.00	0.375	0.375	0.500	0.500
42 x 42 x 20	42.000	20.000	30.00	26.00	0.375	0.375	0.500	0.500
42 x 42 x 18	42.000	18.000	30.00	25.50	0.375	0.375	0.500	0.500
42 x 42 x 16	42.000	16.000	30.00	25.00	0.375	0.375	0.500	0.500
44 x 44 x 42	44.000	42.000	32.00	30.00	0.375	0.375	0.500	0.500
44 x 44 x 40	44.000	40.000	32.00	29.50	0.375	0.375	0.500	0.500
44 x 44 x 38	44.000	38.000	32.00	29.00	0.375	0.375	0.500	0.500
44 x 44 x 36	44.000	36.000	32.00	28.50	0.375	0.375	0.500	0.500
44 x 44 x 34	44.000	34.000	32.00	28.50	0.375	0.375	0.500	0.500
44 x 44 x 32	44.000	32.000	32.00	28.00	0.375	0.375	0.500	0.500
44 x 44 x 30	44.000	30.000	32.00	28.00	0.375	0.375	0.500	0.500
44 x 44 x 28	44.000	28.000	32.00	27.50	0.375	0.375	0.500	0.50
44 x 44 x 26	44.000	26.000	32.00	27.50	0.375	0.375	0.500	0.500
44 x 44 x 24	44.000	24.000	32.00	27.50	0.375	0.375	0.500	0.500
44 x 44 x 22	44.000	22.000	32.00	27.00	0.375	0.375	0.500	0.500
44 x 44 x 20	44.000	20.000	32.00	27.00	0.375	0.375	0.500	0.500



ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter		Center to End		STD		X-S	
	OD ₁	OD ₂	Run C	Outlet M	T ₁	T ₂	T ₁	T ₂
46 x 46 x 44	46.000	44.000	33.50	31.50	0.375	0.375	0.500	0.500
46 x 46 x 42	46.000	42.000	33.50	31.00	0.375	0.375	0.500	0.500
46 x 46 x 40	46.000	40.000	33.50	30.50	0.375	0.375	0.500	0.500
46 x 46 x 38	46.000	38.000	33.50	30.00	0.375	0.375	0.500	0.500
46 x 46 x 36	46.000	36.000	33.50	30.00	0.375	0.375	0.500	0.500
46 x 46 x 34	46.000	34.000	33.50	29.50	0.375	0.375	0.500	0.500
46 x 46 x 32	46.000	32.000	33.50	29.50	0.375	0.375	0.500	0.500
46 x 46 x 30	46.000	30.000	33.50	29.00	0.375	0.375	0.500	0.500
46 x 46 x 28	46.000	28.000	33.50	29.00	0.375	0.375	0.500	0.500
46 x 46 x 26	46.000	26.000	33.50	29.00	0.375	0.375	0.500	0.500
46 x 46 x 24	46.000	24.000	33.50	28.50	0.375	0.375	0.500	0.500
46 x 46 x 22	46.000	22.000	33.50	28.50	0.375	0.375	0.500	0.500
48 x 48 x 46	48.000	46.000	35.00	33.00	0.375	0.375	0.500	0.500
48 x 48 x 44	48.000	44.000	35.00	33.00	0.375	0.375	0.500	0.500
48 x 48 x 42	48.000	42.000	35.00	32.00	0.375	0.375	0.500	0.500
48 x 48 x 40	48.000	40.000	35.00	32.00	0.375	0.375	0.500	0.500
48 x 48 x 38	48.000	38.000	35.00	32.00	0.375	0.375	0.500	0.500
48 x 48 x 36	48.000	36.000	35.00	31.00	0.375	0.375	0.500	0.500
48 x 48 x 34	48.000	34.000	35.00	31.00	0.375	0.375	0.500	0.500
48 x 48 x 32	48.000	32.000	35.00	31.00	0.375	0.375	0.500	0.500
48 x 48 x 30	48.000	30.000	35.00	30.00	0.375	0.375	0.500	0.500
48 x 48 x 28	48.000	28.000	35.00	30.00	0.375	0.375	0.500	0.500
48 x 48 x 26	48.000	26.000	35.00	30.00	0.375	0.375	0.500	0.500
48 x 48 x 24	48.000	24.000	35.00	29.00	0.375	0.375	0.500	0.500
48 x 48 x 22	48.000	22.000	35.00	29.00	0.375	0.375	0.500	0.500

ASME

Carbon Steel

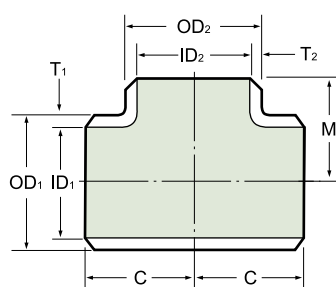
Wrought Steel Butt-Welding Fittings

Reducing Tee

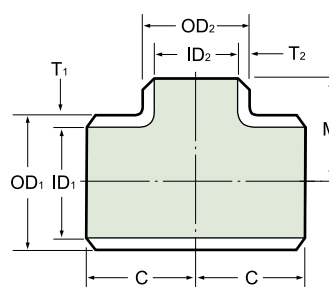
Sch20, Sch30, Sch60, Sch100,
Sch120, Sch140

ASME B16.9

Nominal Pipe Size	Outside Diameter		Center to End		Sch 20		Sch 30	
	OD ₁	OD ₂	Run C	Outlet M	T ₁	T ₂	T ₁	T ₂
4 x 4 x 4	4.500	4.500	4.12	4.12	-	-	-	-
5 x 5 x 5	5.563	5.563	4.88	4.88	-	-	-	-
5 x 5 x 4	5.563	4.500	4.88	4.62	-	-	-	-
6 x 6 x 6	6.625	6.625	5.62	5.62	-	-	-	-
6 x 6 x 5	6.625	5.563	5.62	5.38	-	-	-	-
6 x 6 x 4	6.625	4.500	5.62	5.12	-	-	-	-
8 x 8 x 8	8.625	8.625	7.00	7.00	0.250	0.250	0.277	0.277
8 x 8 x 6	8.625	6.625	7.00	6.62	-	-	-	-
8 x 8 x 5	8.625	5.563	7.00	6.38	-	-	-	-
8 x 8 x 4	8.625	4.500	7.00	6.12	-	-	-	-
10 x 10 x 10	10.750	10.750	8.50	8.50	0.250	0.250	0.307	0.307
10 x 10 x 8	10.750	8.625	8.50	8.00	0.250	0.250	0.307	0.277
10 x 10 x 6	10.750	6.625	8.50	7.62	-	-	-	-
10 x 10 x 5	10.750	5.563	8.50	7.50	-	-	-	-
10 x 10 x 4	10.750	4.500	8.50	7.25	-	-	-	-
12 x 12 x 12	12.750	12.750	10.00	10.00	0.250	0.250	0.330	0.330
12 x 12 x 10	12.750	10.750	10.00	9.50	0.250	0.250	0.330	0.307
12 x 12 x 8	12.750	8.625	10.00	9.00	0.250	0.250	0.330	0.277
12 x 12 x 6	12.750	6.625	10.00	8.62	-	-	-	-
12 x 12 x 5	12.750	5.563	10.00	8.50	-	-	-	-
14 x 14 x 14	14.000	14.000	11.00	11.00	0.312	0.312	0.375	0.375
14 x 14 x 12	14.000	12.750	11.00	10.62	0.312	0.250	0.375	0.330
14 x 14 x 10	14.000	10.750	11.00	10.12	0.312	0.250	0.375	0.307
14 x 14 x 8	14.000	8.625	11.00	9.75	0.312	0.250	0.375	0.277
14 x 14 x 6	14.000	6.625	11.00	9.38	-	-	-	-
16 x 16 x 16	16.000	16.000	12.00	12.00	0.312	0.312	0.375	0.375
16 x 16 x 14	16.000	14.000	12.00	12.00	0.312	0.312	0.375	0.375
16 x 16 x 12	16.000	12.750	12.00	11.62	0.312	0.250	0.375	0.330
16 x 16 x 10	16.000	10.750	12.00	11.12	0.312	0.250	0.375	0.307
16 x 16 x 8	16.000	8.625	12.00	10.75	0.312	0.250	0.375	0.277
16 x 16 x 6	16.000	6.625	12.00	10.38	-	-	-	-



Straight



Reducing

Sch 60		Sch 100		Sch 120		Sch 140		Nominal Pipe Size
T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	
-	-	-	-	0.438	0.438	-	-	4 x 4 x 4
-	-	-	-	0.500	0.500	-	-	5 x 5 x 5
-	-	-	-	0.500	0.438	-	-	5 x 5 x 4
-	-	-	-	0.562	0.562	-	-	6 x 6 x 6
-	-	-	-	0.562	0.500	-	-	6 x 6 x 5
-	-	-	-	0.562	0.438	-	-	6 x 6 x 4
0.406	0.406	0.594	0.594	0.719	0.719	0.812	0.812	8 x 8 x 8
-	-	-	-	0.719	0.562	-	-	8 x 8 x 6
-	-	-	-	0.719	0.500	-	-	8 x 8 x 5
-	-	-	-	0.719	0.438	-	-	8 x 8 x 4
0.500	0.500	0.719	0.719	0.844	0.844	1.000	1.000	10 x 10 x 10
0.500	0.406	0.719	0.594	0.844	0.719	1.000	0.812	10 x 10 x 8
-	-	-	-	0.844	0.562	-	-	10 x 10 x 6
-	-	-	-	0.844	0.500	-	-	10 x 10 x 5
-	-	-	-	0.844	0.438	-	-	10 x 10 x 4
0.562	0.562	0.844	0.844	1.000	1.000	1.125	1.125	12 x 12 x 1
0.562	0.500	0.844	0.719	1.000	0.844	1.125	1.000	12 x 12 x 10
0.562	0.406	0.844	0.594	1.000	0.719	1.125	0.812	12 x 12 x 8
-	-	-	-	1.000	0.562	-	-	12 x 12 x 6
-	-	-	-	1.000	0.500	-	-	12 x 12 x 5
0.594	0.594	0.938	0.936	1.094	1.094	1.250	1.250	14 x 14 x 14
0.594	0.562	0.938	0.844	1.094	1.000	1.250	1.125	14 x 14 x 12
0.594	0.500	0.938	0.719	1.094	0.844	1.250	1.000	14 x 14 x 10
0.594	0.406	0.938	0.594	1.094	0.719	1.250	0.812	14 x 14 x 8
-	-	-	-	1.094	0.562	-	-	14 x 14 x 6
0.656	0.656	1.031	1.031	1.219	1.219	1.438	1.438	16 x 16 x 16
0.656	0.594	1.031	0.938	1.219	1.094	1.438	1.250	16 x 16 x 14
0.656	0.562	1.031	0.844	1.219	1.000	1.438	1.125	16 x 16 x 12
0.656	0.500	1.031	0.719	1.219	0.844	1.438	1.000	16 x 16 x 10
0.656	0.406	1.031	0.594	1.219	0.719	1.438	0.812	16 x 16 x 8
-	-	-	-	1.219	0.562	-	-	16 x 16 x 6

Wrought Steel Butt-Welding Fittings

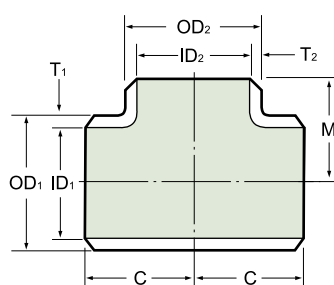
Tee

Sch20, Sch30, Sch60,
Sch100, Sch120, Sch140

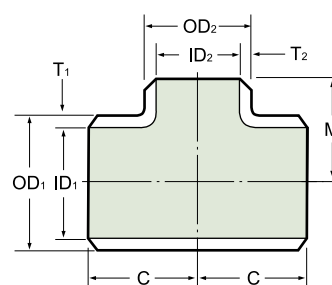
ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter		Center to End		Sch 20		Sch 30	
	OD ₁	OD ₂	Run C	Outlet M	T ₁	T ₂	T ₁	T ₂
18 x 18 x 18	18.000	18.000	13.50	13.50	0.312	0.312	0.438	0.438
18 x 18 x 16	18.000	16.000	13.50	13.00	0.312	0.312	0.438	0.375
18 x 18 x 14	18.000	14.000	13.50	13.00	0.312	0.312	0.438	0.375
18 x 18 x 12	18.000	12.750	13.50	12.62	0.312	0.250	0.438	0.330
18 x 18 x 10	18.000	10.750	13.50	12.12	0.312	0.250	0.438	0.307
18 x 18 x 8	18.000	8.625	13.50	11.75	0.312	0.250	0.438	0.277
20 x 20 x 20	20.000	20.000	15.00	15.00	0.375	0.375	0.500	0.500
20 x 20 x 18	20.000	18.000	15.00	14.50	0.375	0.312	0.500	0.438
20 x 20 x 16	20.000	16.000	15.00	14.00	0.375	0.312	0.500	0.375
20 x 20 x 14	20.000	14.000	15.00	14.00	0.375	0.312	0.500	0.375
20 x 20 x 12	20.000	12.750	15.00	13.62	0.375	0.250	0.500	0.330
20 x 20 x 10	20.000	10.750	15.00	13.12	0.375	0.250	0.500	0.307
20 x 20 x 8	20.000	8.625	15.00	12.75	0.375	0.250	0.500	0.277
22 x 22 x 22	22.000	22.000	16.50	16.50	0.375	0.375	0.500	0.500
22 x 22 x 20	22.000	20.000	16.50	16.00	0.375	0.375	0.500	0.500
22 x 22 x 18	22.000	18.000	16.50	15.50	0.375	0.312	0.500	0.438
22 x 22 x 16	22.000	16.000	16.50	15.00	0.375	0.312	0.500	0.375
22 x 22 x 14	22.000	14.000	16.50	15.00	0.375	0.312	0.500	0.375
22 x 22 x 12	22.000	12.750	16.50	14.62	0.375	0.250	0.500	0.330
22 x 22 x 10	22.000	10.750	16.50	14.12	0.375	0.250	0.500	0.307
24 x 24 x 24	24.000	24.000	17.00	17.00	0.375	0.375	0.562	0.562
24 x 24 x 22	24.000	22.000	17.00	17.00	0.375	0.375	0.562	0.500
24 x 24 x 20	24.000	20.000	17.00	17.00	0.375	0.375	0.562	0.500
24 x 24 x 18	24.000	18.000	17.00	16.50	0.375	0.312	0.562	0.438
24 x 24 x 16	24.000	16.000	17.00	16.00	0.375	0.312	0.562	0.375
24 x 24 x 14	24.000	14.000	17.00	16.00	0.375	0.312	0.562	0.375
24 x 24 x 12	24.000	12.750	17.00	15.62	0.375	0.250	0.562	0.330
24 x 24 x 10	24.000	10.750	17.00	15.12	0.375	0.250	0.562	0.307
26 x 26 x 26	26.000	26.000	19.50	19.50	0.500	0.500	-	-
26 x 26 x 24	26.000	24.000	19.50	19.00	0.500	0.375	-	-
26 x 26 x 22	26.000	22.000	19.50	18.50	0.500	0.375	-	-
26 x 26 x 20	26.000	20.000	19.50	18.00	0.500	0.375	-	-
26 x 26 x 18	26.000	18.000	19.50	17.50	0.500	0.312	-	-
26 x 26 x 16	26.000	16.000	19.50	17.00	0.500	0.312	-	-
26 x 26 x 14	26.000	14.000	19.50	17.00	0.500	0.312	-	-
26 x 26 x 12	26.000	12.750	19.50	16.62	0.500	0.250	-	-



Straight



Reducing

ASME B16.9

Unit : inch

Sch 60		Sch 100		Sch 120		Sch 140		Nominal Pipe Size
T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	
0.750	0.750	1.156	1.156	1.375	1.375	1.562	1.562	18 x 18 x 18
0.750	0.656	1.156	1.031	1.375	1.219	1.562	1.438	18 x 18 x 16
0.750	0.594	1.156	0.938	1.375	1.094	1.562	1.250	18 x 18 x 14
0.750	0.562	1.156	0.844	1.375	1.000	1.562	1.125	18 x 18 x 12
0.750	0.500	1.156	0.719	1.375	0.844	1.562	1.000	18 x 18 x 10
0.750	0.406	1.156	0.594	1.375	0.719	1.562	0.812	18 x 18 x 8
0.812	0.812	1.281	1.281	1.500	1.500	1.750	1.750	20 x 20 x 20
0.812	0.750	1.281	1.156	1.500	1.375	1.750	1.562	20 x 20 x 18
0.812	0.656	1.281	1.031	1.500	1.219	1.750	1.438	20 x 20 x 16
0.812	0.594	1.281	0.938	1.500	1.094	1.750	1.250	20 x 20 x 14
0.812	0.562	1.281	0.844	1.500	1.000	1.750	1.125	20 x 20 x 12
0.812	0.500	1.281	0.719	1.500	0.844	1.750	1.000	20 x 20 x 10
0.812	0.406	1.281	0.594	1.500	0.719	1.750	0.812	20 x 20 x 8
0.875	0.875	1.375	1.375	1.625	1.625	1.875	1.875	22 x 22 x 22
0.875	0.812	1.375	1.281	1.625	1.500	1.875	1.750	22 x 22 x 20
0.875	0.750	1.375	1.156	1.625	1.375	1.875	1.562	22 x 22 x 18
0.875	0.656	1.375	1.031	1.625	1.219	1.875	1.438	22 x 22 x 16
0.875	0.594	1.375	0.938	1.625	1.094	1.875	1.250	22 x 22 x 14
0.875	0.562	1.375	0.844	1.625	1.000	1.875	1.125	22 x 22 x 12
0.875	0.500	1.375	0.719	1.625	0.844	1.875	1.000	22 x 22 x 10
0.969	0.969	1.531	1.531	1.812	1.812	2.062	2.062	24 x 24 x 24
0.969	0.875	1.531	1.375	1.812	1.625	2.062	1.875	24 x 24 x 22
0.969	0.812	1.531	1.281	1.812	1.500	2.062	1.750	24 x 24 x 20
0.969	0.750	1.531	1.156	1.812	1.375	2.062	1.562	24 x 24 x 18
0.969	0.656	1.531	1.031	1.812	1.219	2.062	1.438	24 x 24 x 16
0.969	0.594	1.531	0.938	1.812	1.094	2.062	1.250	24 x 24 x 14
0.969	0.562	1.531	0.844	1.812	1.000	2.062	1.125	24 x 24 x 12
0.969	0.500	1.531	0.719	1.812	0.844	2.062	1.000	24 x 24 x 10
-	-	-	-	-	-	-	-	26 x 26 x 26
-	-	-	-	-	-	-	-	26 x 26 x 24
-	-	-	-	-	-	-	-	26 x 26 x 22
-	-	-	-	-	-	-	-	26 x 26 x 20
-	-	-	-	-	-	-	-	26 x 26 x 18
-	-	-	-	-	-	-	-	26 x 26 x 16
-	-	-	-	-	-	-	-	26 x 26 x 14
-	-	-	-	-	-	-	-	26 x 26 x 12

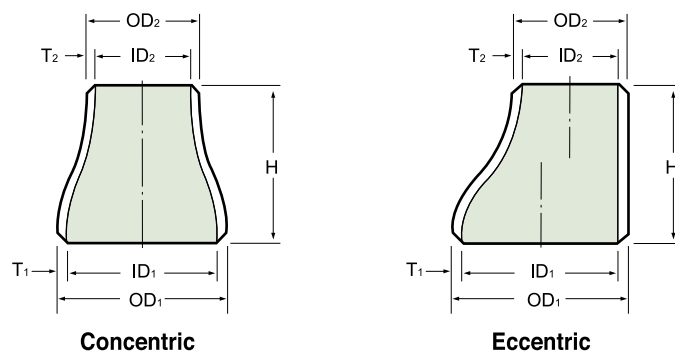
Wrought Steel Butt-Welding Fittings

Reducer

STD, Sch40, X-S, Sch80,
Sch160, XX-S

ASME B16.9

Nominal Pipe Size	Outside Diameter		End to End	STD		Sch 40	
	OD ₁	OD ₂	H	T ₁ T	2	T ₁	T ₂
3/4 X 1/2	1.050	0.840	1.50	0.113	0.109	0.113	0.109
3/4 X 3/8	1.050	0.675	1.50	0.113	0.091	0.113	0.091
1 X 3/4	1.315	1.050	2.00	0.133	0.113	0.133	0.113
1 X 1/2	1.315	0.840	2.00	0.133	0.109	0.133	0.109
1 1/4 X 1	1.660	1.315	2.00	0.140	0.133	0.140	0.133
1 1/4 X 3/4	1.660	1.050	2.00	0.140	0.113	0.140	0.113
1 1/4 X 1/2	1.660	0.840	2.00	0.140	0.109	0.140	0.109
1 1/2 X 1 1/4	1.900	1.660	2.50	0.145	0.140	0.145	0.140
1 1/2 X 1	1.900	1.315	2.50	0.145	0.133	0.145	0.133
1 1/2 X 3/4	1.900	1.050	2.50	0.145	0.113	0.145	0.113
1 1/2 X 1/2	1.900	0.840	2.50	0.145	0.109	0.145	0.109
2 X 1 1/2	2.375	1.900	3.00	0.154	0.145	0.154	0.145
2 X 1 1/4	2.375	1.660	3.00	0.154	0.140	0.154	0.140
2 X 1	2.375	1.315	3.00	0.154	0.133	0.154	0.133
2 X 3/4	2.375	1.050	3.00	0.154	0.113	0.154	0.113
2 1/2 X 2	2.875	2.375	3.50	0.203	0.154	0.203	0.154
2 1/2 X 1 1/2	2.875	1.900	3.50	0.203	0.145	0.203	0.145
2 1/2 X 1 1/4	2.875	1.660	3.50	0.203	0.140	0.203	0.140
2 1/2 X 1	2.875	1.315	3.50	0.203	0.133	0.203	0.133
3 X 2 1/2	3.500	2.875	3.50	0.216	0.203	0.216	0.203
3 X 2	3.500	2.375	3.50	0.216	0.154	0.216	0.154
3 X 1 1/2	3.500	1.900	3.50	0.216	0.145	0.216	0.145
3 X 1 1/4	3.500	1.660	3.50	0.216	0.140	0.216	0.140
3 1/2 X 3	4.000	3.500	4.00	0.226	0.216	0.226	0.216
3 1/2 X 2 1/2	4.000	2.875	4.00	0.226	0.203	0.226	0.203
3 1/2 X 2	4.000	2.375	4.00	0.226	0.154	0.226	0.154
3 1/2 X 1 1/2	4.000	1.900	4.00	0.226	0.145	0.226	0.145
3 1/2 X 1 1/4	4.000	1.660	4.00	0.226	0.140	0.226	0.140
4 X 3 1/2	4.500	4.000	4.00	0.237	0.226	0.237	0.226
4 X 3	4.500	3.500	4.00	0.237	0.216	0.237	0.216
4 X 2 1/2	4.500	2.875	4.00	0.237	0.203	0.237	0.203
4 X 2	4.500	2.375	4.00	0.237	0.154	0.237	0.154
4 X 1 1/2	4.500	1.900	4.00	0.237	0.145	0.237	0.145



Unit : inch

X-S		Sch 80		Sch 160		XX-S		Nominal Pipe Size
T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	
0.154	0.147	0.154	0.147	0.219	0.188	0.308	0.294	3/4 X 1/2
0.154	0.126	0.154	0.126	0.219	-	-	-	3/4 X 3/8
0.179	0.154	0.179	0.154	0.250	0.219	0.358	0.308	1 X 3/4
0.179	0.147	0.179	0.147	0.250	0.219	0.358	0.294	1 X 1/2
0.191	0.179	0.191	0.179	0.250	0.250	0.382	0.358	1 1/4 X 1
0.191	0.154	0.191	0.154	0.250	0.219	0.382	0.308	1 1/4 X 3/4
0.191	0.147	0.191	0.147	0.250	0.188	0.382	0.294	1 1/4 X 1/2
0.200	0.191	0.200	0.191	0.281	0.250	0.400	0.382	1 1/2 X 1 1/4
0.200	0.179	0.200	0.179	0.281	0.250	0.400	0.358	1 1/2 X 1
0.200	0.154	0.200	0.154	0.281	0.219	0.400	0.308	1 1/2 X 3/4
0.200	0.147	0.200	0.147	0.281	0.188	0.400	0.294	1 1/2 X 1/2
0.218	0.200	0.218	0.200	0.344	0.281	0.436	0.400	2 X 1 1/2
0.218	0.191	0.218	0.191	0.344	0.250	0.436	0.382	2 X 1 1/4
0.218	0.179	0.218	0.179	0.344	0.250	0.436	0.358	2 X 1
0.218	0.154	0.218	0.154	0.344	0.219	0.436	0.308	2 X 3/4
0.276	0.218	0.276	0.218	0.375	0.344	0.552	0.436	2 1/2 X 2
0.276	0.200	0.276	0.200	0.375	0.281	0.552	0.400	2 1/2 X 1 1/2
0.276	0.191	0.276	0.191	0.375	0.250	0.552	0.382	2 1/2 X 1 1/4
0.276	0.179	0.276	0.179	0.375	0.250	0.552	0.358	2 1/2 X 1
0.300	0.276	0.300	0.276	0.438	0.375	0.600	0.552	3 X 2 1/2
0.300	0.218	0.300	0.218	0.438	0.344	0.600	0.436	3 X 2
0.300	0.200	0.300	0.200	0.438	0.281	0.600	0.400	3 X 1 1/2
0.300	0.191	0.300	0.191	0.438	0.250	0.600	0.382	3 X 1 1/4
0.318	0.300	0.318	0.300	-	-	-	-	3 1/2 X 3
0.318	0.276	0.318	0.276	-	-	-	-	3 1/2 X 2 1/2
0.318	0.218	0.318	0.218	-	-	-	-	3 1/2 X 2
0.318	0.200	0.318	0.200	-	-	-	-	3 1/2 X 1 1/2
0.318	0.191	0.318	0.191	-	-	-	-	3 1/2 X 1 1/4
0.337	0.318	0.337	0.318	-	-	-	-	4 X 3 1/2
0.337	0.300	0.337	0.300	0.531	0.438	0.674	0.600	4 X 3
0.337	0.276	0.337	0.276	0.531	0.375	0.674	0.552	4 X 2 1/2
0.337	0.218	0.337	0.218	0.531	0.344	0.674	0.436	4 X 2
0.337	0.200	0.337	0.200	0.531	0.281	0.674	0.400	4 X 1 1/2

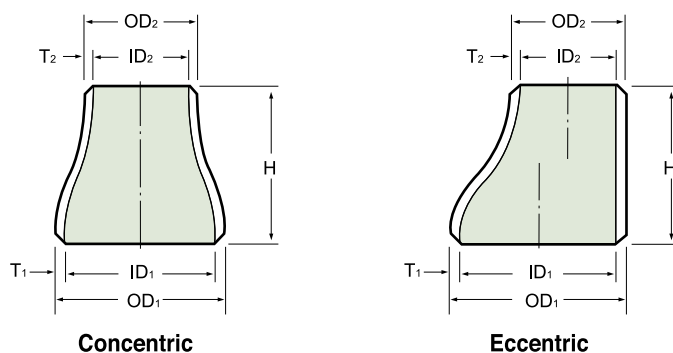
Wrought Steel Butt-Welding Fittings

Reducer

STD, Sch40, X-S, Sch80,
Sch160, XX-S

ASME B16.9

Nominal Pipe Size	Outside Diameter		End to End	STD		Sch 40	
	OD ₁	OD ₂	H	T ₁ T	2	T ₁	T ₂
5 x 4	5.563	4.500	5.00	0.258	0.237	0.258	0.237
5 x 3 1/2	5.563	4.000	5.00	0.258	0.226	0.258	0.226
5 x 3	5.563	3.500	5.00	0.258	0.216	0.258	0.216
5 x 2 1/2	5.563	2.875	5.00	0.258	0.203	0.258	0.203
5 x 2	5.563	2.375	5.00	0.258	0.154	0.258	0.154
6 x 5	6.625	5.563	5.50	0.280	0.258	0.280	0.258
6 x 4	6.625	4.500	5.50	0.280	0.237	0.280	0.237
6 x 3 1/2	6.625	4.000	5.50	0.280	0.226	0.280	0.226
6 x 3	6.625	3.500	5.50	0.280	0.216	0.280	0.216
6 x 2 1/2	6.625	2.875	5.50	0.280	0.203	0.280	0.203
8 x 6	8.625	6.625	6.00	0.322	0.280	0.322	0.280
8 x 5	8.625	5.563	6.00	0.322	0.258	0.322	0.258
8 x 4	8.625	4.500	6.00	0.322	0.237	0.322	0.237
8 x 3 1/2	8.625	4.000	6.00	0.322	0.226	0.322	0.226
10 x 8	10.750	8.625	7.00	0.365	0.322	0.365	0.322
10 x 6	10.750	6.625	7.00	0.365	0.280	0.365	0.280
10 x 5	10.750	5.563	7.00	0.365	0.258	0.365	0.258
10 x 4	10.750	4.500	7.00	0.365	0.237	0.365	0.237
12 x 10	12.750	10.750	8.00	0.375	0.365	0.406	0.365
12 x 8	12.750	8.625	8.00	0.375	0.322	0.406	0.322
12 x 6	12.750	6.625	8.00	0.375	0.280	0.406	0.280
12 x 5	12.750	5.563	8.00	0.375	0.258	0.406	0.258
14 x 12	14.000	12.750	13.00	0.375	0.375	0.438	0.406
14 x 10	14.000	10.750	13.00	0.375	0.365	0.438	0.365
14 x 8	14.000	8.625	13.00	0.375	0.322	0.438	0.322
14 x 6	14.000	6.625	13.00	0.375	0.280	0.438	0.280



Unit : inch

X-S		Sch 80		Sch 160		XX-S		Nominal Pipe Size
T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	
0.375	0.337	0.375	0.337	0.625	0.531	0.750	0.674	5 x 4
0.375	0.318	0.375	0.318	-	-	-	-	5 x 3 1/2
0.375	0.300	0.375	0.300	0.625	0.438	0.750	0.600	5 x 3
0.375	0.276	0.375	0.276	0.625	0.375	0.750	0.552	5 x 2 1/2
0.375	0.218	0.375	0.218	0.625	0.344	0.750	0.436	5 x 2
0.432	0.375	0.432	0.375	0.719	0.625	0.864	0.750	6 x 5
0.432	0.337	0.432	0.337	0.719	0.531	0.864	0.674	6 x 4
0.432	0.318	0.432	0.318	-	-	-	-	6 x 3 1/2
0.432	0.300	0.432	0.300	0.719	0.438	0.864	0.600	6 x 3
0.432	0.276	0.432	0.276	0.719	0.375	0.864	0.552	6 x 2 1/2
0.500	0.432	0.500	0.432	0.906	0.719	0.875	0.864	8 x 6
0.500	0.375	0.500	0.375	0.906	0.625	0.875	0.750	8 x 5
0.500	0.337	0.500	0.337	0.906	0.531	0.875	0.674	8 x 4
0.500	0.318	0.500	0.318	-	-	-	-	8 x 3 1/2
0.500	0.500	0.594	0.500	1.125	0.906	1.000	0.875	10 x 8
0.500	0.432	0.594	0.432	1.125	0.719	1.000	0.864	10 x 6
0.500	0.375	0.594	0.375	1.125	0.625	1.000	0.750	10 x 5
0.500	0.337	0.594	0.337	1.125	0.531	1.000	0.674	10 x 4
0.500	0.500	0.688	0.594	1.312	1.125	1.000	1.000	12 x 10
0.500	0.500	0.688	0.500	1.312	0.906	1.000	0.875	12 x 8
0.500	0.432	0.688	0.432	1.312	0.719	1.000	0.864	12 x 6
0.500	0.375	0.688	0.375	1.312	0.625	1.000	0.750	12 x 5
0.500	0.500	0.750	0.688	1.406	1.312	-	-	14 x 12
0.500	0.500	0.750	0.594	1.406	1.125	-	-	14 x 10
0.500	0.500	0.750	0.500	1.406	0.906	-	-	14 x 8
0.500	0.432	0.750	0.432	1.406	0.719	-	-	14 x 6

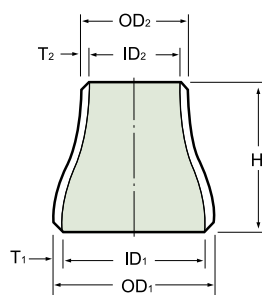
Wrought Steel Butt-Welding Fittings

Reducer

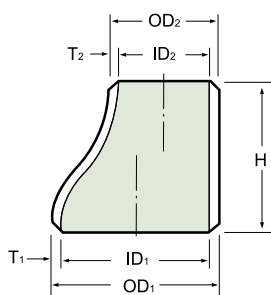
STD, Sch40, X-S, Sch80,
Sch160

ASME B16.9

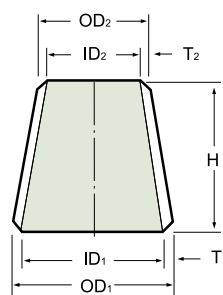
Nominal Pipe Size	Outside Diameter		End to End	STD		Sch 40	
	OD ₁	OD ₂	H	T ₁ T	2	T ₁	T ₂
16 x 14	16.000	14.000	14.00	0.375	0.375	0.500	0.438
16 x 12	16.000	12.750	14.00	0.375	0.375	0.500	0.406
16 x 10	16.000	10.750	14.00	0.375	0.365	0.500	0.365
16 x 8	16.000	8.625	14.00	0.375	0.322	0.500	0.322
18 x 16	18.000	16.000	15.00	0.375	0.375	0.562	0.500
18 x 14	18.000	14.000	15.00	0.375	0.375	0.562	0.438
18 x 12	18.000	12.750	15.00	0.375	0.375	0.562	0.406
18 x 10	18.000	10.750	15.00	0.375	0.365	0.562	0.365
20 x 18	20.000	18.000	20.00	0.375	0.375	0.594	0.562
20 x 16	20.000	16.000	20.00	0.375	0.375	0.594	0.500
20 x 14	20.000	14.000	20.00	0.375	0.375	0.594	0.438
20 x 12	20.000	12.750	20.00	0.375	0.375	0.594	0.406
22 x 20	22.000	20.000	20.00	0.375	0.375	*0.594	0.594
22 x 18	22.000	18.000	20.00	0.375	0.375	*0.594	0.562
22 x 16	22.000	16.000	20.00	0.375	0.375	*0.594	0.500
22 x 14	22.000	14.000	20.00	0.375	0.375	*0.594	0.438
24 x 22	24.000	22.000	20.00	0.375	0.375	0.688	*0.594
24 x 20	24.000	20.000	20.00	0.375	0.375	0.688	0.594
24 x 18	24.000	18.000	20.00	0.375	0.375	0.688	0.562
24 x 16	24.000	16.000	20.00	0.375	0.375	0.688	0.500
26 x 24	26.000	24.000	24.00	0.375	0.375	*0.688	0.688
26 x 22	26.000	22.000	24.00	0.375	0.375	*0.688	*0.594
26 x 20	26.000	20.000	24.00	0.375	0.375	*0.688	0.594
26 x 18	26.000	18.000	24.00	0.375	0.375	*0.688	0.562
28 x 26	28.000	26.000	24.00	0.375	0.375	*0.688	*0.688
28 x 24	28.000	24.000	24.00	0.375	0.375	*0.688	0.688
28 x 20	28.000	20.000	24.00	0.375	0.375	*0.688	0.594
28 x 18	28.000	18.000	24.00	0.375	0.375	*0.688	0.562



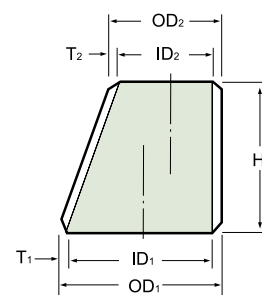
Concentric (I)



Eccentric (I)



Concentric (II)



Eccentric (II)

Unit : inch

X-S		Sch 80		Sch 160		Nominal Pipe Size
T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	
0.500	0.500	0.844	0.750	1.594	1.406	16 x 14
0.500	0.500	0.844	0.688	1.594	1.312	16 x 12
0.500	0.500	0.844	0.594	1.594	1.125	16 x 10
0.500	0.500	0.844	0.500	1.594	0.906	16 x 8
0.500	0.500	0.938	0.844	1.781	1.594	18 x 16
0.500	0.500	0.938	0.750	1.781	1.406	18 x 14
0.500	0.500	0.938	0.688	1.781	1.312	18 x 12
0.500	0.500	0.938	0.594	1.781	1.125	18 x 10
0.500	0.500	1.031	0.938	1.969	1.781	20 x 18
0.500	0.500	1.031	0.844	1.969	1.594	20 x 16
0.500	0.500	1.031	0.750	1.969	1.406	20 x 14
0.500	0.500	1.031	0.688	1.969	1.312	20 x 12
0.500	0.500	1.125	1.031	2.125	1.969	22 x 20
0.500	0.500	1.125	0.938	2.125	1.781	22 x 18
0.500	0.500	1.125	0.844	2.125	1.594	22 x 16
0.500	0.500	1.125	0.750	2.125	1.406	22 x 14
0.500	0.500	1.219	1.125	2.344	2.125	24 x 22
0.500	0.500	1.219	1.031	2.344	1.969	24 x 20
0.500	0.500	1.219	0.938	2.344	1.781	24 x 18
0.500	0.500	1.219	0.844	2.344	1.594	24 x 16
0.500	0.500	-	-	-	-	26 x 24
0.500	0.500	-	-	-	-	26 x 22
0.500	0.500	-	-	-	-	26 x 20
0.500	0.500	-	-	-	-	26 x 18
0.500	0.500	-	-	-	-	28 x 26
0.500	0.500	-	-	-	-	28 x 24
0.500	0.500	-	-	-	-	28 x 20
0.500	0.500	-	-	-	-	28 x 18

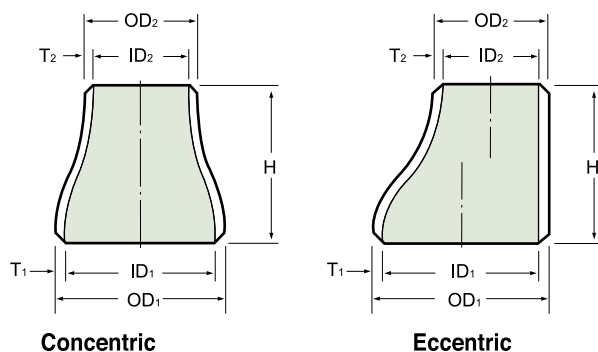
Wrought Steel Butt-Welding Fittings

Reducer

Sch20, Sch30, Sch60, Sch100,
Sch120, Sch140

ASME B16.9

Nominal Pipe Size	Outside Diameter		End to End	Sch 20		Sch 30	
	OD ₁	OD ₂	H	T ₁ T	2	T ₁	T ₂
5 x 4	5.563	4.500	5.00	-	-	-	-
6 x 5	6.625	5.563	5.50	-	-	-	-
6 x 4	6.625	4.500	5.50	-	-	-	-
8 x 6	8.625	6.625	6.00	-	-	-	-
8 x 5	8.625	5.563	6.00	-	-	-	-
8 x 4	8.625	4.500	6.00	-	-	-	-
10 x 8	10.750	8.625	7.00	0.250	0.250	0.307	0.277
10 x 6	10.750	6.625	7.00	-	-	-	-
10 x 5	10.750	5.563	7.00	-	-	-	-
10 x 4	10.750	4.500	7.00	-	-	-	-
12 x 10	12.750	10.750	8.00	0.250	0.250	0.330	0.307
12 x 8	12.750	8.625	8.00	0.250	0.250	0.330	0.277
12 x 6	12.750	6.625	8.00	-	-	-	-
12 x 5	12.750	5.563	8.00	-	-	-	-
14 x 12	14.000	12.750	13.00	0.312	0.250	0.375	0.330
14 x 10	14.000	10.750	13.00	0.312	0.250	0.375	0.307
14 x 8	14.000	8.625	13.00	0.312	0.250	0.375	0.277
14 x 6	14.000	6.625	13.00	-	-	-	-
16 x 14	16.000	14.000	14.00	0.312	0.312	0.375	0.375
16 x 12	16.000	12.750	14.00	0.312	0.250	0.375	0.330
16 x 10	16.000	10.750	14.00	0.312	0.250	0.375	0.307
16 x 8	16.000	8.625	14.00	0.312	0.250	0.375	0.277
18 x 16	18.000	16.000	15.00	0.312	0.312	0.438	0.375
18 x 14	18.000	14.000	15.00	0.312	0.312	0.438	0.375
18 x 12	18.000	12.750	15.00	0.312	0.250	0.438	0.330
18 x 10	18.000	10.750	15.00	0.312	0.250	0.438	0.307
20 x 18	20.000	18.000	20.00	0.375	0.312	0.500	0.438
20 x 16	20.000	16.000	20.00	0.375	0.312	0.500	0.375
20 x 14	20.000	14.000	20.00	0.375	0.312	0.500	0.375
20 x 12	20.000	12.000	20.00	0.375	0.250	0.500	0.330



Unit : inch

Sch 60		Sch 100		Sch 120		Sch 140		Nominal Pipe Size
T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	
-	-	-	-	0.500	0.438	-	-	5 x 4
-	-	-	-	0.562	0.500	-	-	6 x 5
-	-	-	-	0.562	0.438	-	-	6 x 4
-	-	-	-	0.719	0.562	-	-	8 x 6
-	-	-	-	0.719	0.500	-	-	8 x 5
-	-	-	-	0.719	0.438	-	-	8 x 4
0.500	0.406	0.719	0.594	0.844	0.719	1.000	0.812	10 x 8
-	-	-	-	0.844	0.562	-	-	10 x 6
-	-	-	-	0.844	0.500	-	-	10 x 5
-	-	-	-	0.844	0.438	-	-	10 x 4
0.562	0.500	0.844	0.719	1.000	0.844	1.125	1.000	12 x 10
0.562	0.406	0.844	0.594	1.000	0.719	1.125	0.812	12 x 8
-	-	-	-	1.000	0.562	-	-	12 x 6
-	-	-	-	1.000	0.500	-	-	12 x 5
0.594	0.562	0.938	0.844	1.094	1.000	1.250	1.125	14 x 12
0.594	0.500	0.938	0.719	1.094	0.844	1.250	1.000	14 x 10
0.594	0.406	0.938	0.594	1.094	0.719	1.250	0.812	14 x 8
-	-	-	-	1.094	0.562	-	-	14 x 6
0.656	0.594	1.031	0.938	1.219	1.094	1.438	1.250	16 x 14
0.656	0.562	1.031	0.844	1.219	1.000	1.438	1.125	16 x 12
0.656	0.500	1.031	0.719	1.219	0.844	1.438	1.000	16 x 10
0.656	0.406	1.031	0.594	1.219	0.719	1.438	0.812	16 x 8
0.750	0.656	1.156	1.031	1.375	1.219	1.562	1.438	18 x 16
0.750	0.594	1.156	0.938	1.375	1.094	1.562	1.250	18 x 14
0.750	0.562	1.156	0.844	1.375	1.000	1.562	1.125	18 x 12
0.750	0.500	1.156	0.719	1.375	0.844	1.562	1.000	18 x 10
0.812	0.750	1.281	1.156	1.500	1.375	1.750	1.562	20 x 18
0.812	0.656	1.281	1.031	1.500	1.219	1.750	1.438	20 x 16
0.812	0.594	1.281	0.938	1.500	1.094	1.750	1.250	20 x 14
0.812	0.562	1.281	0.844	1.500	1.000	1.750	1.125	20 x 12

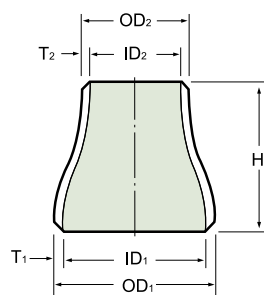
Wrought Steel Butt-Welding Fittings

Reducer

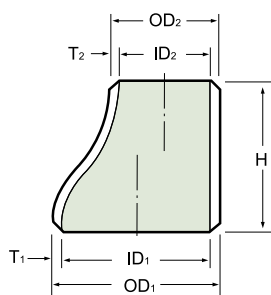
Sch20, Sch30, Sch60, Sch100,
Sch120, Sch140

ASME B16.9

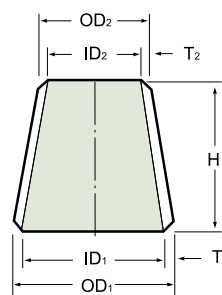
Nominal Pipe Size	Outside Diameter		End to End	Sch 20		Sch 30	
	OD ₁	OD ₂	H	T ₁ T	2	T ₁	T ₂
22 x 20	22.000	20.000	20.00	0.375	0.375	0.500	0.500
22 x 18	22.000	18.000	20.00	0.375	0.312	0.500	0.438
22 x 16	22.000	16.000	20.00	0.375	0.312	0.500	0.375
22 x 14	22.000	14.000	20.00	0.375	0.312	0.500	0.375
24 x 22	24.000	22.000	20.00	0.375	0.375	0.562	0.500
24 x 20	24.000	20.000	20.00	0.375	0.375	0.562	0.500
24 x 18	24.000	18.000	20.00	0.375	0.312	0.562	0.438
24 x 16	24.000	16.000	20.00	0.375	0.312	0.562	0.375
26 x 24	26.000	24.000	24.00	0.500	0.375	-	-
26 x 22	26.000	22.000	24.00	0.500	0.375	-	-
26 x 20	26.000	20.000	24.00	0.500	0.375	-	-
26 x 18	26.000	18.000	24.00	0.500	0.312	-	-
28 x 26	28.000	26.000	24.00	0.500	0.500	-	-
28 x 24	28.000	24.000	24.00	0.500	0.375	0.625	0.562
28 x 20	28.000	20.000	24.00	0.500	0.375	0.625	0.500
28 x 18	28.000	18.000	24.00	0.500	0.312	0.625	0.438
30 x 28	30.000	28.000	24.00	0.500	0.500	0.625	0.625
30 x 26	30.000	26.000	24.00	0.500	0.500	-	-
30 x 24	30.000	24.000	24.00	0.500	0.375	0.625	0.562
30 x 20	30.000	20.000	24.00	0.500	0.375	0.625	0.500
32 x 30	32.000	30.000	24.00	0.500	0.500	0.625	0.625
32 x 28	32.000	28.000	24.00	0.500	0.500	0.625	0.625
32 x 26	32.000	26.000	24.00	0.500	0.500	-	-
32 x 24	32.000	24.000	24.00	0.500	0.375	0.625	0.562
34 x 32	34.000	32.000	24.00	0.500	0.500	0.625	0.625
34 x 30	34.000	30.000	24.00	0.500	0.500	0.625	0.625
34 x 28	34.000	28.000	24.00	0.500	0.500	0.625	0.625
34 x 26	34.000	26.000	24.00	0.500	0.500	-	-
36 x 34	36.000	34.000	24.00	0.500	0.500	0.625	0.625
36 x 32	36.000	32.000	24.00	0.500	0.500	0.625	0.625
36 x 30	36.000	30.000	24.00	0.500	0.500	0.625	0.625
36 x 28	36.000	28.000	24.00	0.500	0.500	0.625	0.625



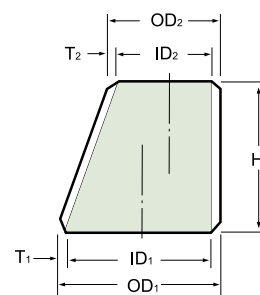
Concentric (I)



Eccentric (I)



Concentric (II)



Eccentric (II)

Unit : inch

Sch 60		Sch 100		Sch 120		Sch 140		Nominal Pipe Size
T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	
0.875	0.812	1.375	1.281	1.625	1.500	1.875	1.750	22 x 20
0.875	0.750	1.375	1.156	1.625	1.375	1.875	1.562	22 x 18
0.875	0.656	1.375	1.031	1.625	1.219	1.875	1.438	22 x 16
0.875	0.594	1.375	0.938	1.625	1.094	1.875	1.250	22 x 14
0.969	0.875	1.531	1.375	1.812	1.625	2.062	1.875	24 x 22
0.969	0.812	1.531	1.281	1.812	1.500	2.062	1.750	24 x 20
0.969	0.750	1.531	1.156	1.812	1.375	2.062	1.562	24 x 18
0.969	0.656	1.531	1.031	1.812	1.219	2.062	1.438	24 x 16
-	-	-	-	-	-	-	-	26 x 24
-	-	-	-	-	-	-	-	26 x 22
-	-	-	-	-	-	-	-	26 x 20
-	-	-	-	-	-	-	-	26 x 18
-	-	-	-	-	-	-	-	28 x 26
-	-	-	-	-	-	-	-	28 x 24
-	-	-	-	-	-	-	-	28 x 20
-	-	-	-	-	-	-	-	28 x 18
-	-	-	-	-	-	-	-	30 x 28
-	-	-	-	-	-	-	-	30 x 26
-	-	-	-	-	-	-	-	30 x 24
-	-	-	-	-	-	-	-	30 x 20
-	-	-	-	-	-	-	-	32 x 30
-	-	-	-	-	-	-	-	32 x 28
-	-	-	-	-	-	-	-	32 x 26
-	-	-	-	-	-	-	-	32 x 24
-	-	-	-	-	-	-	-	34 x 32
-	-	-	-	-	-	-	-	34 x 30
-	-	-	-	-	-	-	-	34 x 28
-	-	-	-	-	-	-	-	34 x 26
-	-	-	-	-	-	-	-	36 x 34
-	-	-	-	-	-	-	-	36 x 32
-	-	-	-	-	-	-	-	36 x 30
-	-	-	-	-	-	-	-	36 x 28

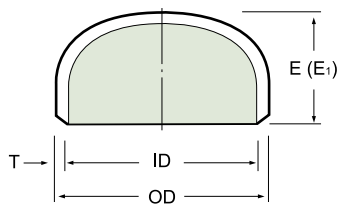
Wrought Steel Butt-Welding Fittings

Cap

STD, Sch40, X-S, Sch80,
Sch160, XX-S

ASME B16.9

Nominal Pipe Size	Outside Diameter O.D	Length	Limiting Wall Thickness for Length E	Length	STD		Sch 40	
		E		1	T	I.D	T	I.D
1/2	0.840	1.00	0.18	1.00	0.109	0.622	0.109	0.622
3/4	1.050	1.00	0.15	1.00	0.113	0.824	0.113	0.824
1	1.315	1.50	0.18	1.50	0.133	1.049	0.133	1.049
1 1/4	1.660	1.50	0.19	1.50	0.140	1.380	0.140	1.380
1 1/2	1.900	1.50	0.20	1.50	0.145	1.610	0.145	1.610
2	2.375	1.50	0.22	1.75	0.154	2.067	0.154	2.067
2 1/2	2.875	1.50	0.28	2.00	0.203	2.469	0.203	2.469
3	3.500	2.00	0.30	2.50	0.216	3.068	0.216	3.068
3 1/2	4.000	2.50	0.32	3.00	0.226	3.548	0.226	3.548
4	4.500	2.50	0.34	3.00	0.237	4.026	0.237	4.026
5	5.563	3.00	0.38	3.50	0.258	5.047	0.258	5.047
6	6.625	3.50	0.43	4.00	0.280	6.065	0.280	6.065
8	8.625	4.00	0.50	5.00	0.322	7.981	0.322	7.981
10	10.750	5.00	0.50	6.00	0.365	10.020	0.365	10.020
12	12.750	6.00	0.50	7.00	0.375	12.000	0.406	11.938
14	14.000	6.50	0.50	7.50	0.375	13.250	0.438	13.124
16	16.000	7.00	0.50	8.00	0.375	15.250	0.500	15.000
18	18.000	8.00	0.50	9.00	0.375	17.250	0.562	16.876
20	20.000	9.00	0.50	10.00	0.375	19.250	0.594	18.812
22	22.000	10.00	0.50	10.00	0.375	21.250	*0.594	20.812
24	24.000	10.50	0.50	12.00	0.375	23.250	0.688	22.624
26	26.000	10.50	-	-	0.375	25.250	*0.688	24.624
28	28.000	10.50	-	-	0.375	27.250	*0.688	26.624
30	30.000	10.50	-	-	0.375	29.250	*0.688	28.624
32	32.000	10.50	-	-	0.375	31.250	0.688	30.624
34	34.000	10.50	-	-	0.375	33.250	0.688	32.624
36	36.000	10.50	-	-	0.375	35.250	0.750	34.500
38	38.000	12.00	-	-	0.375	37.250	-	-
40	40.000	12.00	-	-	0.375	39.250	-	-
42	42.000	12.00	-	-	0.375	41.250	-	-
44	44.000	13.50	-	-	0.375	43.250	-	-
46	46.000	13.50	-	-	0.375	45.250	-	-
48	48.000	13.50	-	-	0.375	47.250	-	-
*50	50.000	14.07	-	-	-	-	-	-
*52	52.000	14.57	-	-	-	-	-	-
*54	54.000	15.15	-	-	-	-	-	-
*56	56.000	15.65	-	-	-	-	-	-
*58	58.000	16.23	-	-	-	-	-	-
*60	60.000	16.53	-	-	-	-	-	-



Cap

Unit : inch

X-S		Sch 80		Sch 160		XX-S		Nominal Pipe Size
T	I.D	T	I.D	T	I.D	T	I.D	
0.147	0.546	0.147	0.546	0.188	0.464	0.294	0.252	1/2
0.154	0.742	0.154	0.742	0.219	0.612	0.308	0.434	3/4
0.179	0.957	0.179	0.957	0.250	0.815	0.358	0.599	1
0.191	1.278	0.191	1.278	0.250	1.160	0.382	0.896	1 1/4
0.200	1.500	0.200	1.500	0.281	1.338	0.400	1.100	1 1/2
0.218	1.939	0.218	1.939	0.344	1.687	0.436	1.503	2
0.276	2.323	0.276	2.323	0.375	2.125	0.552	1.771	2 1/2
0.300	2.900	0.300	2.900	0.438	2.624	0.600	2.300	3
0.318	3.364	0.318	3.364	-	-	-	-	3 1/2
0.337	3.826	0.337	3.826	0.531	3.438	0.674	3.152	4
0.375	4.813	0.375	4.813	0.625	4.313	0.750	4.063	5
0.432	5.761	0.432	5.761	0.719	5.187	0.864	4.897	6
0.500	7.625	0.500	7.625	0.906	6.813	0.875	6.875	8
0.500	9.750	0.594	9.562	1.125	8.500	1.000	8.750	10
0.500	11.750	0.688	11.374	1.312	10.126	1.000	10.750	12
0.500	13.000	0.750	12.500	1.406	11.188	-	-	14
0.500	15.000	0.844	14.312	1.594	12.812	-	-	16
0.500	17.000	0.938	16.124	1.781	14.438	-	-	18
0.500	19.000	1.031	17.938	1.969	16.062	-	-	20
0.500	21.000	1.125	19.750	2.125	17.750	-	-	22
0.500	23.000	1.219	21.562	2.344	19.312	-	-	24
0.500	25.000	-	-	-	-	-	-	26
0.500	27.000	-	-	-	-	-	-	28
0.500	29.000	-	-	-	-	-	-	30
0.500	31.000	-	-	-	-	-	-	32
0.500	33.000	-	-	-	-	-	-	34
0.500	35.000	-	-	-	-	-	-	36
0.500	37.000	-	-	-	-	-	-	38
0.500	39.000	-	-	-	-	-	-	40
0.500	41.000	-	-	-	-	-	-	42
0.500	43.000	-	-	-	-	-	-	44
0.500	45.000	-	-	-	-	-	-	46
0.500	47.000	-	-	-	-	-	-	48
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-

ASME

Carbon Steel

Stainless Steel butt-welding fittings

ASME

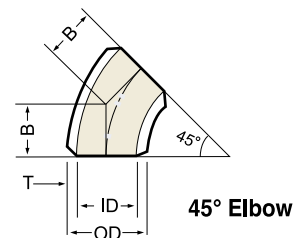
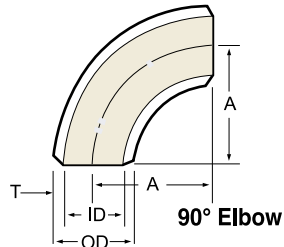
Elbow 90° , 45° – Sch5s, Sch10s, Sch40s, Sch80s	-----	48
Tee – Sch5s, Sch10s, Sch40s, Sch80s	-----	49
Reducer – Sch5s, Sch10s, Sch40s, Sch80s	-----	52
Cap – Sch5s, Sch10s, Sch40s, Sch80s	-----	54

○ Stainless Steel Butt-Welding Fittings

Elbow 90° (Long, Short)

Elbow 45° (Long)

Sch5s, Sch10s, Sch40s, Sch80s



ASME B16.9

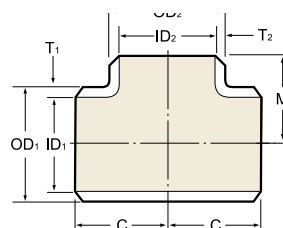
Unit : inch

Nominal Pipe Size	Outside Diameter O.D	Center to End			Sch 5s		Sch 10s		Sch 40s		Sch 80s	
		Long		Short	T	I.D	T	I.D	T	I.D	T	I.D
		A	B	A								
1/2	0.840	1.50	0.62	-	0.065	0.710	0.083	0.674	0.109	0.622	0.147	0.546
3/4	1.050	1.50	0.75	-	0.065	0.920	0.083	0.884	0.113	0.824	0.154	0.742
1	1.315	1.50	0.88	1.00	0.065	1.185	0.109	1.097	0.133	1.049	0.179	0.957
1 1/4	1.660	1.88	1.00	1.25	0.065	1.530	0.109	1.442	0.140	1.380	0.191	1.278
1 1/2	1.900	2.25	1.12	1.50	0.065	1.770	0.109	1.682	0.145	1.610	0.200	1.500
2	2.375	3.00	1.38	2.00	0.065	2.245	0.109	2.157	0.154	2.067	0.218	1.939
2 1/2	2.875	3.75	1.75	2.50	0.083	2.709	0.120	2.635	0.203	2.469	0.276	2.323
3	3.500	4.50	2.00	3.00	0.083	3.334	0.120	3.260	0.216	3.068	0.300	2.900
3 1/2	4.000	5.25	2.25	3.50	0.083	3.834	0.120	3.760	0.226	3.548	0.318	3.364
4	4.500	6.00	2.50	4.00	0.083	4.417	0.120	4.260	0.237	4.026	0.337	3.826
5	5.563	7.50	3.12	5.00	0.109	5.345	0.134	5.295	0.258	5.047	0.375	4.813
6	6.625	9.00	3.75	6.00	0.109	6.407	0.134	6.357	0.280	6.065	0.432	5.761
8	8.625	12.00	5.00	8.00	0.109	8.407	0.148	8.329	0.322	7.981	0.500	7.625
10	10.750	15.00	6.25	10.00	0.134	10.482	0.165	10.420	0.365	10.020	0.500	9.7 50
12	12.750	18.00	7.50	12.00	0.156	12.438	0.180	12.390	0.375	12.000	0.500	11. 750
14	14.000	21.00	8.75	14.00	0.156	13.688	0.188	13.624	-	-	-	-
16	16.000	24.00	10.00	16.00	0.165	15.670	0.188	15.624	-	-	-	-
18	18.000	27.00	11.25	18.00	0.165	17.670	0.188	17.624	-	-	-	-
20	20.000	30.00	12.50	20.00	0.188	19.624	0.218	19.564	-	-	-	-
22	22.000	33.00	13.50	22.00	0.188	21.624	0.218	21.564	-	-	-	-
24	24.000	36.00	15.00	24.00	0.218	23.564	0.250	23.500	-	-	-	-
30	30.000	45.00	18.50	30.00	0.250	29.500	0.312	29.376	-	-	-	-

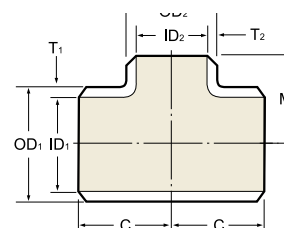
Stainless Steel Butt-Welding Fittings

Tee

Sch5s, Sch10s, Sch40s, Sch80s



Straight



Reducing

ASME B16.9

Unit : mm

Nominal Pipe Size	Outside Diameter		Center to End		Sch 5s		Sch 10s		Sch 40s		Sch 80s	
			Run C	Outlet M	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂
	OD ₁	OD ₂										
1/2 x 1/2 x 1/2	0.840	0.840	1.00	1.00	0.065	0.065	0.083	0.083	0.109	0.109	0.147	0.147
1/2 x 1/2 x 3/8	0.840	0.675	1.00	1.00	-	-	0.083	0.065	0.109	0.109	0.147	0.126
1/2 x 1/2 x 1/4	0.840	0.540	1.00	1.00	-	-	0.083	0.065	0.109	0.088	0.147	0.119
3/4 x 3/4 x 3/4	1.050	1.050	1.12	1.12	0.065	0.065	0.083	0.083	0.113	0.113	0.154	0.154
3/4 x 3/4 x 1/2	1.050	0.840	1.12	1.12	0.065	0.065	0.083	0.083	0.113	0.109	0.154	0.147
3/4 x 3/4 x 3/8	1.050	0.675	1.12	1.12	-	-	0.083	0.065	0.113	0.091	0.154	0.126
1 x 1 x 1	1.315	1.315	1.50	1.50	0.065	0.065	0.109	0.109	0.133	0.133	0.179	0.179
1 x 1 x 3/4	1.315	1.050	1.50	1.50	0.065	0.065	0.109	0.083	0.133	0.113	0.179	0.154
1 x 1 x 1/2	1.315	0.840	1.50	1.50	0.065	0.065	0.109	0.083	0.133	0.109	0.179	0.14
1/4 x 1/4 x 1/4	1.660	1.660	1.88	1.88	0.065	0.065	0.109	0.109	0.140	0.140	0.191	0.191
1/4 x 1/4 x 1	1.660	1.315	1.88	1.88	0.065	0.065	0.109	0.109	0.140	0.133	0.191	0.179
1/4 x 1/4 x 3/4	1.660	1.050	1.88	1.88	0.065	0.065	0.109	0.083	0.140	0.113	0.191	0.154
1/4 x 1/4 x 1/2	1.660	0.840	1.88	1.88	0.065	0.065	0.109	0.083	0.140	0.109	0.191	0.147
1 1/2 x 1 1/2 x 1 1/2	1.900	1.900	2.25	2.25	0.065	0.065	0.109	0.109	0.145	0.145	0.200	0.200
1 1/2 x 1 1/2 x 1/4	1.900	1.660	2.25	2.25	0.065	0.065	0.109	0.109	0.145	0.140	0.200	0.191
1 1/2 x 1 1/2 x 1	1.900	1.315	2.25	2.25	0.065	0.065	0.109	0.109	0.145	0.133	0.200	0.179
1 1/2 x 1 1/2 x 3/4	1.900	1.050	2.25	2.25	0.065	0.065	0.109	0.083	0.145	0.113	0.200	0.154
1 1/2 x 1 1/2 x 1/2	1.900	0.840	2.25	2.25	0.065	0.065	0.109	0.083	0.145	0.109	0.200	0.147
2 x 2 x 2	2.375	2.375	2.50	2.50	0.065	0.065	0.109	0.109	0.154	0.154	0.218	0.218
2 x 2 x 1 1/2	2.375	1.900	2.50	2.38	0.065	0.065	0.109	0.109	0.154	0.145	0.218	0.200
2 x 2 x 1 1/4	2.375	1.660	2.50	2.25	0.065	0.065	0.109	0.109	0.154	0.140	0.218	0.191
2 x 2 x 1	2.375	1.315	2.50	2.00	0.065	0.065	0.109	0.109	0.154	0.133	0.218	0.179
2 x 2 x 3/4	2.375	1.050	2.50	1.75	0.065	0.065	0.109	0.083	0.154	0.113	0.218	0.154
2 1/2 x 2 1/2 x 2 1/2	2.875	2.875	3.00	3.00	0.083	0.083	0.120	0.120	0.203	0.203	0.276	0.276
2 1/2 x 2 1/2 x 2	2.875	2.375	3.00	2.75	0.083	0.065	0.120	0.109	0.203	0.154	0.276	0.218
2 1/2 x 2 1/2 x 1 1/2	2.875	1.900	3.00	2.62	0.083	0.065	0.120	0.109	0.203	0.145	0.276	0.200
2 1/2 x 2 1/2 x 1 1/4	2.875	1.660	3.00	2.50	0.083	0.065	0.120	0.109	0.203	0.140	0.276	0.191
2 1/2 x 2 1/2 x 1	2.875	1.315	3.00	2.25	0.083	0.065	0.120	0.109	0.203	0.133	0.276	0.179
3 x 3 x 3	3.500	3.500	3.38	3.38	0.083	0.083	0.120	0.120	0.216	0.216	0.300	0.300
3 x 3 x 2 1/2	3.500	2.875	3.38	3.25	0.083	0.083	0.120	0.120	0.216	0.203	0.300	0.276
3 x 3 x 2	3.500	2.375	3.38	3.00	0.083	0.065	0.120	0.109	0.216	0.154	0.300	0.218
3 x 3 x 1 1/2	3.500	1.900	3.38	2.88	0.083	0.065	0.120	0.109	0.216	0.145	0.300	0.200
3 x 3 x 1 1/4	3.500	1.660	3.38	2.75	0.083	0.065	0.120	0.109	0.216	0.140	0.300	0.191
3 1/2 x 3 1/2 x 3 1/2	4.000	4.000	3.75	3.75	0.083	0.083	0.120	0.120	0.226	0.226	0.318	0.318
3 1/2 x 3 1/2 x 3	4.000	3.500	3.75	3.62	0.083	0.083	0.120	0.120	0.226	0.216	0.318	0.300
3 1/2 x 3 1/2 x 2 1/2	4.000	2.875	3.75	3.50	0.083	0.083	0.120	0.120	0.226	0.203	0.318	0.276
3 1/2 x 3 1/2 x 2	4.000	2.375	3.75	3.25	0.083	0.065	0.120	0.109	0.226	0.154	0.318	0.218
3 1/2 x 3 1/2 x 1 1/2	4.000	1.900	3.75	3.12	0.083	0.065	0.120	0.109	0.226	0.145	0.318	0.200

○ Stainless Steel Butt–Welding Fittings

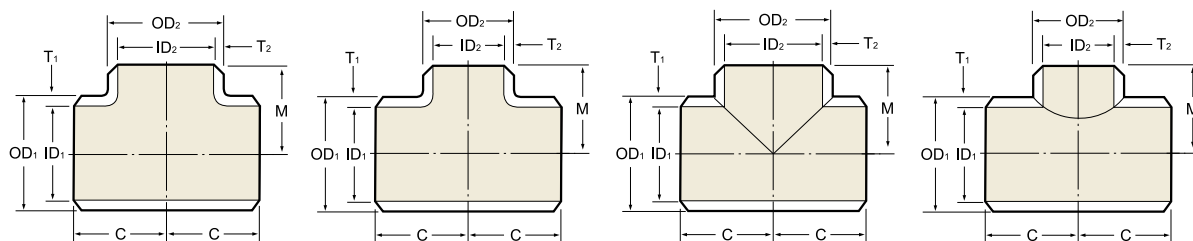
Tee

Sch5s, Sch10s, Sch40s,
Sch80s

ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter		Center to End		Sch 5s		Sch 10s		Sch 40s		Sch 80s	
	OD ₁	OD ₂	Run C	Outlet M	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂
4 x 4 x 4	4.500	4.500	4.12	4.12	0.083	0.083	0.120	0.120	0.237	0.237	0.337	0.3 37
4 x 4 x 3 1/2	4.500	4.000	4.12	4.00	0.083	0.083	0.120	0.120	0.237	0.226	0.337	0.318
4 x 4 x 3	4.500	3.500	4.12	3.88	0.083	0.083	0.120	0.120	0.237	0.216	0.337	0.3 00
4 x 4 x 2 1/2	4.500	2.875	4.12	3.75	0.083	0.083	0.120	0.120	0.237	0.203	0.337	0.276
4 x 4 x 2	4.500	2.375	4.12	3.50	0.083	0.065	0.120	0.109	0.237	0.154	0.337	0.2 18
4 x 4 x 1 1/2	4.500	1.900	4.12	3.38	0.083	0.065	0.120	0.109	0.237	0.145	0.337	0.200
5 x 5 x 5	5.563	5.563	4.88	4.88	0.109	0.109	0.134	0.134	0.258	0.258	0.375	0.3 75
5 x 5 x 4	5.563	4.500	4.88	4.62	0.109	0.083	0.134	0.120	0.258	0.237	0.375	0.3 37
5 x 5 x 3 1/2	5.563	4.000	4.88	4.50	0.109	0.083	0.134	0.120	0.258	0.226	0.375	0.318
5 x 5 x 3	5.563	3.500	4.88	4.38	0.109	0.083	0.134	0.120	0.258	0.216	0.375	0.3 00
5 x 5 x 2 1/2	5.563	2.875	4.88	4.25	0.109	0.083	0.134	0.120	0.258	0.203	0.375	0.276
5 x 5 x 2	5.563	2.375	4.88	4.12	0.109	0.065	0.134	0.109	0.258	0.154	0.375	0.2 18
6 x 6 x 6	6.625	6.625	5.62	5.62	0.109	0.109	0.134	0.134	0.280	0.280	0.432	0.4 32
6 x 6 x 5	6.625	5.563	5.62	5.38	0.109	0.109	0.134	0.134	0.280	0.258	0.432	0.3 75
6 x 6 x 4	6.625	4.500	5.62	5.12	0.109	0.083	0.134	0.120	0.280	0.237	0.432	0.3 37
6 x 6 x 3 1/2	6.625	4.000	5.62	5.00	0.109	0.083	0.134	0.120	0.280	0.226	0.432	0.318
6 x 6 x 3	6.625	3.500	5.62	4.88	0.109	0.083	0.134	0.120	0.280	0.216	0.432	0.3 00
6 x 6 x 2 1/2	6.625	2.875	5.62	4.75	0.109	0.083	0.134	0.120	0.280	0.203	0.432	0.276
8 x 8 x 8	8.625	8.625	7.00	7.00	0.109	0.109	0.148	0.148	0.322	0.322	0.500	0.5 00
8 x 8 x 6	8.625	6.625	7.00	6.62	0.109	0.109	0.148	0.134	0.322	0.280	0.520	0.4 32
8 x 8 x 5	8.625	5.563	7.00	6.38	0.109	0.109	0.148	0.134	0.322	0.258	0.500	0.3 75
8 x 8 x 4	8.625	4.500	7.00	6.12	0.109	0.083	0.148	0.120	0.322	0.237	0.500	0.3 37
8 x 8 x 3 1/2	8.625	4.000	7.00	6.00	0.109	0.083	0.148	0.120	0.322	0.226	0.500	0.318
10 x 10 x 10	10.750	10.750	8.50	8.50	0.134	0.134	0.165	0.165	0.365	0.365	0.500	0.500
10 x 10 x 8	10.750	8.625	8.50	8.00	0.134	0.109	0.165	0.148	0.365	0.322	0.5 00	0.500
10 x 10 x 6	10.750	6.625	8.50	7.62	0.134	0.109	0.165	0.134	0.365	0.280	0.5 00	0.432
10 x 10 x 5	10.750	5.563	8.50	7.50	0.134	0.109	0.165	0.134	0.365	0.258	0.5 00	0.375
10 x 10 x 4	10.750	4.500	8.50	7.25	0.134	0.083	0.165	0.120	0.365	0.237	0.5 20	0.337
12 x 12 x 12	12.750	12.750	10.00	10.00	0.156	0.156	0.180	0.180	0.375	0.37 5	0.500	0.500
12 x 12 x 10	12.750	10.750	10.00	9.50	0.156	0.134	0.180	0.165	0.375	0.365	0.500	0.500
12 x 12 x 8	12.750	8.625	10.00	9.00	0.156	0.109	0.180	0.148	0.375	0.322	0.500	0.500
12 x 12 x 6	12.750	6.625	10.00	8.62	0.156	0.109	0.180	0.134	0.375	0.280	0.500	0.432
12 x 12 x 5	12.750	5.563	10.00	8.50	0.156	0.109	0.180	0.134	0.375	0.258	0.500	0.375
14 x 14 x 14	14.000	14.000	11.00	11.00	0.156	0.156	0.188	0.188	-	-	-	-
14 x 14 x 12	14.000	12.750	11.00	10.62	0.156	0.156	0.188	0.180	-	-	-	-
14 x 14 x 10	14.000	10.750	11.00	10.12	0.156	0.134	0.188	0.165	-	-	-	-
14 x 14 x 8	14.000	8.625	11.00	9.75	0.156	0.109	0.188	0.148	-	-	-	-
14 x 14 x 6	14.000	6.625	11.00	9.38	0.156	0.109	0.188	0.134	-	-	-	-



Straight (I)

Reducing (I)

Straight (II)

Reducing (II)

ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter		Center to End		Sch 5s		Sch 10s		Sch 40s		Sch 80s	
			Run C	Outlet M	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂
	OD ₁	OD ₂										
16 x 16 x 16	16.000	16.000	12.00	12.00	0.165	0.165	0.188	0.188	-	-	-	-
16 x 16 x 14	16.000	14.000	12.00	12.00	0.165	0.156	0.188	0.188	-	-	-	-
16 x 16 x 12	16.000	12.750	12.00	11.62	0.165	0.156	0.188	0.180	-	-	-	-
16 x 16 x 10	16.000	10.750	12.00	11.12	0.165	0.134	0.188	0.165	-	-	-	-
16 x 16 x 8	16.000	8.625	12.00	10.75	0.165	0.109	0.188	0.148	-	-	-	-
16 x 16 x 6	16.000	6.625	12.00	10.38	0.165	0.109	0.188	0.134	-	-	-	-
18 x 18 x 18	18.000	18.000	13.50	13.50	0.165	0.165	0.188	0.188	-	-	-	-
18 x 18 x 16	18.000	16.000	13.50	13.00	0.165	0.165	0.188	0.188	-	-	-	-
18 x 18 x 14	18.000	14.000	13.50	13.00	0.165	0.156	0.188	0.188	-	-	-	-
18 x 18 x 12	18.000	12.750	13.50	12.62	0.165	0.156	0.188	0.180	-	-	-	-
18 x 18 x 10	18.000	10.750	13.50	12.12	0.165	0.134	0.188	0.165	-	-	-	-
18 x 18 x 8	18.000	8.625	13.50	11.75	0.165	0.109	0.188	0.148	-	-	-	-
20 x 20 x 20	20.000	20.000	15.00	15.00	0.188	0.188	0.218	0.218	-	-	-	-
20 x 20 x 18	20.000	18.000	15.00	14.50	0.188	0.156	0.218	0.188	-	-	-	-
20 x 20 x 16	20.000	16.000	15.00	14.00	0.188	0.165	0.218	0.188	-	-	-	-
20 x 20 x 14	20.000	14.000	15.00	14.00	0.188	0.165	0.218	0.188	-	-	-	-
20 x 20 x 12	20.000	12.750	15.00	13.62	0.188	0.156	0.218	0.180	-	-	-	-
20 x 20 x 10	20.000	10.750	15.00	13.12	0.188	0.134	0.218	0.165	-	-	-	-
20 x 20 x 8	20.000	8.625	15.00	12.75	0.188	0.109	0.218	0.148	-	-	-	-
22 x 22 x 22	22.000	22.000	16.50	16.50	0.188	0.188	0.218	0.218	-	-	-	-
22 x 22 x 20	22.000	20.000	16.50	16.00	0.188	0.188	0.218	0.218	-	-	-	-
22 x 22 x 18	22.000	18.000	16.50	15.50	0.188	0.165	0.218	0.188	-	-	-	-
22 x 22 x 16	22.000	16.000	16.50	15.00	0.188	0.165	0.218	0.188	-	-	-	-
22 x 22 x 14	22.000	14.000	16.50	15.00	0.188	0.156	0.218	0.188	-	-	-	-
22 x 22 x 12	22.000	12.750	16.50	14.62	0.188	0.156	0.218	0.180	-	-	-	-
22 x 22 x 10	22.000	10.750	16.50	14.12	0.188	0.134	0.218	0.165	-	-	-	-
24 x 24 x 24	24.000	24.000	17.00	17.00	0.218	0.218	0.250	0.250	-	-	-	-
24 x 24 x 22	24.000	22.000	17.00	17.00	0.218	0.188	0.250	0.218	-	-	-	-
24 x 24 x 20	24.000	20.000	17.00	17.00	0.218	0.188	0.250	0.218	-	-	-	-
24 x 24 x 18	24.000	18.000	17.00	16.50	0.218	0.165	0.250	0.188	-	-	-	-
24 x 24 x 16	24.000	16.000	17.00	16.00	0.218	0.165	0.250	0.188	-	-	-	-
24 x 24 x 14	24.000	14.000	17.00	16.00	0.218	0.156	0.250	0.188	-	-	-	-
24 x 24 x 12	24.000	12.750	17.00	15.62	0.218	0.156	0.250	0.180	-	-	-	-
24 x 24 x 10	24.000	10.750	17.00	15.12	0.218	0.134	0.250	0.165	-	-	-	-
30 x 30 x 30	30.000	30.000	22.00	22.00	0.250	0.250	0.312	0.312	-	-	-	-
30 x 30 x 24	30.000	24.000	22.00	21.00	0.250	0.218	0.312	0.258	-	-	-	-
30 x 30 x 22	30.000	22.000	22.00	20.50	0.250	0.188	0.312	0.218	-	-	-	-
30 x 30 x 20	30.000	20.000	22.00	20.00	0.250	0.188	0.312	0.218	-	-	-	-
30 x 30 x 18	30.000	18.000	22.00	19.50	0.250	0.165	0.312	0.188	-	-	-	-
30 x 30 x 16	30.000	16.000	22.00	19.00	0.250	0.165	0.312	0.188	-	-	-	-
30 x 30 x 14	30.000	14.000	22.00	19.00	0.250	0.156	0.312	0.188	-	-	-	-
30 x 30 x 12	30.000	12.750	22.00	18.62	0.250	0.156	0.312	0.180	-	-	-	-
30 x 30 x 10	30.000	10.750	22.00	18.12	0.250	0.134	0.312	0.165	-	-	-	-

ASME

Stainless Steel

○ Stainless Steel Butt–Welding Fittings

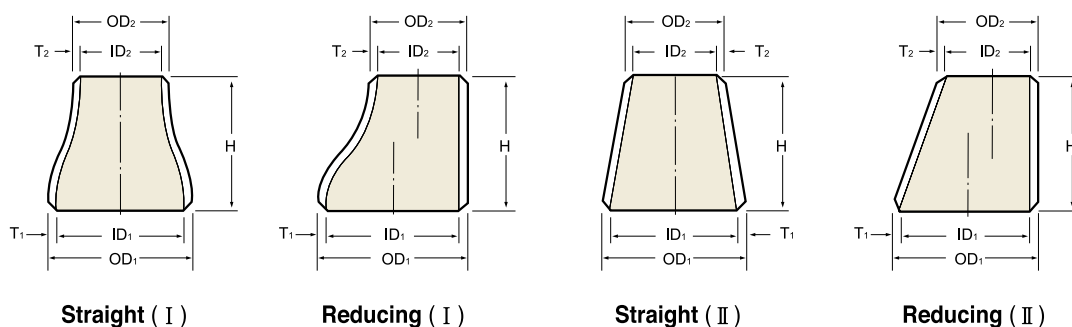
Reducer

Sch5s, Sch10s, Sch40s,
Sch80s

ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter		End to End H	Wall Thickness T							
				sch 5s		sch 10s		sch 40s		sch 80s	
	OD ₁	OD ₂		T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂
3/4 x 1/2	1.050	0.840	1.50	0.065	0.065	0.083	0.083	0.113	0.109	0.154	0.147
1 x 3/4	1.315	1.050	2.00	0.065	0.065	0.109	0.083	0.133	0.133	0.179	0.154
1 x 1/2	1.315	0.840	2.00	0.065	0.065	0.109	0.083	0.133	0.109	0.179	0.147
1 1/4 x 1	1.660	1.135	2.00	0.065	0.065	0.109	0.109	0.140	0.133	0.191	0.179
1 1/4 x 3/4	1.660	1.050	2.00	0.065	0.065	0.109	0.083	0.140	0.113	0.191	0.154
1 1/4 x 1/2	1.660	0.840	2.00	0.065	0.065	0.109	0.083	0.140	0.109	0.191	0.147
1 1/2 x 1 1/4	1.900	1.660	2.50	0.065	0.065	0.109	0.109	0.145	0.140	0.200	0.191
1 1/2 x 1	1.900	1.315	2.50	0.065	0.065	0.109	0.109	0.145	0.133	0.200	0.179
1 1/2 x 3/4	1.900	1.050	2.50	0.065	0.065	0.109	0.083	0.145	0.113	0.200	0.154
1 1/2 x 1/2	1.900	0.840	2.50	0.065	0.065	0.109	0.083	0.145	0.109	0.200	0.147
2 x 1 1/2	2.375	1.900	3.00	0.065	0.065	0.109	0.109	0.154	0.145	0.218	0.200
2 x 1 1/4	2.375	1.660	3.00	0.065	0.065	0.109	0.109	0.154	0.140	0.218	0.191
2 x 1	2.375	1.315	3.00	0.065	0.065	0.109	0.109	0.154	0.133	0.218	0.179
2 x 3/4	2.375	1.050	3.00	0.065	0.065	0.109	0.083	0.154	0.113	0.218	0.154
2 1/2 x 2	2.875	2.375	3.50	0.083	0.065	0.120	0.109	0.203	0.154	0.276	0.218
2 1/2 x 1 1/2	2.875	1.900	3.50	0.083	0.065	0.120	0.109	0.203	0.145	0.276	0.200
2 1/2 x 1 1/4	2.875	1.660	3.50	0.083	0.065	0.120	0.109	0.203	0.140	0.276	0.191
2 1/2 x 1	2.875	1.315	3.50	0.083	0.065	0.120	0.109	0.203	0.133	0.276	0.179
3 x 2 1/2	3.500	2.875	3.50	0.083	0.083	0.120	0.120	0.216	0.203	0.300	0.276
3 x 2	3.500	2.375	3.50	0.083	0.065	0.120	0.109	0.216	0.154	0.300	0.218
3 x 1 1/2	3.500	1.900	3.50	0.083	0.065	0.120	0.109	0.216	0.145	0.300	0.200
3 x 1 1/4	3.500	1.660	3.50	0.083	0.065	0.120	0.109	0.216	0.140	0.300	0.191
3 1/2 x 3	4.000	3.500	4.00	0.083	0.083	0.120	0.120	0.226	0.216	0.318	0.318
3 1/2 x 2 1/2	4.000	2.875	4.00	0.083	0.083	0.120	0.120	0.226	0.203	0.318	0.276
3 1/2 x 2	4.000	2.375	4.00	0.083	0.065	0.120	0.109	0.226	0.154	0.318	0.218
3 1/2 x 1 1/2	4.000	1.900	4.00	0.083	0.065	0.120	0.109	0.226	0.145	0.318	0.200
3 1/2 x 1 1/4	4.000	1.660	4.00	0.083	0.065	0.120	0.109	0.226	0.140	0.318	0.191
4 x 3 1/2	4.500	4.000	4.00	0.083	0.083	0.120	0.120	0.237	0.226	0.337	0.318
4 x 3	4.500	3.500	4.00	0.083	0.083	0.120	0.120	0.237	0.216	0.337	0.300
4 x 2 1/2	4.500	2.875	4.00	0.083	0.083	0.120	0.120	0.237	0.203	0.337	0.276
4 x 2	4.500	2.375	4.00	0.083	0.065	0.120	0.109	0.237	0.154	0.337	0.218
4 x 1 1/2	4.500	1.900	4.00	0.083	0.065	0.120	0.109	0.237	0.145	0.337	0.200
5 x 4	5.563	4.500	5.00	0.109	0.083	0.134	0.120	0.258	0.237	0.375	0.337
5 x 3 1/2	5.563	4.000	5.00	0.109	0.083	0.134	0.120	0.258	0.226	0.375	0.318
5 x 3	5.563	3.500	5.00	0.109	0.083	0.134	0.120	0.258	0.216	0.375	0.300
5 x 2 1/2	5.563	2.875	5.00	0.109	0.083	0.134	0.120	0.258	0.203	0.375	0.276
5 x 2	5.563	2.375	5.00	0.109	0.065	0.134	0.109	0.258	0.154	0.375	0.218
6 x 5	6.625	5.563	5.50	0.109	0.109	0.134	0.134	0.280	0.258	0.432	0.375
6 x 4	6.625	4.500	5.50	0.109	0.083	0.134	0.120	0.280	0.237	0.432	0.337
6 x 3 1/2	6.625	4.000	5.50	0.109	0.083	0.134	0.120	0.280	0.226	0.432	0.318
6 x 3	6.625	3.500	5.50	0.109	0.083	0.134	0.120	0.280	0.216	0.432	0.300
6 x 2 1/2	6.625	2.875	5.50	0.109	0.083	0.134	0.120	0.280	0.203	0.432	0.276



ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter		End to End H	Wall Thickness T							
				sch 5s		sch 10s		sch 40s		sch 80s	
	OD ₁	OD ₂		T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂
8 x 6	8.625	6.625	6.00	0.109	0.109	0.148	0.134	0.322	0.280	0.500	0.432
8 x 5	8.625	5.563	6.00	0.109	0.109	0.148	0.134	0.322	0.258	0.500	0.375
8 x 4	8.625	4.500	6.00	0.109	0.083	0.148	0.120	0.322	0.237	0.500	0.337
8 x 3 1/2	8.625	4.000	6.00	0.109	0.083	0.148	0.120	0.322	0.226	0.500	0.318
10 x 8	10.750	8.625	7.00	0.134	0.109	0.165	0.148	0.365	0.322	0.500	0.500
10 x 6	10.750	6.625	7.00	0.134	0.109	0.165	0.134	0.365	0.280	0.500	0.432
10 x 5	10.750	5.563	7.00	0.134	0.109	0.165	0.134	0.365	0.258	0.500	0.375
10 x 4	10.750	4.500	7.00	0.134	0.083	0.165	0.120	0.365	0.237	0.500	0.337
12 x 10	12.750	10.750	8.00	0.156	0.134	0.180	0.165	0.375	0.365	0.500	0.500
12 x 8	12.750	8.625	8.00	0.156	0.109	0.180	0.148	0.375	0.322	0.500	0.500
12 x 6	12.750	6.625	8.00	0.156	0.109	0.180	0.134	0.375	0.280	0.500	0.432
12 x 5	12.750	5.563	8.00	0.156	0.109	0.180	0.134	0.375	0.258	0.500	0.375
14 x 12	14.000	12.750	13.00	0.156	0.156	0.188	0.180	-	-	-	-
14 x 10	14.000	10.750	13.00	0.156	0.134	0.188	0.165	-	-	-	-
14 x 8	14.000	8.625	13.00	0.156	0.109	0.188	0.148	-	-	-	-
14 x 6	14.000	6.625	13.00	0.156	0.109	0.188	0.134	-	-	-	-
16 x 14	16.000	14.000	14.00	0.165	0.156	0.188	0.188	-	-	-	-
16 x 12	16.000	12.750	14.00	0.165	0.156	0.188	0.180	-	-	-	-
16 x 10	16.000	10.750	14.00	0.165	0.134	0.188	0.165	-	-	-	-
16 x 8	16.000	8.625	14.00	0.165	0.109	0.188	0.148	-	-	-	-
18 x 16	18.000	16.000	15.00	0.165	0.165	0.188	0.188	-	-	-	-
18 x 14	18.000	14.000	15.00	0.165	0.156	0.188	0.188	-	-	-	-
18 x 12	18.000	12.750	15.00	0.165	0.156	0.188	0.180	-	-	-	-
18 x 10	18.000	10.750	15.00	0.165	0.134	0.188	0.165	-	-	-	-
20 x 18	20.000	18.000	20.00	0.188	0.165	0.218	0.188	-	-	-	-
20 x 16	20.000	16.000	20.00	0.188	0.165	0.218	0.188	-	-	-	-
20 x 14	20.000	14.000	20.00	0.188	0.156	0.218	0.188	-	-	-	-
20 x 12	20.000	12.750	20.00	0.188	0.156	0.218	0.180	-	-	-	-
22 x 20	22.000	20.000	20.00	0.188	0.188	0.218	0.218	-	-	-	-
22 x 18	22.000	18.000	20.00	0.188	0.165	0.218	0.188	-	-	-	-
22 x 16	22.000	16.000	20.00	0.188	0.165	0.218	0.188	-	-	-	-
22 x 14	22.000	14.000	20.00	0.188	0.156	0.218	0.188	-	-	-	-
24 x 22	24.000	22.000	20.00	0.218	0.188	0.250	0.218	-	-	-	-
24 x 20	24.000	20.000	20.00	0.218	0.188	0.250	0.218	-	-	-	-
24 x 18	24.000	18.000	20.00	0.218	0.165	0.250	0.188	-	-	-	-
24 x 16	24.000	16.000	20.00	0.218	0.165	0.250	0.188	-	-	-	-
30 x 24	30.000	24.000	24.00	0.250	0.218	0.312	0.250	-	-	-	-
30 x 22	30.000	22.000	24.00	0.250	0.188	0.312	0.218	-	-	-	-
30 x 20	30.000	20.000	24.00	0.250	0.188	0.312	0.218	-	-	-	-

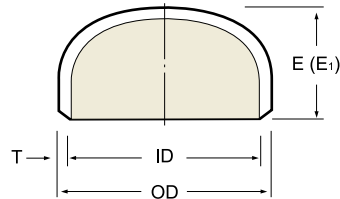
ASME

Stainless Steel

○ Stainless Steel Butt-Welding Fittings

Cap

Sch5s, Sch10s, Sch40s, Sch80s



Cap

ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter O.D	Wall Thickness T				Length E	Limiting Wall Thickness For Length E	Length E1
		5s	10s	40s	80s			
1/2	0.840	0.065	0.083	0.109	0.147	1.00	0.18	1.00
3/4	1.050	0.065	0.083	0.113	0.154	1.00	0.15	1.00
1	1.315	0.065	0.109	0.133	0.179	1.50	0.18	1.50
1 1/4	1.660	0.065	0.109	0.140	0.191	1.50	0.19	1.50
1 1/2	1.900	0.065	0.109	0.145	0.200	1.50	0.20	1.50
2	2.375	0.065	0.109	0.154	0.218	1.50	0.22	1.75
2 1/2	2.875	0.083	0.120	0.203	0.276	1.50	0.28	2.00
3	3.500	0.083	0.120	0.216	0.300	2.00	0.30	2.50
3 1/2	4.000	0.083	0.120	0.226	0.318	2.50	0.32	3.00
4	4.500	0.083	0.120	0.237	0.337	2.50	0.34	3.00
5	5.563	0.109	0.134	0.258	0.375	3.00	0.38	3.50
6	6.625	0.109	0.134	0.280	0.432	3.50	0.43	4.00
8	8.625	0.109	0.148	0.322	0.500	4.00	0.50	5.00
10	10.750	0.134	0.165	0.365	0.500	5.00	0.50	6.00
12	12.750	0.156	0.180	0.375	0.500	6.00	0.50	7.00
14	14.000	0.156	0.188	-	-	6.50	0.50	7.50
16	16.000	0.165	0.188	-	-	7.00	0.50	8.00
18	18.000	0.165	0.188	-	-	8.00	0.50	9.00
20	20.000	0.188	0.218	-	-	9.00	0.50	10.00
22	22.000	0.188	0.218	-	-	10.00	0.50	10.00
24	24.000	0.218	0.250	-	-	10.50	0.50	12.00
30	30.000	0.250	0.312	-	-	10.50	-	-

Carbon Steel butt-welding fitting

KS/JIS

Elbow 90° , 45° – SPP/SGP, 7.9T, STD, X-S	56
Elbow 90° , 45° – Sch40, Sch80, Sch120, Sch160	57
Tee – SPP/SGP, 7.9T, STD, X-S	58
Tee – Sch40, Sch80, Sch120, Sch160	62
Reducer – SPP/SGP, 7.9T, STD, X-S	65
Reducer – Sch40, Sch80, Sch120, Sch160	69
Cap – Sch40, Sch80, Sch120, Sch160	72

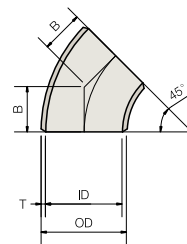
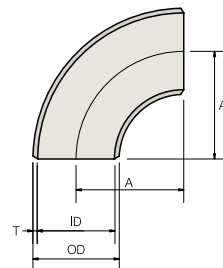
● Elbow 90° (Long, Short) / Elbow 45° (Long)

SPP / SGP, 7.9, STD, X-S

· KS B 1543, JIS B 2311

Unit : mm

Nominal Pipe Size	Outside Diameter OD	Inside Diameter ID	Wall Thickness T	Long		Short
				90° A	45° B	90° A
15	21.7	16.1	2.8	38.1	15.8	-
20	27.2	21.6	2.8	38.1	15.8	-
25	34.0	27.6	3.2	38.1	15.8	25.4
32	42.7	35.7	3.5	47.6	19.7	31.8
40	48.6	41.6	3.5	57.2	23.7	38.1
50	60.5	52.9	3.8	76.2	31.6	50.8
65	76.3	67.9	4.2	95.3	39.5	63.5
80	89.1	80.7	4.2	114.3	47.3	76.2
90	101.6	93.2	4.2	133.4	55.3	88.9
100	114.3	105.3	4.5	152.4	63.1	101.6
125	139.8	130.8	4.5	190.5	78.9	127.0
150	165.2	155.2	5.0	228.6	94.7	152.4
200	216.3	204.7	5.8	304.8	126.3	203.2
250	267.4	254.2	6.6	381.0	157.8	254.0
300	318.5	304.7	6.9	457.2	189.4	304.8
350	355.6	339.8	7.9	533.4	220.9	355.6
400	406.4	390.6	7.9	609.6	252.5	406.4
450	457.2	441.4	7.9	685.8	284.1	457.2
500	508.0	492.2	7.9	762.0	315.6	508.0



* ASTM규격 별도 문의

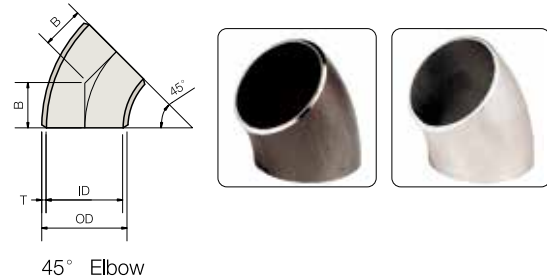
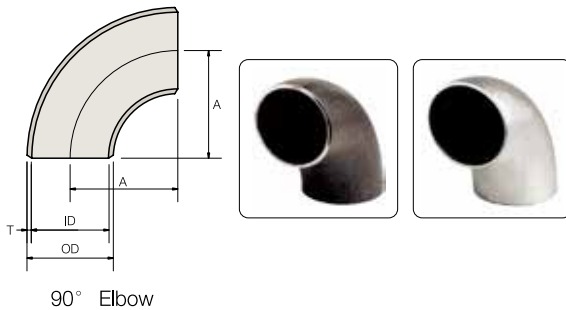
· KS B 1543, JIS B 2311/3

Unit : mm

Nominal Pipe Size	Outside Diameter OD	Wall Thickness T						Center to Center		
		7.9 T		STD		X-S		Long		Short
		ID	T	ID	T	ID	T	A (90°)	B (45°)	A (90°)
350	355.6	339.8	7.9	336.6	9.5	330.2	12.7	533.4	220.9	355.6
400	406.4	390.6	7.9	387.4	9.5	381.0	12.7	609.6	252.5	406.4
450	457.2	441.4	7.9	438.2	9.5	431.8	12.7	685.8	284.1	457.2
500	508.0	492.2	7.9	489.0	9.5	482.6	12.7	762.0	315.6	508.0
550	558.8	543.0	7.9	539.8	9.5	533.4	12.7	838.2	347.2	558.8
600	609.6	593.8	7.9	590.6	9.5	584.2	12.7	914.4	378.7	609.6
650	660.4	644.6	7.9	641.4	9.5	635.0	12.7	990.6	410.3	660.4
700	711.2	695.4	7.9	692.2	9.5	685.8	12.7	1066.8	441.9	711.2
750	762.0	746.2	7.9	743.0	9.5	736.6	12.7	1143.0	473.4	762.0
800	812.8	797.0	7.9	793.8	9.5	787.4	12.7	1219.2	505.0	812.8
850	863.6	847.8	7.9	844.6	9.5	838.2	12.7	1295.4	536.6	863.6
900	914.4	898.6	7.9	895.4	9.5	889.0	12.7	1371.6	568.1	914.4
950	965.2	949.4	7.9	946.2	9.5	939.8	12.7	1447.8	599.7	965.2
1000	1016.0	1000.2	7.9	997.0	9.5	990.6	12.7	1524.0	631.2	1016.0
1050	1066.8	1051.0	7.9	1047.8	9.5	1041.4	12.7	1600.2	662.8	1066.8
1100	1117.6	1101.8	7.9	1098.6	9.5	1092.2	12.7	1676.4	694.4	1117.6
1150	1168.4	1152.6	7.9	1149.4	9.5	1143.0	12.7	1752.6	725.9	1168.4
1200	1219.2	1203.4	7.9	1200.2	9.5	1193.8	12.7	1828.8	757.5	1219.2

● Elbow 90° (Long, Short) / Elbow 45° (Long)

Sch40, Sch80, Sch120, Sch160



· KS B 1543 / JIS B 2312 / JIS B 2313

Unit : mm

Nominal Pipe Size	Outside Diameter OD	Wall Thickness T								Center to Center		
		Sch 40		Sch 80		Sch 120		Sch 160		Long		Short
		ID	T	ID	T	ID	T	ID	T	A (90°)	B (45°)	A (90°)
15	21.7	16.1	2.8	14.3	3.7	-	-	-	-	38.1	15.8	-
20	27.2	21.4	2.9	19.4	3.9	-	-	-	-	38.1	15.8	-
25	34.0	27.2	3.4	25.0	4.5	-	-	-	-	38.1	15.8	25.4
32	42.7	35.5	3.6	32.9	4.9	-	-	-	-	47.6	19.7	31.8
40	48.6	41.2	3.7	38.4	5.1	-	-	34.4	7.1	57.2	23.7	38.1
50	60.5	52.7	3.9	49.5	5.5	-	-	43.1	8.7	76.2	31.6	50.8
65	76.3	65.9	5.2	62.3	7.0	-	-	57.3	9.5	95.3	39.5	63.5
80	89.1	78.1	5.5	73.9	7.6	-	-	66.9	11.1	114.3	47.3	76.2
90	101.6	90.2	5.7	85.4	8.1	-	-	76.2	12.7	133.4	55.3	88.9
100	114.3	102.3	6.0	97.1	8.6	92.1	11.1	87.3	13.5	152.4	63.1	101.6
125	139.8	126.6	6.6	120.8	9.5	114.4	12.7	108.0	15.9	190.5	78.9	127.0
150	165.2	151.0	7.1	143.2	11.0	136.6	14.3	128.8	18.2	228.6	94.7	152.4
200	216.3	199.9	8.2	190.9	12.7	179.9	18.2	170.3	23.0	304.8	126.3	203.2
250	267.4	248.8	9.3	237.2	15.1	224.6	21.4	210.2	28.6	381.0	157.8	254.0
300	318.5	297.9	10.3	283.7	17.4	267.7	25.4	251.9	33.3	457.2	189.4	304.8
350	355.6	333.4	11.1	317.6	19.0	300.0	27.8	284.2	35.7	533.4	220.9	355.6
400	406.4	381.0	12.7	363.6	21.4	344.6	30.9	325.4	40.5	609.6	252.5	406.4
450	457.2	428.6	14.3	409.6	23.8	387.4	34.9	366.8	45.2	685.8	284.1	457.2
500	508.0	477.8	15.1	455.6	26.2	431.8	38.1	408.0	50.0	762.0	315.6	508.0
550	558.8	528.6	15.1	501.6	28.6	-	-	-	-	838.2	347.2	558.8
600	609.6	574.8	17.4	547.6	31.0	-	-	-	-	914.4	378.7	609.6
650	660.4	625.6	17.4	-	-	-	-	-	-	990.6	410.3	660.4
700	711.2	676.4	17.4	-	-	-	-	-	-	1066.8	441.9	711.2
750	762.0	727.2	17.4	-	-	-	-	-	-	1143.0	473.4	762.0
800	812.8	778.0	17.4	-	-	-	-	-	-	1219.2	505.0	812.8
850	863.6	828.8	17.4	-	-	-	-	-	-	1295.4	536.6	863.6
900	914.4	876.4	19.0	-	-	-	-	-	-	1371.6	568.1	914.4

KS/JIS

Carbon Steel

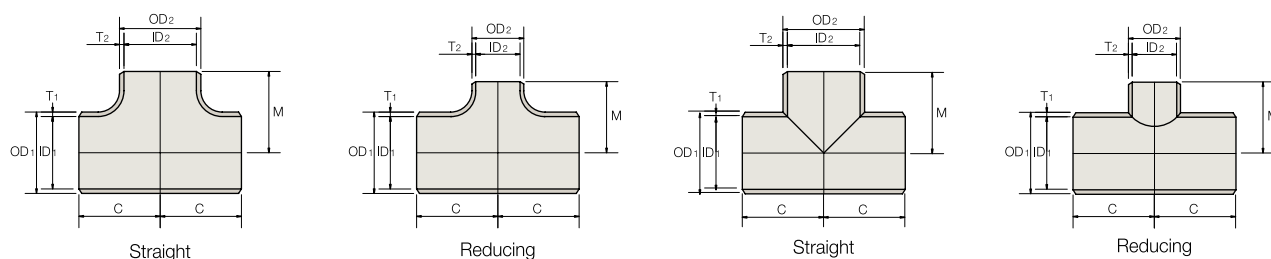
 Tee SPP / SGP



· KS B 1543, JIS B 2311

Unit : mm

Nominal Pipe Size	Run			Outlet			Center to End	
	Outside Diameter OD ₁	Inside Diameter ID ₁	Wall Thickness T ₁	Outside Diameter OD ₂	Inside Diameter ID ₂	Wall Thickness T ₂	C	M
15X15	21,7	16,1	2,8	21,7	16,1	2,8	25,4	25,4
20X20	27,2	21,6	2,8	27,2	21,6	2,8	28,6	28,6
20X15	27,2	21,6	2,8	21,7	16,1	2,8	28,6	28,6
25X25	34,0	27,6	3,2	34,0	27,6	3,2	38,1	38,1
25X20	34,0	27,6	3,2	27,2	21,6	2,8	38,1	38,1
25X15	34,0	27,6	3,2	21,7	16,1	2,8	38,1	38,1
32X32	42,7	35,7	3,5	42,7	35,7	3,5	47,6	47,6
32X25	42,7	35,7	3,5	34,0	27,6	3,2	47,6	47,6
32X20	42,7	35,7	3,5	27,2	21,6	2,8	47,6	47,6
32X15	42,7	35,7	3,5	21,7	16,1	2,8	47,6	47,6
40X40	48,6	41,6	3,5	48,6	41,6	3,5	57,2	57,2
40X32	48,6	41,6	3,5	42,7	35,7	3,5	57,2	57,2
40X25	48,6	41,6	3,5	34,0	27,6	3,2	57,2	57,2
40X20	48,6	41,6	3,5	27,2	21,6	2,8	57,2	57,2
40X15	48,6	41,6	3,5	21,7	16,1	2,8	57,2	57,2
50X50	60,5	52,9	3,8	60,5	52,9	3,8	63,5	63,5
50X40	60,5	52,9	3,8	48,6	41,6	3,5	63,5	60,3
50X32	60,5	52,9	3,8	42,7	35,7	3,5	63,5	57,2
50X25	60,5	52,9	3,8	34,0	27,6	3,2	63,5	50,8
50X20	60,5	52,9	3,8	27,2	21,6	2,8	63,5	44,5
65X65	76,3	67,9	4,2	76,3	67,9	4,2	76,2	76,2
65X50	76,3	67,9	4,2	60,5	52,9	3,8	76,2	69,9
65X40	76,3	67,9	4,2	48,6	41,6	3,5	76,2	66,7
65X32	76,3	67,9	4,2	42,7	35,7	3,5	76,2	63,5
65X25	76,3	67,9	4,2	34,0	27,6	3,2	76,2	57,2
80X80	89,1	80,7	4,2	89,1	80,7	4,2	85,7	85,7
80X65	89,1	80,7	4,2	76,3	67,9	4,2	85,7	82,6
80X50	89,1	80,7	4,2	60,5	52,9	3,8	85,7	76,2
80X40	89,1	80,7	4,2	48,6	41,6	3,5	85,7	73,0
80X32	89,1	80,7	4,2	42,7	35,7	3,5	85,7	69,9
90X90	101,6	93,2	4,2	101,6	93,2	4,2	95,3	95,3
90X80	101,6	93,2	4,2	89,1	80,7	4,2	95,3	92,1
90X65	101,6	93,2	4,2	76,3	67,9	4,2	95,3	88,9
90X50	101,6	93,2	4,2	60,5	52,9	3,8	95,3	82,6
90X40	101,6	93,2	4,2	48,6	41,6	3,5	95,3	79,4
100X100	114,3	105,3	4,5	114,3	105,3	4,5	104,8	104,8
100X90	114,3	105,3	4,5	101,6	93,2	4,2	104,8	101,6
100X80	114,3	105,3	4,5	89,1	80,7	4,2	104,8	98,4
100X65	114,3	105,3	4,5	76,3	67,9	4,2	104,8	95,3
100X50	114,3	105,3	4,5	60,5	52,9	3,8	104,8	88,9
100X40	114,3	105,3	4,5	48,6	41,6	3,5	104,8	85,7
125X125	139,8	130,8	4,5	139,8	130,8	4,5	123,8	123,8
125X100	139,8	130,8	4,5	114,3	105,3	4,5	123,8	117,5
125X90	139,8	130,8	4,5	101,6	93,2	4,2	123,8	114,3
125X80	139,8	130,8	4,5	89,1	80,7	4,2	123,8	111,1
125X65	139,8	130,8	4,5	76,3	67,9	4,2	123,8	108,0
125X50	139,8	130,8	4,5	60,5	52,9	3,8	123,8	104,8



· KS B 1543, JIS B 2311

Unit : mm

Nominal Pipe Size	Run			Outlet			Center to End	
	Outside Diameter OD ₁	Inside Diameter ID ₁	Wall Thickness T ₁	Outside Diameter OD ₂	Inside Diameter ID ₂	Wall Thickness T ₂	C	M
150X150	165.2	155.2	5.0	165.2	155.2	5.0	142.9	142.9
150X125	165.2	155.2	5.0	139.8	130.8	4.5	142.9	136.5
150X100	165.2	155.2	5.0	114.3	105.3	4.5	142.9	130.2
150X90	165.2	155.2	5.0	101.6	93.2	4.2	142.9	127.0
150X80	165.2	155.2	5.0	89.1	80.7	4.2	142.9	123.8
150X65	165.2	155.2	5.0	76.3	67.9	4.2	142.9	120.7
200X200	216.3	204.7	5.8	216.3	204.7	5.8	177.8	177.8
200X150	216.3	204.7	5.8	165.2	155.2	5.0	177.8	168.3
200X125	216.3	204.7	5.8	139.8	130.8	4.5	177.8	161.9
200X100	216.3	204.7	5.8	114.3	105.3	4.5	177.8	155.6
200X90	216.3	204.7	5.8	101.6	93.2	4.2	177.8	152.4
250X250	267.4	254.2	6.6	267.4	254.2	6.6	215.9	215.9
250X200	267.4	254.2	6.6	216.3	204.7	5.8	215.9	203.2
250X150	267.4	254.2	6.6	165.2	155.2	5.0	215.9	193.7
250X125	267.4	254.2	6.6	139.8	130.8	4.5	215.9	190.5
250X100	267.4	254.2	6.6	114.3	105.3	4.5	215.9	184.2
300X300	318.5	304.7	6.9	318.5	304.7	6.9	254.0	254.0
300X250	318.5	304.7	6.9	267.4	254.2	6.6	254.0	241.3
300X200	318.5	304.7	6.9	216.3	204.7	5.8	254.0	228.6
300X150	318.5	304.7	6.9	165.2	155.2	5.0	254.0	219.1
300X125	318.5	304.7	6.9	139.8	130.8	4.5	254.0	215.9
350X350	355.6	339.8	7.9	355.6	339.8	7.9	279.4	279.4
350X300	355.6	339.8	7.9	318.5	304.7	6.9	279.4	269.9
350X250	355.6	339.8	7.9	267.4	254.2	6.6	279.4	257.2
350X200	355.6	339.8	7.9	216.3	204.7	5.8	279.4	247.7
350X150	355.6	339.8	7.9	165.2	155.2	5.0	279.4	238.1
400X400	406.4	390.6	7.9	406.4	390.6	7.9	304.8	304.8
400X350	406.4	390.6	7.9	355.6	339.8	7.9	304.8	304.8
400X300	406.4	390.6	7.9	318.5	304.7	6.9	304.8	295.3
400X250	406.4	390.6	7.9	267.4	254.2	6.6	304.8	282.6
400X200	406.4	390.6	7.9	216.3	204.7	5.8	304.8	273.1
400X150	406.4	390.6	7.9	165.2	155.2	5.0	304.8	263.5
450X450	457.2	441.4	7.9	457.2	441.4	7.9	342.9	342.9
450X400	457.2	441.4	7.9	406.4	390.6	7.9	342.9	330.2
450X350	457.2	441.4	7.9	355.6	339.8	7.9	342.9	330.2
450X300	457.2	441.4	7.9	318.5	304.7	6.9	342.9	320.7
450X250	457.2	441.4	7.9	267.4	254.2	6.6	342.9	308.0
500X500	508.0	492.2	7.9	508.0	492.2	7.9	381.0	381.0
500X450	508.0	492.2	7.9	457.2	441.4	7.9	381.0	368.3
500X400	508.0	492.2	7.9	406.4	390.6	7.9	381.0	355.6
500X350	508.0	492.2	7.9	355.6	339.8	7.9	381.0	355.6
500X300	508.0	492.2	7.9	318.5	304.8	6.9	381.0	346.1
500X250	508.0	492.2	7.9	267.4	254.2	6.6	381.0	333.4
500X200	508.0	492.2	7.9	216.3	204.7	5.8	381.0	323.9

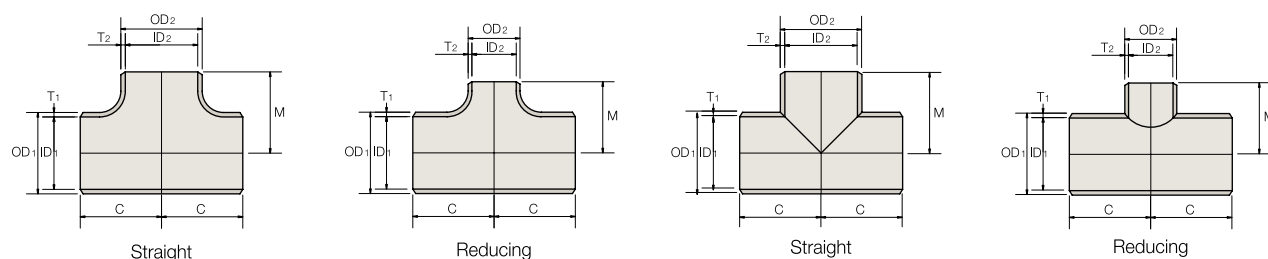
● Tee 7.9T, STD, X-S



· KS B 1543, JIS B 2311

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness						Center to End	
	OD ₁	OD ₂	7.9T		STD		X-S		C	M
			T ₁	T ₂	T ₁	T ₂	T ₁	T ₂		
350X350	355.6	355.6	7.9	7.9	9.5	9.5	12.7	12.7	279.4	279.4
400X400	406.4	406.4	7.9	7.9	9.5	9.5	12.7	12.7	304.8	304.8
400X350	406.4	355.6	7.9	7.9	9.5	9.5	12.7	12.7	304.8	304.8
400X300	406.4	318.5	7.9	7.9	9.5	9.5	12.7	12.7	304.8	295.3
450X450	457.2	457.2	7.9	7.9	9.5	9.5	12.7	12.7	342.9	342.9
450X400	457.2	406.4	7.9	7.9	9.5	9.5	12.7	12.7	342.9	330.2
450X350	457.2	355.6	7.9	7.9	9.5	9.5	12.7	12.7	342.9	330.2
450X300	457.2	318.5	7.9	7.9	9.5	9.5	12.7	12.7	342.9	320.7
500X500	508.0	508.0	7.9	7.9	9.5	9.5	12.7	12.7	381.0	381.0
500X450	508.0	457.2	7.9	7.9	9.5	9.5	12.7	12.7	381.0	368.3
500X400	508.0	406.4	7.9	7.9	9.5	9.5	12.7	12.7	381.0	355.6
500X350	508.0	355.6	7.9	7.9	9.5	9.5	12.7	12.7	381.0	355.6
500X300	508.0	318.5	7.9	7.9	9.5	9.5	12.7	12.7	381.0	346.1
550X550	558.8	558.8	7.9	7.9	9.5	9.5	12.7	12.7	419.1	419.1
550X500	558.8	508.0	7.9	7.9	9.5	9.5	12.7	12.7	419.1	406.4
550X450	558.8	457.2	7.9	7.9	9.5	9.5	12.7	12.7	419.1	393.7
550X400	558.8	406.4	7.9	7.9	9.5	9.5	12.7	12.7	419.1	381.0
600X600	609.6	609.6	7.9	7.9	9.5	9.5	12.7	12.7	431.8	431.8
600X550	609.6	558.8	7.9	7.9	9.5	9.5	12.7	12.7	431.8	431.8
600X500	609.6	508.0	7.9	7.9	9.5	9.5	12.7	12.7	431.8	431.8
600X450	609.6	457.2	7.9	7.9	9.5	9.5	12.7	12.7	431.8	419.1
650X650	660.4	660.4	7.9	7.9	9.5	9.5	12.7	12.7	495.3	495.3
650X600	660.4	609.6	7.9	7.9	9.5	9.5	12.7	12.7	495.3	482.6
650X550	660.4	558.8	7.9	7.9	9.5	9.5	12.7	12.7	495.3	469.9
650X500	660.4	508.0	7.9	7.9	9.5	9.5	12.7	12.7	495.3	457.2
700X700	711.2	711.2	7.9	7.9	9.5	9.5	12.7	12.7	520.7	520.7
700X650	711.2	660.4	7.9	7.9	9.5	9.5	12.7	12.7	520.7	520.7
700X600	711.2	609.6	7.9	7.9	9.5	9.5	12.7	12.7	520.7	508.0
700X550	711.2	558.8	7.9	7.9	9.5	9.5	12.7	12.7	520.7	495.3
750X750	762.0	762.0	7.9	7.9	9.5	9.5	12.7	12.7	558.8	558.8
750X700	762.0	711.2	7.9	7.9	9.5	9.5	12.7	12.7	558.8	546.1
750X650	762.0	660.4	7.9	7.9	9.5	9.5	12.7	12.7	558.8	546.1
750X600	762.0	609.6	7.9	7.9	9.5	9.5	12.7	12.7	558.8	533.4



KS B 1543, JIS B 2311

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness						Center to End	
	OD ₁	OD ₂	7.9T		STD		X-S		C	M
			T ₁	T ₂	T ₁	T ₂	T ₁	T ₂		
800X800	812.8	812.8	7.9	7.9	9.5	9.5	12.7	12.7	596.9	596.9
800X750	812.8	762.0	7.9	7.9	9.5	9.5	12.7	12.7	596.9	584.2
800X700	812.8	711.2	7.9	7.9	9.5	9.5	12.7	12.7	596.9	571.5
800X650	812.8	660.4	7.9	7.9	9.5	9.5	12.7	12.7	596.9	571.5
850X850	863.6	863.6	7.9	7.9	9.5	9.5	12.7	12.7	635.0	635.0
850X800	863.6	812.8	7.9	7.9	9.5	9.5	12.7	12.7	635.0	622.3
850X750	863.6	762.0	7.9	7.9	9.5	9.5	12.7	12.7	635.0	609.6
850X700	863.6	711.2	7.9	7.9	9.5	9.5	12.7	12.7	635.0	596.9
900X900	914.4	914.4	7.9	7.9	9.5	9.5	12.7	12.7	673.1	673.1
900X850	914.4	863.6	7.9	7.9	9.5	9.5	12.7	12.7	673.1	660.4
900X800	914.4	812.8	7.9	7.9	9.5	9.5	12.7	12.7	673.1	647.7
900X750	914.4	762.0	7.9	7.9	9.5	9.5	12.7	12.7	673.1	635.0
950X950	965.2	965.2	7.9	7.9	9.5	9.5	12.7	12.7	711.2	711.2
950X900	965.2	914.4	7.9	7.9	9.5	9.5	12.7	12.7	711.2	711.2
950X850	965.2	863.6	7.9	7.9	9.5	9.5	12.7	12.7	711.2	698.5
950X800	965.2	812.8	7.9	7.9	9.5	9.5	12.7	12.7	711.2	685.8
1000X1000	1016.0	1016.0	7.9	7.9	9.5	9.5	12.7	12.7	749.3	749.3
1000X950	1016.0	965.2	7.9	7.9	9.5	9.5	12.7	12.7	749.3	749.3
1000X900	1016.0	914.4	7.9	7.9	9.5	9.5	12.7	12.7	749.3	736.6
1000X850	1016.0	863.6	7.9	7.9	9.5	9.5	12.7	12.7	749.3	723.9
1050X1050	1066.8	1066.8	7.9	7.9	9.5	9.5	12.7	12.7	762.0	711.2
1050X1000	1066.8	1016.0	7.9	7.9	9.5	9.5	12.7	12.7	762.0	711.2
1050X950	1066.8	965.2	7.9	7.9	9.5	9.5	12.7	12.7	762.0	711.2
1050X900	1066.8	914.4	7.9	7.9	9.5	9.5	12.7	12.7	762.0	711.2
1100X1100	1117.6	1117.6	7.9	7.9	9.5	9.5	12.7	12.7	812.8	762.0
1100X1050	1117.6	1066.8	7.9	7.9	9.5	9.5	12.7	12.7	812.8	762.0
1100X1000	1117.6	1016.0	7.9	7.9	9.5	9.5	12.7	12.7	812.8	749.3
1100X950	1117.6	965.2	7.9	7.9	9.5	9.5	12.7	12.7	812.8	736.6
1150X1150	1168.4	1168.4	7.9	7.9	9.5	9.5	12.7	12.7	850.9	800.1
1150X1100	1168.4	1117.6	7.9	7.9	9.5	9.5	12.7	12.7	850.9	800.1
1150X1050	1168.4	1066.8	7.9	7.9	9.5	9.5	12.7	12.7	850.9	787.4
1150X1000	1168.4	1016.0	7.9	7.9	9.5	9.5	12.7	12.7	850.9	774.7
1200X1200	1219.2	1219.2	7.9	7.9	9.5	9.5	12.7	12.7	889.0	838.2
1200X1150	1219.2	1168.4	7.9	7.9	9.5	9.5	12.7	12.7	889.0	838.2
1200X1100	1219.2	1117.6	7.9	7.9	9.5	9.5	12.7	12.7	889.0	838.2
1200X1050	1219.2	1066.8	7.9	7.9	9.5	9.5	12.7	12.7	889.0	812.8

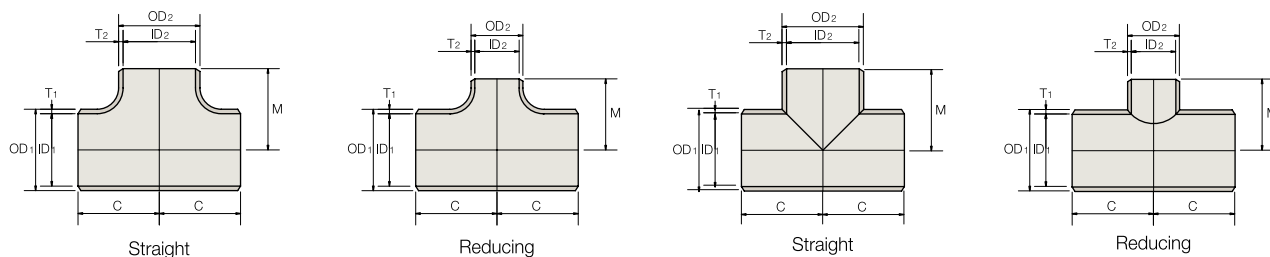
 Tee Sch40, Sch80, Sch120, Sch160



· KS B 1543 / JIS B 2312 / JIS B 2313

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness T								Center to End	
	OD ₁	OD ₂	Sch 40		Sch 80		Sch 120		Sch 160		C	M
			T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂		
15X15	21,7	21,7	2,8	2,8	3,7	3,7	-	-	-	-	25,4	25,4
20X20	27,2	27,2	2,9	2,9	3,9	3,9	-	-	-	-	28,6	28,6
20X15	27,2	21,7	2,9	2,8	3,9	3,7	-	-	-	-	28,6	28,6
25X25	34,0	34,0	3,4	3,4	4,5	4,5	-	-	-	-	38,1	38,1
25X20	34,0	27,2	3,4	2,9	4,5	3,9	-	-	-	-	38,1	38,1
25X15	34,0	21,7	3,4	2,8	4,5	3,7	-	-	-	-	38,1	38,1
32X32	42,7	42,7	3,6	3,6	4,9	4,9	-	-	-	-	47,6	47,6
32X25	42,7	34,0	3,6	3,4	4,9	4,5	-	-	-	-	47,6	47,6
32X20	42,7	27,2	3,6	2,9	4,9	3,9	-	-	-	-	47,6	47,6
32X15	42,7	21,7	3,6	2,8	4,9	3,7	-	-	-	-	47,6	47,6
40X40	48,6	48,6	3,7	3,7	5,1	5,1	-	-	7,1	7,1	57,2	57,2
40X32	48,6	42,7	3,7	3,6	5,1	4,9	-	-	-	-	57,2	57,2
40X25	48,6	34,0	3,7	3,4	5,1	4,5	-	-	-	-	57,2	57,2
40X20	48,6	27,2	3,7	2,9	5,1	3,9	-	-	-	-	57,2	57,2
40X15	48,6	21,7	3,7	2,8	5,1	3,7	-	-	-	-	57,2	57,2
50X50	60,5	60,5	3,9	3,9	5,5	5,5	-	-	8,7	8,7	63,5	63,5
50X40	60,5	48,6	3,9	3,7	5,5	5,1	-	-	8,7	7,1	63,5	60,3
50X32	60,5	42,7	3,9	3,6	5,5	4,9	-	-	-	-	63,5	57,2
50X25	60,5	34,0	3,9	3,4	5,5	4,5	-	-	-	-	63,5	50,8
50X20	60,5	27,2	3,9	2,9	5,5	3,9	-	-	-	-	63,5	44,5
65X65	76,3	76,3	5,2	5,2	7,0	7,0	-	-	9,5	9,5	76,2	76,2
65X50	76,3	60,5	5,2	3,9	7,0	5,5	-	-	9,5	8,7	76,2	69,9
65X40	76,3	48,6	5,2	3,7	7,0	5,1	-	-	9,5	7,1	76,2	66,7
65X32	76,3	42,7	5,2	3,6	7,0	4,9	-	-	-	-	76,2	63,5
65X25	76,3	34,0	5,2	3,4	7,0	4,5	-	-	-	-	76,2	57,2
80X80	89,1	89,1	5,5	5,5	7,6	7,6	-	-	11,1	11,1	85,7	85,7
80X65	89,1	76,3	5,5	5,2	7,6	7,0	-	-	11,1	9,5	85,7	82,6
80X50	89,1	60,5	5,5	3,9	7,6	5,5	-	-	11,1	8,7	85,7	76,2
80X40	89,1	48,6	5,5	3,7	7,6	5,1	-	-	11,1	7,1	85,7	73,0
80X32	89,1	42,7	5,5	3,6	7,6	4,9	-	-	-	-	85,7	69,9
90X90	101,6	101,6	5,7	5,7	8,1	8,1	-	-	12,7	12,7	95,3	95,3
90X80	101,6	89,1	5,7	5,5	8,1	7,6	-	-	12,7	11,1	95,3	92,1
90X65	101,6	76,3	5,7	5,2	8,1	7,0	-	-	12,7	9,5	95,3	88,9
90X50	101,6	60,5	5,7	3,9	8,1	5,5	-	-	12,7	8,7	95,3	82,6
90X40	101,6	48,6	5,7	3,7	8,1	5,1	-	-	12,7	7,1	95,3	79,4
100X100	114,3	114,3	6,0	6,0	8,6	8,6	11,1	11,1	13,5	13,5	104,8	104,8
100X90	114,3	101,6	6,0	5,7	8,6	8,1	-	-	13,5	12,7	104,8	101,6
100X80	114,3	89,1	6,0	5,5	8,6	7,6	-	-	13,5	11,1	104,8	98,4
100X65	114,3	76,3	6,0	5,2	8,6	7,0	-	-	13,5	9,5	104,8	95,3
100X50	114,3	60,5	6,0	3,9	8,6	5,5	-	-	13,5	8,7	104,8	88,9
100X40	114,3	48,6	6,0	3,7	8,6	5,1	-	-	13,5	7,1	104,8	85,7



· KS B 1543 / JIS B 2312 / JIS B 2313

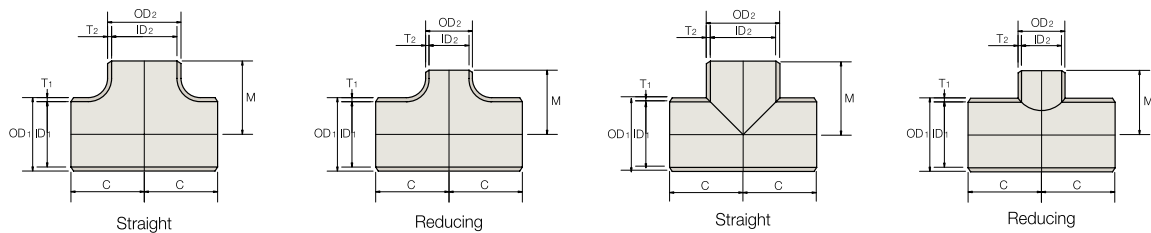
Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness T								Center to End	
	OD ₁	OD ₂	Sch 40		Sch 80		Sch 120		Sch 160		C	M
			T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂		
125X125	139,8	139,8	6,6	6,6	9,5	9,5	12,7	12,7	15,9	15,9	123,8	123,8
125X100	139,8	114,3	6,6	6,0	9,5	8,6	12,7	11,1	15,9	13,5	123,8	117,5
125X90	139,8	101,6	6,6	5,7	9,5	8,1	-	-	15,9	12,7	123,8	114,3
125X80	139,8	89,1	6,6	5,5	9,5	7,6	-	-	15,9	11,1	123,8	111,1
125X65	139,8	76,3	6,6	5,2	9,5	7,0	-	-	15,9	9,5	123,8	108,0
125X50	139,8	60,5	6,6	3,9	9,5	5,5	-	-	15,9	8,7	123,8	104,8
150X150	165,2	165,2	7,1	7,1	11,0	11,0	14,3	14,3	18,2	18,2	142,9	142,9
150X125	165,2	139,8	7,1	6,6	11,0	9,5	14,3	12,7	18,2	15,9	142,9	136,5
150X100	165,2	114,3	7,1	6,0	11,0	8,6	14,3	11,1	18,2	13,2	142,9	130,2
150X90	165,2	101,6	7,1	5,7	11,0	8,1	-	-	18,2	12,7	142,9	127,0
150X80	165,2	89,1	7,1	5,5	11,0	7,6	-	-	18,2	11,1	142,9	123,8
150X65	165,2	76,3	7,1	5,2	11,0	7,0	-	-	18,2	9,5	142,9	120,7
200X200	216,3	216,3	8,2	8,2	12,7	12,7	18,2	18,2	23,0	23,0	177,8	177,8
200X150	216,3	165,2	8,2	7,1	12,7	11,0	18,2	14,3	23,0	18,2	177,8	168,3
200X125	216,3	139,8	8,2	6,6	12,7	9,5	18,2	12,7	23,0	15,9	177,8	161,9
200X100	216,3	114,3	8,2	6,0	12,7	8,6	18,2	11,1	23,0	13,5	177,8	155,6
200X90	216,3	101,6	8,2	5,7	12,7	8,1	-	-	23,0	12,7	177,8	152,4
250X250	267,4	267,4	9,3	9,3	15,1	15,1	21,4	21,4	28,6	28,6	215,9	215,9
250X200	267,4	216,3	9,3	8,2	15,1	12,7	21,4	18,2	28,6	23,0	215,9	203,2
250X150	267,4	165,2	9,3	7,1	15,1	11,0	21,4	14,3	28,6	18,2	215,9	193,7
250X125	267,4	139,8	9,3	6,6	15,1	9,5	21,4	12,7	28,6	15,9	215,9	190,5
250X100	267,4	114,3	9,3	6,0	15,1	8,6	21,4	11,1	28,6	13,5	215,9	184,2
300X300	318,5	318,5	10,3	10,3	17,4	17,4	25,4	25,4	33,3	33,3	254,0	254,0
300X250	318,5	267,4	10,3	9,3	17,4	15,1	25,4	21,4	33,3	28,6	254,0	241,3
300X200	318,5	216,3	10,3	8,2	17,4	12,7	25,4	18,2	33,3	23,0	254,0	228,6
300X150	318,5	165,2	10,3	7,1	17,4	11,0	25,4	14,3	33,3	18,2	254,0	219,1
300X125	318,5	139,8	10,3	6,6	17,4	9,5	25,4	12,7	33,3	15,9	254,0	215,9
350X350	355,6	355,6	11,1	11,1	19,0	19,0	27,8	27,8	35,7	35,7	279,4	279,4
350X300	355,6	318,5	11,1	10,3	19,0	17,4	27,8	25,4	35,7	33,3	279,4	269,9
350X250	355,6	267,4	11,1	9,3	19,0	15,1	27,8	21,4	35,7	28,6	279,4	257,2
350X200	355,6	216,3	11,1	8,2	19,0	12,7	27,8	18,2	35,7	23,0	279,4	247,7
350X150	355,6	165,2	11,1	7,1	19,0	11,0	27,8	14,3	35,7	18,2	279,4	238,1
400X400	406,4	406,4	12,7	12,7	21,4	21,4	30,9	30,9	40,5	40,5	304,8	304,8
400X350	406,4	355,6	12,7	11,1	21,4	19,0	30,9	27,8	40,5	35,7	304,8	304,8
400X300	406,4	318,5	12,7	10,3	21,4	17,4	30,9	25,4	40,5	33,3	304,8	295,3
400X250	406,4	267,4	12,7	9,3	21,4	15,1	30,9	21,4	40,5	28,6	304,8	282,6
400X200	406,4	216,3	12,7	8,2	21,4	12,7	30,9	18,2	40,5	23,0	304,8	273,1
400X150	406,4	165,2	12,7	7,1	21,4	11,0	30,9	14,3	40,5	18,2	304,8	263,5

KS/JIS

Carbon Steel

 Tee Sch40, Sch80, Sch120, Sch160



KS B 1543 / JIS B 2312 / JIS B 2313

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness T								Center to End	
	OD ₁	OD ₂	Sch 40		Sch 80		Sch 120		Sch 160		C	M
			T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂		
450X450	457.2	457.2	14.3	14.3	23.8	23.8	34.9	34.9	45.2	45.2	342.9	342.9
450X400	457.2	406.4	14.3	12.7	23.8	21.4	34.9	30.9	45.2	40.5	342.9	330.2
450X350	457.2	355.6	14.3	11.1	23.8	19.0	34.9	27.8	45.2	35.7	342.9	330.2
450X300	457.2	318.5	14.3	10.3	23.8	17.4	34.9	25.4	45.2	33.3	342.9	320.7
450X250	457.2	267.4	14.3	9.3	23.8	15.1	34.9	21.4	45.2	28.6	342.9	308.0
450X200	457.2	216.3	14.3	8.2	23.8	12.7	34.9	18.2	45.2	23.0	342.9	298.5
500X500	508.0	508.0	15.1	15.1	26.2	26.2	38.1	38.1	50.0	50.0	381.0	381.0
500X450	508.0	457.2	15.1	14.3	26.2	23.8	38.1	34.9	50.0	45.2	381.0	368.3
500X400	508.0	406.4	15.1	12.7	26.2	21.4	38.1	30.9	50.0	40.5	381.0	355.6
500X350	508.0	355.6	15.1	11.1	26.2	19.0	38.1	27.8	50.0	35.7	381.0	355.6
500X300	508.0	318.5	15.1	10.3	26.2	17.4	38.1	25.4	50.0	33.3	381.0	346.1
500X250	508.0	267.4	15.1	9.3	26.2	15.1	38.1	21.4	50.0	28.6	381.0	333.4
500X200	508.0	216.3	15.1	8.2	26.2	12.7	38.1	18.2	50.0	23.0	381.0	323.9
550X550	558.8	558.8	15.1	15.1	28.6	28.6	-	-	-	-	419.1	419.1
550X500	558.8	508.0	15.1	15.1	28.6	26.2	-	-	-	-	419.1	406.4
550X450	558.8	457.2	15.1	14.3	28.6	23.8	-	-	-	-	419.1	393.7
550X400	558.8	406.4	15.1	12.7	28.6	21.4	-	-	-	-	419.1	381.0
600X600	609.6	609.6	17.4	17.4	31.0	31.0	-	-	-	-	431.8	431.8
600X550	609.6	558.8	17.4	15.1	31.0	28.6	-	-	-	-	431.8	431.8
600X500	609.6	508.0	17.4	15.1	31.0	26.2	-	-	-	-	431.8	431.8
600X450	609.6	457.2	17.4	14.3	31.0	23.8	-	-	-	-	431.8	419.1
650X650	660.4	660.4	17.4	17.4	-	-	-	-	-	-	495.3	495.3
650X600	660.4	609.6	17.4	17.4	-	-	-	-	-	-	495.3	482.6
650X550	660.4	558.8	17.4	15.1	-	-	-	-	-	-	495.3	469.9
650X500	660.4	508.0	17.4	15.1	-	-	-	-	-	-	495.3	457.2
700X700	711.2	711.2	17.4	17.4	-	-	-	-	-	-	520.7	520.7
700X650	711.2	660.4	17.4	17.4	-	-	-	-	-	-	520.7	520.7
700X600	711.2	609.6	17.4	17.4	-	-	-	-	-	-	520.7	508.0
700X550	711.2	558.8	17.4	15.1	-	-	-	-	-	-	520.7	495.3
750X750	762.0	762.0	17.4	17.4	-	-	-	-	-	-	558.8	558.8
750X700	762.0	711.2	17.4	17.4	-	-	-	-	-	-	558.8	546.1
750X650	762.0	660.4	17.4	17.4	-	-	-	-	-	-	558.8	546.1
750X600	762.0	609.6	17.4	17.4	-	-	-	-	-	-	558.8	533.4
800X800	812.8	812.8	17.4	17.4	-	-	-	-	-	-	596.9	596.9
800X750	812.8	762.0	17.4	17.4	-	-	-	-	-	-	596.9	584.2
800X700	812.8	711.2	17.4	17.4	-	-	-	-	-	-	596.9	571.5
800X650	812.8	660.4	17.4	17.4	-	-	-	-	-	-	596.9	571.5
850X850	863.6	863.6	17.4	17.4	-	-	-	-	-	-	635.0	635.0
850X800	863.6	812.8	17.4	17.4	-	-	-	-	-	-	635.0	622.3
850X750	863.6	762.0	17.4	17.4	-	-	-	-	-	-	635.0	609.6
850X700	863.6	711.2	17.4	17.4	-	-	-	-	-	-	635.0	596.9
900X900	914.4	914.4	19.0	19.0	-	-	-	-	-	-	673.1	673.1
900X850	914.4	863.6	19.0	17.4	-	-	-	-	-	-	673.1	660.4
900X800	914.4	812.8	19.0	17.4	-	-	-	-	-	-	673.1	647.7
900X750	914.4	762.0	19.0	17.4	-	-	-	-	-	-	673.1	635.0

Reducer

SPP / SGP



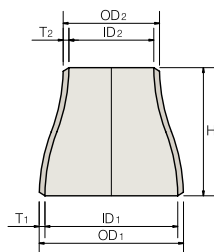
KS B 1543 / JIS B 2311

Unit : mm

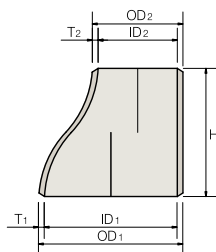
Nominal Pipe Size	Large End			Small End			End to End H
	Outside Diameter OD ₁	Inside Diameter ID ₁	Wall Thickness T ₁	Outside Diameter OD ₂	Inside Diameter ID ₂	Wall Thickness T ₂	
20X15	27.2	21.6	2.8	21.7	16.1	2.8	38.1
25X20	34.0	27.6	3.2	27.2	21.6	2.8	50.8
25X15	34.0	27.6	3.2	21.7	16.1	2.8	50.8
32X25	42.7	35.7	3.5	34.0	27.6	3.2	50.8
32X20	42.7	35.7	3.5	27.2	21.6	2.8	50.8
32X15	42.7	35.7	3.5	21.7	16.1	2.8	50.8
40X32	48.6	41.6	3.5	42.7	35.7	3.5	63.5
40X25	48.6	41.6	3.5	34.0	27.6	3.2	63.5
40X20	48.6	41.6	3.5	27.2	21.6	2.8	63.5
40X15	48.6	41.6	3.5	21.7	16.1	2.8	63.5
50X40	60.5	52.9	3.8	48.6	41.6	3.5	76.2
50X32	60.5	52.9	3.8	42.7	35.7	3.5	76.2
50X25	60.5	52.9	3.8	34.0	27.6	3.2	76.2
50X20	60.5	52.9	3.8	27.2	21.6	2.8	76.2
65X50	76.3	67.9	4.2	60.5	52.9	3.8	88.9
65X40	76.3	67.9	4.2	48.6	41.6	3.5	88.9
65X32	76.3	67.9	4.2	42.7	35.7	3.5	88.9
65X25	76.3	67.9	4.2	34.0	27.6	3.2	88.9
80X65	89.1	80.7	4.2	76.3	67.9	4.2	88.9
80X50	89.1	80.7	4.2	60.5	52.9	3.8	88.9
80X40	89.1	80.7	4.2	48.6	41.6	3.5	88.9
80X32	89.1	80.7	4.2	42.7	35.7	3.5	88.9
90X80	101.6	93.2	4.2	89.1	80.7	4.2	101.6
90X65	101.6	93.2	4.2	76.3	67.9	4.2	101.6
90X50	101.6	93.2	4.2	60.5	52.9	3.8	101.6
90X40	101.6	93.2	4.2	48.6	41.6	3.5	101.6
90X32	101.6	93.2	4.2	42.7	35.7	3.5	101.6
100X90	114.3	105.3	4.5	101.6	93.2	4.2	101.6
100X80	114.3	105.3	4.5	89.1	80.7	4.2	101.6
100X65	114.3	105.3	4.5	76.3	67.9	4.2	101.6
100X50	114.3	105.3	4.5	60.5	52.9	3.8	101.6
100X40	114.3	105.3	4.5	48.6	41.6	3.5	101.6
125X100	139.8	130.8	4.5	114.3	105.3	4.5	127.0
125X90	139.8	130.8	4.5	101.6	93.2	4.2	127.0
125X80	139.8	130.8	4.5	89.1	80.7	4.2	127.0
125X65	139.8	130.8	4.5	76.3	67.9	4.2	127.0
125X50	139.8	130.8	4.5	60.5	52.9	3.8	127.0

KS/JIS

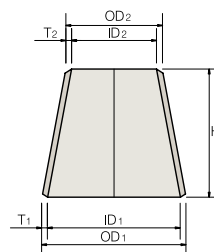
Carbon Steel



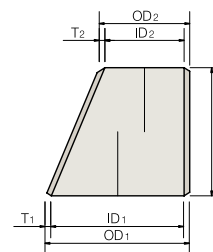
Concentric



Eccentric



Concentric



Eccentric

· KS B 1543 / JIS B 2311

Unit : mm

Nominal Pipe Size	Large End			Small End			End to End H
	Outside Diameter OD ₁	Inside Diameter ID ₁	Wall Thickness T ₁	Outside Diameter OD ₂	Inside Diameter ID ₂	Wall Thickness T ₂	
150X125	165.2	155.2	5.0	139.8	130.8	4.5	139.7
150X100	165.2	155.2	5.0	114.3	105.3	4.5	139.7
150X90	165.2	155.2	5.0	101.6	93.2	4.2	139.7
150X80	165.2	155.2	5.0	89.1	80.7	4.2	139.7
150X65	165.2	155.2	5.8	76.3	67.9	4.2	139.7
200X150	216.3	204.7	5.8	165.2	155.2	5.0	152.4
200X125	216.3	204.7	5.8	139.8	130.8	4.5	152.4
200X100	216.3	204.7	5.8	114.3	105.3	4.5	152.4
200X90	216.3	204.7	5.8	101.6	93.2	4.2	152.4
250X200	267.4	254.2	6.6	216.3	204.7	5.8	177.8
250X150	267.4	254.2	6.6	165.2	155.2	5.0	177.8
250X125	267.4	254.2	6.6	139.8	130.8	4.5	177.8
250X100	267.4	254.2	6.6	114.3	105.3	4.5	177.8
300X250	318.5	304.7	6.9	267.4	254.2	6.6	203.2
300X200	318.5	304.7	6.9	216.3	204.7	5.8	203.2
300X150	318.5	304.7	6.9	165.2	155.2	5.0	203.2
300X125	318.5	304.7	6.9	139.8	130.8	4.5	203.2
350X300	355.6	339.8	7.9	318.5	304.7	6.9	330.2
350X250	355.6	339.8	7.9	267.4	254.2	6.6	330.2
350X200	355.6	339.8	7.9	216.3	204.7	5.8	330.2
350X150	355.6	339.8	7.9	165.2	155.2	5.0	330.2
400X350	406.4	390.6	7.9	355.6	339.8	7.9	355.6
400X300	406.4	390.6	7.9	318.5	304.7	6.9	355.6
400X250	406.4	390.6	7.9	267.4	254.2	6.6	355.6
400X200	406.4	390.6	7.9	216.3	204.7	5.8	355.6
450X400	457.2	441.4	7.9	406.4	390.6	7.9	381.0
450X350	457.2	441.4	7.9	355.6	339.8	7.9	381.0
450X300	457.2	441.4	7.9	318.5	304.7	6.9	381.0
450X250	457.2	441.4	7.9	267.4	254.2	6.6	381.0
500X450	508.0	492.2	7.9	457.2	441.4	7.9	508.0
500X400	508.0	492.2	7.9	406.4	390.6	7.9	508.0
500X350	508.0	492.2	7.9	355.6	339.8	7.9	508.0
500X300	508.0	492.2	7.9	318.5	304.7	6.9	508.0

Reducer 7.9T, STD, X-S



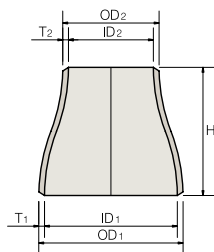
KS B 1543 / JIS B 2311

Unit : mm

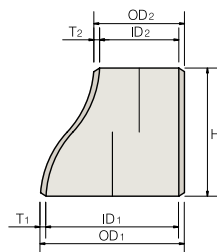
Nominal Pipe Size	Outside Diameter		Wall Thickness						End to End H
	OD ₁	OD ₂	7.9T		STD		X-S		
			T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	
400X350	406.4	355.6	7.9	7.9	9.5	9.5	12.7	12.7	355.6
450X400	457.2	406.4	7.9	7.9	9.5	9.5	12.7	12.7	381.0
450X350	457.2	355.6	7.9	7.9	9.5	9.5	12.7	12.7	381.0
500X450	508.0	457.2	7.9	7.9	9.5	9.5	12.7	12.7	508.0
500X400	508.0	406.4	7.9	7.9	9.5	9.5	12.7	12.7	508.0
500X350	508.0	355.6	7.9	7.9	9.5	9.5	12.7	12.7	508.0
550X500	558.8	508.0	7.9	7.9	9.5	9.5	12.7	12.7	508.0
550X450	558.8	457.2	7.9	7.9	9.5	9.5	12.7	12.7	508.0
550X400	558.8	406.4	7.9	7.9	9.5	9.5	12.7	12.7	508.0
550X350	558.8	355.6	7.9	7.9	9.5	9.5	12.7	12.7	508.0
600X550	609.6	558.8	7.9	7.9	9.5	9.5	12.7	12.7	508.0
600X500	609.6	508.0	7.9	7.9	9.5	9.5	12.7	12.7	508.0
600X450	609.6	457.2	7.9	7.9	9.5	9.5	12.7	12.7	508.0
600X400	609.6	406.4	7.9	7.9	9.5	9.5	12.7	12.7	508.0
650X600	660.4	609.6	7.9	7.9	9.5	9.5	12.7	12.7	609.6
650X550	660.4	558.8	7.9	7.9	9.5	9.5	12.7	12.7	609.6
650X500	660.4	508.0	7.9	7.9	9.5	9.5	12.7	12.7	609.6
650X450	660.4	457.2	7.9	7.9	9.5	9.5	12.7	12.7	609.6
700X650	711.2	660.4	7.9	7.9	9.5	9.5	12.7	12.7	609.6
700X600	711.2	609.6	7.9	7.9	9.5	9.5	12.7	12.7	609.6
700X550	711.2	558.8	7.9	7.9	9.5	9.5	12.7	12.7	609.6
700X500	711.2	508.0	7.9	7.9	9.5	9.5	12.7	12.7	609.6
750X700	762.0	711.2	7.9	7.9	9.5	9.5	12.7	12.7	609.6
750X650	762.0	660.4	7.9	7.9	9.5	9.5	12.7	12.7	609.6
750X600	762.0	609.6	7.9	7.9	9.5	9.5	12.7	12.7	609.6
750X550	762.0	558.8	7.9	7.9	9.5	9.5	12.7	12.7	609.6
800X750	812.8	762.0	7.9	7.9	9.5	9.5	12.7	12.7	609.6
800X700	812.8	711.2	7.9	7.9	9.5	9.5	12.7	12.7	609.6
800X650	812.8	660.4	7.9	7.9	9.5	9.5	12.7	12.7	609.6
800X600	812.8	609.6	7.9	7.9	9.5	9.5	12.7	12.7	609.6

KS/JIS

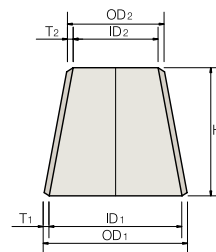
Carbon Steel



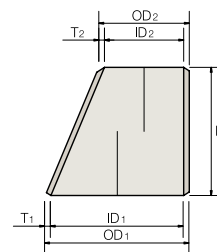
Concentric



Eccentric



Concentric



Eccentric

· KS B 1543 / JIS B 2311

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness						End to End H
	OD ₁	OD ₂	7.9T		STD		X-S		
			T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	
850X800	863.6	812.8	7.9	7.9	9.5	9.5	12.7	12.7	609.6
850X750	863.6	762.0	7.9	7.9	9.5	9.5	12.7	12.7	609.6
850X700	863.6	711.2	7.9	7.9	9.5	9.5	12.7	12.7	609.6
850X650	863.6	660.4	7.9	7.9	9.5	9.5	12.7	12.7	609.6
900X850	914.4	863.6	7.9	7.9	9.5	9.5	12.7	12.7	609.6
900X800	914.4	812.8	7.9	7.9	9.5	9.5	12.7	12.7	609.6
900X750	914.4	762.0	7.9	7.9	9.5	9.5	12.7	12.7	609.6
900X700	914.4	711.2	7.9	7.9	9.5	9.5	12.7	12.7	609.6
950X900	965.2	914.4	7.9	7.9	9.5	9.5	12.7	12.7	609.6
950X850	965.2	863.6	7.9	7.9	9.5	9.5	12.7	12.7	609.6
950X800	965.2	812.8	7.9	7.9	9.5	9.5	12.7	12.7	609.6
950X750	965.2	762.0	7.9	7.9	9.5	9.5	12.7	12.7	609.6
1000X950	1016.0	965.2	7.9	7.9	9.5	9.5	12.7	12.7	609.6
1000X900	1016.0	914.4	7.9	7.9	9.5	9.5	12.7	12.7	609.6
1000X850	1016.0	863.6	7.9	7.9	9.5	9.5	12.7	12.7	609.6
1000X800	1016.0	812.8	7.9	7.9	9.5	9.5	12.7	12.7	609.6
1050X1000	1066.8	1016.0	7.9	7.9	9.5	9.5	12.7	12.7	609.6
1050X950	1066.8	965.2	7.9	7.9	9.5	9.5	12.7	12.7	609.6
1050X900	1066.8	914.4	7.9	7.9	9.5	9.5	12.7	12.7	609.6
1050X850	1066.8	863.6	7.9	7.9	9.5	9.5	12.7	12.7	609.6
1100X1050	1117.6	1066.8	7.9	7.9	9.5	9.5	12.7	12.7	609.6
1100X1000	1117.6	1016.0	7.9	7.9	9.5	9.5	12.7	12.7	609.6
1100X950	1117.6	965.2	7.9	7.9	9.5	9.5	12.7	12.7	609.6
1100X900	1117.6	914.4	7.9	7.9	9.5	9.5	12.7	12.7	609.6
1150X1100	1168.4	1117.6	7.9	7.9	9.5	9.5	12.7	12.7	711.2
1150X1050	1168.4	1066.8	7.9	7.9	9.5	9.5	12.7	12.7	711.2
1150X1000	1168.4	1016.0	7.9	7.9	9.5	9.5	12.7	12.7	711.2
1150X950	1168.4	965.2	7.9	7.9	9.5	9.5	12.7	12.7	711.2
1200X1150	1219.2	1168.4	7.9	7.9	9.5	9.5	12.7	12.7	711.2
1200X1100	1219.2	1117.6	7.9	7.9	9.5	9.5	12.7	12.7	711.2
1200X1050	1219.2	1066.8	7.9	7.9	9.5	9.5	12.7	12.7	711.2
1200X1000	1219.2	1016.0	7.9	7.9	9.5	9.5	12.7	12.7	711.2

● Reducer Sch40, Sch80, Sch160



· KS B 1543 / JIS B 2312 / JIS B 2313

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness T						End to End H
	OD ₁	OD ₂	Sch 40		Sch 80		Sch 160		
			T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	
20X15	27.2	21.7	2.9	2.8	3.9	3.7	-	-	38.1
25X20	34.0	27.2	3.4	2.9	4.5	3.9	-	-	50.8
25X15	34.0	21.7	3.4	2.8	4.5	3.7	-	-	50.8
32X25	42.7	34.0	3.6	3.4	4.9	4.5	-	-	50.8
32X20	42.7	27.2	3.6	2.9	4.9	3.9	-	-	50.8
32X15	42.7	21.7	3.6	2.8	4.9	3.7	-	-	50.8
40X32	48.6	42.7	3.7	3.6	5.1	4.9	-	-	63.5
40X25	48.6	34.0	3.7	3.4	5.1	4.5	-	-	63.5
40X20	48.6	27.2	3.7	2.9	5.1	3.9	-	-	63.5
40X15	48.6	21.7	3.7	2.8	5.1	3.7	-	-	63.5
50X40	60.5	48.6	3.9	3.7	5.5	5.1	8.7	7.1	76.2
50X32	60.5	42.7	3.9	3.6	5.5	4.9	-	-	76.2
50X25	60.5	34.0	3.9	3.4	5.5	4.5	-	-	76.2
50X20	60.5	27.2	3.9	2.9	5.5	3.9	-	-	76.2
65X50	76.3	60.5	5.2	3.9	7.0	5.5	9.5	8.7	88.9
65X40	76.3	48.6	5.2	3.7	7.0	5.1	9.5	7.1	88.9
65X32	76.3	42.7	5.2	3.6	7.0	4.9	-	-	88.9
65X25	76.3	34.0	5.2	3.4	7.0	4.5	-	-	88.9
80X65	89.1	76.3	5.5	5.2	7.6	7.0	11.1	9.5	88.9
80X50	89.1	60.5	5.5	3.9	7.6	5.5	11.1	8.7	88.9
80X40	89.1	48.6	5.5	3.7	7.6	5.1	11.1	7.1	88.9
80X32	89.1	42.7	5.5	3.6	7.6	4.9	-	-	88.9
90X80	101.6	89.1	5.7	5.5	8.1	7.6	12.7	11.1	101.6
90X65	101.6	76.3	5.7	5.2	8.1	7.0	12.7	9.5	101.6
90X50	101.6	60.5	5.7	3.9	8.1	5.5	12.7	8.7	101.6
90X40	101.6	48.6	5.7	3.7	8.1	5.1	12.7	7.1	101.6
90X32	101.6	42.7	5.7	3.6	8.1	4.9	-	-	101.6
100X90	114.3	101.6	6.0	5.7	8.6	8.1	13.5	12.7	101.6
100X80	114.3	89.1	6.0	5.5	8.6	7.6	13.5	11.1	101.6
100X65	114.3	76.3	6.0	5.2	8.6	7.0	13.5	9.5	101.6
100X50	114.3	60.5	6.0	3.9	8.6	5.5	13.5	8.7	101.6
100X40	114.3	48.6	6.0	3.7	8.6	5.1	13.5	7.1	101.6

KS/JIS

Carbon Steel

● Reducer

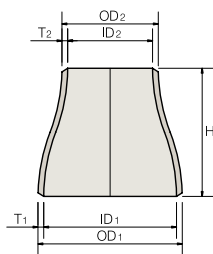
Sch40, Sch80, Sch120, Sch160



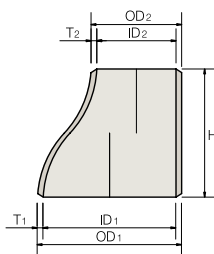
· KS B 1543 / JIS B 2312 / JIS B 2313

Unit : mm

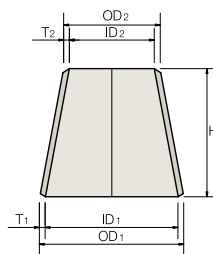
Nominal Pipe Size	Outside Diameter		Wall Thickness T								End to End H
	OD ₁	OD ₂	Sch 40		Sch 80		Sch 120		Sch 160		
			T ₁	T ₂	T ₁₁	T ₂	T ₁	T ₂	T ₁	T ₂	
125X100	139.8	114.3	6.6	6.0	9.5	8.6	12.7	11.1	15.9	13.5	127.0
125X90	139.8	101.6	6.6	5.7	9.5	8.1	-	-	15.9	12.7	127.0
125X80	139.8	89.1	6.6	5.5	9.5	7.6	-	-	15.9	11.1	127.0
125X65	139.8	76.3	6.6	5.2	9.5	7.0	-	-	15.9	9.5	127.0
125X50	139.8	60.5	6.6	3.9	9.5	5.5	-	-	15.9	8.7	127.0
150X125	165.2	139.8	7.1	6.6	11.0	9.5	14.3	12.7	18.2	15.9	139.7
150X100	165.2	114.3	7.1	6.0	11.0	8.6	14.3	11.1	18.2	13.5	139.7
150X90	165.2	101.6	7.1	5.7	11.0	8.1	-	-	18.2	12.7	139.7
150X80	165.2	89.1	7.1	5.5	11.0	7.6	-	-	18.2	11.1	139.7
150X65	165.2	76.3	7.1	5.2	11.0	7.0	-	-	18.2	9.5	139.7
200X150	216.3	165.2	8.2	7.1	12.7	11.0	18.2	14.3	23.0	18.2	152.4
200X125	216.3	139.8	8.2	6.6	12.7	9.5	18.2	12.7	23.0	15.9	152.4
200X100	216.3	114.3	8.2	6.0	12.7	8.6	18.2	11.1	23.0	13.5	152.4
200X90	216.3	101.6	8.2	5.7	12.7	8.1	-	-	23.0	12.7	152.4
250X200	267.4	216.3	9.3	8.2	15.1	12.7	21.4	18.2	28.6	23.0	177.8
250X150	267.4	165.2	9.3	7.1	15.1	11.0	21.4	14.3	28.6	18.2	177.8
250X125	267.4	139.8	9.3	6.6	15.1	9.5	21.4	12.7	28.6	15.9	177.8
250X100	267.4	114.3	9.3	6.0	15.1	8.6	-	-	28.6	13.5	177.8
300X250	318.5	267.4	10.3	9.3	17.4	15.1	25.4	21.4	33.3	28.6	203.2
300X200	318.5	216.3	10.3	8.2	17.4	12.7	25.4	18.2	33.3	23.0	203.2
300X150	318.5	165.2	10.3	7.1	17.4	11.0	25.4	14.3	33.3	18.2	203.2
300X125	318.5	139.8	10.3	6.6	17.4	9.5	25.4	12.7	33.3	15.9	203.2
350X300	355.6	318.5	11.1	10.3	19.0	17.4	27.8	25.4	35.7	33.3	330.2
350X250	355.6	267.4	11.1	9.3	19.0	15.1	27.8	21.4	35.7	28.6	330.2
350X200	355.6	216.3	11.1	8.2	19.0	12.7	27.8	18.2	35.7	23.0	330.2
350X150	355.6	165.2	11.1	7.1	19.0	11.0	27.8	14.3	35.7	18.2	330.2
400X350	406.4	355.6	12.7	11.1	21.4	19.0	30.9	27.8	40.5	35.7	355.6
400X300	406.4	318.5	12.7	10.3	21.4	17.4	30.9	25.4	40.5	33.3	355.6
400X250	406.4	267.4	12.7	9.3	21.4	15.1	30.9	21.4	40.5	28.6	355.6
400X200	406.4	216.3	12.7	8.2	21.4	12.7	30.9	18.2	40.5	23.0	355.6
450X400	457.2	406.4	14.3	12.7	23.8	21.4	34.9	30.9	45.2	40.5	381.0
450X350	457.2	355.6	14.3	11.1	23.8	19.0	34.9	27.8	45.2	35.7	381.0
450X300	457.2	318.5	14.3	10.3	23.8	17.4	34.9	25.4	45.2	33.3	381.0
450X250	457.2	267.4	14.3	9.3	23.8	15.1	34.9	21.4	45.2	28.6	381.0
500X450	508.0	457.2	15.1	14.3	26.2	23.8	38.1	34.9	50.0	54.2	508.0
500X400	508.0	406.4	15.1	12.7	26.2	21.4	38.1	30.9	50.0	40.5	508.0
500X350	508.0	355.6	15.1	11.1	26.2	19.0	38.1	27.8	50.0	35.7	508.0
500X300	508.0	318.5	15.1	10.3	26.2	17.4	38.1	25.4	50.0	33.3	508.0



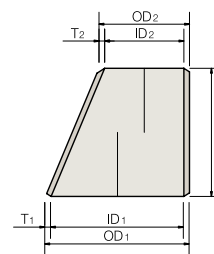
Concentric



Eccentric



Concentric



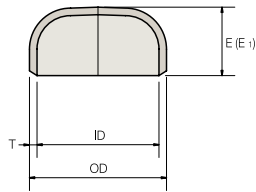
Eccentric

· KS B 1543 / JIS B 2312 / JIS B 2313

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness T								End to End H
	OD ₁	OD ₂	Sch 40		Sch 80		Sch 120		Sch 160		
			T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	
550X500	558,8	508,0	15,1	15,1	28,6	26,2	-	-	-	-	508,0
550X450	558,8	457,2	15,1	14,3	28,6	23,8	-	-	-	-	508,0
550X400	558,8	406,4	15,1	12,7	28,6	21,4	-	-	-	-	508,0
550X350	558,8	355,6	15,1	11,1	28,6	19,0	-	-	-	-	508,0
600X550	609,6	558,8	17,4	15,1	31,0	28,6	-	-	-	-	508,0
600X500	609,6	508,0	17,4	15,1	31,0	26,2	-	-	-	-	508,0
600X450	609,6	457,2	17,4	14,3	31,0	23,8	-	-	-	-	508,0
600X400	609,6	406,4	17,4	12,7	31,0	21,4	-	-	-	-	508,0
650X600	660,4	609,6	17,4	17,4	-	-	-	-	-	-	609,6
650X550	660,4	558,8	17,4	15,1	-	-	-	-	-	-	609,6
650X500	660,4	508,0	17,4	15,1	-	-	-	-	-	-	609,6
650X450	660,4	457,2	17,4	14,3	-	-	-	-	-	-	609,6
700X650	711,2	660,4	17,4	17,4	-	-	-	-	-	-	609,6
700X600	711,2	609,7	17,4	17,4	-	-	-	-	-	-	609,6
700X550	711,2	558,8	17,4	15,1	-	-	-	-	-	-	609,6
700X500	711,2	508,0	17,4	15,1	-	-	-	-	-	-	609,6
750X700	762,0	711,2	17,4	17,4	-	-	-	-	-	-	609,6
750X650	762,0	660,4	17,4	17,4	-	-	-	-	-	-	609,6
750X600	762,0	609,6	17,4	17,4	-	-	-	-	-	-	609,6
750X550	762,0	558,8	17,4	15,1	-	-	-	-	-	-	609,6
800X750	812,8	762,0	17,4	17,4	-	-	-	-	-	-	609,6
800X700	812,8	711,2	17,4	17,4	-	-	-	-	-	-	609,6
800X650	812,8	660,4	17,4	17,4	-	-	-	-	-	-	609,6
800X600	812,8	609,6	17,4	17,4	-	-	-	-	-	-	609,6
850X800	863,6	812,8	17,4	17,4	-	-	-	-	-	-	609,6
850X750	863,6	762,0	17,4	17,4	-	-	-	-	-	-	609,6
850X700	863,6	711,2	17,4	17,4	-	-	-	-	-	-	609,6
850X650	863,6	660,4	17,4	17,4	-	-	-	-	-	-	609,6
900X850	914,4	863,6	19,0	17,4	-	-	-	-	-	-	609,6
900X800	914,4	812,8	19,0	17,4	-	-	-	-	-	-	609,6
900X750	914,4	762,0	19,0	17,4	-	-	-	-	-	-	609,6
900X700	914,4	711,2	19,0	17,4	-	-	-	-	-	-	609,6

● Cap Sch40, Sch80, Sch120, Sch160



Cap



· KS B 1543 / JIS B 2312 / JIS B 2313

Unit : mm

Nominal Pipe Size	Outside Diameter OD	Wall Thickness T				Cap		
		Sch 40	Sch 80	Sch 120	Sch 160	E	E1	Limited Wall Thickness Fore
15	21.7	2.8	3.7	-	-	25.4	-	-
20	27.2	2.9	3.9	-	-	25.4	-	-
25	34.0	3.4	4.5	-	-	38.1	-	-
32	42.7	3.6	4.9	-	-	38.1	-	-
40	48.6	3.7	5.1	-	7.1	38.1	-	-
50	60.5	3.9	5.5	-	8.7	38.1	44.5	5.5
65	76.3	5.2	7.0	-	9.5	38.1	50.8	7.0
80	89.1	5.5	7.6	-	11.1	50.8	63.5	7.6
90	101.6	5.7	8.1	-	12.7	63.5	76.2	8.1
100	114.3	6.0	8.6	11.1	13.5	63.5	76.2	8.6
125	139.8	6.6	9.5	12.7	15.9	76.2	88.9	9.5
150	165.2	7.1	11.0	14.3	18.2	88.9	101.6	11.0
200	216.3	8.2	12.7	18.2	23.0	101.6	127.0	12.7
250	267.4	9.3	15.1	21.4	28.6	127.0	152.4	12.7
300	318.5	10.3	17.4	25.4	33.3	152.4	177.8	12.7
350	355.6	11.1	19.0	27.8	35.7	165.1	190.5	12.7
400	406.4	12.7	21.4	30.9	40.5	177.8	203.2	12.7
450	457.2	14.3	23.8	34.9	45.2	203.2	228.6	12.7
500	508.0	15.1	26.2	38.1	50.0	228.6	254.0	12.7



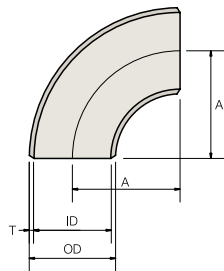
Stainless Steel butt-welding fittings

KS/JIS

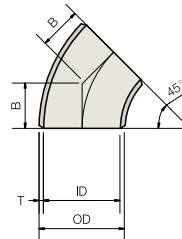
Elbow 90° , 45° – Sch 10s, Sch20s, Sch40s	74
Tee – Sch 10s, Sch20s, Sch40s	75
Reducer – Sch10s, Sch20s, Sch40s	77
Cap – Sch10s, Sch20s, Sch40s	79

● **Elbow 90° (Long, Short) / Elbow 45° (Long)**

Sch10s, Sch20s, Sch40s



90° Elbow



45° Elbow



· KS B 1543 / JIS B 2312 / JIS B 2313

Unit : mm

Nominal Pipe Size	Outside Diameter OD	Wall Thickness T						Center to Center		
		Sch10s		Sch20s		Sch40s		Long		Short
		ID	T	ID	T	ID	T	A (90°)	B (45°)	A (90°)
15	21.7	17.5	2.1	16.7	2.5	16.1	2.8	38.1	15.8	-
20	27.2	23.0	2.1	22.2	2.5	21.4	2.9	38.1	15.8	-
25	34.0	28.4	2.8	28.0	3.0	27.2	3.4	38.1	15.8	25.4
32	42.7	37.1	2.8	36.7	3.0	35.5	3.6	47.6	19.7	31.8
40	48.6	43.0	2.8	42.6	3.0	41.2	3.7	57.2	23.7	38.1
50	60.5	54.9	2.8	53.5	3.5	52.7	3.9	76.2	31.6	50.8
65	76.3	70.3	3.0	69.3	3.5	65.9	5.2	95.3	39.5	63.5
80	89.1	83.1	3.0	81.1	4.0	78.1	5.5	114.3	47.3	76.2
90	101.6	95.6	3.0	93.6	4.0	90.2	5.7	133.4	55.3	88.9
100	114.3	108.3	3.0	106.3	4.0	102.3	6.0	152.4	63.1	101.6
125	139.8	133.0	3.4	129.8	5.0	126.6	6.6	190.5	78.9	127.0
150	165.2	158.4	3.4	155.2	5.0	151.0	7.1	228.6	94.7	152.4
200	216.3	208.3	4.0	203.3	6.5	199.9	8.2	304.8	126.3	203.2
250	267.4	259.4	4.0	254.4	6.5	248.8	9.3	381.0	157.8	254.0
300	318.5	309.5	4.5	305.5	6.5	297.9	10.3	457.2	189.4	304.8
350	355.6	346.0	4.8	339.6	8.0	333.4	11.1	533.4	220.9	355.6
400	406.4	396.8	4.8	390.4	8.0	381.0	12.7	609.6	252.5	406.4
450	457.2	447.6	4.8	441.2	8.0	428.6	14.3	685.8	284.1	457.2
500	508.0	497.0	5.5	489.0	8.0	477.8	15.1	762.0	315.6	508.0
550	558.8	547.8	5.5	-	-	-	-	838.2	347.2	558.8
600	609.6	596.8	6.4	-	-	-	-	914.4	378.7	609.6
750	762.0	746.2	7.9	-	-	-	-	1143.0	473.4	762.0

* ASTM규격 별도 문의



Tee

Sch10s, Sch20s, Sch40s



KS B 1543 / JIS B 2312 / JIS B 2313

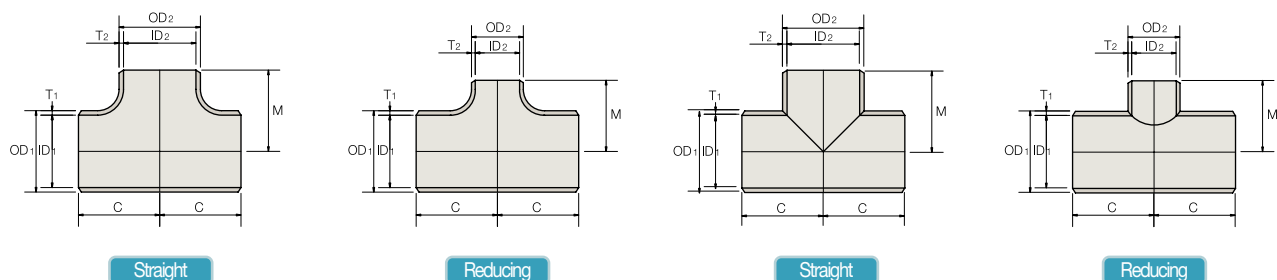
Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness T						Center to End	
	OD ₁	OD ₂	Sch 10s		Sch 20s		Sch 40s		C	M
			T ₁	T ₂	T ₁	T ₂	T ₁	T ₂		
15X15	21,7	21,7	2,1	2,1	2,5	2,5	2,8	2,8	25,4	25,4
20X20	27,2	27,2	2,1	2,1	2,5	2,5	2,9	2,9	28,6	28,6
25X25	34,0	34,0	2,8	2,8	3,0	3,0	3,4	3,4	38,1	38,1
32X32	42,7	42,7	2,8	2,8	3,0	3,0	3,6	3,6	47,6	47,6
32X25	42,7	34,0	2,8	2,8	3,0	3,0	3,6	3,4	47,6	47,6
40X40	48,6	48,6	2,8	2,8	3,0	3,0	3,7	3,7	57,2	57,2
40X32	48,6	42,7	2,8	2,8	3,0	3,0	3,7	3,6	57,2	57,2
40X25	48,6	34,0	2,8	2,8	3,0	3,0	3,7	3,4	57,2	57,2
50X50	60,5	60,5	2,8	2,8	3,5	3,5	3,9	3,9	63,5	63,5
50X40	60,5	48,6	2,8	2,8	3,5	3,0	3,9	3,7	63,5	60,3
50X32	60,5	42,7	2,8	2,8	3,5	3,0	3,9	3,6	63,5	57,2
65X65	76,3	76,3	3,0	3,0	3,5	3,5	5,2	5,2	76,2	76,2
65X50	76,3	60,5	3,0	2,8	3,5	3,5	5,2	3,9	76,2	69,9
65X40	76,3	48,6	3,0	2,8	3,5	3,0	5,2	3,7	76,2	66,7
80X80	89,1	89,1	3,0	3,0	4,0	4,0	5,5	5,5	85,7	85,7
80X65	89,1	76,3	3,0	3,0	4,0	3,5	5,5	5,2	85,7	82,6
80X50	89,1	60,5	3,0	2,8	4,0	3,5	5,5	3,9	85,7	76,2
90X90	101,6	101,6	3,0	3,0	4,0	4,0	5,7	5,7	95,3	95,3
90X80	101,6	89,1	3,0	3,0	4,0	4,0	5,7	5,5	95,3	92,1
90X65	101,6	76,3	3,0	3,0	4,0	3,5	5,7	5,2	95,3	88,9
100X100	114,3	114,3	3,0	3,0	4,0	4,0	6,0	6,0	104,8	104,8
100X90	114,3	101,6	3,0	3,0	4,0	4,0	6,0	5,7	104,8	101,6
100X80	114,3	89,1	3,0	3,0	4,0	4,0	6,0	5,5	104,8	98,4
100X65	114,3	76,3	3,0	3,0	4,0	3,5	6,0	5,2	104,8	95,3
125X125	139,8	139,8	3,4	3,4	5,0	5,0	6,6	6,6	123,8	123,8
125X100	139,8	114,3	3,4	3,0	5,0	4,0	6,6	6,0	123,8	117,5
125X90	139,8	101,6	3,4	3,0	5,0	4,0	6,6	5,7	123,8	114,3
125X80	139,8	89,1	3,4	3,0	5,0	4,0	6,6	5,5	123,8	111,1
150X150	165,2	165,2	3,4	3,4	5,0	5,0	7,1	7,1	142,9	142,9
150X125	165,2	139,8	3,4	3,4	5,0	5,0	7,1	6,6	142,9	136,5
150X100	165,2	114,3	3,4	3,0	5,0	4,0	7,1	6,0	142,9	130,2
200X200	216,3	216,3	4,0	4,0	6,5	6,5	8,2	8,2	177,8	177,8
200X150	216,3	165,2	4,0	3,4	6,5	5,0	8,2	7,1	177,8	168,3
200X125	216,3	139,8	4,0	3,4	6,5	5,0	8,2	6,6	177,8	161,9
250X250	267,4	267,4	4,0	4,0	6,5	6,5	9,3	9,3	215,9	215,9
250X200	267,4	216,3	4,0	4,0	6,5	6,5	9,3	8,2	215,9	203,2
250X150	267,4	165,2	4,0	3,4	6,5	5,0	9,3	7,1	215,9	193,7
300X300	318,5	318,5	4,5	4,5	6,5	6,5	10,3	10,3	254,0	254,0
300X250	318,5	267,4	4,5	4,0	6,5	6,5	10,3	9,3	254,0	241,3
300X200	318,5	216,3	4,5	4,0	6,5	6,5	10,3	8,2	254,0	228,6

KS/JIS

Stainless Steel





· KS B 1543 / JIS B 2312 / JIS B 2313

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness T						Center to End	
	OD ₁	OD ₂	Sch 10s		Sch 20s		Sch 40s		C	M
			T ₁	T ₂	T ₁	T ₂	T ₁	T ₂		
350X350	355,6	355,6	4,8	4,8	8,0	8,0	11,1	11,1	279,4	279,4
350X300	355,6	318,5	4,8	4,5	8,0	6,5	11,1	10,3	279,4	269,9
350X250	355,6	267,4	4,8	4,0	8,0	6,5	11,1	9,3	279,4	257,2
350X200	355,6	216,3	4,8	4,0	8,0	6,5	11,1	8,2	279,4	247,7
400X400	406,4	406,4	4,8	4,8	8,0	8,0	12,7	12,7	304,8	304,8
400X350	406,4	355,6	4,8	4,8	8,0	8,0	12,7	11,1	304,8	304,8
400X300	406,4	318,5	4,8	4,5	8,0	6,5	12,7	10,3	304,8	295,3
400X250	406,4	267,4	4,8	4,0	8,0	6,5	12,7	9,3	304,8	282,6
450X450	457,2	457,2	4,8	4,8	8,0	8,0	14,3	14,3	342,9	342,9
450X400	457,2	406,4	4,8	4,8	8,0	8,0	14,3	12,7	342,9	330,2
450X350	457,2	355,6	4,8	4,8	8,0	8,0	14,3	11,1	342,9	330,2
450X300	457,2	318,5	4,8	4,5	8,0	6,5	14,3	10,3	342,9	320,7
500X500	508,0	508,0	5,5	5,5	9,5	9,5	15,1	15,1	381,0	381,0
500X450	508,0	457,2	5,5	4,8	9,5	8,0	15,1	14,3	381,0	368,3
500X400	508,0	406,4	5,5	4,8	9,5	8,0	15,1	12,7	381,0	355,6
500X350	508,0	355,6	5,5	4,8	9,5	8,0	15,1	11,1	381,0	355,6
550X550	558,8	558,8	5,5	5,5	-	-	-	-	419,1	419,1
550X500	558,8	508,0	5,5	5,5	-	-	-	-	419,1	406,4
550X450	558,8	457,2	5,5	4,8	-	-	-	-	419,1	393,7
550X400	558,8	406,4	5,5	4,8	-	-	-	-	419,1	381,0
600X600	609,6	609,6	6,4	6,4	-	-	-	-	431,8	431,8
600X550	609,6	558,8	6,4	5,5	-	-	-	-	431,8	431,8
600X500	609,6	508,0	6,4	5,5	-	-	-	-	431,8	431,8
600X450	609,6	457,2	6,4	4,8	-	-	-	-	431,8	419,1
750X750	762,0	762,0	7,9	7,9	-	-	-	-	558,8	558,8
750X600	762,0	609,6	7,9	6,4	-	-	-	-	558,8	533,4

Reducer

Sch10s, Sch20s, Sch40s



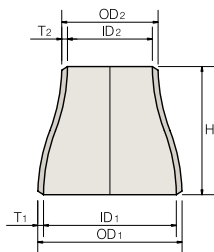
KS B 1543 / JIS B 2312 / JIS B 2313

Unit : mm

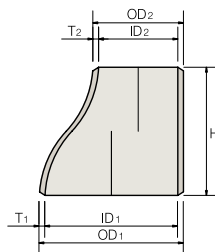
Nominal Pipe Size	Outside Diameter		Wall Thickness T						End to End H
	OD ₁	OD ₂	Sch 10s		Sch 20s		Sch 40s		
			T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	
25X20	34.0	27.2	2.8	2.1	3.0	2.5	3.4	2.9	50.8
25X15	34.0	21.7	2.8	2.1	3.0	2.5	3.4	2.8	50.8
32X25	42.7	34.0	2.8	2.8	3.0	3.0	3.6	3.4	50.8
32X20	42.7	27.2	2.8	2.1	3.0	2.5	3.6	2.9	50.8
40X32	48.6	42.7	2.8	2.8	3.0	3.0	3.7	3.6	63.5
40X25	48.6	34.0	2.8	2.8	3.0	3.0	3.7	3.4	63.5
40X20	48.6	27.2	2.8	2.1	3.0	2.5	3.7	2.9	63.5
50X40	60.5	48.6	2.8	2.8	3.5	3.0	3.9	3.7	76.2
50X32	60.5	42.7	2.8	2.8	3.5	3.0	3.9	3.6	76.2
50X25	60.5	34.0	2.8	2.8	3.5	3.0	3.9	3.4	76.2
65X50	76.3	60.5	3.0	2.8	3.5	3.5	5.2	3.9	88.9
65X40	76.3	48.6	3.0	2.8	3.5	3.0	5.2	3.7	88.9
65X32	76.3	42.7	3.0	2.8	3.5	3.0	5.2	3.6	88.9
80X65	89.1	76.3	3.0	3.0	4.0	3.5	5.5	5.2	88.9
80X50	89.1	60.5	3.0	2.8	4.0	3.5	5.5	3.9	88.9
80X40	89.1	48.6	3.0	2.8	4.0	3.0	5.5	3.7	88.9
90X80	101.6	89.1	3.0	3.0	4.0	4.0	5.7	5.5	101.6
90X65	101.6	76.3	3.0	3.0	4.0	3.5	5.7	5.2	101.6
90X50	101.6	60.5	3.0	2.8	4.0	3.5	5.7	3.9	101.6
100X90	114.3	101.6	3.0	3.0	4.0	4.0	6.0	5.7	101.6
100X80	114.3	89.1	3.0	3.0	4.0	4.0	6.0	5.5	101.6
100X65	114.3	76.3	3.0	3.0	4.0	3.5	6.0	5.2	101.6
100X50	114.3	60.5	3.0	2.8	4.0	3.5	6.0	3.9	101.6
125X100	139.8	114.3	3.4	3.0	5.0	4.0	6.6	6.0	127.0
125X90	139.8	101.6	3.4	3.0	5.0	4.0	6.6	5.7	127.0
125X80	139.8	89.1	3.4	3.0	5.0	4.0	6.6	5.5	127.0
125X65	139.8	76.3	3.4	3.0	5.0	3.5	6.6	5.2	127.0
150X125	165.2	139.8	3.4	3.4	5.0	5.0	7.1	6.6	139.7
150X100	165.2	114.3	3.4	3.0	5.0	4.0	7.1	6.0	139.7
150X90	165.2	101.6	3.4	3.0	5.0	4.0	7.1	5.7	139.7
150X80	165.2	89.1	3.4	3.0	5.0	4.0	7.1	5.5	139.7
200X150	216.3	165.2	4.0	3.4	6.5	5.0	8.2	7.1	152.4
200X125	216.3	139.8	4.0	3.4	6.5	5.0	8.2	6.6	152.4
200X100	216.3	114.3	4.0	3.0	6.5	4.0	8.2	6.0	152.4

KS/JIS

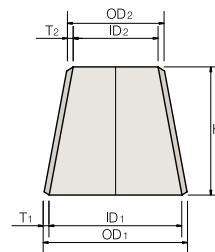
Stainless Steel



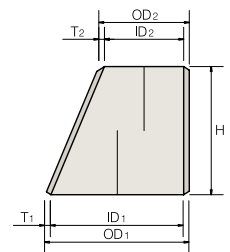
Concentric



Eccentric



Concentric



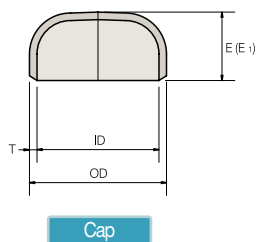
Eccentric

· KS B 1543 / JIS B 2312 / JIS B 2313

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness T						End to End H
	OD ₁	OD ₂	Sch 10s		Sch 20s		Sch 40s		
			T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	
250X200	267,4	216,3	4,0	4,0	6,5	6,5	9,3	8,2	177,8
250X150	267,4	165,2	4,0	3,4	6,5	5,0	9,3	7,1	177,8
250X125	267,4	139,8	4,0	3,4	6,5	5,0	9,3	6,6	177,8
250X100	267,4	114,3	4,0	3,0	6,5	4,0	9,3	6,0	177,8
300X250	318,5	267,4	4,5	4,0	6,5	6,5	10,3	9,3	203,2
300X200	318,5	216,3	4,5	4,0	6,5	6,5	10,3	8,2	203,2
300X150	318,5	165,2	4,5	3,4	6,5	5,0	10,3	7,1	203,2
300X125	318,5	139,8	4,5	3,4	6,5	5,0	10,3	6,6	203,2
350X300	355,6	318,5	4,8	4,5	8,0	6,5	11,1	10,3	330,2
350X250	355,6	267,4	4,8	4,0	8,0	6,5	11,1	9,3	330,2
350X200	355,6	216,3	4,8	4,0	8,0	6,5	11,1	8,2	330,2
350X150	355,6	165,2	4,8	3,4	8,0	5,0	11,1	7,1	330,2
400X350	406,4	355,6	4,8	4,8	8,0	8,0	12,7	11,1	355,6
400X300	406,4	318,5	4,8	4,5	8,0	6,5	12,7	10,3	355,6
400X250	406,4	267,4	4,8	4,0	8,0	6,5	12,7	9,3	355,6
400X200	406,4	216,3	4,8	4,0	8,0	6,5	12,7	8,2	355,6
450X400	457,2	406,4	4,8	4,8	8,0	8,0	14,3	12,7	381,0
450X350	457,2	355,6	4,8	4,8	8,0	8,0	14,3	11,1	381,0
450X300	457,2	318,5	4,8	4,5	8,0	6,5	14,3	10,3	381,0
450X250	457,2	267,4	3,8	4,0	8,0	6,5	14,3	9,3	381,0
500X450	508,0	457,2	5,5	4,8	9,5	8,0	15,1	14,3	508,0
500X400	508,0	406,4	5,5	4,8	9,5	8,0	15,1	12,7	508,0
500X350	508,0	355,6	5,5	4,8	9,5	8,0	15,1	11,1	508,0
500X300	508,0	318,5	5,5	4,5	9,5	6,5	15,1	10,3	508,0
550X500	558,8	508,0	5,5	5,5	-	-	-	-	508,0
550X450	558,8	457,2	5,5	4,8	-	-	-	-	508,0
550X400	558,8	406,4	5,5	4,8	-	-	-	-	508,0
600X550	609,6	558,8	6,4	5,5	-	-	-	-	508,0
600X500	609,6	508,0	6,4	5,5	-	-	-	-	508,0
600X450	609,6	457,2	6,4	4,8	-	-	-	-	508,0
750X600	762,0	609,6	7,9	6,4	-	-	-	-	609,6

Cap sch10s, sch20s, sch40s



· KS B 1543 / JIS B 2312 / JIS B 2313

Unit : mm

Nominal Pipe Size	Outside Diameter OD	Wall Thickness T			Cap		
		Sch 10s	Sch 20s	Sch 40s	E	E ₁	Limited Wall
15	21,7	2,1	2,5	2,8	25,4	-	-
20	27,2	2,1	2,5	2,9	25,4	-	-
25	34,0	2,8	3,0	3,4	38,1	-	-
32	42,7	2,8	3,0	3,6	38,1	-	-
40	48,6	2,8	3,0	3,7	38,1	-	-
50	60,5	2,8	3,5	3,9	38,1	44,5	5,5
65	76,3	3,0	3,5	5,2	38,1	50,8	7,0
80	89,1	3,0	4,0	5,5	50,8	63,5	7,6
90	101,6	3,0	4,0	5,7	63,5	76,2	8,1
100	114,3	3,0	4,0	6,0	63,5	76,2	8,6
125	139,8	3,4	5,0	6,6	76,2	88,9	9,5
150	165,2	3,4	5,0	7,1	88,9	101,6	11,0
200	216,3	4,0	6,5	8,2	101,6	127,0	12,7
250	267,4	4,0	6,5	9,3	127,0	152,4	12,7
300	318,5	4,5	6,5	10,3	152,4	177,8	12,7
350	355,6	4,8	8,0	11,1	165,1	190,5	12,7
400	406,4	4,8	8,0	12,7	177,8	203,2	12,7
450	457,2	4,8	8,0	14,3	203,2	228,6	12,7
500	508,0	5,5	9,5	15,1	228,6	254,0	12,7

KS/JIS

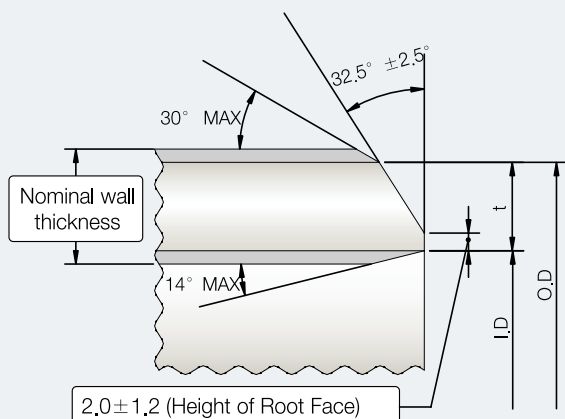
Stainless Steel

Engineering Data

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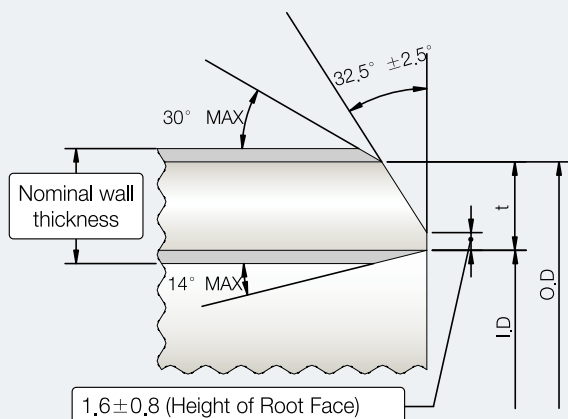
Engineering Data

Steel Butt-Welding Pipe Fittings for Ordinary Use



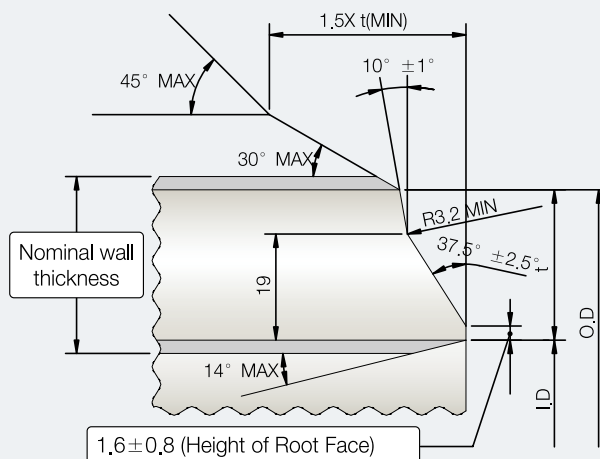
Steel Butt-Welding Pipe Fittings for Special Use

· KS B 1543 / JIS B 2312 / JIS B 2313



- In the Case Where T is 22.4mm or Less

Steel Butt-Welding Pipe Fittings for Special Use



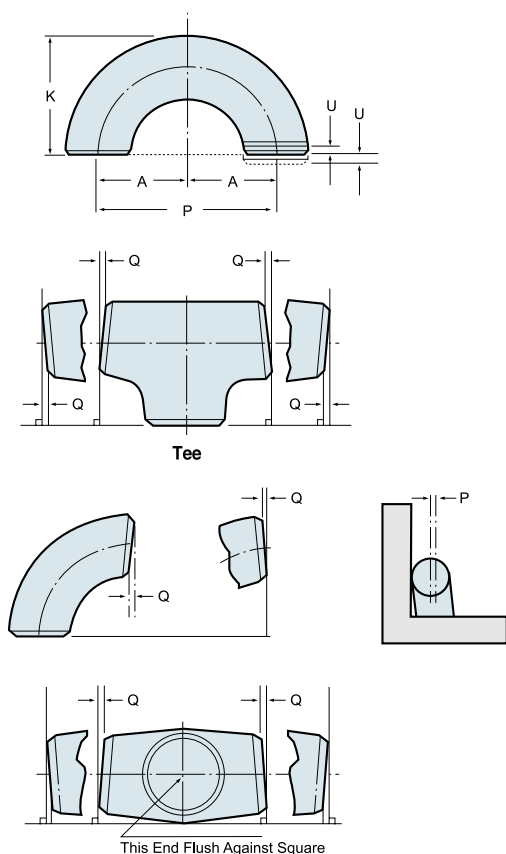
- In the Case Where T is Over 22.4mm

○ Dimensional Tolerances

ASME B16.9

1. Wrought Steel Butt Welding Fittings

All Fittings				90° and 45° Elbows	Tees	Reducers	Caps	180° Returns			
Nominal Pipe Size	Outside Diameter at Bevel OD	Inside Diameter at End ID	Wall Thickness T	Center-to-End Dimension A, B	Center-to-End Dimension C, M	End to End H	Back to Face E	Center-to-Center Dimension P	Back-to-Face Dimension K	Alignments of Ends K	
1/2 ~ 2 1/2	+0.06 - 0.03	±0.03	Not less than 87 1/2 % of nominal thickness	±0.06	±0.06	±0.06	±0.12	±0.25	±0.25	±0.03	
3 ~ 4	±0.06	±0.06					±0.25				
5 ~ 8	+0.09 - 0.06			±0.25	±0.38	±0.06					
10 ~ 18	+0.16 - 0.12	±0.12									
20 ~ 24	+0.25 - 0.19	±0.19		±0.12	±0.12	±0.19	±0.38	-	-	-	
26 ~ 30				±0.19	±0.19						
32 ~ 48				±0.19	±0.19						



Nominal Pipe Size	Angularity Tolerance	
	Off Angle Q	Off Plane P
1/2 ~ 4	0.03	0.06
5 ~ 8	0.06	0.12
10 ~ 12	0.09	0.19
14 ~ 16		0.25
18 ~ 24	0.12	0.38
26 ~ 30	0.19	
32 ~ 42		0.50
44 ~ 48		0.75

• Dimensions are in inches.

○ Dimensional Tolerances

KS / JIS

{ KS B 1543
JIS B 2311 }

1. Steel Butt-Welding Pipe Fittings for Ordinary Use

Item	Type of Pipe Fittling	Nominal Diameter				
		1/2 ~ 2 1/2	3~4	5~8	10~18	20
		Tolerance				
Outside Dia (OD)	All pipe Fitting	±20	±25	±35	+5.0 , - 4.5	+6.4 , - 4.8
Inside Dia (ID)		±20	±25	±35	±45	±48
Wall thickness (T)		+ Not specified 15%				
Center-to-end-dimension (A,B)	90° Elbow 45° Elbow	±20		±32		±48
Center-to-Center dimension (P)	180° Elbow	±64		±95		-
Back-to-face dimension (K)		±64				-
Alignment of ends(Max.) (U)		1.6		32		-
End-to-end dimension (H)	Reducer	±20		±32		
Center-to-end dimension (C)	Tee	±20		±32		
Back-to-face dimension (E)	CAP	±32		±64		

2. Steel Butt-Welding Pipe Fittings for Special Use and Steel Plate Butt-Welding Pipe Fittings

{ JIS B 2312
KS B 1543, JIS B 2313 }

Item	Type of Pipe Fitting	Nominal Diameter						
		1/2 ~ 2 1/2	3~4	5~8	10~18	20~24	26~30	32~36
		Tolerance						
Outside Dia999 (OD)	All pipe Fitting	+ 1.6 , - 0.8	±1.6	+ 2.4 , - 1.6	+4.0 , - 3.2	+ 6.4 , - 4.8		
Inside Dia999 (ID)		±0.8	±1.6		±3.2	±4.8		
Wall thickness (T)		+ Not specfied - 12.5%						
Center-to-end-dimension (A)	90° Elbow 45° Elbow	±1.6			±2.4		±3.2	±4.8
Center-to-Center dimension (P)	180° Elbow	±6.4			±9.5	-		
Back-to-face dimension (K)		±6.4			-			
Alignment of ends(Max.) (U)		*±0.8,**±1.6			*±1.6,**±3.2	-		
End-to-end dimension (H)	Reducer	±1.6			±2.4		±4.8	
Center-to-end dimension (C,M)	Tee	±1.6			±2.4		±3.2	±4.8
Outside of end Peripheral length	All Pipe Fitting	-					±0.5%	

* Application of JIS B 2312

** Application of KS B 1543, JIS B 2313

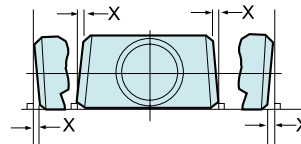
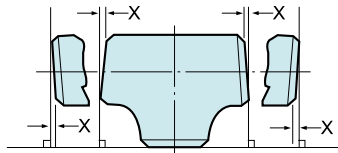
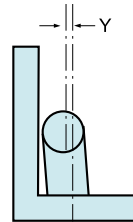
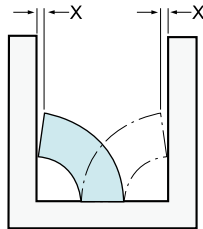
* Dimensions are in millimeters.

{ JIS B 2311 JIS B 2312 }
{ KS B 1543, JIS B 2313 }

3. Right Angle for Shaft-Center of Pipe Fittings

Item	Type of Pipe Fitting	Nominal Diameter							
		1/2 ~ 4	5~8	10~12	14~16	18~24	26~30	32~42	44~48
		Tolerance							
Off Angle(X)	Elbow Reducer Tee	0.8	1.6	2.4		3.2	4.8		
Off Plane(Y)	Elbow Tee	1.6	3.2	4.8	6.4	9.5		12.7	19.1

• Dimensions are in millimeters.

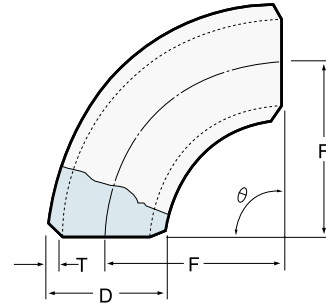


○ Approx' Weight Equation

1. ELBOW

$$W = 15.4864 \times \theta / 360 \times F \times T \times (D - T) \times 10^{-5}$$

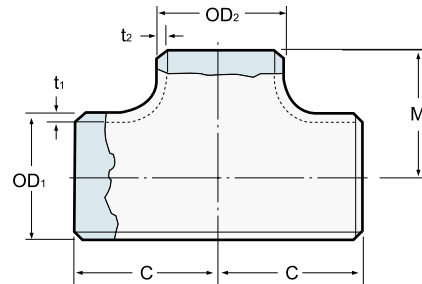
W = Weight(kg)
 F = Center to End(mm)
 D = Outside Diameter (mm)
 T = Wall Thickness (mm)
 θ = Angle



2.TEE

$$W = [0.02466\{2Ct_1(OD_1 - t_1) + t_2(OD_2 - t_2) \times (M - OD_1/2)\} \times 10^{-3} \times K]$$

W = Weight(kg)
 C = Center to End (mm)
 OD_1 = Outside Diameter (mm)
 t_1 = Wall Thickness (mm)
 OD_2 = Outside Diameter (mm)
 t_2 = Wall Thickness (mm)
 M = Center to End (mm)
 K = 1(PLATE)
 K = 1.363(PIPE)

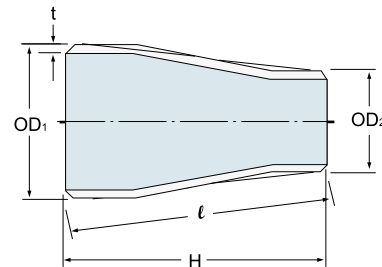


3. REDUCER

$$W = 1.232t_1 (OD_1 + OD_2 - 2t_1) l \times 10^{-5}$$

$$l = \frac{\sqrt{H^2 + (OD_1 - OD_2)^2}}{2}$$

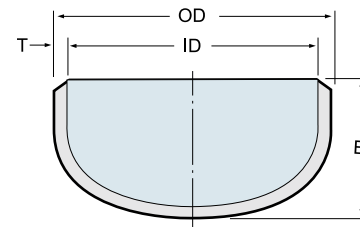
W = Weight(kg)
 H = End to End(mm)
 OD_1 = Large Size Outside Diameter (mm)
 OD_2 = Small Size
 t_1 = Wall Thickness (mm)



4. CAP

$$W = 7.85 \times \frac{\pi}{4} (OD + E)^2 \times T \times 10^{-6}$$

W = Weight(kg)
 OD = Outside Diameter (mm)
 T = Wall Thickness (mm)
 E = End to End(mm)





***NEWASIA continues its efforts for maximizing
the customer satisfactions.***

Butt-Welding Fittings Approx' Weight

90° Elbow

Unit : Kg

Nominal Pipe Size	Long							Short							Nominal Pipe Size
	SGP	STD	S40	X-S	S80	XX-S	S160	SGP	STD	S40	X-S	S80	XX-S	S160	
15	0.08	0.08	0.08	0.10	0.10	0.15	0.12	-	-	-	-	-	-	-	15
20	0.10	0.11	0.11	0.14	0.14	0.22	0.13	-	-	-	-	-	-	-	20
25	0.15	0.16	0.16	0.20	0.20	0.36	0.25	0.10	0.11	0.11	0.14	0.14	0.22	0.17	25
32	0.26	0.26	0.26	0.35	0.35	0.64	0.42	0.17	0.18	0.18	0.23	0.23	0.39	0.28	32
40	0.35	0.37	0.37	0.50	0.50	0.93	0.65	0.24	0.25	0.25	0.33	0.33	0.57	0.49	40
50	0.64	0.66	0.66	0.90	0.90	1.69	1.33	0.43	0.44	0.44	0.60	0.60	1.13	0.89	50
65	1.12	1.29	1.29	1.79	1.79	3.43	2.33	0.75	0.91	0.91	1.19	1.19	2.19	1.49	65
80	1.58	2.04	2.04	2.74	2.74	5.25	3.83	1.05	1.36	1.36	1.83	1.83	3.49	2.55	80
100	2.91	3.84	3.84	5.36	5.36	10.20	8.02	1.94	2.56	2.56	3.58	3.58	6.79	5.35	100
125	4.49	6.48	6.48	9.13	9.13	17.60	14.70	2.99	4.32	4.32	6.09	6.09	11.80	9.79	125
150	7.09	9.94	9.94	15.00	15.00	29.10	24.20	4.73	6.63	6.63	10.00	10.00	19.50	16.20	150
200	14.40	20.10	20.10	30.50	30.50	51.40	53.20	9.61	13.40	13.40	20.30	20.30	34.30	35.50	200
250	25.40	35.40	35.40	47.70	57.00	92.80	103.00	16.90	23.60	23.60	31.80	38.00	61.00	68.60	250
300	38.10	52.00	57.00	68.70	94.00	134.00	171.00	25.40	34.60	38.00	45.80	63.00	89.50	114.00	300
350	56.70	67.90	79.10	89.90	133.00	-	236.00	37.80	45.30	53.00	60.00	89.00	-	158.00	350
400	74.30	89.00	118.00	118.00	195.00	-	350.00	49.50	59.10	79.00	78.30	130.00	-	234.00	400
450	94.20	113.00	169.00	150.00	275.00	-	495.00	62.80	75.30	113.00	99.90	183.00	-	330.00	450
500	116.00	140.00	220.00	186.00	373.00	-	676.00	77.70	93.10	147.00	124.00	249.00	-	451.00	500
550	141.00	169.00	267.00	225.00	493.00	-	886.00	94.10	113.00	178.00	150.00	329.00	-	591.00	550
600	168.00	202.00	366.00	268.00	636.00	-	1160.00	112.00	135.00	244.00	179.00	424.00	-	773.00	600
650	198.00	237.00	430.00	315.00	-	-	-	132.00	158.00	287.00	210.00	-	-	-	650
700	230.00	276.00	500.00	367.00	-	-	-	154.00	184.00	334.00	245.00	-	-	-	700
750	264.00	316.00	575.00	421.00	-	-	-	176.00	211.00	383.00	281.00	-	-	-	750
800	301.00	361.00	654.00	480.00	-	-	-	201.00	241.00	436.00	320.00	-	-	-	800
850	340.00	408.00	739.00	543.00	-	-	-	227.00	272.00	493.00	362.00	-	-	-	850
900	380.00	457.00	904.00	608.00	-	-	-	253.00	304.00	603.00	405.00	-	-	-	900
950	425.00	510.00	-	679.00	-	-	-	283.00	340.00	-	453.00	-	-	-	950
1000	471.00	565.00	-	753.00	-	-	-	314.00	377.00	-	502.00	-	-	-	1000
1050	518.00	622.00	-	828.00	-	-	-	346.00	416.00	-	554.00	-	-	-	1050
1100	570.00	684.00	-	912.00	-	-	-	380.00	456.00	-	608.00	-	-	-	1100
1150	623.00	748.00	-	997.00	-	-	-	415.00	499.00	-	665.00	-	-	-	1150
1200	677.00	814.00	-	1085.00	-	-	-	452.00	543.00	-	724.00	-	-	-	1200
1250	735.00	884.00	-	1178.00	-	-	-	490.00	589.00	-	786.00	-	-	-	1250
1300	796.00	956.00	-	1305.00	-	-	-	530.00	637.00	-	870.00	-	-	-	1300
1350	857.00	1031.00	-	1375.00	-	-	-	572.00	688.00	-	917.00	-	-	-	1350
1400	926.00	1109.00	-	1480.00	-	-	-	616.00	740.00	-	976.00	-	-	-	1400
1450	991.00	1190.00	-	1588.00	-	-	-	661.00	794.00	-	1059.00	-	-	-	1450
1500	1060.00	1274.00	-	1700.00	-	-	-	707.00	849.00	-	1133.00	-	-	-	1500

45° Elbow

Unit : Kg

Nominal Pipe Size	Long						
	SGP	STD	S40	X-S	S80	XX-S	S160
15	0.04	0.04	0.04	0.06	0.05	-	-
20	0.05	0.06	0.06	0.07	0.07	-	-
25	0.08	0.08	0.08	0.10	0.10	0.18	0.13
32	0.13	0.13	0.13	0.18	0.18	0.32	0.21
40	0.18	0.19	0.19	0.25	0.25	0.47	0.33
50	0.32	0.33	0.33	0.45	0.45	0.85	0.67
65	0.60	0.69	0.69	0.90	0.90	1.72	1.17
80	0.79	1.02	1.02	1.37	1.37	2.68	1.92
100	1.46	1.92	1.92	2.68	2.68	5.09	4.01
125	2.25	3.24	3.24	4.57	4.57	8.80	7.35
150	3.55	4.97	4.97	7.50	7.50	14.50	12.10
200	7.20	10.10	10.10	15.30	15.30	25.70	26.60
250	12.70	17.70	17.70	23.90	28.50	41.00	51.50
300	19.00	26.00	28.50	34.40	47.00	65.00	85.50
350	28.40	34.00	40.10	45.00	66.50	-	118.00
400	37.20	44.50	59.00	59.00	97.50	-	175.00
450	47.10	56.50	84.50	75.50	138.00	-	247.00
500	58.30	70.00	110.00	93.00	187.00	-	338.00
550	70.50	84.50	-	113.00	257.00	-	443.00
600	84.10	101.00	183.00	134.00	318.00	-	580.00
650	99.00	119.00	-	158.00	-	-	-
700	115.00	138.00	-	184.00	-	-	-
750	132.00	158.00	-	211.00	-	-	-
800	150.00	180.00	327.00	240.00	-	-	-
850	170.00	204.00	369.00	272.00	-	-	-
900	190.00	228.00	452.00	304.00	-	-	-
950	212.00	255.00	-	339.00	-	-	-
1000	235.00	282.00	-	376.00	-	-	-
1050	259.00	311.00	-	414.00	-	-	-
1100	285.00	342.00	-	456.00	-	-	-
1150	312.00	374.00	-	498.00	-	-	-
1200	339.00	407.00	-	542.00	-	-	-

Cap

Unit : Kg

Nominal Pipe Size	SGP	STD	S40	X-S	S80	XX-S	S160
15	0.03	0.04	0.04	0.05	0.05	0.10	0.06
20	0.04	0.05	0.05	0.07	0.07	0.13	0.09
25	0.08	0.11	0.11	0.15	0.15	0.29	0.20
32	0.11	0.14	0.14	0.20	0.20	0.39	0.25
40	0.15	0.17	0.17	0.24	0.24	0.50	0.35
50	0.23	0.24	0.24	0.33	0.33	0.68	0.54
65	0.34	0.42	0.42	0.57	0.57	1.33	0.77
80	0.51	0.67	0.67	0.92	0.92	2.18	1.40
100	0.88	1.17	1.17	1.68	1.68	3.80	2.76
125	1.29	1.90	1.90	2.73	2.73	6.22	4.85
150	1.99	2.83	2.83	4.38	4.38	9.85	7.81
200	3.61	5.11	5.11	7.91	7.91	16.40	15.20
250	6.33	8.92	8.92	12.20	16.40	28.35	28.90
300	9.43	13.10	13.10	17.40	26.40	39.40	47.70
350	13.20	15.90	18.60	21.20	34.90	-	61.20
400	16.60	20.00	26.70	26.70	49.00	-	92.80
450	21.20	25.50	41.50	34.10	69.00	-	131.00
500	26.40	31.80	54.10	42.50	93.70	-	179.00
550	31.50	38.80	61.40	51.70	116.00	-	219.00
600	36.60	45.10	90.10	60.10	160.00	-	307.00
650	41.00	50.50	82.30	67.30	-	-	-
700	45.50	56.20	103.00	74.90	-	-	-
750	50.30	62.10	114.00	82.80	-	-	-
800	55.40	68.40	126.00	91.20	-	-	-
850	62.30	75.40	138.00	100.00	-	-	-
900	68.00	81.90	164.00	109.00	-	-	-
950	79.00	94.70	-	126.00	-	-	-
1000	95.00	102.00	-	137.00	-	-	-
1050	92.00	110.00	-	147.00	-	-	-
1100	103.00	126.00	-	167.00	-	-	-
1150	111.00	134.00	-	179.00	-	-	-
1200	118.00	143.00	-	191.00	-	-	-

Tee

Unit : Kg

Nominal Pipe Size	SGP	STD	S40	X-S	S80	XX-S	S160	Nominal Pipe Size	SGP	STD	S40	X-S	S80	XX-S	S160
15X15	0,09	0,09	0,09	0,11	0,11	0,17	0,12	450X450	70,00	83,90	125,00	111,00	204,00	-	356,00
20X20	0,13	0,13	0,13	0,17	0,17	0,26	0,21	450X400	67,90	81,40	121,00	108,00	197,00	-	352,00
20X15	0,12	0,12	0,12	0,16	0,16	0,24	0,19	450X350	66,90	80,20	119,00	106,00	194,00	-	344,00
25X25	0,24	0,25	0,25	0,32	0,32	0,53	0,41	450X300	65,40	78,30	117,00	104,00	189,00	-	337,00
25X20	0,23	0,24	0,24	0,30	0,30	0,49	0,38	450X250	63,40	76,90	114,00	102,00	186,00	-	329,00
25X15	0,22	0,23	0,23	0,29	0,29	0,47	0,37	500X500	86,60	104,00	163,00	138,00	277,00	-	502,00
32X32	0,42	0,43	0,43	0,56	0,56	0,95	0,69	500X450	84,20	101,00	158,00	134,00	268,00	-	488,00
32X25	0,39	0,40	0,40	0,53	0,53	0,89	0,65	500X400	82,10	98,40	154,00	131,00	262,00	-	475,00
32X20	0,37	0,37	0,37	0,48	0,48	0,84	0,62	500X350	81,10	97,20	152,00	129,00	258,00	-	469,00
32X15	0,36	0,36	0,36	0,47	0,47	0,81	0,59	500X300	79,20	96,00	150,00	127,00	254,00	-	462,00
40X40	0,58	0,61	0,61	0,81	0,81	1,40	1,07	500X250	77,60	94,00	147,00	125,00	250,00	-	452,00
40X32	0,56	0,59	0,59	0,78	0,78	1,35	1,01	500X200	76,30	92,10	145,00	123,00	245,00	-	444,00
40X25	0,53	0,56	0,56	0,74	0,74	1,28	0,97	550X550	106,00	126,00	198,00	167,00	365,00	-	657,00
40X20	0,51	0,53	0,53	0,70	0,70	1,21	0,92	550X500	103,00	123,00	193,00	163,00	356,00	-	640,00
40X15	0,49	0,51	0,51	0,67	0,67	1,17	0,90	550X450	101,00	120,00	188,00	159,00	347,00	-	624,00
50X50	0,86	0,88	0,88	1,20	1,20	2,16	1,78	550X400	98,90	117,00	183,00	156,00	340,00	-	610,00
50X40	0,80	0,82	0,82	1,11	1,11	2,00	1,63	600X600	116,00	139,00	252,00	185,00	438,00	-	800,00
50X32	0,77	0,79	0,79	1,07	1,07	1,91	1,56	600X550	115,00	138,00	249,00	183,00	432,00	-	790,00
50X25	0,73	0,75	0,75	1,01	1,01	1,81	1,50	600X500	114,00	136,00	247,00	181,00	427,00	-	782,00
50X20	0,70	0,71	0,71	0,98	0,98	1,76	1,45	600X450	111,00	133,00	241,00	177,00	418,00	-	764,00
65X65	1,42	1,74	1,74	2,28	2,28	3,92	2,86	650X650	147,00	176,00	319,00	234,00	-	-	-
65X50	1,31	1,56	1,56	2,06	2,06	3,56	2,64	650X600	144,00	172,00	312,00	229,00	-	-	-
65X40	1,25	1,51	1,51	1,98	1,98	3,40	2,48	650X550	141,00	169,00	308,00	225,00	-	-	-
65X32	1,22	1,48	1,48	1,94	1,94	3,32	2,42	650X500	138,00	166,00	302,00	221,00	-	-	-
65X25	1,18	1,36	1,36	1,80	1,80	3,22	2,36	700X700	165,00	198,00	359,00	264,00	-	-	-
80X80	1,87	2,41	2,41	3,25	3,25	5,90	4,55	700X650	163,00	197,00	356,00	261,00	-	-	-
80X65	1,79	2,29	2,29	3,07	3,07	5,53	4,23	700X600	160,00	193,00	350,00	256,00	-	-	-
80X50	1,68	2,12	2,12	2,85	2,85	5,18	4,02	700X550	157,00	190,00	347,00	252,00	-	-	-
80X40	1,62	2,06	2,06	2,77	2,77	5,03	3,87	750X750	190,00	228,00	414,00	304,00	-	-	-
80X32	1,60	2,02	2,02	2,74	2,74	4,95	3,80	750X700	188,00	226,00	406,00	301,00	-	-	-
100X100	3,13	4,12	4,12	5,77	5,77	10,60	8,50	750X650	185,00	222,00	356,00	296,00	-	-	-
100X80	2,92	3,93	3,93	5,33	5,33	9,76	7,92	750X600	182,00	218,00	350,00	291,00	-	-	-
100X65	2,84	3,71	3,71	5,15	5,15	9,39	7,56	800X800	217,00	259,00	474,00	347,00	-	-	-
100X50	2,72	3,53	3,53	4,94	4,94	9,02	7,34	800X750	213,00	256,00	466,00	341,00	-	-	-
100X40	2,66	3,48	3,48	4,83	4,83	8,87	7,23	800X700	209,00	252,00	458,00	335,00	-	-	-
125X125	4,53	6,54	6,54	9,20	9,20	17,30	14,80	800X650	208,00	250,00	455,00	333,00	-	-	-
125X100	4,30	6,13	6,13	8,63	8,63	16,10	13,70	850X850	246,00	295,00	535,00	393,00	-	-	-
125X80	4,08	5,83	5,83	8,19	8,19	15,30	13,00	850X800	243,00	292,00	526,00	389,00	-	-	-
125X65	4,00	5,71	5,71	8,01	8,01	15,00	12,80	850X750	238,00	290,00	518,00	380,00	-	-	-
125X50	3,90	5,58	5,58	7,92	7,92	14,70	12,50	850X700	236,00	288,00	511,00	377,00	-	-	-
150X150	6,84	9,58	9,58	15,40	15,40	27,20	23,30	900X900	276,00	331,00	656,00	441,00	-	-	-
150X125	6,45	9,08	9,08	13,60	13,60	25,60	21,90	900X850	271,00	329,00	645,00	434,00	-	-	-
150X100	6,23	8,67	8,67	13,00	13,00	24,50	20,80	900X800	269,00	326,00	636,00	431,00	-	-	-
150X80	6,01	8,38	8,38	12,60	12,60	23,70	20,10	900X750	264,00	323,00	627,00	422,00	-	-	-
150X65	5,92	8,36	8,36	12,50	12,50	23,30	19,80	950X950	308,00	370,00	-	493,00	-	-	-
200X200	12,80	17,90	17,90	27,10	27,10	45,70	47,20	950X900	306,00	367,00	-	489,00	-	-	-
200X150	11,90	16,60	16,60	25,20	25,20	43,00	43,50	950X850	302,00	362,00	-	481,00	-	-	-
200X125	11,50	16,10	16,10	24,30	24,30	41,40	42,10	950X800	298,00	357,00	-	476,00	-	-	-
200X100	11,30	15,70	15,70	23,70	23,70	41,00	40,30	1000X1000	342,00	411,00	-	547,00	-	-	-
250X250	21,80	30,40	30,40	41,00	49,00	79,20	88,00	1000X950	340,00	408,00	-	543,00	-	-	-
250X200	20,40	28,50	28,50	38,90	45,80	54,40	81,40	1000X900	335,00	402,00	-	536,00	-	-	-
250X150	19,50	27,20	27,20	37,00	43,90	71,50	78,50	1000X850	331,00	397,00	-	529,00	-	-	-
250X125	19,20	26,80	26,80	36,20	43,10	70,00	77,00	1050X1050	352,00	422,00	-	562,00	-	-	-
250X100	18,90	26,80	26,80	36,20	42,50	68,90	76,30	1050X1000	350,00	420,00	-	559,00	-	-	-
300X300	32,00	43,60	48,70	57,70	79,20	113,00	143,00	1050X950	348,00	418,00	-	557,00	-	-	-
300X250	30,40	41,60	45,30	55,20	74,80	104,00	135,00	1050X900	346,00	416,00	-	554,00	-	-	-
300X200	29,00	39,70	42,50	53,10	71,40	102,00	128,00	1100X1100	369,00	475,00	-	633,00	-	-	-
300X150	28,10	38,40	42,00	51,20	69,50	100,00	125,00	1100X1050	394,00	473,00	-	630,00	-	-	-
300X125	27,80	38,70	41,70	51,20	68,70	98,30	124,00	1100X1000	389,00	467,00	-	623,00	-	-	-
350X350	44,70	53,50	62,40	70,90	104,00	-	186,00	1100X950	385,00	462,00	-	616,00	-	-	-
350X300	42,70	51,90	60,20	68,80	100,00	-	179,00	1150X1150	434,00	521,00	-	695,00	-	-	-
350X250	41,20	49,90	57,60	66,30	95,90	-	174,00	1150X1100	432,00	519,00	-	691,00	-	-	-
350X200	40,00	48,20	55,80	64,50	92,90	-	168,00	1150X1050	427,00	513,00	-	683,00	-	-	-
350X150	39,00	47,10	54,50	62,60	91,00	-	164,00	1150X1000	423,00	507,00	-	676,00	-	-	-
400X400	55,20	66,10	88,00	87,70	145,00	-	260,00	1200X1200	474,00	569,00	-	759,00	-	-	-
400X350	54,20	64,90	86,00	86,10	140,00	-	255,00	1200X1150	472,00	566,00	-	755,00	-	-	-
400X300	52,70	63,10	84,00	83,60	136,00	-	248,00	1200X1100	470,00	564,00	-	751,00	-	-	-
400X250	51,20	61,30	82,00	81,20	132,00	-	241,00	1200X1050	462,00	555,00	-	739,00	-	-	-
400X200	49,40	59,80	79,00	80,00	129,00	-	235,00								
400X150	48,50	58,50	77,00	77,80	127,00	-	230,00								

Butt-Welding Fittings Approx' Weight

Reducer

Unit : Kg

Nominal Pipe Size	SGP	STD	S40	X-S	S80	XX-S	S160	Nominal Pipe Size	SGP	STD	S40	X-S	S80	XX-S	S160
20X15	0,06	0,06	0,06	0,08	0,08	-	-	550X500	52,10	62,40	98,00	82,90	181,00	-	-
25X20	0,11	0,12	0,12	0,15	0,15	0,25	0,19	550X450	49,50	59,40	93,20	78,90	172,00	-	-
25X15	0,10	0,11	0,11	0,14	0,14	0,22	0,17	550X400	47,00	56,40	88,40	74,80	164,00	-	-
32X25	0,16	0,16	0,16	0,21	0,21	0,35	0,25	550X350	45,30	54,30	83,60	72,10	156,00	-	-
32X20	0,15	0,15	0,15	0,19	0,19	0,31	0,23	600X550	57,10	68,40	124,00	91,00	215,00	-	-
32X15	0,13	0,14	0,14	0,18	0,18	-	-	600X500	54,80	65,70	119,00	87,30	206,00	-	-
40X32	0,24	0,25	0,25	0,33	0,33	0,57	0,43	600X450	52,60	63,00	114,00	83,80	197,00	-	-
40X25	0,21	0,22	0,22	0,30	0,30	0,50	0,38	600X400	50,40	60,50	109,00	80,30	185,00	-	-
40X20	0,20	0,21	0,21	0,27	0,27	0,45	0,35	650X600	74,50	89,40	162,00	119,00	-	-	-
40X15	0,18	0,18	0,18	0,24	0,24	0,40	0,32	650X550	71,50	85,80	155,00	114,00	-	-	-
50X40	0,37	0,38	0,38	0,51	0,51	0,91	0,75	650X500	68,50	82,10	148,00	109,00	-	-	-
50X32	0,35	0,36	0,36	0,48	0,48	0,85	0,70	650X450	66,30	79,50	142,00	106,00	-	-	-
50X25	0,31	0,33	0,33	0,44	0,44	0,77	0,64	700X650	80,60	96,60	175,00	129,00	-	-	-
50X20	0,29	0,30	0,30	0,40	0,40	0,69	0,58	700X600	77,50	93,00	168,00	124,00	-	-	-
65X50	0,60	0,73	0,73	0,95	0,95	1,68	1,20	700X550	74,50	89,40	162,00	119,00	-	-	-
65X40	0,55	0,67	0,67	0,87	0,87	1,51	1,08	700X500	72,40	86,80	155,00	115,00	-	-	-
65X32	0,52	0,64	0,64	0,83	0,83	1,42	1,02	750X700	86,60	104,00	188,00	138,00	-	-	-
65X25	0,48	0,56	0,56	0,73	0,73	1,23	0,93	750X650	83,60	100,00	182,00	133,00	-	-	-
80X65	0,73	0,94	0,94	1,25	1,25	2,25	1,71	750X600	80,60	96,60	175,00	129,00	-	-	-
80X50	0,66	0,85	0,85	1,13	1,13	2,01	1,57	750X550	78,50	94,20	168,00	125,00	-	-	-
80X40	0,62	0,79	0,79	1,04	1,04	1,83	1,44	800X750	92,60	111,00	202,00	148,00	-	-	-
80X32	0,59	0,75	0,75	1,00	1,00	1,74	1,37	800X700	89,60	108,00	195,00	143,00	-	-	-
100X80	1,10	1,45	1,45	2,02	2,02	3,65	3,00	800X650	86,60	104,00	188,00	138,00	-	-	-
100X65	1,04	1,37	1,37	1,90	1,90	3,41	2,76	800X600	84,60	102,00	184,00	135,00	-	-	-
100X50	0,97	1,27	1,27	1,76	1,76	3,11	2,58	850X800	98,70	118,00	215,00	158,00	-	-	-
100X40	0,91	1,19	1,19	1,64	1,64	2,89	2,41	850X750	95,60	115,00	208,00	153,00	-	-	-
125X100	1,74	2,50	2,50	3,52	3,52	6,47	5,59	850X700	92,60	111,00	205,00	148,00	-	-	-
125X80	1,58	2,27	2,27	3,18	3,18	5,78	5,30	850X650	90,70	109,00	200,00	145,00	-	-	-
125X65	1,50	2,16	2,16	3,02	3,02	5,46	4,70	900X850	104,60	125,60	250,00	167,30	-	-	-
125X50	1,41	2,03	2,03	2,85	2,85	5,12	4,43	900X800	101,60	122,00	243,00	162,40	-	-	-
150X125	2,55	3,57	3,57	5,38	5,38	9,89	8,63	900X750	98,60	118,40	238,00	157,60	-	-	-
150X100	2,36	3,30	3,30	4,96	4,96	8,98	7,88	900X700	95,60	114,70	234,00	152,80	-	-	-
150X80	2,18	3,04	3,04	4,56	4,56	8,21	7,21	950X900	112,00	133,00	-	177,00	-	-	-
150X65	2,09	2,94	2,94	4,38	4,38	7,88	6,80	950X850	108,00	129,00	-	172,00	-	-	-
200X150	4,17	5,71	5,71	8,63	8,63	14,30	15,00	950X800	105,00	126,00	-	167,00	-	-	-
200X125	3,87	5,40	5,40	8,14	8,14	13,40	14,00	950X750	103,00	124,00	-	165,00	-	-	-
200X100	3,67	5,10	5,10	7,68	7,68	12,60	13,10	1000X950	117,00	140,00	-	187,00	-	-	-
250X200	6,87	9,58	9,58	12,90	15,40	24,30	27,50	1000X900	114,00	137,00	-	182,00	-	-	-
250X150	6,32	8,78	8,78	11,80	14,20	22,10	25,10	1000X850	111,00	133,00	-	177,00	-	-	-
250X125	6,06	8,42	8,42	11,30	14,50	21,10	23,90	1000X800	109,00	131,00	-	174,00	-	-	-
250X100	5,80	8,20	8,20	11,00	14,00	20,50	22,60	1050X1000	123,00	147,00	-	196,00	-	-	-
300X250	9,97	13,60	14,70	18,00	24,80	35,00	44,60	1050X950	120,00	144,00	-	192,00	-	-	-
300X200	9,29	12,70	13,70	16,70	22,70	33,00	41,00	1050X900	117,00	140,00	-	187,00	-	-	-
300X150	8,69	11,80	12,80	15,60	21,40	32,00	38,00	1050X850	115,00	138,00	-	184,00	-	-	-
300X125	8,39	11,70	12,60	15,30	20,60	31,00	36,40	1100X1050	129,00	155,00	-	206,00	-	-	-
350X300	21,20	25,40	29,50	33,60	49,80	-	88,50	1100X1000	126,00	151,00	-	201,00	-	-	-
350X250	19,70	23,60	27,40	31,20	46,10	-	81,60	1100X950	123,00	147,00	-	196,00	-	-	-
350X200	18,30	21,80	25,40	28,90	42,20	-	74,70	1100X900	121,00	146,00	-	194,00	-	-	-
350X150	16,90	20,30	23,60	26,80	39,10	-	68,30	1150X1100	157,00	189,00	-	252,00	-	-	-
400X350	25,90	31,00	41,10	41,10	67,70	-	121,00	1150X1050	154,00	185,00	-	246,00	-	-	-
400X300	24,10	29,60	39,20	39,20	65,00	-	116,00	1150X1000	150,00	180,00	-	241,00	-	-	-
400X250	22,40	27,80	36,80	36,80	60,80	-	108,00	1150X950	148,00	178,00	-	237,00	-	-	-
400X200	21,70	26,20	34,50	34,50	56,60	-	99,90	1200X1150	164,00	197,00	-	263,00	-	-	-
450X400	31,50	37,80	56,20	50,10	91,40	-	165,00	1200X1100	161,00	193,00	-	257,00	-	-	-
450X350	29,80	35,70	53,00	47,40	86,40	-	155,00	1200X1050	157,00	189,00	-	252,00	-	-	-
450X300	27,70	33,20	51,70	44,00	83,00	-	149,00	1200X1000	155,00	186,00	-	248,00	-	-	-
450X250	27,10	32,70	48,40	43,20	78,50	-	140,00								
500X450	47,00	56,40	88,40	74,90	150,00	-	-								
500X400	44,70	53,50	83,90	71,10	142,00	-	-								
500X350	42,40	50,80	79,60	67,40	136,00	-	233,00								
500X300	40,80	49,20	76,90	65,10	130,00	-	-								

Stainless Steel Fittings

Unit : Kg

Nominal Pipe Size	90° Elbow (L)		90° Elbow (S)		Tee		Reducer		Cap	
	Sch 10s	Sch 20s	Sch 10s	Sch 20s	Sch 10s	Sch 20s	Sch 10s	Sch 20s	Sch 10s	Sch 20s
15	0,06	0,07	-	-	0,07	0,08	-	-	0,03	0,03
20	0,06	0,09	-	-	0,10	0,11	0,04	0,05	0,04	0,04
25	0,13	0,14	0,08	0,09	0,20	0,22	0,09	0,10	0,09	0,10
32	0,20	0,22	0,13	0,15	0,33	0,36	0,12	0,13	0,11	0,12
40	0,28	0,30	0,19	0,20	0,46	0,50	0,18	0,20	0,13	0,14
50	0,47	0,59	0,31	0,39	0,63	0,79	0,27	0,34	0,17	0,21
65	0,79	0,94	0,52	0,63	1,00	1,18	0,43	0,50	0,23	0,28
80	1,16	1,51	0,77	1,00	1,38	1,78	0,52	0,69	0,37	0,48
100	2,00	2,60	1,33	1,74	2,15	2,80	0,80	1,04	0,59	0,78
125	3,46	4,97	2,31	3,31	3,48	5,01	1,33	1,92	0,99	1,44
150	4,96	7,09	3,31	4,73	4,75	6,83	1,78	2,55	1,39	1,99
200	9,55	15,90	6,37	10,70	8,43	14,30	2,72	4,56	2,38	4,05
250	16,60	25,00	11,10	16,70	14,20	21,50	4,49	6,77	4,13	6,23
300	25,80	35,70	17,20	23,90	21,60	30,20	6,78	9,40	6,39	8,89
350	34,60	56,90	23,10	37,80	27,30	44,80	13,00	21,20	7,99	13,20
400	45,30	74,50	30,20	49,50	33,70	55,20	15,80	25,90	10,10	16,70
450	57,40	94,50	38,30	62,80	42,70	70,00	19,20	29,80	12,90	21,30
500	82,10	142,00	54,70	95,00	61,00	104,00	33,10	56,00	18,50	31,80
550	99,50	170,00	66,30	114,00	74,10	126,20	36,70	62,50	22,60	38,80
600	136,00	202,00	90,40	135,00	93,90	139,40	46,00	68,60	30,10	45,10

Comparison of ASTM Specifications and Similar Standards

Steel Composition	ASTM Specification and Grade				KS Specification and Grade		
	Marking symbol	Pipe	Plate	forging	Marking symbol	Pipe	Plate
Carbon Steel	-	A120	A283-A	-	SPP	SPP	SB41
	-	A53-B	A284	-	PS38(W), PS38, PT38(W), PT38	SPPS38	SWS41B
	-	A53-B	A284	-	PS42(W), PS42, PT42(W), PT42	SPPS42	SWS41B
					HT38, HT38(W)	SPHT38	SBB42
	WPB	A106-B	A512-60 or 70 A516-60 or 70	A105	HT42, HT42(W)	SPHT42	SBB42
	WPC	A106-C	A515-70 A516-70	A105	HT49, HT49(W)	SPHT49	SBB49
Low Temperature Steel	WPL6	A333 and A334-6	A516-60	A350-LF2	PL39	STPL39	SLAL39
	WPL3	A333 and A334-3	A203-D	A350-LF3	-	-	-
	WPL9	A333 and A334-9	A203-A	A350-LF9	-	-	-
Alloy Steel	WP1	A335-P1	A203-B	A182-F1	PA12, FA12	SPA12	SBB46M
	WP12	A335-P12	A387-12	A182-F12	PA22, FA22	SPA22	SCMV2
	WP11	A335-P11	A387-11	A182-F11	PA23, FA23	SPA23	SCMV3
	WP22	A335-P22	A387-22	A182-F22	PA24, FA24	SPA24	SCMV4
	WP5	A335-P5	A387-5	A182-F5	PA25, FA25	SPA25	SCMV6
	WP7	A335-P7	A387-7	A182-F7	-	-	-
	WP9	A335-P9	A387-9	A182-F9	-	-	-
	WP91	A335-P91	A387-91	A182-F91	-	-	-
Stainless Steel	WP304	A312-TP304	A240-Type 304	A182-F304	STS304, STS304W, STS304F	STS304TP	STS304
	WP304H	A312-TP304H	A240-Type 304H	A182-F304H	-	-	-
	WP304L	A312-TP304L	A240-Type 304L	A182-F304L	STS304L, STS304LW, STS304LF	STS304LTP	STS304L
	WP309	A312-TP309	A240-Type 309S	-	STS309S, STS309SW, STS309SF	STS309STP	STS309S
	WP310	A312-TP310	A240-Type 310S	A182-F310	STS310S, STS310SW, STS310SF	STS310STP	STS310S
	WP316	A312-TP316	A240-Type 316	A182-F316	STS316, STS316W, STS316F	STS316TP	STS316
	WP316H	A312-TP316H	A240-Type 316H	A182-F316H	STS316H, STS316HF	STS316HTP	-
	WP316L	A312-TP316L	A240-Type 316L	A182-F316L	STS316L, STS316LW, STS316LF	STS316LTP	STS316L
	WP317L	A312-TP317L	A240-Type 317L	A182-F317L	STS317L, STS317LW	STS317LTP	STS317L
	WP321	A312-TP321	A240-Type 321	A182-F321	STS321, STS321W, STS321F	STS321TP	STS321
	WP321H	A312-TP321H	A240-Type 321H	A182-F321H	-	-	-
	WP347	A312-TP347	A240-Type 347	A182-F347	STS347, STS347W, STS347F	STS347TP	STS347
	WP347H	A312-TP347H	A240-Type 347H	A182-F347H	STS347H, STS347HF	STS347HTP	-

JIS Specification and Grade			B.S. Specification and grade	DIN Specification and grade	Steel Composition
Marking symbol	Pipe	Plate	Pipe	Pipe	
FSGP or SGP	SGP(STPY400)	SS400	1387-M	2440-ST33-1	Carbon Steel
PG370(W), PS370(W), PT370(W), PT370	STPG370	SM41B	3602-ERW23	1626-ST37	Carbon Steel
PG410(W), PS410(W), PT410(W), PT410	STPG410	SM41B	3602-ERW27	-	Carbon Steel
PS370, PT370(W)	STPT370	SB42	3602-ERW23	17175-ST35.8	Carbon Steel
PS410, PT410(W)	STPT410	SB42	3602-ERW27	17175-ST45.8	Carbon Steel
PS480, PT480(W)	STPT480	SB49	3602-ERW35	-	Carbon Steel
PL380(W)	STPL380	-	3603-Steel 27 LT30	-	Carbon Steel
PL450(W)	STPL450	-	3603-Steel 503 LT100	-	31/2% Ni Steel
PL690(W)	STPL690	-	-	-	3% Ni-1% Cu Steel
PA12(W), FA12	STPA12	-	-	17175-15 Mo3	Carbon-Molybdenum Steel
PA22(W), FA22	STPA22	-	3603-HF620	17175-13 Cr Mo44	1% Cr-1/2% Molybdenum Steel
PA23(W), FA23	STPA23	-	3603-HF621	-	11/4% Cr-1/2% Molybdenum Steel
PA24(W), FA24	STPA24	SCMV4	3603-HF622u	17175-10 Cr Mo910	21/4% Cr-1% Molybdenum Steel
PA25(W), FA25	STPA25	-	3603-HF625	-	5% Cr-1/2% Molybdenum Steel
-	-	-	-	-	7% Cr-1/2% Molybdenum Steel
PA26(W), FA26	STPA26	-	-	-	9% Cr-1% Molybdenum Steel
-	-	-	-	-	9% Cr-1% Mo-0.2%V+Cb+N
SUS304, SUS304W, SUS304F	SUS304TP	SUS304	3605-801	17440-X5 Cr Ni189	18% Cr-8% Ni Steel
SUS304H, SUS304HF	SUS304HTP	-	3605-811	-	18% Cr-8% Ni-(0.04-0.10)% C Steel
SUS304L, SUS304LW	SUS304LTP	SUS304L	3605-811L	17440-X2 Cr Ni189	18% Ni-0.035% C Steel
SUS309S, SUS309SW, SUS309SF	SUS309STP	SUS309S	-	-	22% Cr-12% Ni Steel
SUS310S, SUS310SW, SUS310SF	SUS310STP	SUS310S	3605-805S	-	25% Cr-20% Ni Steel
SUS316, SUS316W, SUS316F	SUS316TP	SUS316	3605-845	17440-X5 Cr Ni Mo1810	18% Cr-8% Ni-Mo Steel
SUS316H, SUS316HF	SUS316HTP	-	3605-855	-	18% Cr-8% Ni-Mo(0.04-0.10)% C Steel
SUS316L, SUS316LW	SUS316LTP	SUS316L	3605-845L	17440-X2 Cr Ni Mo1810	18% Cr-8% Ni-Mo-0.035% C Steel
SUS317L	SUS317LTP	SUS317L	-	-	18% Cr-12% Ni-3.5% Mo-Low C
SUS321, SUS321W, SUS321F	SUS321TP	SUS321	3605-822Ti	17440-X10 Cr Ni Ti189	18% Cr-8% Ni-Ti Steel
SUS321H, SUS321HF	SUS321HTP	-	3605-832Ti	-	18% Cr-8% Ni Ti(0.04-0.10)% C Steel
SUS347, SUS347W, SUS347F	SUS347TP	SUS347	3605-822Nb	17440-X1 Cr Ni Nb189	18% Cr-8% Ni-Cb+Ta Steel
SUS347H, SUS347HF	SUS347HTP	-	3605-832Nb	-	18% Cr-8% Ni-Cb+Ta(0.04-0.10)% C Steel

Materials Specifications for Butt-Welding Fittings ASTM Materials

Marking Symbol		Materials	Form	Chemical Composition(Percent)					
				Max. or Range(Unless otherwise indicated)					
				C	Si	Mn	P	S	Ni
A234	WPB	A106 Gr. B	P	0.30	0.10 Min.	0.29-1.06	0.050	0.058	0.40 Max
		A515 Gr.65	PL	0.28-0.33	0.13-0.33	0.90	0.035	0.040	-
		A515 Gr.70	PL	0.31-0.35	0.13-0.33	0.90	0.035	0.040	-
	WPC	A106 Gr. C	P	0.35	0.10 Min.	0.29-1.06	0.050	0.058	0.40 Max
Alloy	WP1	A335 Gr. P1	P	0.28	0.10-0.50	0.30-0.90	0.045	0.045	-
		A 204 Gr. B	PL	0.20-0.27	0.13-0.32	0.90	0.035	0.040	-
	WP12	A335 Gr. P12	P	0.05-0.15	0.50-1.00	0.30-0.60	0.045	0.045	-
		A387 Gr.12	PL	0.17	0.13-0.32	0.36-0.69	0.035	0.040	-
	WP11	A335 Gr. P11	P	0.05-0.15	0.50-1.00	0.30-0.60	0.030	0.030	-
		A387 Gr.11	PL	0.17	0.44-0.86	0.36-0.69	0.035	0.040	-
	WP22	A335 Gr. P22	P	0.05-0.15	0.50	0.30-0.60	0.040	0.040	-
		A387 Gr. 22	PL	0.15-0.17	0.50	0.27-0.63	0.035	0.035	-
	WP5	A335 Gr. P5	P	0.15	0.50	0.30-0.60	0.040	0.030	-
		A387 Gr.5	PL	0.15	0.50	0.27-0.63	0.040	0.030	-
	WP9	A335 Gr.9	P	0.15	0.25-1.00	0.30-0.60	0.040	0.030	-
		A387 Gr.9	PL	0.15	1.00	0.30-0.60	0.030	0.030	0.400
A403	WP304	A312 Gr. TP304	P	0.08	1.00	2.00	0.045	0.030	8.00-10.05
		A240 Type 304	PL	0.08	0.75	2.00	0.045	0.030	8.00-11.00
	WP304H	A312 Gr. TP304H	P	0.04-0.10	1.00	2.00	0.045	0.030	8.00-10.50
		A240 Type 304H	PL	0.04-0.10	0.75	2.00	0.045	0.030	8.00-13.00
	WP304L	A312 Gr. TP304L	P	0.035	1.00	2.00	0.045	0.030	8.00-12.00
		A240 Type 304L	PL	0.030	0.75	2.00	0.045	0.030	12.00-15.00
	WP309S	A312 Gr. TP309S	P	0.08	1.00	2.00	0.045	0.030	12.00-15.00
		A240 Type 309S	PL	0.08	0.75	2.00	0.045	0.030	19.00-22.00
	WP310S	A312 Gr. TP310S	P	0.08	1.00	2.00	0.045	0.030	19.00-22.00
		A240 Type 310S	PL	0.08	0.75	2.00	0.045	0.030	11.00-14.00
	WP316	A312 Gr. TP316	P	0.08	1.00	2.00	0.045	0.030	10.00-14.00
		A240 Type 316	PL	0.08	0.75	2.00	0.045	0.030	11.00-14.00
	WP316H	A312 Gr. TP316H	P	0.04-0.10	1.00	2.00	0.045	0.030	10.00-14.00
		A240 Type 316H*	PL	0.04-0.10	0.75	2.00	0.045	0.030	10.00-15.00
	WP316L	A312 Gr. TP316L	P	0.035	1.00	2.00	0.045	0.030	10.00-14.00
		A240 Type 316L	PL	0.030	0.75	2.00	0.045	0.035	11.00-14.00
	WP317L	A312 Gr. TP317L	P	0.035	1.00	2.00	0.045	0.030	11.00-15.00
		A240 Type 317L	PL	0.030	0.75	2.00	0.045	0.030	9.00-12.00
A420	WPL6	A333 and A334 Gr.6	P	0.30	0.10 Min.	0.29-1.06	0.025	0.025	-
		A516 Gr.60	PL	0.21-0.27	0.13-0.33	0.60-1.25	0.035	0.040	3.18-3.82
	WPL3	A333 and A334 Gr.3	P	0.19	0.18-0.37	0.31-0.64	0.025	0.025	3.18-3.82
		A516 Gr.D	PL	0.17-0.20	0.13-0.32	0.70-0.80	0.035	0.040	1.60-2.24
	WPL9	A333 and A334 Gr.9	P	0.20	-	0.40-1.06	0.025	0.025	2.10-2.50
		A516 Gr.A	PL	0.17	0.15-0.40	0.70	0.035	0.040	4.50-6.50
A815	S31803	A790 S31803	P	0.030	1.0	2.0	0.030	0.020	6.0-8.0
		A240 S31803	PL	0.030	0.8	1.2	0.035	0.020	6.00-8.00
	S32750	A790 S32750	P	0.05	1.00	1.00	0.030	0.010	-
		A240 S32750	PL	0.030	0.8	1.2	0.035	0.020	6.00-8.00
A860	WPHY42	API 5L Gr.X42	P	0.28	-	1.25	0.04	0.05	-
		A572 Gr.42	PL	0.28	-	1.25	0.04	0.05	-
	WPHY60	API 5L Gr.X60	P	0.26	-	1.35	0.04	0.05	-
		A572 Gr.60	PL	0.26	-	1.35	0.04	0.05	-
	WPHY65	API 5L Gr.X65	P	0.26	-	1.40	0.04	0.05	-
		A572 Gr.65	PL	0.26	-	1.40	0.04	0.05	-

Chemical Composition(Percent)			Other Elements	Mechanical				Marking Symbol
Max. or Range(Unless otherwise indicated)				tensile Strength Min. or Range Ksi(Mpa)		Yied Strength Min. Ksi(Mpa)	Longitudinal Elongation in 2 in(50mm) Min. %	
Cr	Mo	Ti						
-	0.15Max	-	-	60-95	(415-655)	35(240)	30	WPB
-	-	-	-	65-85	(450-585)	35(240)	30	
-	-	-	-	70-90	(485-620)	38(260)	30	
-	0.15Max	-	-	70-95	(483)	40(275)	30	WPC
0.80-1.25	0.44-0.65	-	-	55-80	(379)	30(205)	30	WP1
0.74-0.21	0.41-0.64	-	-	70-90	(485-620)	40(275)	30	
1.00-1.50	-	-	-	60-85	(414)	32(220)	30	WP12
0.94-1.56	0.40-0.65	-	-	56-80	(380-550)	33(230)	30	
1.90-2.60	0.40-0.65	-	-	60	(414)	30(205)	30	WP11
1.88-2.62	0.40-0.70	-	-	60-85	(415-585)	35(240)	30	
4.00-6.00	0.87-1.13	-	-	60	(414)	30(205)	30	WP22
4.00-6.00	0.85-1.15	-	-	60-85	(415-585)	30(205)	30	
8.00-10.00	0.45-0.65	-	-	60	(414)	30(207)	30	WP5
8.00-10.00	0.40-0.70	-	-	60-85	(415-585)	30(205)	30	
8.00-9.50	0.90-1.10	-	-	60	(414)	30(205)	30	WP9
8.00-9.50	0.90-1.10	-	-	60-85	(415-585)	30(205)	30	
18.00-20.00	0.85-1.05	-	V:0.18-0.25 Cb:0.06-10	85	585	60(415)	-	WP91
18.00-20.00	0.85-1.05	-	N:0.030-0.070 Al:0.04	85-110	585-760	60(415)	20	
18.00-20.00	-	-	-	75	(515)	30(205)	30	WP304
18.00-20.00	-	-	-	75	(515)	30(205)	40	
18.00-20.00	-	-	-	75	(517)	30(205)	35	WP304H
18.00-20.00	-	-	-	75	(515)	30(205)	40	
22.00-24.00	-	-	-	70	(485)	30(205)	30	WP304L
22.00-24.00	-	-	-	70	(485)	30(205)	40	
24.00-26.00	-	-	-	75	(515)	30(205)	30	WP309
24.00-26.00	-	-	-	75	(515)	30(205)	40	
16.00-18.00	-	-	-	75	(515)	30(205)	30	WP310S
16.00-18.00	-	-	-	75	(515)	30(205)	40	
16.00-18.00	2.00-3.00	-	-	75	(515)	30(205)	35	WP316
16.00-18.00	2.00-3.00	-	-	75	(515)	30(205)	40	
16.00-18.00	2.00-3.00	-	-	75	(485)	30(205)	35	WP316H
16.00-18.00	2.00-3.00	-	-	75	(485)	30(205)	40	
18.00-20.00	2.00-3.00	-	-	70	(515)	25(170)	35	WP316L
18.00-20.00	2.00-3.00	-	-	70	(515)	25(170)	40	
17.00-19.00	3.00-4.00	-	-	75	(515)	30(205)	35	WP317L
17.00-19.00	3.00-4.00	-	N:0.10	75	(550)	35(205)	40	
17.00-20.00	-	5 x C-0.60	-	70	(483)	30(205)	35	WP321
17.00-19.00	-	5 x C-0.70	-	65	(448)	30(205)	40	
17.00-20.00	-	4 x C-0.60	-	75	(515)	30(205)	35	WP321H
17.00-19.00	-	4 x C-0.70	-	75	(515)	30(205)	40	
17.00-19.00	-	-	Ca+Ta10 x C-0.100	75	(515)	30(205)	35	WP347
17.00-19.00	-	-	Ca+Ta10 x C-1.00	75	(515)	30(205)	40	
19.50-20.50	-	-	Ca+Ta10 x C-0.100	75	(517)	30(205)	30	WP347H
-	-	-	Ca+Ta8 x C-1.00	75	(515)	30(205)	40	
-	6.00-6.50	-	N:0.18-0.22 Cu:0.50-1.00	94-119	(650-820)	44(300)	35	S31254
-	-	-	-	60	(141)	35(241)	30	WPL6
-	-	-	-	60-80	(415-550)	35(222)	25	
-	-	-	-	65	(448)	35(241)	30	WPL3
-	-	-	-	65-85	(450-585)	37(255)	23	
21.00-23.00	-	-	Cu:0.75-1.25	65	(435)	46(315)	28	WPL8
-	-	-	-	65-85	(450-585)	37(255)	23	
24.00-26.00	2.50-3.50	-	N:0.08-0.20	90	620	65(450)	25	S31803
24.00-26.00	3.00-5.00	-	N:0.24-0.32 Cu:0.5	116	795	80(550)	15	S32750
-	3.00-4.00	N : 0.20-0.30 Cu:0.50-1.00 W:0.50-1.00 Cr+3.3 Mo+16N=40Min.		108	750	80(550)	25	S32760
-	-	-	-	109-130	750-895			
-	-	-	-	60	414	42(289)	-	WPHY42
-	-	-	-	-	-	-	24	
-	-	0.03 Min.	Cb:0.005min, V:0.02min	75	517	60(413)	-	WPHY60
-	-	-		-	-	-	18	
-	-	-	Cb:0.005min, V:0.02min	77	530	65(448)	-	WPHY65
-	-	-		80	550	-	17	

Materials Specifications for Fittings JIS Materials

Marking Symbol	JIS Code Number & Materials	Chemical Composition(%)					
		C	SI	MN	P	S	NI
SGP	G3452, SGP	-	-	-	0.050 Max.	0.050 Max.	-
PG370	G3454, STPG370	0.25 Max.	0.35 Max.	0.30-0.90	0.040 Max.	0.040 Max.	-
PG410	G3454, STPG410	0.30 Max.	0.35 Max.	0.30-1.00	0.040 Max.	0.040 Max.	-
PT370	G3456, STPT370	0.25 Max.	0.10-0.35	0.30-0.90	0.035 Max.	0.035 Max.	-
PT410	G3456, STPT410	0.30 Max.	0.10-0.35	0.30-1.00	0.035 Max.	0.035 Max.	-
PT480	G3456, STPT480	0.33 Max.	0.10-0.35	0.30-1.00	0.035 Max.	0.035 Max.	-
STS370	G3455, STS370	0.25 Max.	0.10-0.35	0.30-1.10	0.035 Max.	0.035 Max.	-
STS410	G3455, STS410	0.30 Max.	0.10-0.35	0.30-1.40	0.035 Max.	0.035 Max.	-
STS480	G3455, STS480	0.33 Max.	0.10-0.35	0.30-1.50	0.035 Max.	0.035 Max.	-
PY400	G3457, STPY400	-	-	-	0.050 Max.	0.050 Max.	-
SUS304	G3459, SUS304TP	0.08 Max.	1.00 Max.	2.00 Max.	0.040 Max.	0.030 Max.	8.00-11.00
SUS304H	G3459, SUS304HTP	0.04-1.00	0.75 Max.	2.00 Max.	0.040 Max.	0.030 Max.	8.00-11.00
SUS340L	G3459, SUS304LTP	0.03 Max.	1.00 Max.	2.00 Max.	0.040 Max.	0.030 Max.	9.00-13.00
SUS316	G3459, SUS316TP	0.08 Max.	1.00 Max.	2.00 Max.	0.040 Max.	0.030 Max.	10.00-14.00
SUS316H	G3459, SUS316HTP	0.04-0.10	0.75 Max.	2.00 Max.	0.030 Max.	0.030 Max.	11.00-14.00
SUS316L	G3459, SUS316LTP	0.03 Max.	1.00 Max.	2.00 Max.	0.040 Max.	0.030 Max.	12.00-16.00
PL380	G3460, STPL380	0.25 Max.	0.35 Max.	1.35 Max.	0.035 Max.	0.035 Max.	-
PL450	G3460, STPL450	0.18 Max.	0.10-0.35	0.30-0.60	0.030 Max.	0.030 Max.	3.00-3.80
SS400	G3101, SS400	-	-	-	0.050 Max.	0.050 Max.	-
SM400B	S3106, SM400B	0.20 Max.	0.35 Max.	0.60-1.20	0.040 Max.	0.040 Max.	-
SM490B	G3106, SM490B	0.18 Max.	0.55 Max.	1.50 Max.	0.040 Max.	0.040 Max.	-
SB410	G3103, SB410	0.24 Max.	0.15-0.30	0.90 Max.	0.035 Max.	0.040 Max.	-
SB450	G3103, SB450	0.28 Max.	0.15-0.30	0.90 Max.	0.035 Max.	0.040 Max.	-
S20C	G4051, S20C	0.18-0.23	0.15-0.35	0.30-0.60	0.030 Max.	0.035 Max.	-
S25C	G4051, S25C	0.22-0.28	0.15-0.35	0.30-0.60	0.030 Max.	0.035 Max.	-
S45C	G4051, S45C	0.42-0.48	0.15-0.30	0.60-0.90	0.030 Max.	0.035 Max.	-
SF45	G3201, SF45	0.60 Max.	0.15-0.50	0.30-1.20	0.030 Max.	0.035 Max.	-
SF50	G3201, SF50	0.60 Max.	0.15-0.50	0.30-1.20	0.030 Max.	0.035 Max.	-

Chemical Composition (%)		Chemical Composition (%)			Reduction of Area	Hardness (HB)
CR	MO	Tensile Strength kgf/mm ² (N/mm ²)	Yield Strength kgf/mm ² (N/mm ²)	Elongation(%) Test Piece No.(N/mm ²)		
-	-	"30 Min.(294) Min."	-	"(11, 12) 30 Min.(5) 25 Min."	-	-
-	-	"38 Min.(373) Min."	"22 Min.(216) Min."	"(11, 12) 30 Min.(5) 25 Min."	-	-
-	-	"42 Min.(412) Min."	"25 Min.(245) Min."	"(11, 12) 25 Min.(5) 20 Min."	-	-
-	-	"38 Min.(373) Min."	"22 Min.(216) Min."	"(11, 12) 30 Min.(5) 25 Min."	-	-
-	-	"42 Min.(412) Min."	"25 Min.(245) Min."	"(11, 12) 25 Min.(5) 20 Min."	-	-
-	-	"49 Min.(481) Min."	"28 Min.(275) Min."	"(11, 12) 25 Min.(5) 20 Min."	-	-
-	-	"38 Min.(373) Min."	"22 Min.(216) Min."	"(11, 12) 30 Min.(5) 25 Min."	-	-
-	-	"42 Min.(412) Min."	"25 Min.(245) Min."	"(11, 12) 25 Min.(5) 20 Min."	-	-
-	-	"49 Min.(481) Min."	"28 Min.(275) Min."	"(11, 12) 25 Min.(5) 20 Min."	-	-
-	-	"41 Min.(402) Min."	"23 Min.(226) Min."	"(11, 12) 25 Min.(5) 20 Min."	-	-
18.00-20.00	-	"53 Min.(520) Min."	"21 Min.(206) Min."	"(5) 18 Min."	-	-
18.00-20.00	-	"53 Min.(520) Min."	"21 Min.(206) Min."	"(11, 12) 35 Min.(5) 25 Min."	-	-
18.00-20.00	-	"49 Min.(481) Min."	"18 Min.(177) Min."	"(11, 12) 35 Min.(5) 25 Min."	-	-
16.00-18.00	2.00-3.00	"53 Min.(520) Min."	"21 Min.(206) Min."	"(11, 12) 35 Min.(5) 25 Min."	-	-
16.00-18.00	2.00-3.00	"53 Min.(520) Min."	"21 Min.(206) Min."	"(11, 12) 35 Min.(5) 25 Min."	-	-
16.00-18.00	2.00-3.00	"49 Min.(481) Min."	"18 Min.(177) Min."	"(11, 12) 35 Min.(5) 25 Min."	-	-
-	-	"39 Min.(382) Min."	"21 Min.(206) Min."	"(11, 12) 35 Min.(5) 25 Min."	-	-
-	-	"46 Min.(451) Min."	"25 Min.(245) Min."	"(11, 12) 30 Min.(5) 20 Min."	-	-
-	-	"41-52(402-510)"	"16t Max. 25 Min.(245) Min."	"(5) 21 Min.(14) 17 Min."	-	-
-	-	"41-52(402-510)"	"16t Max. 25 Min.(245) Min."	"(5) 23 Min.(1A) 18 Min."	-	-
-	-	"50-62(490-608)"	"16t Max. 33 Min.(324) Min."	"(5) 22 Min.(1A) 17 Min."	-	-
-	-	"42-56(412-549)"	"23 Min.(226) Min."	"(1A) 21 Min.(10) 25 Min."	-	-
-	-	"46-60(451-588)"	"25 Min.(245) Min."	"(1A) 19 Min.(10) 23 Min."	-	-
-	-	"41 Min.(402) Min."	"(N) 25 Min.(245) Min."	"28 Min."	-	116-174
-	-	"45 Min.(441) Min."	"(N) 27 Min.(265) Min."	"27 Min."	-	123-183
-	-	"58 Min.(569) Min."	"(N) 35 Min.(343) Min."	"20 Min."	-	167-227
-	-	"45-55(444-539)"	"23 Min.(226) Min."	"(14A)(A) 24 Min.(T) 19 Min."	"(A)45(T)35"	"121 Min."
-	-	"50-60(490-588)"	"25 Min.(245) Min."	"(14A)(A) 22 Min.(T) 17 Min."	"(A)40(T)30"	"134 Min."

○ Wall Thickness of Welded and Seamless Pipe

Nominal Pipe Size		Outside diameter		Nominal Wall Thickness							
A	B	KS/JIS	ANSI	SGP	Sch 5s	Sch 10s	Sch 10	Sch 20s	Sch 20	Sch 30	Sch 40s
6	1/8	10.50	10.29	-	-	1.24	-	1.5	-	-	1.73
8	1/4	13.80	13.72	-	-	1.65	-	2.0	-	-	2.24
10	3/8	17.30	17.14	-	-	1.65	-	2.0	-	-	2.31
15	1/2	21.70	21.34	2.8	1.65	2.11	-	2.5	-	-	2.77
20	3/4	27.20	26.67	2.8	1.65	2.11	-	2.5	-	-	2.87
25	1	34.00	33.40	3.2	1.65	2.77	-	3.0	-	-	3.38
32	1 1/4	42.70	42.16	3.5	1.65	2.77	-	3.0	-	-	3.56
40	1 1/2	48.60	48.26	3.5	1.65	2.77	-	3.0	-	-	3.68
50	2	60.50	60.32	3.8	1.65	2.77	-	3.5	3.20	-	3.91
65	2 1/2	76.30	73.02	4.2	2.11	3.05	-	3.5	4.50	-	5.16
80	3	89.10	88.90	4.2	2.11	3.05	-	4.0	4.50	-	5.49
90	3 1/2	101.60	101.60	4.2	2.11	3.05	-	4.0	4.50	-	5.74
100	4	114.30	114.30	4.5	2.11	3.05	-	4.0	4.90	-	6.02
125	5	139.80	141.30	4.5	2.77	3.40	-	5.0	5.10	-	6.55
150	6	165.20	168.30	5.0	2.77	3.40	-	5.0	5.50	-	7.11
200	8	216.30	219.08	5.8	2.77	3.76	-	6.5	6.35	7.04	8.18
250	10	267.40	273.05	6.6	3.40	4.19	-	6.5	6.35	7.80	9.27
300	12	318.50	323.85	6.9	3.96	4.57	-	6.5	6.35	8.38	9.53
350	14	355.60	355.60	7.9	3.96	4.78	6.35	8.0	7.92	9.52	9.53
400	16	406.40	406.40	7.9	4.19	4.78	6.35	8.0	7.92	9.52	9.53
450	18	457.20	457.20	7.9	4.19	4.78	6.35	8.0	7.92	11.12	9.53
500	20	508.00	508.00	7.9	4.78	5.54	6.35	9.5	9.52	12.70	9.53
550	22	558.80	558.80	-	4.78	5.54	6.35	-	9.52	12.70	9.53
600	24	609.60	609.60	-	5.54	6.35	6.35	-	9.52	14.27	9.53
650	26	660.40	660.40	-	-	*7.92	7.92	-	12.70	-	9.53
700	28	711.20	711.20	-	-	*7.92	7.92	-	12.70	15.88	9.53
750	30	762.00	762.00	-	6.35	*7.92	7.92	-	12.70	15.88	9.53
800	32	812.80	812.80	-	-	*7.92	7.92	-	12.70	15.88	9.53
850	34	863.60	863.60	-	-	*7.92	7.92	-	12.70	15.88	9.53
900	36	914.40	914.40	-	-	*7.92	7.92	-	12.70	15.88	9.53
950	38	965.20	965.20	-	-	*7.92	-	-	-	-	9.53
1000	40	1016.00	1016.00	-	-	*7.92	-	-	-	-	9.53
1050	42	1066.80	1066.80	-	-	*7.92	-	-	-	-	9.53
1100	44	1117.60	1117.60	-	-	*7.92	-	-	-	-	9.53
1150	46	1168.40	1168.40	-	-	*7.92	-	-	-	-	9.53
1200	48	1219.20	1219.20	-	-	*7.92	-	-	-	-	9.53

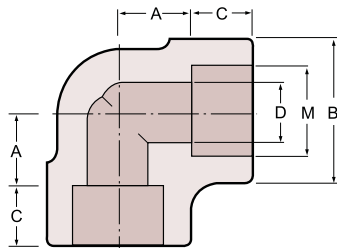
Unit : mm

Nominal Wall Thickness											Nominal Pipe Size Inch
STD	Sch 40	Sch 60	Sch 80s	X-S	Sch 80	Sch 100	Sch 120	Sch 140	Sch 160	XX-S	
1.73	1.73	2.20	2.41	2.41	2.41	-	-	-	3.15	4.83	1/8
2.24	2.24	2.40	3.02	3.02	3.02	-	-	-	3.68	6.05	1/4
2.31	2.31	2.80	3.20	3.20	3.20	-	-	-	4.01	6.40	3/8
2.77	2.77	3.20	3.73	3.73	3.73	-	-	-	4.78	7.47	1/2
2.87	2.87	3.40	3.91	3.91	3.91	-	-	-	5.56	7.82	3/4
3.38	3.38	3.90	4.55	4.55	4.55	-	-	-	6.35	9.09	1
3.56	3.56	4.50	4.85	4.85	4.85	-	-	-	6.35	9.70	1 1/4
3.68	3.68	4.50	5.08	5.08	5.08	-	-	-	7.14	10.16	1 1/2
3.91	3.91	4.90	5.54	5.54	5.54	-	-	-	8.74	11.07	2
5.16	5.16	6.00	7.01	7.01	7.01	-	-	-	9.52	14.02	2 1/2
5.49	5.49	6.60	7.62	7.62	7.62	-	-	-	11.12	15.24	3
5.74	5.74	7.00	8.08	8.08	8.08	-	-	-	-	-	3 1/2
6.02	6.02	7.10	8.56	8.56	8.56	-	11.12	-	13.49	17.12	4
6.55	6.55	8.10	9.53	9.53	9.53	-	12.70	-	15.88	19.05	5
7.11	7.11	9.30	10.97	10.97	10.97	-	14.27	-	18.26	21.94	6
8.18	8.18	10.31	12.70	12.70	12.70	15.09	18.26	20.62	23.01	22.22	8
9.27	9.27	12.70	12.70	12.70	15.09	18.26	21.44	25.40	28.58	25.40	10
9.53	10.31	14.27	*12.70	12.70	17.48	21.44	25.40	28.58	33.32	25.40	12
9.53	11.13	15.09	*12.70	12.70	19.05	23.83	27.79	31.75	35.71	-	14
9.53	12.70	16.66	*12.70	12.70	21.44	26.19	30.96	36.52	40.49	-	16
9.53	14.27	19.05	*12.70	12.70	23.82	29.36	34.92	39.67	45.24	-	18
9.53	15.09	20.62	*12.70	12.70	26.19	32.54	38.10	44.45	50.01	-	20
9.53	-	22.22	*12.70	12.70	28.58	34.92	41.28	47.62	53.98	-	22
9.53	17.48	24.61	*12.70	12.70	30.96	38.89	46.02	52.37	59.54	-	24
9.53	-	-	*12.70	12.70	-	-	-	-	-	-	26
9.53	-	-	*12.70	12.70	-	-	-	-	-	-	28
9.53	-	-	*12.70	12.70	-	-	-	-	-	-	30
9.53	17.48	-	*12.70	12.70	-	-	-	-	-	-	32
9.53	17.48	-	*12.70	12.70	-	-	-	-	-	-	34
9.53	19.05	-	*12.70	12.70	-	-	-	-	-	-	36
9.53	-	-	*12.70	12.70	-	-	-	-	-	-	38
9.53	-	-	*12.70	12.70	-	-	-	-	-	-	40
9.53	-	-	*12.70	12.70	-	-	-	-	-	-	42
9.53	-	-	*12.70	12.70	-	-	-	-	-	-	44
9.53	-	-	*12.70	12.70	-	-	-	-	-	-	46
9.53	-	-	*12.70	12.70	-	-	-	-	-	-	48

SOCKET-WELDING FITTINGS

Class Designation 3000, 6000 & 9000

90° Elbow



Size M	B	D	A	C	Unit Weight (Kg)
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3000

1/4	26.5	9.4	11.1	10	0.132
3/8	26.5	12.7	13.4	10	0.113
1/2	34.0	16.1	16.0	13	0.226
3/4	38.5	21.2	20.0	14	0.312
1	46.5	27.0	23.0	15	0.596
1 1/4	56.5	35.4	28.0	17	0.709
1 1/2	63.5	41.2	33.0	18	0.850
2	76.0	52.7	39.0	22	1.474
2 1/2	92.0	62.7	42.0	24	2.460
3	110.0	78.0	57.1	31.5	4.650
4	146.0	102.0	68.0	45	9.410

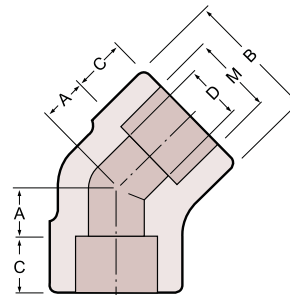
6000

1/2	38.5	12.0	20.0	16	0.425
3/4	46.5	15.8	23.0	16	0.652
1	56.5	21.0	28.0	18	1.020
1 1/4	63.5	29.7	33.0	20	1.446
1 1/2	76.0	34.2	40.0	22	2.380
2	84.0	43.1	42.0	24	3.760
2 1/2	110.0	54.0	57.1	24	6.120
3	121.0	67.7	66.0	31.5	8.760
4	152.0	87.0	70.0	45	14.300

9000

1/2	46.5	6.4	23.0	16	0.510
3/4	56.5	11.0	28.0	16	0.782
1	63.5	15.2	33.0	18	1.224
1 1/4	76.0	22.7	40.0	20	1.807
1 1/2	84.0	27.9	42.0	22	2.975
2	110.0	38.1	54.0	24	4.700
2 1/2	121.0	45.0	66.0	24	10.512
3	146.0	58.5	70.0	31.5	13.020

45° Elbow



Size M	B	D	A	C	Unit Weight (Kg)
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3000

1/4	26.5	9.4	7.9	10	0.093
3/8	26.5	12.7	7.9	10	0.142
1/2	34.0	16.1	13.0	13	0.284
3/4	38.5	21.2	13.0	14	0.397
1	46.5	27.0	14.0	15	0.624
1 1/4	56.5	35.4	18.0	17	0.907
1 1/2	63.5	41.2	22.0	18	0.782
2	76.0	52.7	24.0	22	1.265
2 1/2	92.0	62.7	29.0	24	3.062
3	110.0	78.0	34.0	31.5	4.763
4	146.0	102.0	42.0	45	8.250

6000

1/2	38.5	12.0	13	16	0.397
3/4	46.5	15.8	14	16	0.595
1	56.5	21.0	22	18	0.935
1 1/4	63.5	29.7	22	20	1.157
1 1/2	76.0	34.2	24	22	1.982
2	84.0	43.1	29	24	4.000
2 1/2	110.0	54.0	34	24	5.875
3	121.0	67.7	34	31.5	6.509
4	152.0	87.0	42	45	12.360

9000

1/2	46.5	6.4	14	16	0.875
3/4	56.5	11.0	22	16	1.369
1	63.5	15.2	22	18	1.725
1 1/4	76.0	22.7	24	20	2.931
1 1/2	84.0	27.9	29	22	5.062
2	110.0	38.1	34	24	6.400
2 1/2	121.0	45.0	34	24	7.925
3	146.0	58.5	42	31.5	11.569

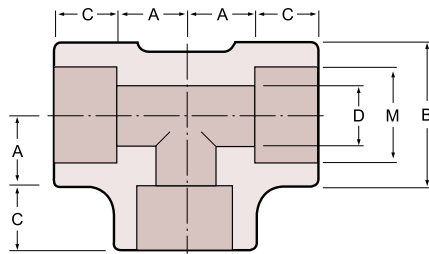
Dimensions are in millimeters.

• Dimensional Tolerances See ASME B16.11 or JIS B2316

SOCKET-WELDING FITTINGS

Class Designation 3000, 6000 & 9000

Tee



Size M	B	D	A	C	Unit Weight (Kg)
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3000

1/4	26.5	9.4	11.1	10	0.161
3/8	26.5	12.7	13.4	10	0.142
1/2	34.0	16.1	16.0	13	0.170
3/4	38.5	21.2	20.0	14	0.397
1	46.5	27.0	23.0	15	0.624
1 1/4	56.5	35.4	28.0	17	0.907
1 1/2	63.5	41.2	33.0	18	1.134
2	76.0	52.7	39.0	22	1.701
2 1/2	92.0	62.7	42.0	24	3.424
3	110.0	78.0	57.1	31.5	5.670
4	146.0	102.0	68.0	45	12.247

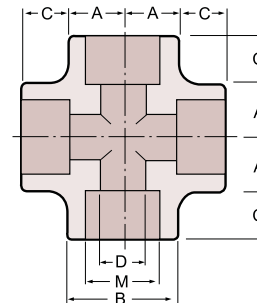
6000

1/2	38.5	12.0	20.0	16	0.623
3/4	46.5	15.8	23.0	16	0.907
1	56.5	21.0	28.0	18	1.503
1 1/4	63.5	29.7	33.0	20	1.701
1 1/2	76.0	34.2	40.0	22	2.948
2	84.0	43.1	42.0	24	3.702
2 1/2	110.0	54.0	57.1	24	8.723
3	121.0	67.7	66.0	31.5	10.660
4	152.0	87.0	70.0	45	19.020

9000

1/2	46.5	6.4	23.0	16	0.779
3/4	56.5	11.0	28.0	16	1.333
1	63.5	15.2	33.0	18	1.879
1 1/4	76.0	22.7	40.0	20	2.126
1 1/2	84.0	27.9	42.0	22	3.685
2	110.0	38.1	54.0	24	4.627
2 1/2	121.0	45.0	66.0	24	10.903
3	146.0	58.4	70.0	31.5	13.325

Cross



Size M	B	D	A	C	Unit Weight (Kg)
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3000

1/4	26.5	9.4	11.1	10	0.182
3/8	26.5	12.7	13.4	10	0.170
1/2	34.0	16.1	16.0	13	0.368
3/4	38.5	21.2	20.0	14	0.519
1	46.5	27.0	23.0	15	0.680
1 1/4	56.5	35.4	28.0	17	1.020
1 1/2	63.5	41.2	33.0	18	1.389
2	76.0	52.7	39.0	22	2.325
2 1/2	92.0	62.7	42.0	24	7.484
3	110.0	78.0	57.1	32	10.432
4	146.0	102.0	68.0	45	18.144

6000

1/2	38.5	12.0	20.0	16	0.660
3/4	46.5	15.8	23.0	16	1.120
1	56.5	21.0	28.0	18	1.730
1 1/4	63.5	29.7	33.0	20	2.381
1 1/2	76.0	34.2	40.0	22	3.750
2	84.0	43.1	42.0	24	7.860
2 1/2	110.0	54.0	57.1	24	10.600
3	121.0	67.7	66.0	31.5	13.600
4	152.0	87.0	70.0	45	26.000

9000

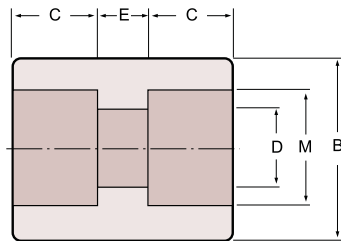
1/2	46.5	6.4	23.0	16	1.615
3/4	56.5	11.0	28.0	16	2.113
1	63.5	15.2	33.0	18	3.896
1 1/4	76.0	22.7	40.0	20	6.298
1 1/2	84.0	27.9	42.0	22	9.280
2	110.0	38.1	54.0	24	18.741
2 1/2	121.0	45.0	66.0	24	25.702
3	146.0	58.4	70.0	31.5	33.761

- Dimensions are in millimeters.
- Dimensional Tolerances See ASME B16.11 or JIS B2316

SOCKET-WELDING FITTINGS

Class Designation 3000, 6000 & 9000

Full Coupling



Size M	B	D	C	E	Unit Weight (Kg)
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3000

1/4	21.0	9.4	10	6.4	0.05
3/8	25.0	12.7	10	6.4	0.12
1/2	31.0	16.1	10	9.6	0.12
3/4	36.3	21.2	13	9.6	0.18
1	44.5	27.0	13	12.7	0.26
1 1/4	54.0	35.4	13	12.7	0.35
1 1/2	60.3	41.2	13	12.7	0.47
2	73.5	52.7	16	19.1	0.81
2 1/2	92.5	62.7	16	19.1	1.25
3	106.8	78.0	16	19.1	1.53
4	140.0	102.0	19	19.1	2.91

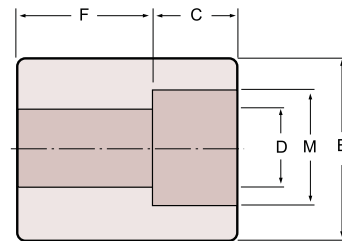
6000

1/2	32.6	12.0	10	9.6	0.170
3/4	40.0	15.8	13	9.6	0.249
1	48.5	21.0	13	12.7	0.420
1 1/4	57.2	29.7	13	12.7	0.525
1 1/2	64.7	34.2	13	12.7	0.665
2	80.3	43.1	16	19.1	1.240
2 1/2	98.0	54.0	16	19.1	1.640
3	114.3	67.7	16	19.1	2.746
4	160.0	87.0	19	19.1	4.679

9000

1/2	40.4	6.4	10	9.6	0.270
3/4	45.5	11.0	13	9.6	0.327
1	55.0	15.2	13	12.7	0.518
1 1/4	66.5	22.7	13	12.7	0.813
1 1/2	73.0	27.9	13	12.7	0.940
2	88.0	38.1	16	19.1	1.553
2 1/2	108.0	45.0	16	19.1	2.430
3	127.0	58.5	16	19.1	3.721
4	160.0	80.3	19	19.1	5.137

Half Coupling



Size M	B	D	C	F	Unit Weight (Kg)
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3000

1/4	21.0	9.4	10	15.7	0.058
3/8	25.0	12.7	10	17.5	0.073
1/2	31.0	16.1	10	22.4	0.138
3/4	36.3	21.2	13	23.9	0.203
1	44.5	27.0	13	28.4	0.313
1 1/4	54.0	35.4	13	30.2	0.431
1 1/2	60.3	41.2	13	31.8	0.593
2	73.5	52.7	16	41.1	1.280
2 1/2	92.5	62.7	16	42.9	1.490
3	106.8	78.0	16	44.5	2.202
4	140.0	102.0	19	47.7	4.250

6000

1/2	32.6	12.0	10	22.4	0.193
3/4	40.0	15.8	13	23.9	0.284
1	48.5	21.0	13	28.4	0.488
1 1/4	57.2	29.7	13	30.2	0.583
1 1/2	64.7	34.2	13	31.8	0.640
2	80.3	43.1	16	41.1	1.726
2 1/2	98.0	54.0	16	42.9	2.247
3	114.3	67.7	16	44.5	3.412
4	160.0	87.0	19	47.7	5.730

9000

1/2	40.4	6.4	10	22.4	0.312
3/4	45.5	11.0	13	23.9	0.389
1	55.0	15.2	13	28.4	0.641
1 1/4	66.5	22.7	13	30.2	0.980
1 1/2	73.0	27.9	13	31.8	1.179
2	88.0	38.1	16	41.1	1.994
2 1/2	108.0	45.0	16	42.9	3.210
3	127.0	58.5	16	44.5	4.597
4	160.0	80.3	19	47.7	7.610

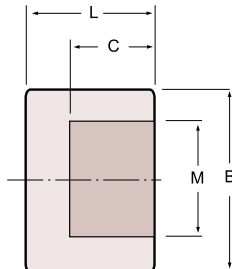
• Dimensions are in millimeters.

• Dimensional Tolerances See ASME B16.11 or JIS B2316

SOCKET-WELDING FITTINGS

Class Designation 3000, 6000 & 9000

Cap



Size M	B	C	L	Unit Weight (Kg)
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3000

1/4	21.0	10	20	0.048
3/8	25.0	10	20	0.076
1/2	31.0	10	20	0.100
3/4	36.3	13	25	0.182
1	44.5	13	27	0.241
1 1/4	54.0	13	30	0.350
1 1/2	60.3	13	30	0.612
2	73.5	16	36	0.880
2 1/2	92.5	16	42	1.520
3	106.8	16	46	2.208
4	140.0	19	55	4.417

6000

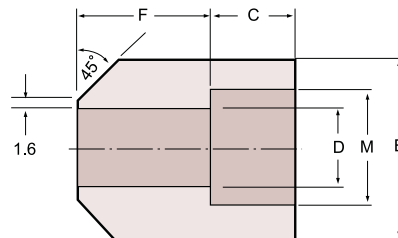
1/2	32.6	10	26	0.055
3/4	40.0	13	27	0.223
1	48.5	13	30	0.382
1 1/4	57.2	13	35	0.511
1 1/2	64.7	13	36	0.735
2	80.3	16	39	1.289
2 1/2	98.0	16	45	2.056
3	114.3	16	52	3.364

9000

1/2	40.4	10	30	0.262
3/4	45.5	13	30	0.320
1	55.0	13	33	0.520
1 1/4	66.5	13	40	1.256
1 1/2	73.0	13	40	1.440
2	88.0	16	43	1.686
2 1/2	108.0	16	50	2.986
3	127.0	16	58	4.666

- Dimensions are in millimeters.
- Dimensional Tolerances See ASME B16.11 or JIS B2316

Boss



Size M	B	D	C	F	Unit Weight (Kg)
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3000

1/4	21.0	9.4	10	15.7	0.058
3/8	25.0	12.7	10	17.5	0.073
1/2	31.0	16.1	10	22.4	0.138
3/4	36.3	21.2	13	23.9	0.203
1	44.5	27.0	13	28.4	0.313
1 1/4	54.0	35.4	13	30.2	0.431
1 1/2	60.3	41.2	13	31.8	0.593
2	73.5	52.7	16	41.1	1.280
2 1/2	92.5	62.7	16	42.9	1.490
3	106.8	78.0	16	44.5	2.202
4	140.0	102.0	19	47.7	4.250

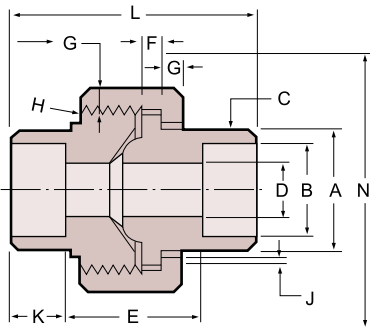
6000

1/2	32.6	12.0	10	22.4	0.193
3/4	40.0	15.8	13	23.9	0.284
1	48.5	21.0	13	28.4	0.488
1 1/4	57.2	29.7	13	30.2	0.583
1 1/2	64.7	34.2	13	31.8	0.640
2	80.3	43.1	16	41.1	1.726
2 1/2	98.0	54.0	16	42.9	2.247
3	114.3	67.7	16	44.5	3.412
4	160.0	87.0	19	47.7	5.730

SOCKET-WELDING FITTINGS

Class Designation 3000 and 6000

Union



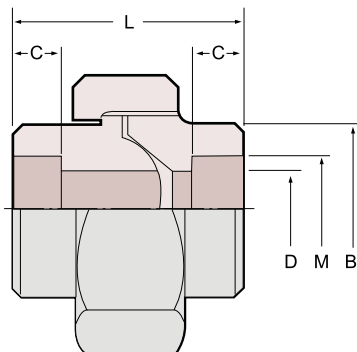
MSS SP-83(Class 3000)

Unit : mm

Nom. Pipe Size	Pipe End Min. A	Socket Bore Dia. B	Socket Wall Min. C	Water Way Bore D	Laying Length E	Male Flange Min. F	Nut Min. G	Thrds. Per 25.4 Max. H	Bearing Min. J	Depth Of Socket Min. K	Length Assem. Nominal L	Clear Assem. Nut N
1/8	21.8	10.92 10.67	3.17	6.83 6.43	22.4 19.0	3.17	3.17	16	1.24	9.6	41.4	49.0
1/4	21.8	14.22 13.97	3.30	9.85 9.45	22.4 19.0	3.17	3.17	16	1.24	9.6	41.4	49.0
3/8	25.9	17.78 17.53	3.48	13.92 13.51	26.9 20.6	3.43	3.43	14	1.37	9.6	46.0	55.0
1/2	31.2	21.84 21.59	4.06	17.47 17.07	26.9 20.6	3.68	3.68	14	1.50	9.6	49.0	57.0
3/4	37.1	27.18 26.92	4.27	21.79 21.39	31.8 25.4	4.06	4.06	11	1.68	12.7	56.9	67.0
1	45.5	34.04 33.78	4.95	26.14 27.74	34.3 26.2	4.57	4.44	11	1.85	12.7	62.0	79.0
1 1/4	54.9	42.67 42.42	5.28	35.76 35.36	40.6 32.5	5.33	5.21	11	2.13	12.7	71.1	94.0
1 1/2	61.5	48.77 48.51	5.54	41.61 41.20	42.2 34.0	5.84	5.59	10	2.31	12.7	76.5	111.0
2	75.2	61.47 61.21	6.05	52.53 52.12	45.5 37.0	6.60	6.35	10	2.69	15.8	86.1	132.0
2 1/2	91.7	74.17 73.66	7.65	64.72 64.31	61.7 52.1	7.49	7.11	8	3.07	15.8	102.4	148.0
3	109.2	90.17 89.66	8.31	77.67 77.27	63.8 53.6	8.25	8.00	8	3.53	15.8	109.0	175.0

SBC BEND STANDARDS(Class 3000, Class 6000)

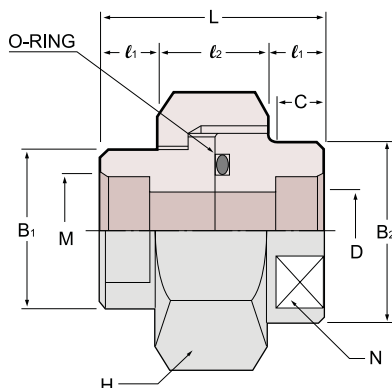
Unit : mm



Nom. Pipe Size	B		L		C		D		H		Unit Weight (Kg)	
	3000	6000	3000	6000	3000	6000	3000	6000	3000	6000	3000	6000
1/4	21.0		41		10.0		9.4		35 HEX		0.19	
3/8	25.0	32.0	46		10.0		12.7		40 HEX		0.25	
1/2	32.0	40.0	51	57	10.0	13	16.1	12.0	46 HEX	56 HEX	0.43	0.62
3/4	40.0	44.5	57	64	13.0	13	21.2	15.8	58 HEX	65 HEX	0.62	0.94
1	48.0	51.0	64	72	13.0	13	27.0	21.0	65 HEX	74 HEX	1.03	1.98
1 1/4	55.0	57.2	72	78	13.0	16	35.4	29.7	76 OCT	83 OCT	1.15	1.41
1 1/2	63.5	71.5	78	88	13.0	16	41.2	34.2	83 OCT	103 OCT	1.53	2.75
2	76.0	90.0	88	110	16.0	16	52.7	43.1	103 OCT	124 OCT	3.05	5.05
2 1/2	95.0	105.0	110	120	18.0	18	62.7	54.0	124 OCT	150 OCT	5.14	6.87
3	116.0	125.0	120	140	22.5	22	78.0	67.7	142 OCT	176 OCT	7.12	10.85

O-RING TYPE(Class 3000)

Unit : mm

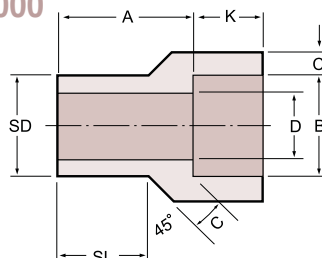


Size M	B1	B2	D	C	f	z	L	M	H	O-Ring	Unit Weight (Kg)
1/4	22	24	10	10	10	18	38	21	35 HEX	P18	0.16
3/8	27	30	12	10	10	18	38	26	41 HEX	P20	0.23
1/2	32	35	16	10	12	20	44	32	46 HEX	G25	0.33
3/4	38	42	20	13	12	26	50	38	54 HEX	G30	0.54
1	47	52	25	13	15	26	56	46	63 HEX	G35	0.79
1 1/4	56	60	32	13	15	30	60	54	77 HEX	G45	1.10
1 1/2	63	68	38	13	18	36	72	63	80 OCT	G50	1.54
2	76	82	48	17	18	36	72	77	95 OCT	G65	2.08

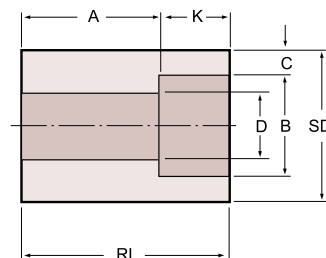
SOCKET-WELDING FITTINGS

Class Designation 3000 and 6000

Reducer Insert



TYPE 1



TYPE 2

Unit : mm

Nominal Pipe Size	TYPE(2)		Socket		Shank Dia. SD	Laying Length A		Bore D		Wall Min. C		Length Min.					
	3M	6M	Dia. B	Depth Min.k		3M		6M		3M		6M		SL		RL(Min)	
						3M	6M	3M	6M	3M	6M	3M	6M	3M	6M		
3/8 X 1/4	1	1	14.22	10	17.15	19	21	9.0	6.5	3.78	4.60	14	16				
1/2 X 3/8	1	1	17.65	10	21.34	21	23	12.5	9.0	4.01	5.03	16	16				
1/2 X 1/4	2	1	14.22	10	21.34	21	21	9.0	6.0	3.78	4.60	16	16				
3/4 X 1/2	1	1	21.84	10	26.67	22	25	16.0	11.5	4.67	5.97	17	19				
3/4 X 3/8	2	1	17.65	10	26.67	16	22	12.5	9.0	4.01	5.03		19	21			
3/4 X 1/4	2	2	14.22	10	26.67	18	22	9.0	6.5	3.78	4.60			21	32		
1 X 3/4	1	1	27.18	13	33.40	24	28	21.0	15.5	4.90	6.96	19	21				
1 X 1/2	2	1	21.84	10	33.40	16	28	16.0	11.5	4.67	5.97		21	28			
1 X 3/8	2	2	17.65	10	33.40	18	22	12.5	9.0	4.01	5.03			28	33		
1 X 1/4	2	2	14.22	10	33.40	19	24	9.0	6.0	3.78	4.60			28	33		
1 1/4 X 1	1	1	33.91	13	42.16	25	60	26.5	20.5	5.69	7.92	21	22				
1 1/4 X 3/4	2	2	27.18	13	42.16	18	21	21.0	15.5	4.90	6.96			32	35		
1 1/4 X 1/2	2	2	21.84	10	42.16	19	22	16.0	11.5	4.67	5.97			32	35		
1 1/4 X 3/8	2	2	17.65	10	42.16	21	24	12.5	9.0	4.01	5.03			32	35		
1 1/4 X 1/4	2	2	14.22	10	42.16	22	25	9.0	6.0	3.78	4.60			32	35		
1 1/2 X 1 1/4	1	1	42.67	13	48.26	28	35	35.0	29.5	6.07	7.92	22	25				
1 1/2 X 1	2	1	33.91	13	48.26	18	29	26.5	20.5	5.69	7.92		25	33			
1 1/2 X 3/4	2	2	27.18	13	48.26	19	25	21.0	15.5	4.90	6.96			33	40		
1 1/2 X 1/2	2	2	21.84	10	48.26	21	27	16.0	11.5	4.67	5.97			33	40		
1 1/2 X 3/8	2	2	17.65	10	48.26	22	28	12.5	9.0	4.01	5.03			33	40		
2 X 1 1/2	1	1	48.77	13	60.32	32	47	41.0	34.0	6.35	8.90	25	40				
2 X 1 1/4	2	2	42.67	13	60.32	21	24	35.0	29.5	6.07	7.92			38	41		
2 X 1	2	2	33.91	13	60.32	22	25	26.5	20.5	5.69	7.92			38	41		
2 X 3/4	2	2	27.18	13	60.32	24	27	21.0	15.5	4.90	6.96			38	41		
2 X 1/2	2	2	21.84	10	60.32	25	28	16.0	11.5	4.67	5.97			38	41		
2 1/2 X 2	1	1	61.24	16	73.02	46	43	52.5	43.0	6.93	10.92	38	32				
2 1/2 X 1 1/2	2	-	48.77	13	73.02	35	-	41.0	-	6.35	-			54	-		
2 1/2 X 1 1/4	2	-	42.67	13	73.02	37	-	35.0	-	6.07	-			54	-		
2 1/2 X 1	2	-	33.91	13	73.02	38	-	26.5	-	5.69	-			54	-		
2 1/2 X 3/4	2	-	27.18	13	73.02	40	-	21.0	-	4.90	-			54	-		
3 X 2 1/2	1	-	74.01	16	88.90	38	-	62.5	-	8.76	-	32	-		-		
3 X 2	2	-	61.24	16	88.90	25	-	52.5	-	6.93	-			48	-		
3 X 1 1/2	2	-	48.77	13	88.90	29	-	41.0	-	6.35	-			48	-		
3 X 1 1/4	2	-	42.67	13	88.90	30	-	35.0	-	6.07	-			48	-		
3 X 1	2	-	33.91	13	88.90	32	-	26.5	-	5.69	-			48	-		
4 X 3	2	-	89.99	16	114.30	33	-	78.0	-	9.50	-			60	-		
4 X 2 1/2	2	-	74.01	16	114.30	38	-	62.5	-	8.76	-			60	-		
4 X 2	2	-	61.24	16	114.30	38	-	52.5	-	6.93	-			60	-		
4 X 1 1/2	2	-	48.77	13	114.30	42	-	41.0	-	6.35	-			60	-		
4 X 1 1/4	2	-	42.67	13	114.30	43	-	35.0	-	6.07	-			60	-		

• Dimensional Tolerances MSS SP-79

(1) At the option of the manufacturer Type 2 Reducers may be furnished in Type 1 configuration.

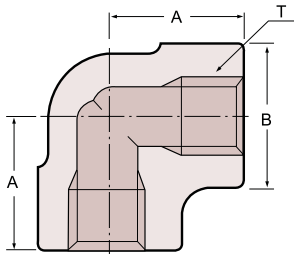
(2) 3M and 6M symbols denote 3000 and 6000 classes respectively.



THREADED FITTINGS

Class Designation 2000, 3000 & 6000

90° Elbow



Size T	B	A	Unit Weight (Kg)
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2000

1/4	26.5	25.4	0.13
3/8	26.5	25.4	0.12
1/2	34.0	28.5	0.23
3/4	38.5	33.5	0.36
1	46.5	38.1	0.55
1 1/4	56.5	44.5	0.95
1 1/2	63.5	50.8	1.12
2	76.0	60.5	1.96
2 1/2	92.0	64.0	3.25
3	110.0	83.0	5.64
3 1/2	121.0	95.5	6.92
4	146.0	106.5	10.43

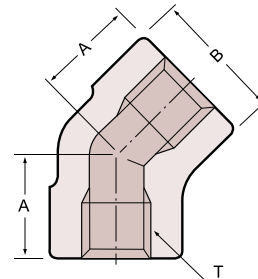
3000

1/4	26.5	25.4	0.120
3/8	34.0	28.5	0.235
1/2	38.5	33.5	0.390
3/4	46.5	38.1	0.570
1	56.5	44.5	0.990
1 1/4	63.5	50.8	1.260
1 1/2	76.0	60.5	2.125
2	84.0	64.0	3.520
2 1/2	110.0	83.0	5.460
3	121.0	95.5	8.000
3 1/2	146.0	106.5	11.230
4	152.0	114.3	13.500

6000

3/8	38.5	33.5	0.40
1/2	46.5	38.5	0.68
3/4	56.5	44.5	1.13
1	63.5	50.8	1.59
1 1/4	76.0	60.5	2.60
1 1/2	84.0	64.0	4.32
2	110.0	83.0	7.33
2 1/2	121.0	95.5	9.25
3	146.0	106.5	12.05
3 1/2	152.0	114.3	14.30
4	152.0	114.3	14.10

45° Elbow



Size T	B	A	Unit Weight (Kg)
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2000

1/4	26.5	19.1	0.16
3/8	26.5	19.1	0.13
1/2	34.0	26.0	0.25
3/4	38.5	28.6	0.32
1	46.5	30.0	0.43
1 1/4	56.5	33.3	0.75
1 1/2	63.5	42.0	1.06
2	76.0	46.0	1.49
2 1/2	92.0	53.0	2.45
3	110.0	64.0	4.00
3 1/2	121.0	64.0	5.12
4	146.0	80.0	8.68

3000

1/4	26.5	19.1	0.16
3/8	34.0	26.0	0.28
1/2	38.5	28.6	0.38
3/4	46.5	30.0	0.51
1	56.5	33.3	1.03
1 1/4	63.5	42.0	1.22
1 1/2	76.0	46.0	2.36
2	84.0	53.0	3.66
2 1/2	110.0	64.0	6.12
3	121.0	64.0	6.12
3 1/2	146.0	80.0	8.40
4	152.0	80.0	11.30

6000

3/8	38.5	28.6	0.45
1/2	46.5	30.0	0.72
3/4	56.5	33.3	1.00
1	63.5	42.0	1.56
1 1/4	76.0	46.0	2.29
1 1/2	84.0	53.0	3.80
2	110.0	64.0	5.76
2 1/2	121.0	64.0	7.20
3	146.0	80.0	11.30
3 1/2	152.0	80.0	13.20
4	152.0	80.0	11.80

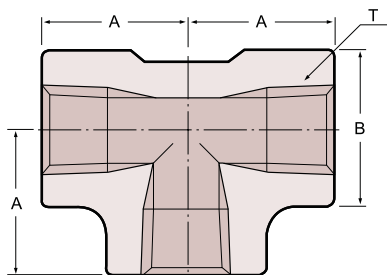
Dimensions are in millimeters.

. Dimensional Tolerances See ASME B16.11 or JIS B2316

THREADED FITTINGS

Class Designation 2000, 3000 & 6000

Tee



Size T	B	A	Unit Weight (Kg)
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2000

1/4	26.5	25.4	0.18
3/8	26.5	25.4	0.14
1/2	34.0	28.5	0.26
3/4	38.5	33.5	0.43
1	46.5	38.1	0.65
1 1/4	56.5	44.5	0.91
1 1/2	63.5	50.8	1.25
2	76.0	60.5	2.10
2 1/2	92.0	64.0	3.94
3	110.0	83.0	5.98
3 1/2	121.0	95.5	7.41
4	146.0	106.5	12.36

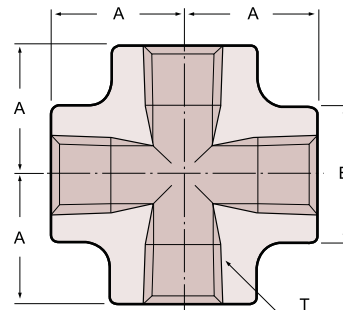
3000

1/4	26.5	25.4	0.18
3/8	34.0	28.5	0.32
1/2	38.5	33.5	0.52
3/4	46.5	38.1	0.73
1	56.5	44.5	1.26
1 1/4	63.5	50.8	1.65
1 1/2	76.0	60.5	2.81
2	84.0	64.0	4.35
2 1/2	110.0	83.0	6.26
3	121.0	95.5	10.05
3 1/2	146.0	106.5	14.62
4	152.0	114.3	16.50

6000

3/8	38.5	33.5	0.59
1/2	46.5	38.1	0.96
3/4	56.5	44.5	1.50
1	63.5	50.8	2.10
1 1/4	76.0	60.5	3.30
1 1/2	84.0	64.0	5.72
2	110.0	83.0	9.64
2 1/2	121.0	95.5	13.40
3	146.0	106.5	16.15
3 1/2	152.0	114.3	18.23
4	152.0	114.3	16.70

Cross



Size T	B	A	Unit Weight (Kg)
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2000

1/4	26.5	25.4	0.14
3/8	26.5	25.4	0.22
1/2	34.0	28.5	0.37
3/4	38.5	33.5	0.52
1	46.5	38.1	0.79
1 1/4	56.5	44.5	1.28
1 1/2	63.5	50.8	1.62
2	76.0	60.5	2.62
2 1/2	92.0	64.0	4.66
3	110.0	83.0	7.10
3 1/2	121.0	95.5	8.85
4	146.0	106.5	14.83

3000

1/4	26.5	25.4	0.23
3/8	34.0	28.5	0.40
1/2	38.5	33.5	0.63
3/4	46.5	38.1	0.93
1	56.5	44.5	1.47
1 1/4	63.5	50.8	1.78
1 1/2	76.0	60.5	3.42
2	84.0	64.0	5.50
2 1/2	110.0	83.0	7.66
3	121.0	95.5	11.21
3 1/2	146.0	106.5	16.72
4	152.0	114.3	19.00

6000

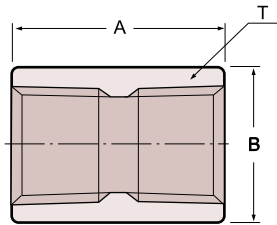
3/8	38.5	33.5	0.67
1/2	46.5	38.1	1.12
3/4	56.5	44.5	1.90
1	63.5	50.8	2.90
1 1/4	76.0	60.5	4.20
1 1/2	84.0	64.0	6.65
2	110.0	83.0	10.00
2 1/2	121.0	95.5	16.00
3	146.0	106.5	19.87
3 1/2	152.0	114.3	28.10
4	152.0	114.3	24.60

- Dimensions are in millimeters.
- Dimensional Tolerances See ASME B16.11 or JIS B2316

THREADED FITTINGS

Class Designation 2000, 3000 & 6000

Full Coupling



Size T	B	L	Unit Weight (Kg)
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2000

1/4	19.0	35.0	0.050
3/8	22.0	38.0	0.061
1/2	28.5	48.0	0.142
3/4	35.0	51.0	0.218
1	44.5	61.0	0.418
1 1/4	57.0	67.0	0.720
1 1/2	63.5	80.0	1.065
2	76.0	86.0	1.400
2 1/2	92.0	92.0	2.550
3	108.0	108.0	3.830
3 1/2	127.0	114.3	5.720
4	140.0	121.0	6.350

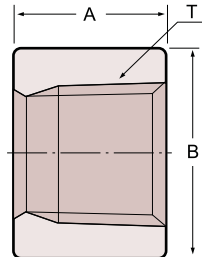
3000

1/4	19.0	35.1	0.050
3/8	22.0	38.1	0.061
1/2	28.5	48.0	0.142
3/4	35.0	51.0	0.218
1	44.5	61.0	0.418
1 1/4	57.0	67.0	0.720
1 1/2	63.5	80.0	1.065
2	76.0	86.0	1.400
2 1/2	92.0	92.0	2.550
3	108.0	108.0	3.830
3 1/2	127.0	114.3	5.720
4	140.0	121.0	6.350

6000

1/4	25.4	35.0	0.120
3/8	31.8	38.0	0.180
1/2	38.1	48.0	0.280
3/4	44.5	51.0	0.450
1	57.0	61.0	0.800
1 1/4	63.5	67.0	1.400
1 1/2	76.0	80.0	1.950
2	92.0	86.0	2.800
2 1/2	108.0	92.0	3.800
3	127.0	108.0	6.010
3 1/2	140.0	114.3	8.250
4	160.0	121.0	10.700

Half Coupling



Size TSize T	B	L	Unit Weight (Kg)
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2000

1/4	19.0	17.5	0.025
3/8	22.0	19.0	0.030
1/2	28.5	24.0	0.070
3/4	35.0	25.5	0.100
1	44.5	30.5	0.210
1 1/4	57.0	33.5	0.365
1 1/2	63.5	40.0	0.520
2	76.0	43.0	0.690
2 1/2	92.0	46.0	1.250
3	108.0	54.0	1.840
3 1/2	127.0	57.5	2.860
4	140.0	60.5	2.510

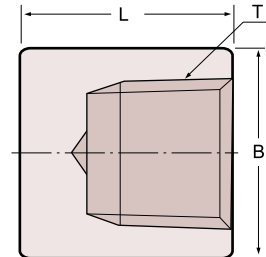
3000

1/4	19.0	17.5	0.025
3/8	22.0	19.0	0.030
1/2	28.5	24.0	0.070
3/4	35.0	25.5	0.100
1	44.5	30.5	0.210
1 1/4	57.0	33.5	0.365
1 1/2	63.5	40.0	0.520
2	76.0	43.0	0.690
2 1/2	92.0	46.0	1.250
3	108.0	54.0	1.840
3 1/2	127.0	57.5	2.860
4	140.0	60.5	3.510

6000

1/4	25.4	17.5	0.06
3/8	31.8	19.0	0.09
1/2	38.1	24.0	0.14
3/4	44.5	25.5	0.23
5	7.0	30.5	0.37
1 1/4	63.5	33.5	0.70
1 1/2	76.0	40.0	0.90
2	92.0	43.0	1.22
2 1/2	108.0	46.0	1.85
3	127.0	54.0	2.95
3 1/2	140.0	57.5	4.12
4	160.0	60.5	5.40

Cap



Size T	B	L	Unit Weight (Kg)
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2000

1/4	19.0	25	0.05
3/8	22.0	25	0.08
1/2	28.5	32	0.12
3/4	35.0	37	0.20
1	44.5	41	0.31
1 1/4	57.0	44	0.60
1 1/2	63.5	44	0.73
2	76.0	48	1.05
2 1/2	92.0	60	2.27
3	108.0	65	3.83
3 1/2	127.0	68	4.52
4	140.0	68	6.35

3000

1/4	19.0	25	0.05
3/8	22.0	25	0.08
1/2	28.5	32	0.12
3/4	35.0	37	0.20
1	44.5	41	0.31
1 1/4	57.0	44	0.60
1 1/2	63.5	44	0.73
2	76.0	48	1.05
2 1/2	92.0	60	2.27
3	108.0	65	3.83
3 1/2	127.0	68	4.52
4	140.0	68	6.35

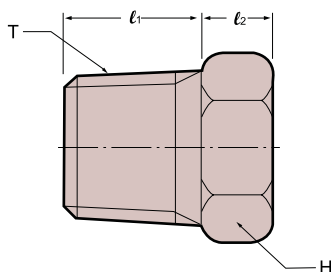
6000

1/4	25.4	27	0.09
3/8	31.8	27	0.14
1/2	38.1	33	0.25
3/4	44.5	38	0.36
1	57.0	43	0.70
1 1/4	63.5	46	0.80
1 1/2	76.0	48	1.28
2	92.0	51	2.16
2 1/2	108.0	64	2.72
3	127.0	68	4.95
3 1/2	140.0	70	6.84
4	160.0	75	9.21

• Dimensions are in millimeters. • Dimensional Tolerances See ASME B16.11 or JIS B2316

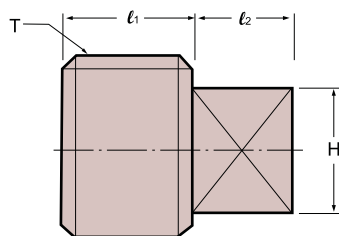
THREADED FITTINGS

Hex. Head Plug



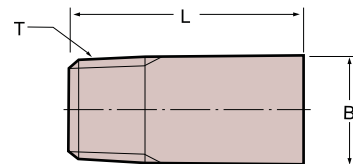
Size T	$\bar{r}$	$\bar{z}$	H	Unit Weight (Kg)
1/8	11	6.3	11.0	0.03
1/4	13	6.3	16.0	0.03
3/8	14	8.0	18.0	0.06
1/2	18	8.0	22.0	0.08
3/4	19	10.0	27.0	0.14
1	21	10.0	35.0	0.22
1 1/4	22	14.0	44.0	0.51
1 1/2	24	16.0	51.0	0.62
2	25	18.0	63.5	1.02
2 1/2	32	19.0	76.2	1.76
3	40	21.0	99.0	2.66
3 1/2	41	22.0	103.0	3.72
4	42	32.0	117.0	5.90

SQ Head Plug



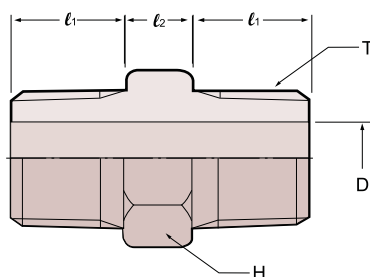
Size T	$\bar{r}$	$\bar{z}$	H	Unit Weight (Kg)
1/8	9.9	6.6	7.0	0.007
1/4	13.0	6.6	9.5	0.014
3/8	13.0	7.9	11.0	0.028
1/2	15.0	9.9	14.5	0.057
3/4	16.0	11.0	16.0	0.085
1	20.1	13.0	21.0	0.140
1 1/4	21.1	15.0	24.0	0.255
1 1/2	21.1	16.0	28.5	0.397
2	23.1	18.0	33.5	0.680
2 1/2	27.0	20.0	38.1	1.020
3	29.0	21.0	42.9	1.301
3 1/2	30.0	22.2	47.6	2.050
4	32.0	25.0	63.5	3.257

Round Head Plug



Size T	B	L	Unit Weight (Kg)
1/8	10.3	35.0	0.057
1/4	13.5	41.3	0.057
3/8	17.5	41.3	0.085
1/2	21.4	44.5	0.170
3/4	27.0	44.5	0.170
1	33.4	50.8	0.340
1 1/4	42.9	50.8	0.340
1 1/2	48.4	50.8	0.710
2	60.3	63.5	0.361
2 1/2	73.0	70.0	2.155
3	88.9	70.0	3.456
3 1/2	101.6	76.2	4.216
4	114.3	76.2	5.838

Hex. Nipple



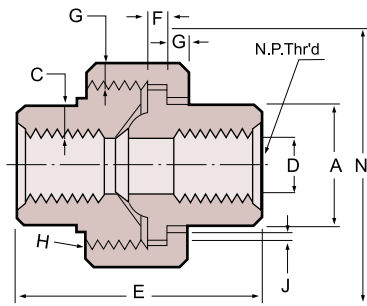
Size T	D	T	$\bar{r}$	$\bar{z}$	Unit Weight (Kg)
1/8	5.5	12	10	6	0.030
1/4	7.0	17	14	8	0.040
3/8	9.0	19	14	8	0.050
1/2	12.0	24	19	9	0.090
3/4	15.0	30	19	10	0.150
1	20.0	36	24	11	0.270
1 1/4	28.0	46	24	12	0.450
1 1/2	32.0	50	25	14	0.620
2	40.0	65	26	16	1.030
2 1/2	60.0	80	38	18	1.510
3	74.0	95	40	20	2.220
4	97.0	116	50	25	2.813

- Dimensions are in millimeters.
- Dimensional Tolerances See ASME B16.11 or JIS B2316

THREADED FITTINGS

Pressure Class 3000 & 6000

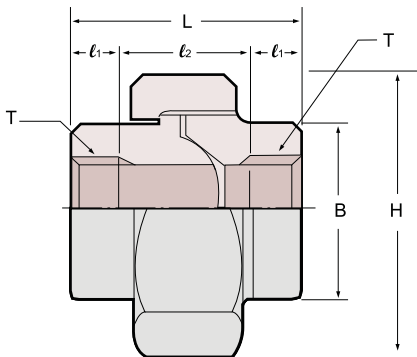
Union



MSS SP-83(Class 3000)

Unit : mm

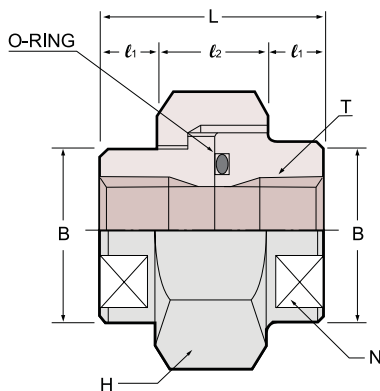
Nom. Pipe Size	Pipe End Min. A	Wall Min. C	Water Way Bore D	Male Flange Min. F	Nut Min. G	Thrds. Per 25.4 Max. H	Bearing Min. J	Length Assem. Nominal L	Clear Assem. Nut N
1/8	14.7	2.41	6.83 6.43	3.17	3.2	16	1.24	41.4	49.0
1/4	19.0	3.02	9.85 9.45	3.17	3.2	16	1.24	41.4	49.0
3/8	22.9	3.20	13.92 13.51	3.43	3.4	14	1.37	46.0	55.0
1/2	27.7	3.73	17.47 17.07	3.68	3.7	14	1.50	49.0	57.0
3/4	33.5	3.91	21.79 21.39	4.06	4.1	11	1.68	56.9	67.0
1	41.4	4.55	28.14 27.74	4.57	4.4	11	1.85	62.0	79.0
1 1/4	50.5	4.85	35.76 35.36	5.33	5.2	11	2.13	71.1	94.0
1 1/2	57.2	5.08	41.61 41.20	5.84	5.6	10	2.31	76.4	111.0
2	70.1	5.54	52.53 52.12	6.60	6.4	10	2.69	86.1	132.0
2 1/2	85.3	7.01	64.72 64.31	7.49	7.1	8	3.07	102.4	148.0
3	102.4	7.62	77.67 77.27	8.25	8.0	8	3.53	109.0	175.0



SBC BEND STANDARDS(Class 3000, Class 6000)

Unit : mm

Nom. Pipe Size	B		f		z		L		H		Unit Weight (Kg)	
	3000	6000	3000	6000	3000	6000	3000	6000	3000	6000	3000	6000
1/4	21.0	25.4	11.5	13.5	18	19	41	46	35 HEX	40 HEX	0.19	0.25
3/8	25.0	32.0	14.0	15.0	18	21	46	51	40 HEX	46 HEX	0.25	0.43
1/2	32.0	40.0	15.0	17.0	21	23	51	57	46 HEX	56 HEX	0.43	0.62
3/4	40.0	44.5	17.0	19.5	23	25	57	64	58 HEX	65 HEX	0.62	0.94
1	48.0	51.0	19.5	22.5	25	27	64	72	65 HEX	74 HEX	1.03	1.08
1 1/4	55.0	57.2	22.5	24.0	27	30	72	78	76 OCT	83 OCT	1.15	1.41
1 1/2	63.5	71.5	24.0	26.0	30	36	78	88	83 OCT	103 OCT	1.54	2.75
2	76.0	90.0	26.0	34.0	36	42	88	110	103 OCT	124 OCT	3.05	5.05
2 1/2	95.0	105.0	34.0	37.5	42	45	110	120	124 OCT	150 OCT	5.14	6.87
3	116.0	125.0	37.0	45.0	45	50	120	140	142 OCT	180 OCT	7.12	10.85



O-RING TYPE(Class 3000)

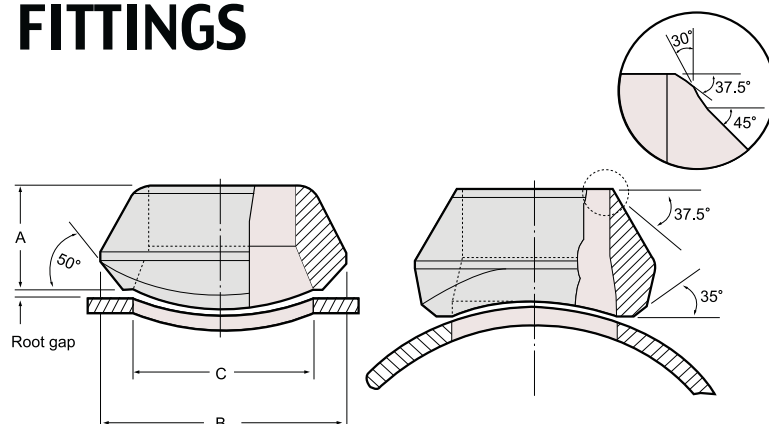
Unit : mm

Size M	B1	f	z	L	N	H	O-Ring	Unit Weight (Kg)
1/4	22	10	18	38	21	35 HEX	P18	0.16
3/8	27	10	18	38	26	41 HEX	P20	0.22
1/2	32	12	20	44	32	46 HEX	G25	0.31
3/4	38	12	26	50	38	54 HEX	G30	0.45
1	47	15	26	56	46	63 HEX	G35	0.76
1 1/4	56	15	30	60	54	77 HEX	G45	1.11
1 1/2	63	18	36	72	63	80 OCT	G50	1.33
2	76	18	36	72	77	95 OCT	G65	1.86

FORGED OUTLET FITTINGS

Weldolet

STD(Sch40), X-S(Sch80),
Sch 160, XX-S



STD, X-S

Unit : mm

Outlet Size	A		B		C		App' Weight(Kg)	
	STD	X-S	STD	X-S	STD	X-S	STD	X-S
1/2	19.1	19.1	34.9	34.9	23.8	23.8	0.08	0.09
3/4	22.2	22.2	44.5	44.5	30.2	30.2	0.11	0.14
1	27.0	27.0	54.0	54.0	36.5	36.5	0.23	0.21
1 1/4	31.8	31.8	65.1	65.1	44.5	44.5	0.36	0.41
1 1/2	33.3	33.3	73.0	73.0	50.8	50.8	0.45	0.50
2	38.1	38.1	88.9	88.9	65.1	65.1	0.80	0.80
2 1/2	41.3	41.3	103.2	103.2	76.2	76.2	1.14	1.20
3	44.5	44.5	122.2	122.2	93.7	93.7	1.82	1.90
4	50.8	50.8	152.4	152.4	120.7	120.7	2.86	2.90
5	57.2	57.2	179.4	179.4	141.3	141.3	4.66	4.70
6	60.3	77.8	215.9	225.4	169.9	169.9	6.45	10.50
8	69.9	98.5	263.5	292.1	220.7	220.7	10.68	16.8
10	77.8	93.7	322.3	323.9	274.7	265.1	17.73	20.90
12	85.7	103.2	377.8	397.4	325.4	317.5	26.82	27.70
14	88.9	100.0	409.6	431.8	357.2	350.8	30.00	31.80
16	93.7	106.4	463.6	466.7	408.0	403.2	34.10	46.40
18	96.8	111.1	520.7	523.9	458.8	455.6	44.10	59.10
20	101.6	119.1	571.5	582.6	508.0	509.6	53.60	71.80
24	115.9	139.7	689.0	708.0	614.4	638.2	100.00	131.80

Sch 160, XX-S

Unit : mm

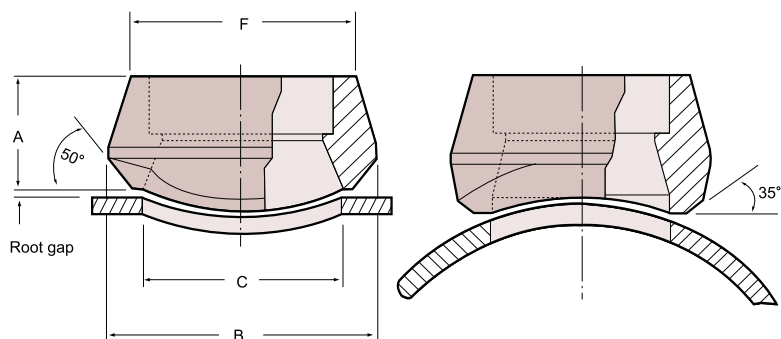
Outlet Size	A		B		C		App' Weight(Kg)	
	Sch 160	XX-S	Sch 160	XX-S	Sch 160	XX-S	Sch 160	XX-S
1/2	28.6	28.6	34.9	34.9	14.3	14.3	0.11	-
3/4	31.8	31.8	44.5	44.5	19.1	19.1	0.32	-
1	38.1	38.1	50.8	50.8	25.4	25.4	0.38	0.38
1 1/4	44.5	44.5	61.9	61.9	33.3	33.3	0.57	0.57
1 1/2	50.8	50.8	69.9	69.9	38.1	38.1	0.80	0.80
2	55.6	55.6	81.0	81.0	42.9	42.9	1.00	1.00
2 1/2	61.9	61.9	96.8	96.8	54.0	54.0	1.54	1.54
3	73.0	73.0	120.7	120.7	73.0	73.0	2.90	2.90
4	84.1	84.1	152.4	152.4	98.4	98.4	4.80	4.80
5	93.7	93.7	187.3	187.3	122.2	122.2	6.50	6.50
6	104.8	104.8	220.7	220.7	146.1	146.1	12.70	12.70
8	111.1	111.1	284.2	284.2	173.0	173.0	20.50	20.50
10	125.4	125.4	312.7	312.7	215.9	215.9	38.60	38.60

- Dimensions are in millimeters.
- Applicable Run Pipe Sizes are from Out-Let size to 36 inch

FORGED OUTLET FITTINGS

Sockolet

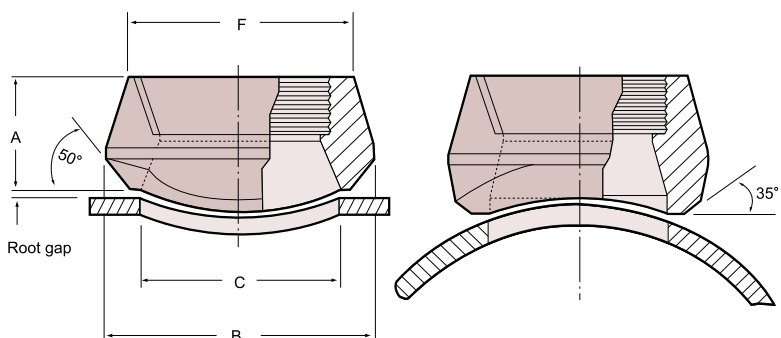
Pressure Class 3000 & 6000



Outlet Size	A		B		C		F		APP'Weight (Kg)	
	3000	6000	3000	6000	3000	6000	3000	6000	3000	6000
1/2	25.4	31.8	34.9	44.5	23.8	19.1	31.8	39.7	0.14	0.23
3/4	27.0	36.5	44.5	50.8	30.2	25.4	36.5	45.2	0.15	0.36
1	33.3	39.7	54.0	61.9	36.5	33.3	46.0	57.2	0.27	0.59
1 1/4	33.3	41.3	65.1	69.9	44.5	38.1	55.6	65.1	0.39	0.73
1 1/2	34.9	42.9	73.0	82.6	50.8	49.2	61.9	76.2	0.47	0.91
2	38.1	58.7	88.9	103.2	65.1	58.7	74.6	92.1	0.73	2.33
2 1/2	46.0	-	103.2	-	76.2	-	87.3	-	1.25	-
3	50.8	-	122.2	-	93.7	-	104.8	-	1.73	-
4	57.2	-	152.4	-	120.7	-	130.2	-	3.30	-

Threadolet

Pressure Class 3000 & 6000



Outlet Size	A		B		C		F		APP'Weight (Kg)	
	3000	6000	3000	6000	3000	6000	3000	6000	3000	6000
1/2	25.4	31.8	34.9	44.5	23.8	19.1	31.8	39.7	0.11	0.20
3/4	27.0	36.5	44.5	50.8	30.2	25.4	36.5	46.6	0.16	0.34
1	33.3	39.7	54.0	61.9	36.5	33.3	46.0	57.2	0.28	0.56
1 1/4	33.3	41.3	65.1	69.9	44.5	38.1	55.6	65.1	0.41	0.71
1 1/2	34.9	42.9	73.0	82.6	50.8	49.2	61.9	76.2	0.45	0.89
2	38.1	52.4	88.9	103.2	65.1	69.9	74.6	92.1	0.80	2.31
2 1/2	46.0	-	103.2	-	76.2	-	87.3	-	1.36	-
3	50.8	-	122.2	-	93.7	-	104.8	-	1.98	-
4	57.2	-	152.4	-	120.7	-	130.2	-	3.23	-

• Dimensions are in millimeters.

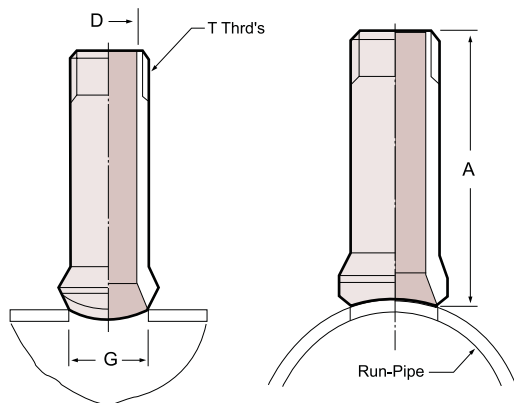
• Applicable Run Pipe Sizes are from Out-Let size to 36 inch

• For the Classes 3000 and 6000 Sockolets and Threadolets, Inside Bore, Thread, Socket bore and Socket Depth Dimensions are According to ASME B16.11

THREADED FITTINGS

Nippolet

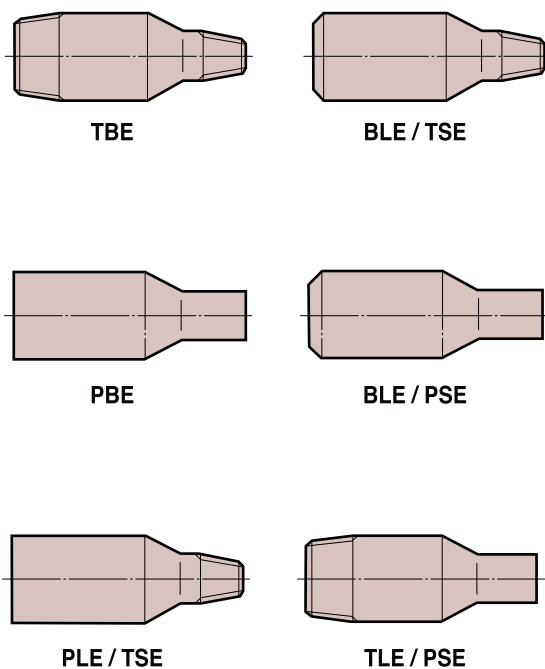
Pressure Class 3000



Run Pipe Size	Outlet Size T	A	G	D	E	Unit Weight (Kg)
36 - 3/4	1/2	88.9	23.9	14.0	21.3	0.36
36 - 1	3/4	88.9	30.2	18.8	26.7	0.56
36 - 1 1/4	1	88.9	36.6	24.4	33.3	0.84
36 - 1 1/2	1 1/4	88.9	44.5	32.5	42.2	1.22
36 - 2	1 1/2	88.9	50.8	38.1	48.3	2.00
36 - 2 1/2	2	88.9	65.0	49.3	60.5	3.12

Swaged Nipple

MSS SP-95



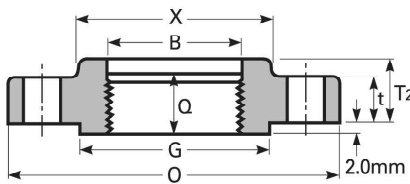
Large end Size	Small end Size	Length (mm)
1/2	3/8 ~ 1/8	70
3/4	1/2 ~ 1/8	76
1	3/4 ~ 1/8	89
1 1/4	1 ~ 1/8	102
1 1/2	1 1/4 ~ 1/8	114
2	1 1/2 ~ 1/8	165
2 1/2	2 ~ 1/8	178
3	2 1/2 ~ 1/8	203
3 1/2	3 ~ 1/8	203
4	3 1/2 ~ 1/4	229
5	4 ~ 1/4	279
6	5 ~ 1/2	305
8	6 ~ 1	330
10	8 ~ 2	381
12	10 ~ 2	406

- TBE : Threaded both end
- PBE : Plane both end
- PLE / TSE : Plane large end - Threaded small end
- BLE / TSE : Beveled large end - Threaded small end

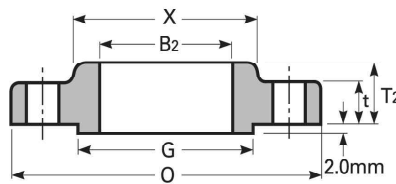
• Swaged Nipples are made of Forged Steel of Pipe



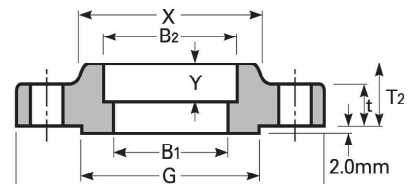
CLASS 150 FLANGES



THREADED



SLIP-ON



SOCKET WELDING

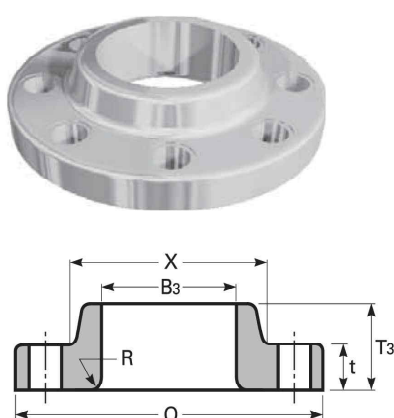
ASME B16.5-2003ED FORGED FLANGES

Unit : mm

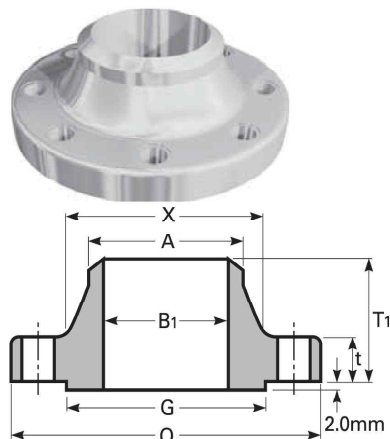
SIZE	Out-side Diam.	Thick-ness	Diam. of HUB	O.D of Raised Face	Diam. of Hub at Bavel	Length Through Hub			Thread Length	BORE			Radius of Fillet	Depth of Socket
						Welding Neck	Slip-On Threaded Socket Welding	Lap Joint		Welding Neck /Socket Welding	Slip-On /Socket-Welding	Lap Joint		
						T1	T2	T3		B1	B2	B3		
1/2	90	9.6	30	35.1	21.3	46	14	16	16	15.8	22.2	22.9	3	10
3/4	100	11.2	38	42.9	26.7	51	14	16	16	20.9	27.7	28.2	3	11
1	110	12.7	49	50.8	33.4	54	16	17	17	26.6	34.5	34.9	3	13
1 1/4	115	14.3	59	63.5	42.2	56	19	21	21	35.1	43.2	43.7	5	14
1 1/2	125	15.9	65	73.2	48.3	60	21	22	22	40.9	49.5	50.0	6	16
2	150	17.5	78	91.9	60.3	62	24	25	25	52.5	61.9	62.5	8	17
2 1/2	180	20.7	90	104.6	73.0	68	27	29	29	62.7	74.6	75.4	8	19
3	190	22.3	108	127.0	88.9	68	29	30	30	77.9	90.7	91.4	10	21
3 1/2	215	22.3	122	139.7	101.6	70	30	32	32	90.1	103.4	104.1	10	22.4
4	230	22.3	135	157.2	114.3	75	32	33	33	102.3	116.1	116.8	11	24.1
5	255	22.3	164	185.7	141.3	87	35	36	36	128.2	143.8	144.4	11	23.9
6	280	23.9	192	215.9	168.3	87	38	40	40	154.1	170.7	171.4	13	26.9
8	345	27.0	246	269.7	219.1	100	43	44	44	202.7	221.5	222.2	13	31.8
10	405	28.6	305	323.9	273.0	100	48	49	49	254.6	276.2	277.4	13	33.3
12	485	30.2	365	381.0	323.8	113	54	56	56	304.8	327.0	328.2	13	39.6
14	535	33.4	400	412.8	355.6	125	56	79	57	To be Specified by Purchaser	359.2	360.2	13	41.4
16	595	35.0	457	469.9	406.4	125	62	87	64		410.5	411.2	13	44.5
18	635	38.1	505	533.4	457.0	138	67	97	68		461.8	462.3	13	49.3
20	700	41.3	559	584.2	508.0	143	71	103	73		513.1	514.4	13	54.1
24	815	46.1	663	692.2	610.0	151	81	111	83		616.0	616.0	13	63.5

Notes :

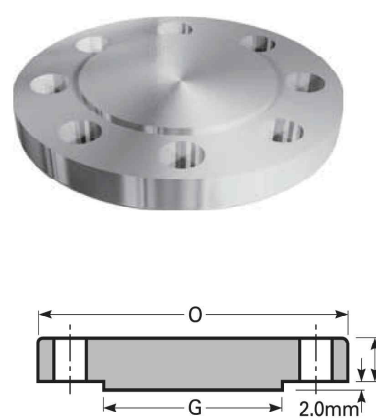
- For the 'BORE' (B1) other than Standard Wall Thickness, refer to page 54-55.
- These flanges may be supplied with a flat face. The flat face may be either the full t dimension of thickness plus 2 mm, or the t dimension thickness without the raised face height.
- This dimension is for large end of hub, 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

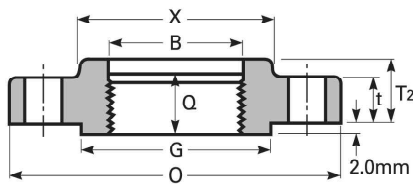
SIZE	DRILLING			BOLTING				APPROXIMATE WEIGHT(Kg)				
	Bolt Circle Diam.	Number of Holes	Diam. of Holes	Diam. of Bolt (inch)	Machine Bolt Length (Raised Face)	Stud Bolt Length		Welding Neck	Slip-On/Threaded	Lap Joint	Blind	Socket Welding
						2mm Raised Face	Ring Joint					
1/2	60.3	4	15.9	1/2	50	55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

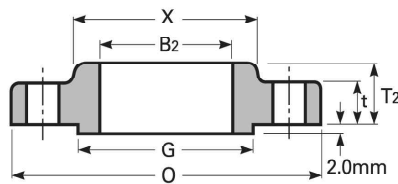
(e) Dimensions in B₁ correspond to the inside diameters of pipe as given in ASME B36.10M for Standard Wall pipe. Thickness of Standard Wall is the same as Schedule 40 in sizes NPS 10 and smaller. These bore sizes are furnished unless otherwise specified by the purchaser.

(f) Depth of Socket(Y) is covered by ASME B16.5 only in sizes through 3 inch, over 3 inch is at the manufacture's option.

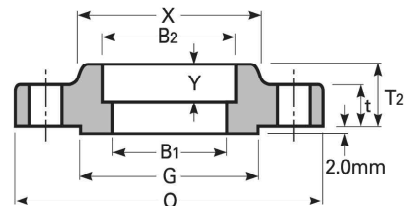
CLASS 300 FLANGES



THREADED



SLIP-ON



SOCKET WELDING

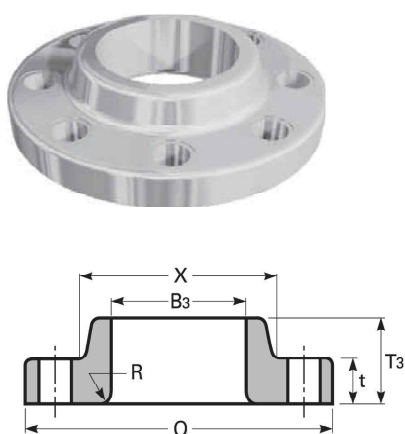
ASME B16.5-2003ED FORGED FLANGES

Unit : mm

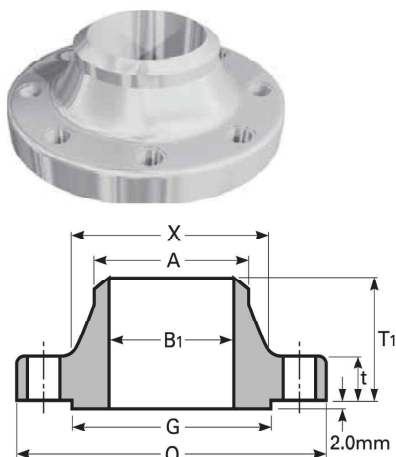
Nom- inal Pipe Size	Out- side Diam.	Thick- ness	Thick- ness Lap Joint	Diam. of Hub	O.D of Rais- ed Face	Diam. of Hub at Bavel	Length Through Hub			Thread Length	BORE			
							Weld- ing Neck	Slip-On Threaded Socket Welding	Lap Joint		Welding Neck /Socket Welding	Slip-On /Socket- Welding	Lap Joint	Counter Bore Min. Threaded
	O	t	t	X	G	A	T1	T2	T3	Q	B1	B2	B3	B
1/2	95	12.7	14.3	38	35.1	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	73.2	48.3	67	29	30	23	40.9	49.5	50.0	50.3
2	165	20.7	22.3	84	91.9	60.3	68	32	33	29	52.5	61.9	62.5	63.5
2 1/2	190	23.9	25.4	100	104.6	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	269.7	219.1	110	60	62	51	202.7	221.5	222.2	222.2
10	445	46.1	47.7	321	323.9	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 :

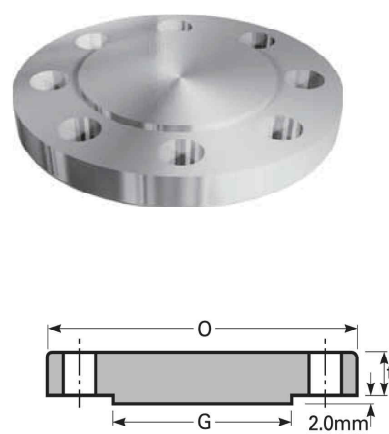
- For the 'BORE' (B1) other than Standard Wall Thickness, refer to page 54-55.
- These flanges may be supplied with a flat face. The flat face may be either the full t dimension of thickness plus 2 mm, or the t dimension thickness without the raised face height.
- This dimension is for large end of hub, 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

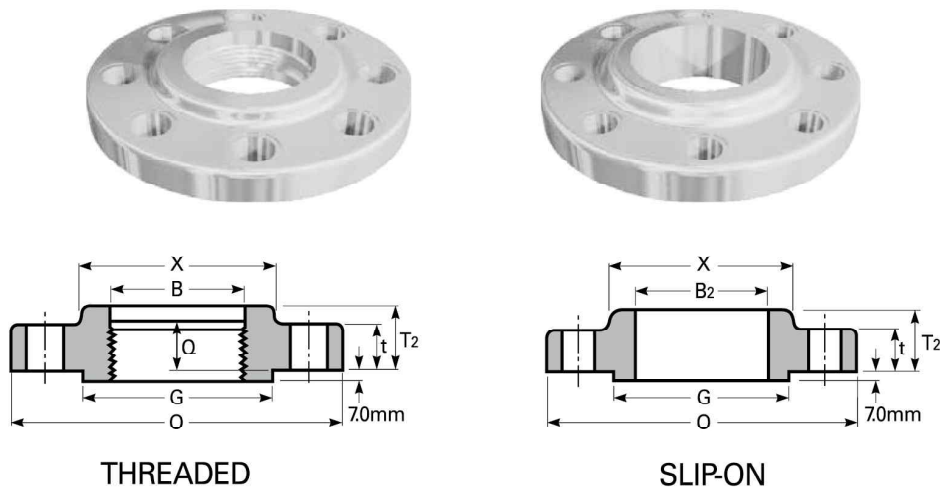
Nom- inal Pipe Size	Radius of Fillet R	Depth of Socket Y	DRILLING			BOLTING				APPROXIMATE WEIGHT(Kg)				
			Bolt Circle Diam.	Num. of Holes	Diam. of Holes	Diam. of Bolt (inch)	Machine Bolt Length (Raised Face)	Stud Bolt Length		Welding Neck	Slip- On/ Threaded	Lap Joint	Blind	Socket Welding
								2mm Raised Face	Ring Joint					
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	72.12	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 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 through 3 inch, over 3 inch is at the manufacture's option.

CLASS 400 FLANGES



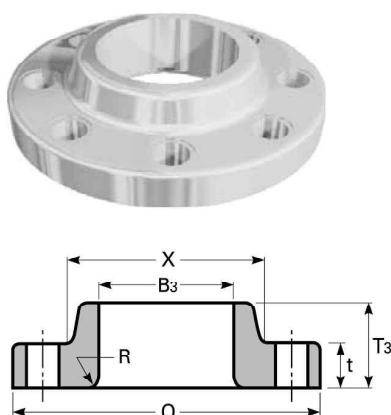
ASME B16.5-2003ED

Unit : mm

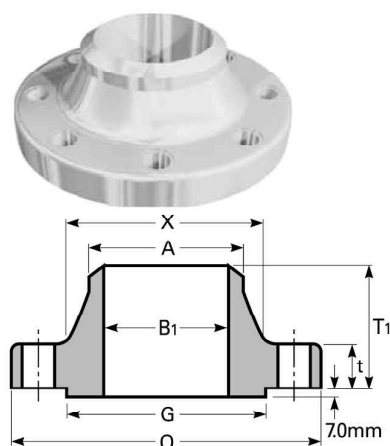
Nom- inal Pipe Size	Outside Diam.	Thick- ness	Diam. of Hub	O.D of Raised Face	Diam. of Hub at Bavel	Length Through Hub			Thread Length	BORE			
						Weld- ing Neck	Slip-On Threaded Socket Welding	Lap Joint		Welding Neck /Socket Welding	Slip-On /Socket- Welding	Lap Joint	Counter Bore Min. Threaded
	O	t	X	G	A	T1	T2	T3	Q	B1	B2	B3	B
1/2	95	14.3	38	35.1	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	73.2	48.3	70	32	32	23		49.5	50.0	50.6
2	165	25.4	84	91.9	60.3	73	37	37	29		61.9	62.5	63.5
2 1/2	190	28.6	100	104.6	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	269.7	219.1	117	68	68	51		221.5	222.2	222.2
10	445	54.0	321	323.9	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 :

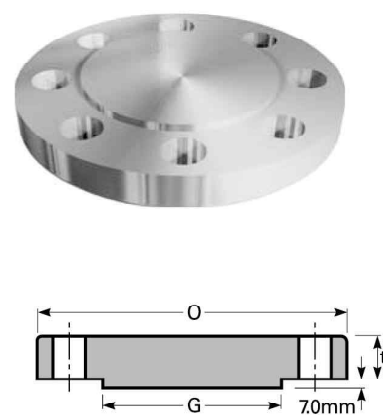
- For the 'BORE' (B1) other than Standard Wall Thickness, refer to page 54-55.
- These flanges may be supplied with a flat face. The flat face may be either the full t dimension of thickness plus 7mm, or the t dimension thickness without the raised face height.
- This dimension is for large end of hub, 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

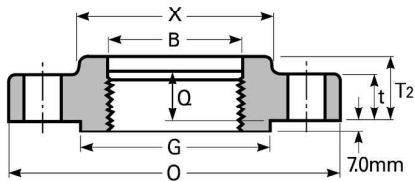
Nom- inal Pipe Size	Ridius of Fillet R	DRILLING			BOLTING				APPROXIMATE WEIGHT(Kg)			
		Bolt Circle Diam.	Num. of Holes	Diam. of Holes	Diam. of Bolt (inch)	Stud Bolt Length			Welding Neck	Slip- On/ Thre- aded	Lap Joint	Blind
						Male- Female Tongue- Groove	7mm Raised Face	Ring Joint				
1/2	3	66.7	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	28.4	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	35.1	1 1/4	195	205	205	72.57	59.02	68.95	98.00
14	13	514.4	20	35.1	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	41.1	1 1/2	235	240	250	193.00	152.00	190.51	261.00
24	13	812.8	24	47.8	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.

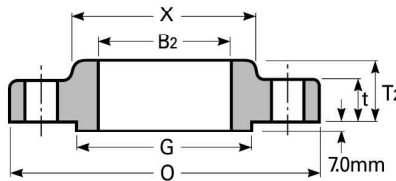
(e) Dimensions in B1 correspond to the inside diameters of pipe as given in ASME B36.10M for Standard Wall pipe. Thickness of Standard Wall is the same as Schedule 40 in sizes NPS 10 and smaller. These bore sizes are furnished unless otherwise specified by the purchaser.

(f) Dimensions of sizes 1/2" through 3 1/2" are the same as for Class 600 flanges.

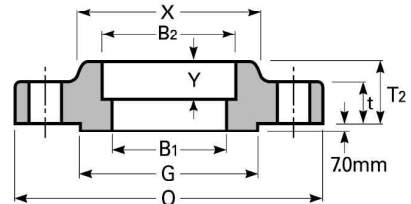
CLASS 600 FLANGES



THREADED



SLIP-ON



SOCKET WELDING

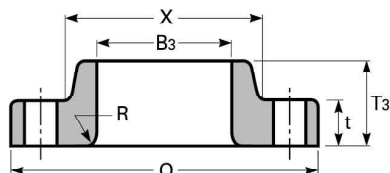
ASME B16.5-2003ED

Unit : mm

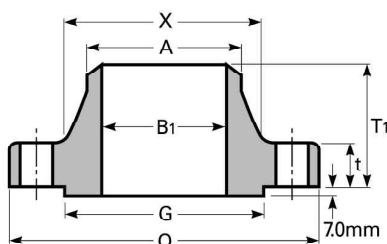
Nom- inal Pipe Size	Outside Diam.	Thick- ness	Diam. of Hub	O.D of Raised Face	Diam. of Hub at Bavel	Length Through Hub			Thread Length	BORE			
						Weld- ing Neck	Slip-On Threaded Socket Welding	Lap Joint		Welding Neck /Socket Welding	Slip-On /Socket Welding	Lap Joint	Counter Bore Min. Threaded
	O	t	X	G	A	T1	T2	T3	Q	B1	B2	B3	B
1/2	95	14.3	38	35.1	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	73.2	48.3	70	32	32	23		49.5	50.0	50.6
2	165	25.4	84	91.9	60.3	73	37	37	29		61.9	62.5	63.5
2 1/2	190	28.6	100	104.6	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	269.7	219.1	133	76	76	58		221.5	222.2	222.2
10	510	63.5	343	323.9	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 :

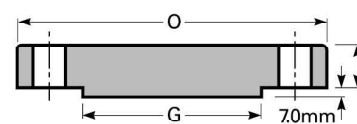
- For the 'BORE' (B1) other than Standard Wall Thickness, refer to page 54-55.
- These flanges may be supplied with a flat face. The flat face may be either the full t dimension of thickness plus 7mm, or the t dimension thickness without the raised face height.
- This dimension is for large end of hub, 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

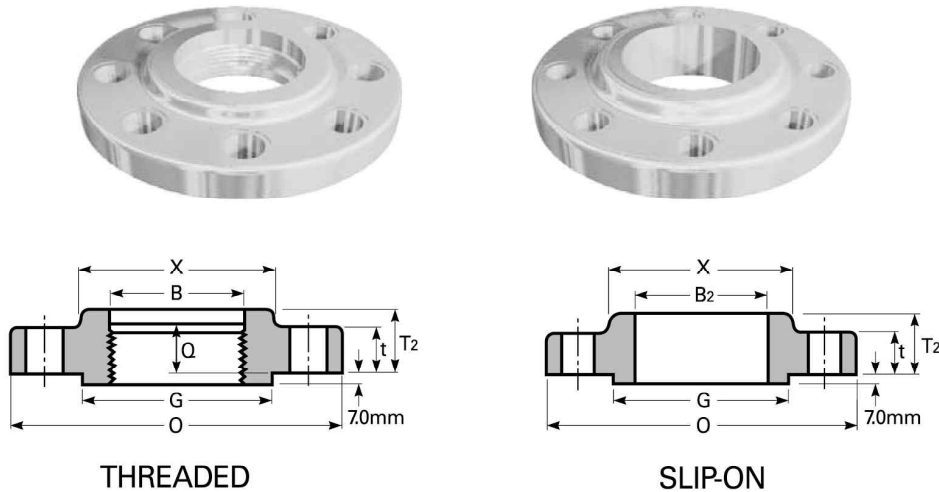
Nominal Pipe Size	Radius of Fillet R	Depth of Socket Y	DRILLING			BOILING				APPROXIMATE WEIGHT(Kg)				
			Bolt Circle Diam.	Num. of Holes	Diam. of Holes	Diam. of Bolt (inch)	Stud Bolt Length			Welding Neck	Slip-On/Threaded	Lap Joint	Blind	Socket Welding
							Male-Female Tongue-Groove	7mm Raised Face	Ring Joint					
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 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 through 3 inch, over 3 inch is at the manufacturer's option.

CLASS 900 FLANGES



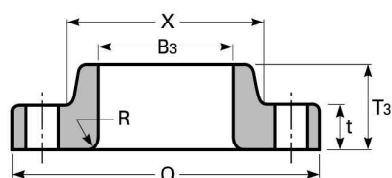
ASME B16.5-2003ED

Unit : mm

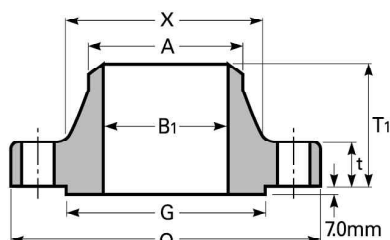
Nominal Pipe Size	Outside Diam.	Thick-ness	Diam. of Hub	O.D of Raised Face	Diam. of Hub at Bavel	Length Through Hub			Thread Length	BORE			
						Weld- ing Neck	Slip-On Threaded Socket Welding	Lap Joint		Welding Neck /Socket Welding	Slip-On /Socket- Welding	Lap Joint	Counter Bore Min. Threaded
	O	t	X	G	A	T1	T2	T3	Q	B1	B2	B3	B
1/2	120	22.3	38	35.1	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	73.2	48.3	83.0	44.0	44.0	32.0		49.5	50.0	50.6
2	215	38.1	105	91.9	60.3	102.0	57.0	57.0	39.0		61.9	62.5	63.5
2 1/2	245	41.3	124	104.6	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	269.7	219.1	162.0	102.0	114.0	64.0		221.5	222.2	222.2
10	545	69.9	368	323.9	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 :

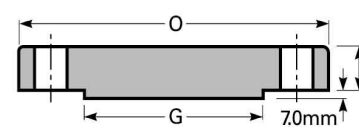
- For the 'BORE' (B1) other than Standard Wall Thickness, refer to page 54-55.
- These flanges may be supplied with a flat face. The flat face may be either the full t dimension of thickness plus 7mm, or the t dimension thickness without the raised face height.
- This dimension is for large end of hub, 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

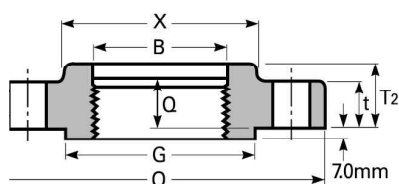
Unit : mm

Nom- inal Pipe Size	Ridius of Fillet R	DRILLING			BOLTING				APPROXIMATE WEIGHT(Kg)			
		Bolt Circle Diam.	Num. of Holes	Diam. of Holes	Diam. of Bolt (inch)	Stud Bolt Length			Welding Neck	Slip- On/ Thre- aded	Lap Joint	Blind
						Male- Female Tongue- Groove	7mm Raised Face	Ring Joint				
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

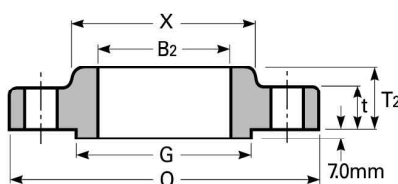
(d) Blind flanges may be made with or without hubs at the manufacturer's option.

(e) Dimensions in B1 correspond to the inside diameters of pipe as given in ASME B36.10M for Standard .

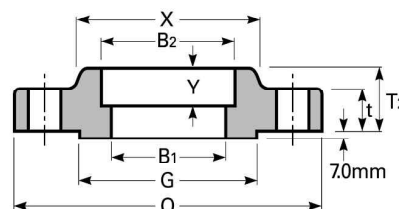
CLASS 1500 FLANGES



THREADED



SLIP-ON



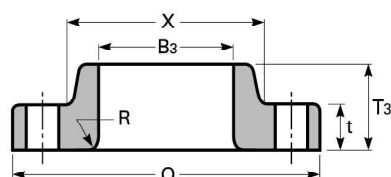
SOCKET WELDING

ASME B16.5-2003ED

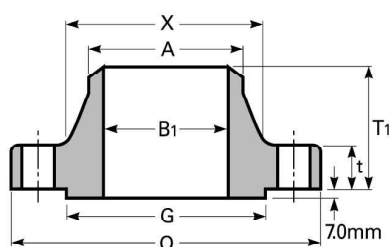
Nominal Pipe Size	Outside Diam.	Thick-ness	Diam. of Hub	O.D of Raised Face	Diam. of Hub at Bavel	Length Through Hub			Thread Length	BORE			
						Weld- ing Neck	Slip-On Threaded Socket Welding	Lap Joint		Welding Neck Socket-Welding	Slip-On Socket-Welding	Lap Joint	Counter Bore Min. Threaded
	O	t	X	G	A	T1	T2	T3	Q	B1	B2	B3	B
1/2	120	22.3	38	35.1	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	73.2	48.3	83	44	44	32		49.5	50.0	50.6
2	215	38.1	105	91.9	60.3	102	57	57	39		61.9	62.5	63.5
2 1/2	245	41.3	124	104.6	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	269.7	219.1	213	142.7	143	76.2		221.5	222.2	222.3
10	585	108.0	368	323.9	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 :

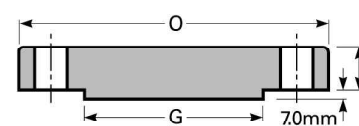
- For the 'BORE' (B1) other than Standard Wall Thickness, refer to page 54-55.
- These flanges may be supplied with a flat face. The flat face may be either the full t dimension of thickness plus 7mm, or the t dimension thickness without the raised face height.
- This dimension is for large end of hub, 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

Nominal Pipe Size	Radius of Fillet	Depth of Socket	DRILLING			BOLTING				APPROXIMATE WEIGHT(Kg)				
			Bolt Circle Diam.	Num. 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
	R	Y						7mm Raised Face	Ring Joint					
1/2	3	10	82.6	4	22.2	3/4	100	110	110	2.10	1.80	1.80	1.90	1.81
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	325	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.

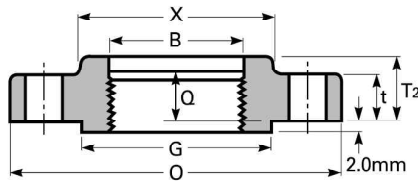
(e) Dimensions in B₁ correspond to the inside diameters of pipe as given in ASME B36.10M for Standard Wall pipe. Thickness of Standard Wall is the same as Schedule 40 in sizes NPS 10 and smaller. These bore sizes are furnished unless otherwise specified by the purchaser.

(f) Depth of Socket(Y) is covered by ASME B16.5 only in sizes through 3 inch, over 3 inch is at the manufacture's option.

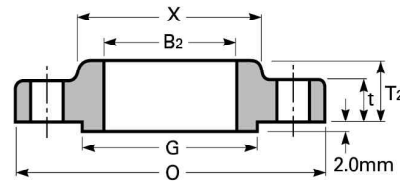
(g) Dimensions of sizes 1/2" through 2 1/2" are the same as for Class 900 flanges.

(h) Over 2 1/2 inch of Bore(B₂) and Thread Length(Q) are at the manufacture's option.

CLASS 2500 FLANGES



THREADED



SLIP-ON

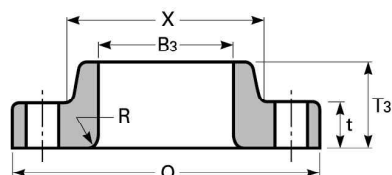
ASME B16.5-2003ED

Unit : mm

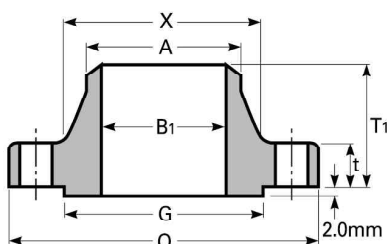
Nominal Pipe Size	Outside Diam.	Thick-ness	Diam. of Hub	O.D of Raised Face	Diam. of Hub at Bavel	Length Through Hub			Thread Length	BORE		
						Weld- ing Neck	Slip-On Threaded Socket Welding	Lap Joint		Welding Neck /Socket Welding	Lap Joint	Counter Bore Min. Threaded
	O	t	X	G	A	T ₁	T ₂	T ₃	Q	B ₁	B ₃	B
1/2	135	30.2	43	35.1	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	73.2	48.3	111	60	60	45		50.0	50.6
2	235	50.9	95	91.9	60.3	127	70	70	51		62.5	63.5
2 1/2	265	57.2	114	104.6	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	-
4	355	76.2	165	157.2	114.3	190	-	108	69.9		116.8	-
5	420	92.1	203	185.7	141.3	229	-	130	76.2		144.4	-
6	485	108.0	235	215.9	168.3	273	-	152	82.6		171.4	-
8	550	127.0	305	269.7	219.1	318	-	178	95.3		222.2	-
10	675	165.1	375	323.9	273.0	419	-	229	108.0		277.4	-
12	760	184.2	441	381.0	323.8	464	-	254	120.7		328.2	-

Notes :

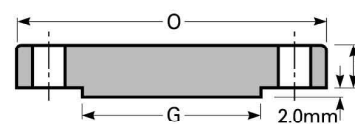
- For the 'BORE' (B₁) other than Standard Wall Thickness, refer to page 54-55.
- These flanges may be supplied with a flat face. The flat face may be either the full t dimension of thickness plus 7mm, or the t dimension thickness without the raised face height.
- This dimension is for large end of hub, 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

Nominal Pipe Size	Radius of Fillet R	DRILLING			BOLTING				APPROXIMATE WEIGHT(Kg)			
		Bolt Circle Diam.	Num. of Holes	Diam. of Holes	Diam. of Bolt (inch)	Male and Female/Longue and Groove	Stud Bolt Length		Welding Neck	Slip-On/Threaded	Lap Joint	Blind
							7mm Raised Face	Ring Joint				
1/2	3.0	88.9	4	22.2	3/4	115	120	120	3.18	3.18	3.00	3.18
3/4	3.0	95.2	4	22.2	3/4	120	125	125	4.08	4.08	3.63	4.54
1	3.0	108.0	4	25.4	7/8	135	140	140	5.45	5.44	4.99	5.44
1 1/4	5.0	130.2	4	28.6	1	145	150	150	9.07	8.16	7.26	8.16
1 1/2	6.0	146.0	4	31.8	1 1/8	165	170	170	11.35	11.00	9.99	10.44
2	8.0	171.4	8	28.6	1	170	180	180	19.07	17.25	16.80	17.71
2 1/2	8.0	196.8	8	31.8	1 1/8	190	195	205	23.61	24.97	24.06	25.42
3	10.0	228.6	8	34.9	1 1/4	215	220	230	42.68	37.68	36.32	39.04
4	11.0	273.0	8	41.3	1 1/2	250	255	260	64.00	58.00	54.48	60.38
5	11.0	323.8	8	47.6	1 3/4	290	300	310	110.68	95.25	92.53	101.15
6	13.0	368.3	8	54.0	2	335	345	355	176.46	146.51	143.01	156.63
8	13.0	438.2	12	54.0	2	375	380	395	261.27	219.99	213.38	240.62
10	13.0	539.8	12	66.7	2 1/2	485	490	510	484.43	419.57	408.60	465.36
12	13.0	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 manufacture'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 manufacture's option.

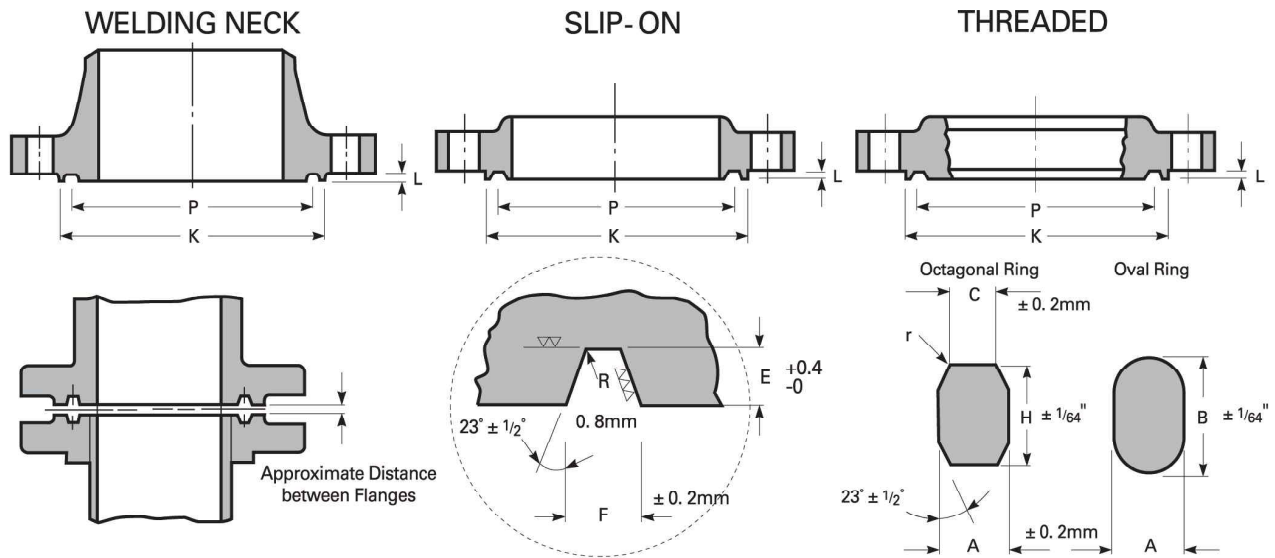
ANSI B16.5-2010

Ring Joint Flanges

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



CLASS 150 FLANGES



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	47.6	8	14.3	12.7	5.2	8.7	6.4	63.5	R15	4
1 1/4	57.2	8	14.3	12.7	5.2	8.7	6.4	73.0	R17	4
1 1/2	65.1	8	14.3	12.7	5.2	8.7	6.4	82.5	R19	4
2	82.6	8	14.3	12.7	5.2	8.7	6.4	102.0	R22	4
2 1/2	101.6	8	14.3	12.7	5.2	8.7	6.4	121.0	R25	4
3	114.3	8	14.3	12.7	5.2	8.7	6.4	133.0	R29	4
3 1/2	131.8	8	14.3	12.7	5.2	8.7	6.4	154.0	R33	4
4	149.2	8	14.3	12.7	5.2	8.7	6.4	171.0	R36	4
5	171.5	8	14.3	12.7	5.2	8.7	6.4	194.0	R40	4
6	193.7	8	14.3	12.7	5.2	8.7	6.4	219.0	R43	4
8	247.7	8	14.3	12.7	5.2	8.7	6.4	273.0	R48	4
10	304.8	8	14.3	12.7	5.2	8.7	6.4	330.0	R52	4
12	381.0	8	14.3	12.7	5.2	8.7	6.4	406.0	R56	4
14	396.9	8	14.3	12.7	5.2	8.7	6.4	425.0	R59	3
16	454.0	8	14.3	12.7	5.2	8.7	6.4	483.0	R64	3
18	517.5	8	14.3	12.7	5.2	8.7	6.4	546.0	R68	3
20	558.8	8	14.3	12.7	5.2	8.7	6.4	597.0	R72	3
24	673.1	8	14.3	12.7	5.2	8.7	6.4	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. throughout its entire circumference.

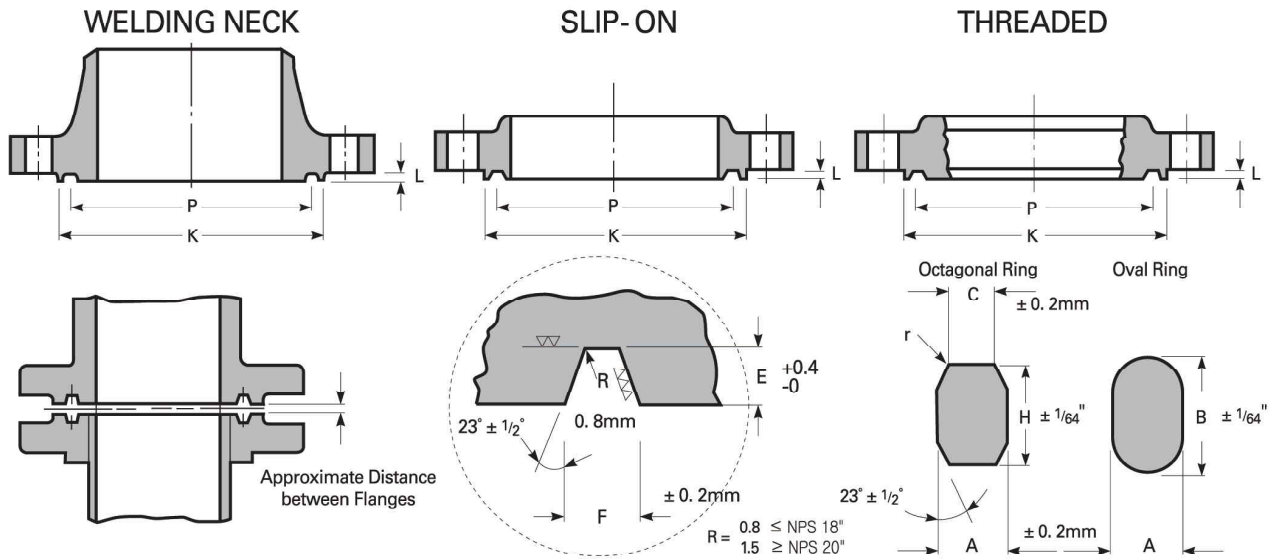
Dimension "R" is max.

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



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
1/2	34.1	6.4	11.1	9.5	4.3	7.1	5.5	51.0	R11	3		3
3/4	42.9	8.0	14.3	12.7	5.2	8.7	6.4	63.5	R13	4		4
1	50.8	8.0	14.3	12.7	5.2	8.7	6.4	70.0	R16	4		4
1 1/4	60.3	8.0	14.3	12.7	5.2	8.7	6.4	79.2	R18	4		4
1 1/2	68.3	8.0	14.3	12.7	5.2	8.7	6.4	90.5	R20	4		4
2	82.6	11.1	17.5	15.9	7.7	11.9	7.9	108.0	R23	6		5
2 1/2	101.6	11.1	17.5	15.9	7.7	11.9	7.9	127.0	R26	6		5
3	123.8	11.1	17.5	15.9	7.7	11.9	7.9	146.0	R31	6		5
3 1/2	131.8	11.1	17.5	15.9	7.7	11.9	7.9	159.0	R34	6		5
4	149.2	11.1	17.5	15.9	7.7	11.9	7.9	175.0	R37	6	6	5
5	181.0	11.1	17.5	15.9	7.7	11.9	7.9	210.0	R41	6	6	5
6	211.1	11.1	17.5	15.9	7.7	11.9	7.9	241.0	R45	6	6	5
8	269.9	11.1	17.5	15.9	7.7	11.9	7.9	302.0	R49	6	6	5
10	323.9	11.1	17.5	15.9	7.7	11.9	7.9	356.0	R53	6	6	5
12	381.0	11.1	17.5	15.9	7.7	11.9	7.9	413.0	R57	6	6	5
14	419.1	11.1	17.5	15.9	7.7	11.9	7.9	457.0	R61	6	6	5
16	469.9	11.1	17.5	15.9	7.7	11.9	7.9	508.0	R65	6	6	5
18	533.4	11.1	17.5	15.9	7.7	11.9	7.9	575.0	R69	6	6	5
20	584.2	12.7	19.1	17.5	8.7	13.5	9.5	635.0	R73	6	6	5
24	692.2	15.9	22.2	20.7	10.5	16.7	11.1	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. throughout its entire circumference.

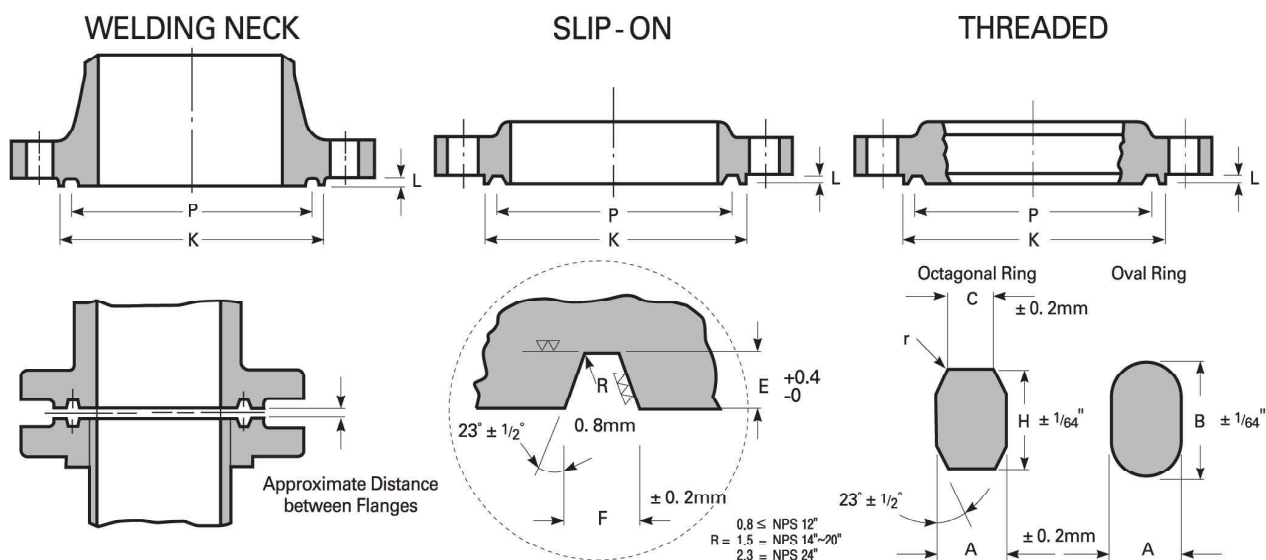
Dimension "R" is max.

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



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	39.7	8.0	14.3	12.7	5.2	8.74	6.35	60.5	R12	4
3/4	44.5	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	60.3	8.0	14.3	12.7	5.2	8.74	6.35	81.0	R18	4
1 1/2	68.3	8.0	14.3	12.7	5.2	8.74	6.35	92.0	R20	4
2	95.3	11.1	17.5	15.9	7.7	11.91	7.92	124.0	R24	3
2 1/2	108.0	11.1	17.5	15.9	7.7	11.91	7.92	136.7	R27	3
3	123.8	11.1	17.5	15.9	7.7	11.9	7.9	156.0	R31	4
4	149.2	11.1	17.5	15.9	7.7	11.9	7.9	181.0	R37	4
5	181.0	11.1	17.5	15.9	7.7	11.9	7.9	216.0	R41	4
6	211.1	11.1	17.5	15.9	7.7	11.9	7.9	241.0	R45	4
8	269.9	11.1	17.5	15.9	7.7	11.9	7.9	308.0	R49	4
10	323.9	11.1	17.5	15.9	7.7	11.9	7.9	362.0	R53	4
12	381.0	11.1	17.5	15.9	7.7	11.9	7.9	419.0	R57	4
14	419.1	15.9	22.2	20.7	10.5	16.7	11.1	467.0	R62	4
16	469.9	15.9	22.2	20.7	10.5	16.7	11.1	524.0	R66	4
18	533.4	19.1	25.4	23.8	11.1	19.8	12.7	594.0	R70	5
20	584.2	19.1	25.4	23.8	12.3	19.8	12.7	648.0	R74	5
24	692.2	25.4	33.4	31.8	17.3	27.0	15.9	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. throughout 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)

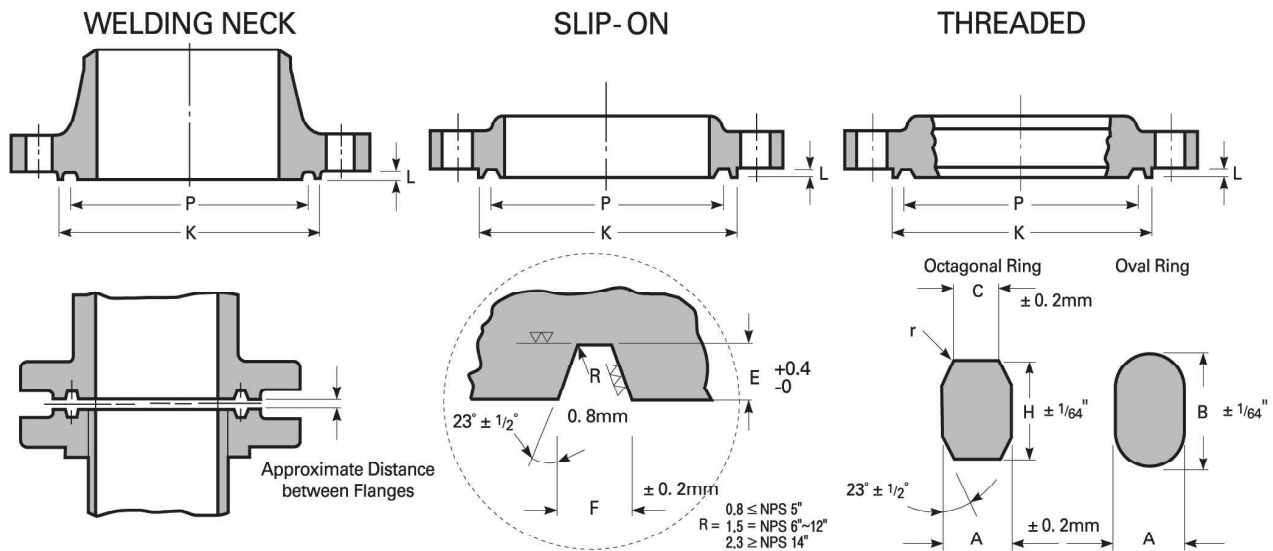
R ≤ 2 +0.8, -0.0

R > 2 ±0.8

•23 deg (angle) ± 1/2 deg



CLASS 1500 FLANGES



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	39.7	8.0	14.3	12.7	5.2	8.74	6.35	60.5	R12	4
3/4	44.5	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	60.3	8.0	14.3	12.7	5.2	8.74	6.35	81.0	R18	4
1 1/2	68.3	8.0	14.3	12.7	5.2	8.74	6.35	92.0	R20	4
2	95.3	11.1	17.5	15.9	7.7	11.91	7.92	124.0	R24	3
2 1/2	108.0	11.1	17.5	15.9	7.7	11.91	7.92	137.0	R27	3
3	136.5	11.1	17.5	15.9	7.7	11.91	7.92	168.0	R35	3
4	161.9	11.1	17.5	15.9	7.7	11.91	7.92	194.0	R39	3
5	193.7	11.1	17.5	15.9	7.7	11.91	7.92	229.0	R44	3
6	211.1	12.7	19.1	17.5	8.7	13.49	9.53	248.0	R46	3
8	269.9	15.9	22.2	20.7	10.5	16.67	11.13	318.0	R50	4
10	323.9	15.9	22.2	20.7	10.5	16.67	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	27.00	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	692.2	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. throughout its entire circumference.

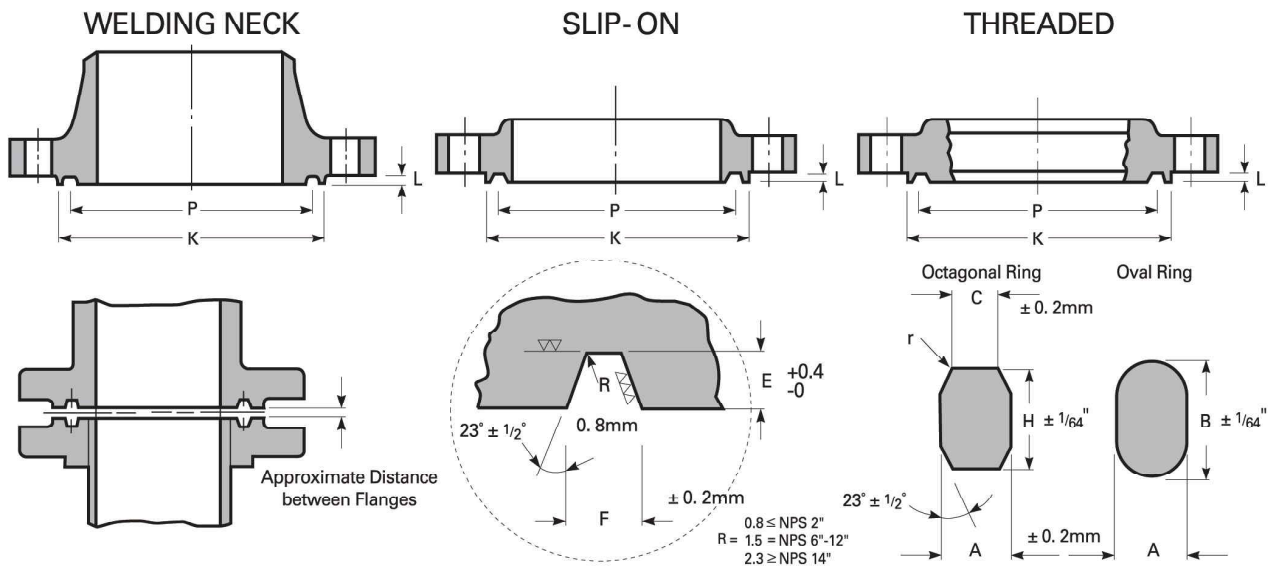
Dimension "R" is max.

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



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	42.9	8.0	14.3	12.7	5.2	8.7	6.4	65.0	R13	13
3/4	50.8	8.0	14.3	12.7	5.2	8.7	6.4	73.0	R16	16
1	60.3	8.0	14.3	12.7	5.2	8.7	6.4	82.5	R18	18
1 1/4	72.2	11.1	17.5	15.9	7.7	11.9	7.9	102.0	R21	21
1 1/2	82.6	11.1	17.5	15.9	7.7	11.9	7.9	114.0	R23	23
2	101.6	11.1	17.5	15.9	7.7	11.9	7.9	133.0	R26	26
2 1/2	111.1	12.7	19.1	17.5	8.7	13.5	9.5	149.0	R28	28
3	127.0	12.7	19.1	17.5	8.7	13.5	9.5	168.0	R32	32
4	157.2	15.9	22.2	20.7	10.5	16.7	11.1	203.0	R38	38
5	190.5	19.1	25.4	23.8	12.3	19.8	12.7	241.0	R42	42
6	228.6	19.1	25.4	23.8	12.3	19.8	12.7	279.0	R47	47
8	279.4	22.2	28.6	27.0	14.8	23.0	14.3	340.0	R51	51
10	342.9	28.6	36.5	34.9	19.8	30.2	17.5	425.0	R55	55
12	406.4	31.8	39.7	38.1	22.3	33.3	17.5	495.0	R60	60

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. throughout 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

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 flanges 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.

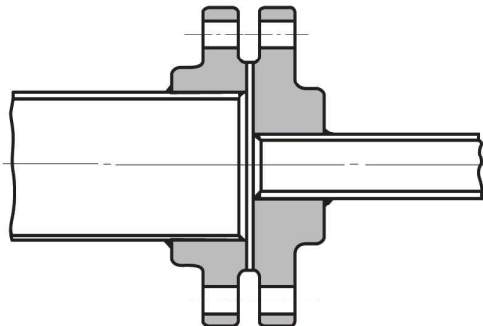
EXAMPLE

- A.** The size designation is NPS 6 x 2 1/2 — Class 300 reducing threaded flange. This flange has the following dimensions: 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 taper 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.

THREADED-SLIP-ON-WELDING NECK

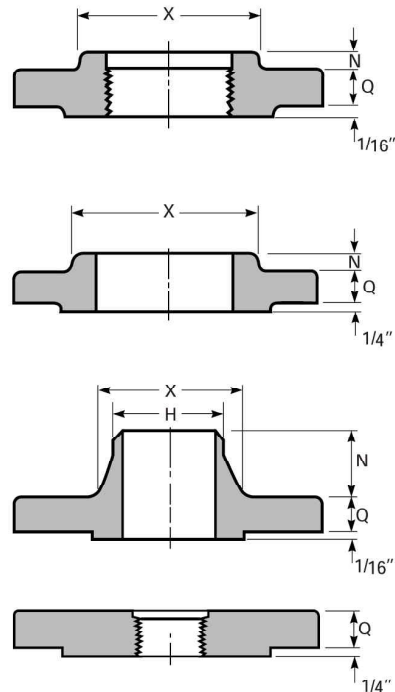


In ordering Reducing Flanges :

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 reducing from a 6" (152.4mm) to a 3" (76.2mm) nominal pipe size should be designated as a 3" x 12 1/2" -300lb. 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 Flange	OUTSIDE DIAMETER OF FLANGE FROM WHICH REDUCTION IS BEING MADE							Smallest Size Bore 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	
Nominal Pipe Size to Which Reduction made to be Specified by Purchaser	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 1/4	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

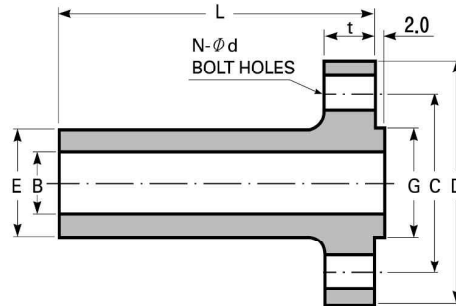
ANSI B16.5-2010

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



LONG WELDING NECK 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	35.1	30.2	12.7	9.6	229	60.3	4	15.9
3/4	100	42.9	38.1	19.1	11.2	229	69.9	4	15.9
1	110	50.8	50.8	25.4	12.7	229	79.4	4	15.9
1 1/4	115	63.5	60.5	31.8	14.3	229	88.9	4	15.9
1 1/2	125	73.2	66.5	38.1	15.9	229	98.4	4	15.9
2	150	91.9	77.7	50.8	17.5	229	120.7	4	19.1
2 1/2	180	104.6	95.3	63.5	20.7	229	139.7	4	19.1
3	190	127.0	108.0	76.2	22.3	229	152.4	4	19.1
3 1/2	215	139.7	124.0	88.9	22.3	229	177.8	8	19.1
4	230	157.2	139.7	101.6	22.3	229	190.5	8	19.1
5	255	185.7	165.1	127.0	22.3	305	215.9	8	22.2
6	280	215.9	196.9	152.4	23.9	305	241.3	8	22.2
8	345	269.7	247.7	203.2	27.0	305	298.5	8	22.2
10	405	323.9	304.8	254.0	28.6	305	362.0	12	25.4
12	485	381.0	365.3	304.8	30.2	305	431.8	12	25.4
14	535	412.8	406.4	355.6	33.4	305	476.3	12	28.6
16	595	469.9	457.2	406.4	35.0	305	539.8	16	28.6
18	635	533.4	508.0	457.2	38.1	305	577.9	16	31.8
20	700	584.2	558.8	508.0	41.3	305	635.0	20	31.8
24	815	692.2	666.8	609.6	46.1	305	749.3	20	34.9

CLASS 300

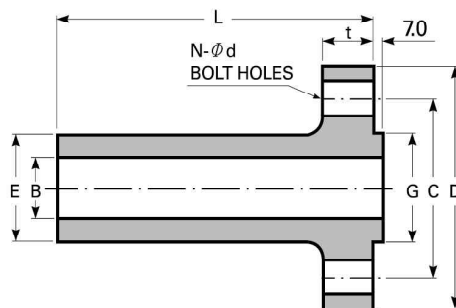
Nominal Pipe Size	Outside Diameter	O.D of Raised Face	Hub Diam. at Bevel	Diameter of Bore	Thickness of Flange Min.	Length Through Hub	Diameter of Bolt Circle	Number of Holes	Diameter of Holes
	D	G	E	B	t	L	C	N	d
1/2	95	35.1	38.1	12.7	14.3	229	66.7	4	15.9
3/4	115	42.9	47.8	19.1	15.9	229	82.6	4	19.1
1	125	50.8	53.8	25.4	17.5	229	88.9	4	19.1
1 1/4	135	63.5	63.5	31.8	19.1	229	98.4	4	19.1
1 1/2	155	73.2	69.9	38.1	20.7	229	114.3	4	22.2
2	165	91.9	84.1	50.8	22.3	229	127.0	8	19.1
2 1/2	190	104.6	100.1	63.5	25.4	229	149.2	8	22.2
3	210	127.0	117.3	76.2	28.6	229	168.3	8	22.2
3 1/2	230	139.7	133.4	88.9	30.2	229	184.2	8	22.2
4	255	157.2	146.1	101.6	31.8	229	200.0	8	22.2
5	280	185.7	177.8	127.0	35.0	305	235.0	8	22.2
6	320	215.9	206.2	152.4	36.6	305	269.9	12	22.2
8	380	269.7	260.4	203.2	41.3	305	330.2	12	25.4
10	445	323.9	320.5	254.0	47.7	305	387.4	16	28.6
12	520	381.0	374.7	304.8	50.8	305	450.8	16	31.8
14	585	412.8	425.5	355.6	54.0	305	514.4	20	31.8
16	650	469.9	482.6	406.4	57.2	305	571.5	20	34.9
18	710	533.4	533.4	457.2	60.4	305	628.6	24	34.9
20	775	584.2	587.2	508.0	63.5	305	685.8	24	34.9
24	915	692.2	701.5	609.6	69.9	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.



LONG WELDING NECK FLANGES



CLASS 400

Unit : mm

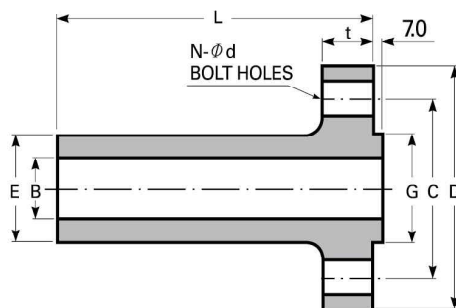
Nominal Pipe Size*	Outside Diameter	O.D of Raised Face	Hub Diam. at Bevel	Diameter of Bore	Thickness of Flange Min.	Length Through Hub	Diameter of Bolt Circle	Number of Holes	Diameter of Holes
	D	G	E	B	t	L	C	N	d
1	125	50.8	53.8	25.4	17.5	229	88.9	4	19.1
1 1/4	135	63.5	63.5	31.8	20.7	229	98.4	4	19.1
1 1/2	155	73.2	69.9	38.1	22.3	229	114.3	4	22.2
2	165	91.9	84.1	50.8	25.4	229	127.0	8	19.1
2 1/2	190	104.6	100.1	63.5	28.6	229	149.2	8	22.2
3	210	127.0	117.3	76.2	31.8	229	168.3	8	22.2
3 1/2	230	139.7	133.4	88.9	35.0	229	184.2	8	25.4
4	255	157.2	146.1	101.6	35.0	229	200.0	8	25.4
5	280	185.7	177.8	127.0	38.1	305	235.0	8	25.4
6	320	215.9	206.2	152.4	41.3	305	269.9	12	25.4
8	380	269.7	260.4	203.2	47.7	305	330.0	12	28.4
10	445	323.9	320.5	254.0	54.0	305	387.4	16	31.8
12	520	381.0	374.7	304.8	57.2	305	450.8	16	35.1
14	585	412.8	425.5	355.6	60.4	305	514.4	20	35.1
16	650	469.9	482.6	406.4	63.5	305	571.5	20	38.1
18	710	533.4	533.4	457.2	66.7	305	628.6	24	38.1
20	775	584.2	587.2	508.0	69.9	305	685.8	24	41.1
24	915	692.2	701.5	609.6	76.2	305	812.8	24	47.8

CLASS 600

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	53.8	25.4	17.5	229	88.9	4	19.1
1 1/4	135	63.5	63.5	31.8	20.7	229	98.4	4	19.1
1 1/2	155	73.2	69.9	38.1	22.3	229	114.3	4	22.2
2	165	91.9	84.1	50.8	25.4	229	127.0	8	19.1
2 1/2	190	104.6	100.1	63.5	28.6	229	149.2	8	22.2
3	210	127.0	117.3	76.2	31.8	229	168.3	8	22.2
3 1/2	230	139.7	133.4	88.9	35.0	229	184.2	8	25.4
4	275	157.2	152.4	101.6	38.1	229	215.9	8	25.4
5	330	185.7	190.5	127.0	44.5	305	266.7	8	28.6
6	355	215.9	222.3	152.4	47.7	305	292.1	12	28.6
8	420	269.7	273.1	203.2	55.6	305	349.2	12	31.8
10	510	323.9	342.9	254.0	63.5	305	431.8	16	34.9
12	560	381.0	400.1	304.8	66.7	305	489.0	20	34.9
14	605	412.8	431.8	355.6	69.9	305	527.0	20	38.1
16	685	469.9	495.3	406.4	76.2	305	603.2	20	41.3
18	745	533.4	546.1	457.2	82.6	305	654.0	20	44.5
20	815	584.2	609.1	508.0	88.9	305	723.9	24	44.5
24	940	692.2	717.6	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.



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	52.3	25.4	28.6	229	101.6	4	25.4
1 1/4	160	63.5	63.5	31.8	28.6	229	111.1	4	25.4
1 1/2	180	73.2	69.9	38.1	31.8	229	123.8	4	28.6
2	215	91.9	104.6	50.8	38.1	229	165.1	8	25.4
2 1/2	245	104.6	124.0	63.5	41.3	229	190.5	8	28.6
3	240	127.0	127.0	76.2	38.1	229	190.5	8	25.4
4	290	157.2	158.8	101.6	44.5	229	235.0	8	31.8
5	350	185.7	190.5	127.0	50.8	229	279.4	8	34.9
6	380	215.9	235.0	152.4	55.6	305	317.5	12	31.8
8	470	269.7	298.5	203.2	63.5	305	393.7	12	38.1
10	545	323.9	368.3	254.0	69.9	305	469.9	16	38.1
12	610	381.0	419.1	304.8	79.4	305	533.4	20	38.1
14	640	412.8	450.9	355.6	85.8	-	558.8	20	41.3
16	705	469.9	508.0	406.4	88.9	-	616.0	20	44.5
18	785	533.4	565.2	457.2	101.6	-	685.8	20	50.8
20	855	584.2	622.3	508.0	108.0	-	749.3	20	54.0
24	1040	692.2	749.3	609.6	139.7	-	901.7	20	66.7

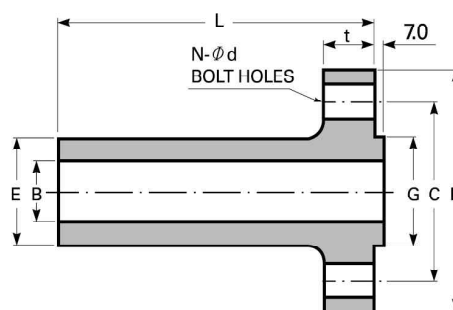
CLASS 1500

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	52.3	25.4	28.6	229	101.6	4	25.4
1 1/4	160	63.5	63.5	31.8	28.6	229	111.1	4	25.4
1 1/2	180	73.2	69.9	38.1	31.8	229	123.8	4	28.6
2	215	91.9	104.6	50.8	38.1	229	165.1	8	25.4
2 1/2	245	104.6	124.0	63.5	41.3	229	190.5	8	28.6
3	265	127.0	133.4	76.2	47.7	229	203.2	8	31.8
4	310	157.2	162.1	101.6	54.0	229	241.3	8	34.9
5	375	185.7	196.9	127.0	73.1	229	292.1	8	41.3
6	395	215.9	228.6	152.4	82.6	305	317.5	12	38.1
8	485	269.7	292.1	203.2	92.1	305	393.7	12	44.5
10	585	323.9	368.3	254.0	108.0	305	482.6	12	50.8
12	675	381.0	450.9	304.8	123.9	305	571.5	16	54.0
14	750	412.8	495.3	355.6	133.4	-	635.0	16	60.3
16	825	469.9	552.5	406.4	146.1	-	704.8	16	66.7
18	915	533.4	596.9	457.2	162.0	-	774.7	16	73.0
20	985	584.2	641.4	508.0	177.8	-	831.8	16	79.4
24	1170	692.2	762.0	609.6	203.2	-	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.

CLASS 2500 FLANGES



LONG WELDING NECK

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	160	50.8	57.2	25.4	35.0	229	108.0	4	25.4
1 1/4	185	63.5	73.2	31.8	38.1	229	130.2	4	28.6
1 1/2	205	73.2	79.2	38.1	44.5	229	146.0	4	31.8
2	235	91.9	95.3	50.8	50.9	229	171.4	8	28.6
2 1/2	265	104.6	114.3	63.5	57.2	229	196.8	8	31.8
3	305	127.0	133.4	76.2	66.7	229	228.6	8	34.9
4	355	157.2	165.1	101.6	76.2	229	273.0	8	41.3
5	420	185.7	203.2	127.0	92.1	229	323.8	8	47.6
6	485	215.9	235.0	152.4	108.0	305	368.3	8	54.0
8	550	269.7	304.8	203.2	127.0	305	438.2	12	54.0
10	675	323.9	374.7	254.0	165.1	305	539.8	12	66.7
12	760	381.0	441.5	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.

► 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.

ANSI B16.48-2005

Line Blanks (API 590 FIG.8)

- CLASS 150 / 300 Flanges
- CLASS 600 / 900 Flanges
- CLASS 1500 / 2500 Flanges



STEEL LINE BLANKS

ASME B16.48-1997

1. General

a. Figure 8 Blank

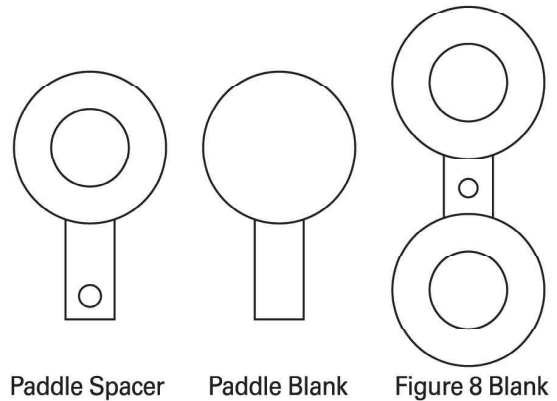
A figure 8 blank(also called a spectacle blank) is a pressure retaining plate with one solid end and one open end connected with a web or tie bar

b. Paddle Blank

A paddle blank is similar to the solid end of a figure 8 blank(with handle) and is generally used in conjunction with a paddle spacer in large sizes.

c. Paddle Spacer

A paddle spacer is similar to the open end of a figure 8 blank(with handle) and is generally used in conjunction with a paddle blank.



2. MATERIAL

Material Group	Forgings	Plate	Castings
1.1	A105 ⁽¹⁾	A515 Gr.70 ⁽¹⁾	A216 Gr. WCB ⁽¹⁾
		A516 Gr.70 ⁽¹⁾⁽²⁾	
		A537 Cl.1 ⁽³⁾	
1.7	A182 Gr.F2 ⁽⁴⁾	A204 Gr.C ⁽⁵⁾	-
1.9	A182 Gr.F11 Cl.2 ⁽⁶⁾	A387 Gr.11 Cl.2 ⁽⁷⁾	A217 Gr. WC6 ⁽⁸⁾
1.10	A182 Gr.F22 Cl.3 ⁽⁷⁾	A387 Gr.22 Cl.2 ⁽⁷⁾	A217 Gr. WC9 ⁽⁸⁾
1.13	A182 Gr.F5	-	-
2.1	A182 Gr.F304 ⁽⁹⁾	A240 Gr. 304 ⁽⁹⁾	A351 Gr. CF8 ⁽⁹⁾
2.2	A182 Gr.F316 ⁽⁹⁾	A240 Gr. 316 ⁽⁹⁾	A351 Gr. CF8M ⁽⁹⁾
2.4	A182 Gr.F321 ⁽⁴⁾	A240 Gr. 321 ⁽⁴⁾	-
2.5	A182 Gr.F347 ⁽⁴⁾	A240 Gr. 347 ⁽⁴⁾	A351 Gr. CF8C ⁽⁹⁾

NOTE:

- (1) Upon prolonged exposure to temperatures above 427°C, the carbide phase of carbon steel may be converted to graphite. Permissible but not recommended for prolonged service above 427°C
- (2) Not to be used over 454°C
- (3) Not to be used over 371°C
- (4) Not to be used above 538°C
- (5) Upon prolonged exposure to temperatures above 468°C, the carbide phase of carbon-molyb-denum steel may be converted to graphite. Permissible but not recommended for prolonged service above 468°C
- (6) Permissible but not recommended for prolonged use above 593°C. Use normalized and tempered material only.
- (7) Permissible but not recommended for prolonged use above 593°C
- (8) Not to be used over 593°C. Use normalized and tempered material only.
- (9) At temperatures over 538°C, use the material only when the carbon content is 0.04% or higher.

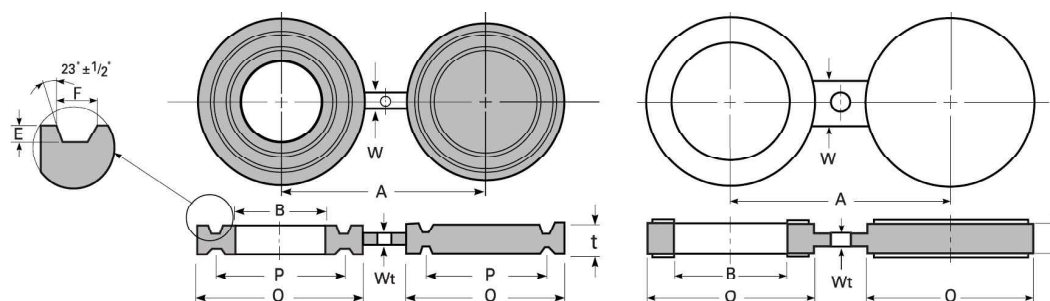
3. TOLERANCE

Tolerance for facings shall be in accordance with ASME B16.5. Thickness tolerances are:

NPS 18 and smaller +3 / -0

NPS 20 and larger +4.8 / -0

CLASS 150 / 300 FLANGES



Class 150 FIGURE 8 BLANK RAISED FACE & FEMALE RING-JOINT FACING

Unit : mm

No-minal Pipe Size	SPECTACLE RAISED FACE						SPECTACLE RING JOINT FACING								
	Inside Diam.	Outside Diam.	Center -line Diam.	Thick- ness	Web Width	Hole Diam.	Inside Diam.	Outside Diam.	Center -line Diam.	Thick- ness	Web Width	Pitch Diam.	Width of Groove	Depth of Groove	Hole Diam.
	B	O	A	t	W		B	O	A	t	W	P	F	E	
1/2	15.7	44.5	60.5	3.0	38.1	15.7	-	-	-	-	-	-	-	-	-
3/4	20.8	53.8	69.9	3.0	38.1	15.7	-	-	-	-	-	-	-	-	-
1	26.7	63.5	79.2	3.0	38.1	15.7	33.5	63.5	79.2	19.1	50.8	47.6	8.7	6.4	15.7
1 1/4	42.2	73.2	88.9	6.4	38.1	15.7	42.2	73.2	88.9	19.1	50.8	57.2	8.7	6.4	15.7
1 1/2	48.3	82.6	98.6	6.4	38.1	15.7	48.3	82.6	98.6	19.1	57.2	65.1	8.7	6.4	15.7
2	60.5	101.6	120.7	6.4	50.8	19.1	60.5	101.6	120.7	19.1	57.2	82.6	8.7	6.4	19.1
2 1/2	73.2	120.7	139.7	6.4	50.8	19.1	73.2	120.7	139.7	22.4	57.2	101.6	8.7	6.4	19.1
3	98.9	133.4	152.4	6.4	63.5	19.1	98.9	133.4	152.4	22.4	57.2	114.3	8.7	6.4	19.1
3 1/2	101.6	158.8	177.8	9.7	63.5	19.1	101.6	153.9	177.8	22.4	63.5	131.8	8.7	6.4	19.1
4	114.3	171.5	190.5	9.7	63.5	19.1	114.3	171.5	190.5	22.4	63.5	149.2	8.7	6.4	19.1
5	141.2	193.5	215.9	9.7	76.2	22.4	141.2	193.5	215.9	25.4	69.9	171.5	8.7	6.4	22.4
6	168.1	218.9	241.3	12.7	76.2	22.4	168.1	218.9	241.3	25.4	82.6	193.7	8.7	6.4	22.4
8	218.9	276.4	298.5	12.7	76.2	22.4	218.9	273.1	298.5	28.4	95.3	247.7	8.7	6.4	22.4
10	273.1	336.6	362.0	15.7	101.6	25.4	273.1	330.2	362.0	31.8	101.6	304.8	8.7	6.4	25.4
12	323.9	406.4	431.8	19.1	101.6	25.4	323.9	406.4	431.8	35.1	120.7	381.0	8.7	6.4	25.4
14	355.6	447.5	476.3	19.1	108.0	28.4	355.6	425.5	476.3	35.1	127.0	396.9	8.7	6.4	28.4
16	406.4	511.0	539.8	22.4	108.0	28.4	406.4	482.6	539.8	38.1	127.0	454.0	8.7	6.4	28.4
18	457.2	546.1	577.9	25.4	114.3	31.8	457.2	546.1	577.9	41.1	127.0	517.5	8.7	6.4	31.8
20	508.0	603.3	635.0	28.4	120.7	31.8	508.0	596.9	635.0	41.1	127.0	558.8	8.7	6.4	31.8
24	609.6	714.2	749.3	31.8	139.7	35.1	609.6	711.2	749.3	47.8	152.4	673.1	8.7	6.4	35.1

Class 300 FIGURE 8 BLANK RAISED FACE & FEMALE RING-JOINT FACING

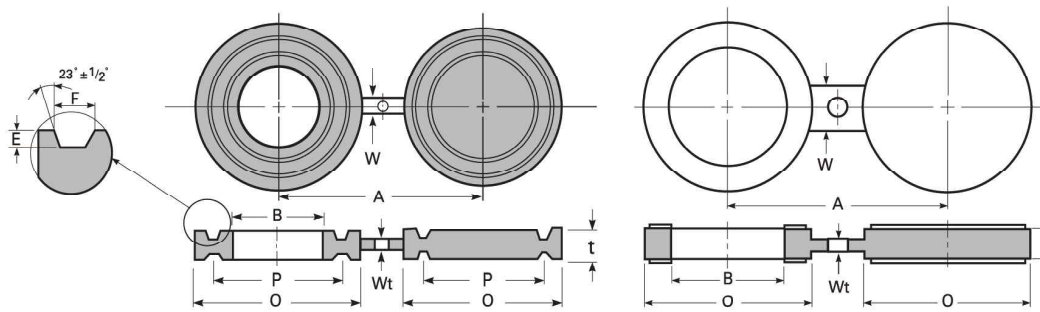
Unit : mm

No-minal Pipe Size	SPECTACLE RAISED FACE						SPECTACLE RING JOINT FACING								
	Inside Diam.	Outside Diam.	Center -line Diam.	Thick- ness	Web Width	Hole Diam.	Inside Diam.	Outside Diam.	Center -line Diam.	Thick- ness	Web Width	Pitch Diam.	Width of Groove	Depth of Groove	Hole Diam.
	B	O	A	t	W		B	O	A	t	W	P	F	E	
1/2	15.7	50.8	66.5	6.4	38.1	15.7	21.3	50.8	57.4	15.7	38.1	34.1	7.1	5.6	15.7
3/4	20.8	63.5	82.6	6.4	38.1	19.1	26.7	63.5	82.6	19.1	44.5	42.9	8.7	6.4	19.1
1	26.7	69.9	88.9	6.4	38.1	19.1	33.5	69.9	88.9	19.1	50.8	50.8	8.7	6.4	19.1
1 1/4	42.2	79.2	98.6	6.4	38.1	19.1	42.2	79.2	98.6	22.4	50.8	60.3	8.7	6.4	19.1
1 1/2	48.3	91.9	114.3	6.4	50.8	22.4	48.3	90.4	114.3	22.4	57.2	68.3	8.7	6.4	22.4
2	60.5	108.0	127.0	9.7	50.8	19.1	60.5	108.0	127.0	25.4	57.2	82.6	11.9	7.9	19.1
2 1/2	73.2	127.0	149.4	9.7	63.5	22.4	73.2	127.0	149.4	28.4	57.2	101.6	11.9	7.9	22.4
3	98.9	146.1	168.1	9.7	63.5	22.4	98.9	146.1	168.1	28.4	57.2	123.8	11.9	7.9	22.4
3 1/2	101.6	162.1	184.2	12.7	63.5	22.4	101.6	168.8	184.2	28.4	63.5	131.8	11.9	7.9	22.4
4	114.3	177.8	200.2	12.7	63.5	22.4	114.3	174.8	200.2	31.8	63.5	149.2	11.9	7.9	22.4
5	141.2	212.9	235.0	15.7	76.2	22.4	141.2	209.6	235.0	35.1	69.9	181.0	11.9	7.9	22.4
6	168.1	247.7	269.7	15.7	76.2	22.4	168.1	241.3	269.7	35.1	82.6	211.2	11.9	7.9	22.4
8	218.9	304.8	330.2	22.4	88.9	25.4	218.9	301.8	330.2	41.1	95.3	269.9	11.9	7.9	25.4
10	273.1	358.6	387.4	25.4	101.6	28.4	273.1	355.6	387.4	44.5	101.6	323.9	11.9	7.9	28.4
12	323.9	419.1	450.9	28.4	101.6	31.8	323.9	412.8	450.9	50.8	120.7	381.0	11.9	7.9	31.8
14	355.6	482.6	514.4	31.8	120.7	31.8	355.6	457.2	514.4	53.8	127.0	419.1	11.9	7.9	31.8
16	406.4	536.4	571.5	38.1	124.0	35.1	406.4	508.0	571.5	57.2	127.0	469.9	11.9	7.9	35.1
18	457.2	593.9	628.7	41.1	114.3	35.1	457.2	574.5	628.7	60.5	127.0	533.4	11.9	7.9	35.1
20	508.0	650.7	685.8	44.5	120.7	35.1	508.0	635.0	685.8	69.9	127.0	584.2	13.5	9.5	35.1
24	609.6	771.7	812.8	50.8	139.7	41.1	609.6	749.3	812.8	79.2	152.4	692.2	16.7	11.1	41.1

Notes :

- (1) Holes size(where required due to bolt spacing) shall be the same as the flange bolt hole, and located such that it will not interfere with bolting between two flanges.
- (2) The thickness of the web(or tie bar) dimension Wt shall be 0.25 in. minimum, except when t is less than 0.25 in., Wt shall equal t

CLASS 600 / 900 FLANGES



Class 600 FIGURE 8 BLANK RAISED FACE & FEMALE RING-JOINT FACING

Unit : mm

No-mi-nal Pipe Size	SPECTACLE RAISED FACE						SPECTACLE RING JOINT FACING								
	Inside Diam.	Outside Diam.	Center- line Diam.	Thick- ness	Web Width	Hole Diam.	Inside Diam.	Outside Diam.	Center- line Diam.	Thick- ness	Web Width	Pitch Diam.	Width of Groove	Depth of Groove	Hole Diam.
	B	O	A	t	W		B	O	A	t	W	P	F	E	
1/2	15.7	50.8	66.5	6.4	38.1	15.7	21.3	50.8	57.4	19.1	38.1	34.1	7.1	5.6	15.7
3/4	20.8	63.5	82.6	6.4	38.1	19.1	26.7	63.5	0.0	22.4	44.5	42.9	8.7	6.4	19.1
1	26.7	69.9	88.9	6.4	57.2	19.1	33.5	69.9	88.9	22.4	50.8	50.8	8.7	6.4	19.1
1 1/4	36.6	79.2	98.6	9.7	57.2	19.1	42.2	79.2	98.6	22.4	50.8	60.3	8.7	6.4	19.1
1 1/2	42.7	91.9	114.3	9.7	66.5	22.4	48.3	90.4	114.3	22.4	57.2	68.3	8.7	6.4	22.4
2	54.9	108.0	127.0	9.7	57.2	19.1	60.5	108.0	127.0	28.4	57.2	82.6	11.9	7.9	19.1
2 1/2	67.1	127.0	149.4	12.7	66.5	22.4	73.2	127.0	149.4	31.8	57.2	101.6	11.9	7.9	22.4
3	82.8	146.1	168.1	12.7	66.5	22.4	88.9	146.1	168.1	31.8	57.2	123.8	11.9	7.9	22.4
3 1/2	95.5	158.8	184.2	15.7	76.2	25.4	101.6	158.8	184.2	35.1	63.5	131.8	11.9	7.9	25.4
4	108.2	190.5	215.9	15.7	76.2	25.4	114.3	174.8	215.9	35.1	63.5	149.2	11.9	7.9	25.4
5	134.6	238.3	266.7	19.1	85.9	28.4	141.2	209.6	266.7	38.1	69.9	181.0	11.9	7.9	28.4
6	161.5	263.7	292.1	22.4	85.9	28.4	168.1	241.3	292.1	44.5	82.6	211.2	11.9	7.9	28.4
8	211.6	317.5	349.3	28.4	95.3	31.8	218.9	301.8	349.3	50.8	95.3	269.9	11.9	7.9	31.8
10	264.7	396.7	431.8	35.1	104.6	35.1	273.1	355.6	431.8	57.2	101.6	323.9	11.9	7.9	35.1
12	314.7	454.2	489.0	41.1	104.6	35.1	323.9	412.8	489.0	63.5	120.7	381.0	11.9	7.9	35.1
14	345.9	489.0	527.1	44.5	114.3	38.1	355.6	457.2	527.1	66.5	127.0	419.1	11.9	7.9	38.1
16	396.7	561.8	603.3	50.8	124.0	41.1	406.4	508.0	603.3	73.2	127.0	469.9	11.9	7.9	41.1
18	447.5	609.6	654.1	53.8	133.4	44.5	457.2	574.5	654.1	79.2	127.0	533.4	11.9	7.9	44.5
20	496.8	679.5	723.9	63.5	133.4	44.5	508.0	635.0	723.9	88.9	127.0	584.2	13.5	9.5	44.5
24	596.9	787.4	838.2	73.2	152.4	50.8	609.6	749.3	838.2	104.6	152.4	692.2	16.7	11.1	50.8

Class 900 FIGURE 8 BLANK RAISED FACE & FEMALE RING-JOINT FACING

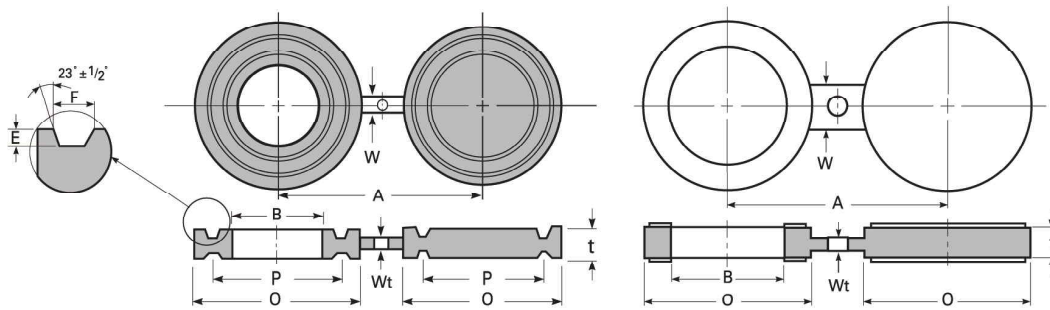
Unit : mm

No-mi-nal Pipe Size	SPECTACLE RAISED FACE						SPECTACLE RING JOINT FACING								
	Inside Diam.	Outside Diam.	Center- line Diam.	Thick- ness	Web Width	Hole Diam.	Inside Diam.	Outside Diam.	Center- line Diam.	Thick- ness	Web Width	Pitch Diam.	Width of Groove	Depth of Groove	Hole Diam.
	B	O	A	t	W		B	O	A	t	W	P	F	E	
1/2	15.7	60.5	82.6	6.4	38.1	22.4	21.3	60.5	82.6	22.4	38.1	39.4	8.7	6.4	22.4
3/4	20.8	66.5	88.9	6.4	41.1	22.4	26.7	66.5	88.9	22.4	44.5	44.5	8.7	6.4	22.4
1	26.7	76.2	101.6	6.4	57.2	25.4	33.5	71.4	101.6	22.4	50.8	50.8	8.7	6.4	25.4
1 1/4	36.6	85.9	111.3	9.7	57.2	25.4	42.2	81.0	111.3	25.4	50.8	60.3	8.7	6.4	25.4
1 1/2	42.7	95.3	124.0	9.7	66.5	28.4	48.3	91.9	124.0	25.4	63.5	68.3	8.7	6.4	28.4
2	54.9	139.7	165.1	12.7	57.2	25.4	60.5	124.0	165.1	31.8	50.8	95.3	11.9	7.9	25.4
2 1/2	67.1	162.1	190.5	12.7	66.5	28.4	73.2	136.7	190.5	35.1	66.5	108.0	11.9	7.9	28.4
3	82.8	165.1	190.5	15.7	66.5	25.4	88.9	155.4	190.5	35.1	66.5	123.8	11.9	7.9	25.4
4	108.2	203.2	235.0	19.1	76.2	31.8	114.3	180.8	235.0	41.1	73.2	149.2	11.9	7.9	31.8
5	134.6	244.3	279.4	22.4	85.9	35.1	141.2	215.9	279.4	44.5	73.2	181.0	11.9	7.9	35.1
6	161.5	285.8	317.5	25.4	85.9	31.8	168.1	241.3	317.5	47.8	73.2	211.2	11.9	7.9	31.8
8	211.6	355.6	393.7	35.1	95.3	38.1	218.9	307.8	393.7	57.2	79.2	269.9	11.9	7.9	38.1
10	264.7	431.8	469.9	41.1	104.6	38.1	273.1	362.0	469.9	63.5	120.7	323.9	11.9	7.9	38.1
12	314.7	495.3	533.4	47.8	104.6	38.1	323.9	419.1	533.4	73.2	120.7	381.0	11.9	7.9	38.1
14	345.9	517.7	558.8	53.8	114.3	41.1	355.6	466.9	558.8	82.6	120.7	419.1	16.7	11.1	41.1
16	396.7	571.5	616.0	60.5	124.0	44.5	406.4	523.7	616.0	91.9	127.0	469.9	16.7	11.1	44.5
18	447.5	635.0	685.8	66.5	133.4	50.8	457.2	593.9	685.8	101.6	133.4	533.4	19.8	12.7	50.8
20	496.8	695.5	749.3	73.2	133.4	53.8	508.0	647.7	749.3	111.3	127.0	584.2	19.8	12.7	53.8
24	596.9	835.2	901.7	88.9	152.4	66.5	609.6	771.7	901.7	133.4	139.7	692.2	27.0	15.9	66.5

Notes :

- (1) Holes size(where required due to bolt spacing) shall be the same as the flange bolt hole, and located such that it will not interfere with bolting between two flanges.
- (2) The thickness of the web(or tie bar) dimension Wt shall be 0.25 in. minimum, except when t is less than 0.25 in., Wt shall equal t

CLASS 1500 / 2500 FLANGES



Class 1500 FIGURE 8 BLANK RAISED FACE & FEMALE RING-JOINT FACING

Unit : mm

No-minal Pipe Size	SPECTACLE RAISED FACE						SPECTACLE RING JOINT FACING								
	Inside Diam.	Outside Diam.	Center -line Diam.	Thick- -ness	Web Width	Hole Diam.	Inside Diam.	Outside Diam.	Center -line Diam.	Thick- -ness	Web Width	Pitch Diam.	Width of Groove	Depth of Groove	Hole Diam.
	B	O	A	t	W		B	O	A	t	W	P	F	E	
1/2	15.7	60.5	82.6	6.4	38.1	22.4	21.3	60.5	82.6	22.4	38.1	39.4	8.7	6.4	22.4
3/4	20.8	66.5	88.9	9.7	41.1	22.4	26.7	66.5	88.9	25.4	44.5	44.5	8.7	6.4	22.4
1	26.7	76.2	101.6	9.7	63.5	25.4	33.5	71.4	101.6	25.4	53.8	50.8	8.7	6.4	25.4
1 1/4	35.1	85.9	111.3	9.7	63.5	25.4	42.2	81.0	111.3	25.4	53.8	60.3	8.7	6.4	25.4
1 1/2	40.9	95.3	124.0	12.7	69.9	28.4	48.3	91.9	124.0	28.4	57.2	68.3	8.7	6.4	28.4
2	52.6	139.7	165.1	12.7	69.9	25.4	60.5	124.0	165.1	35.1	53.8	95.3	11.9	7.9	25.4
2 1/2	62.7	162.1	190.5	15.7	76.2	28.4	73.2	136.7	190.5	38.1	57.2	108.0	11.9	7.9	28.4
3	78.0	171.5	203.2	19.1	76.2	31.8	88.9	168.1	203.2	44.5	73.2	136.5	11.9	7.9	31.8
4	102.4	206.2	241.3	22.4	88.9	35.1	114.3	193.5	241.3	47.8	76.2	161.9	11.9	7.9	35.1
5	128.3	251.0	292.1	28.4	88.9	41.1	141.2	228.6	292.1	53.8	76.2	193.7	11.9	7.9	41.1
6	153.9	279.4	317.5	35.1	88.9	38.1	168.1	247.7	317.5	60.5	79.2	211.2	13.5	9.5	38.1
8	202.7	349.3	393.7	41.1	101.6	44.5	218.9	317.5	482.6	73.2	85.9	269.9	16.7	11.1	44.5
10	254.5	431.8	482.6	50.8	114.3	50.8	273.1	371.3	571.5	82.6	133.4	323.9	16.7	11.1	50.8
12	303.3	517.7	571.5	60.5	114.3	53.8	323.9	438.2	635.0	101.6	133.4	381.0	23.0	14.3	53.8
14	333.2	574.5	635.0	66.5	127.0	60.5	355.6	489.0	704.9	111.3	139.7	419.1	27.0	15.9	60.5
16	381.0	638.0	704.9	76.2	133.4	66.5	406.4	546.1	774.7	124.0	146.1	469.9	30.2	17.5	66.5
18	428.8	701.5	774.7	85.9	146.1	73.2	457.2	612.6	831.9	133.4	152.4	533.4	30.2	17.5	73.2
20	477.8	752.3	831.9	95.3	152.4	79.2	508.0	673.1	749.3	142.7	165.1	584.2	33.4	17.5	79.2
24	574.5	898.7	990.6	111.3	177.8	91.9	609.6	793.8	990.6	168.1	177.8	692.2	36.5	20.6	91.9

Class 2500 FIGURE 8 BLANK RAISED FACE & FEMALE RING-JOINT FACING

Unit : mm

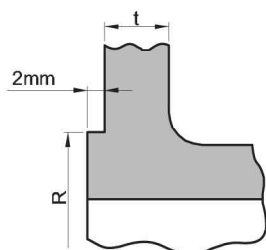
No-minal Pipe Size	SPECTACLE RAISED FACE						SPECTACLE RING JOINT FACING								
	Inside Diam.	Outside Diam.	Center -line Diam.	Thick- -ness	Web Width	Hole Diam.	Inside Diam.	Outside Diam.	Center -line Diam.	Thick- -ness	Web Width	Pitch Diam.	Width of Groove	Depth of Groove	Hole Diam.
	B	O	A	t	W		B	O	A	t	W	P	F	E	
1/2	15.7	66.5	88.9	9.7	38.1	22.4	21.3	65.0	88.9	25.4	38.1	42.9	8.7	6.4	22.4
3/4	20.8	73.2	95.3	9.7	41.1	22.4	26.7	73.2	95.3	28.4	44.5	50.8	8.7	6.4	22.4
1	26.7	82.6	108.0	9.7	63.5	25.4	33.5	82.6	108.0	28.4	53.8	60.3	8.7	6.4	25.4
1 1/4	35.1	101.6	130.0	12.7	63.5	28.4	42.2	101.6	130.0	35.1	53.8	72.2	11.9	7.9	28.4
1 1/2	40.9	114.3	146.1	15.7	69.9	31.8	48.3	114.3	146.1	38.1	60.5	82.6	11.9	7.9	31.8
2	52.6	142.7	171.5	15.7	69.9	28.4	60.5	133.4	171.5	41.1	57.2	101.6	11.9	7.9	28.4
2 1/2	62.7	165.1	196.9	19.1	76.2	31.8	73.2	149.4	196.9	47.8	60.5	111.1	13.5	9.5	31.8
3	78.0	193.5	228.6	22.4	76.2	35.1	88.9	168.1	228.6	50.8	76.2	127.0	13.5	9.5	35.1
4	102.4	231.6	273.1	28.4	88.9	41.1	114.3	203.2	273.1	63.5	82.6	157.2	16.7	11.1	41.1
5	128.3	276.4	323.9	35.1	88.9	47.8	141.2	241.3	323.9	73.2	88.9	190.5	19.8	12.7	47.8
6	153.9	314.5	368.3	41.1	88.9	53.8	168.1	279.4	368.3	82.6	95.3	228.6	19.8	12.7	53.8
8	198.4	384.0	438.2	53.8	101.6	53.8	218.9	339.9	438.2	98.6	95.3	279.4	23.0	14.3	53.8
10	247.7	472.9	539.8	66.5	114.3	66.5	273.1	425.5	539.8	117.3	90.9	342.9	30.2	17.5	66.5
12	288.8	546.1	619.3	79.2	114.3	73.2	323.9	495.3	619.3	133.4	152.4	406.4	33.4	17.5	73.2

Notes :

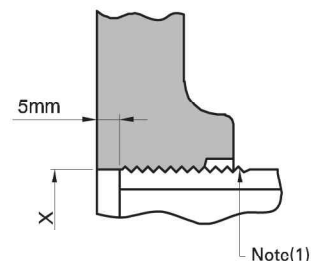
- (1) Holes size(where required due to bolt spacing) shall be the same as the flange bolt hole, and located such that it will not interfere with bolting between two flanges.
- (2) The thickness of the web(or tie bar) dimension Wt shall be 0.25 in. minimum, except when t is less than 0.25 in., Wt shall equal t.

FLANGES FACINGS

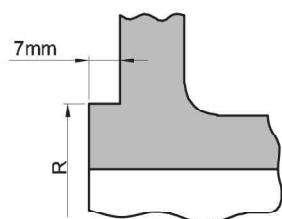
2mm raised face
regularly furnished on
Classes 150 and 300
unless otherwise
ordered



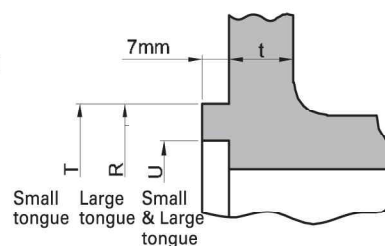
Small female face
(on end of pipe)



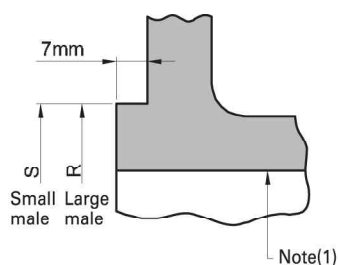
7mm raised face
regularly furnished on
Classes 400 and
higher unless
otherwise ordered



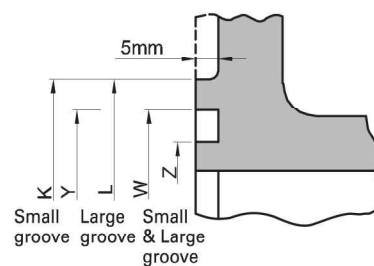
Large or small
tongue face
[Note (2)]



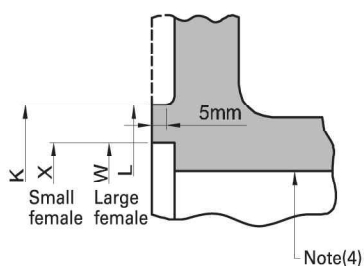
Large or small
male face
[Note (2)]



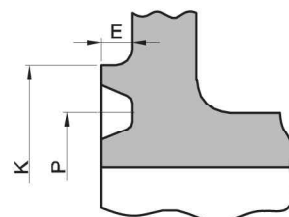
Large or small
groove face
[Note (2)]



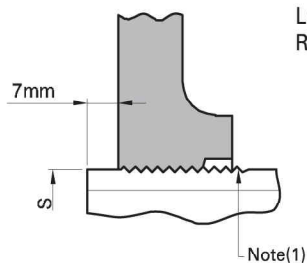
Large or small
female face
[Note (2)]



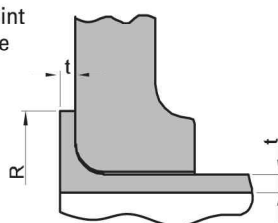
Ring joint face



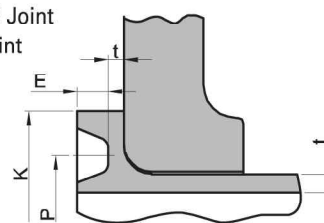
Small male face
(on end of pipe)



Lapped Joint
Raised face



Lapped Joint
Ring joint



ASME B16.5 FORGED FLANGES

Unit : mm

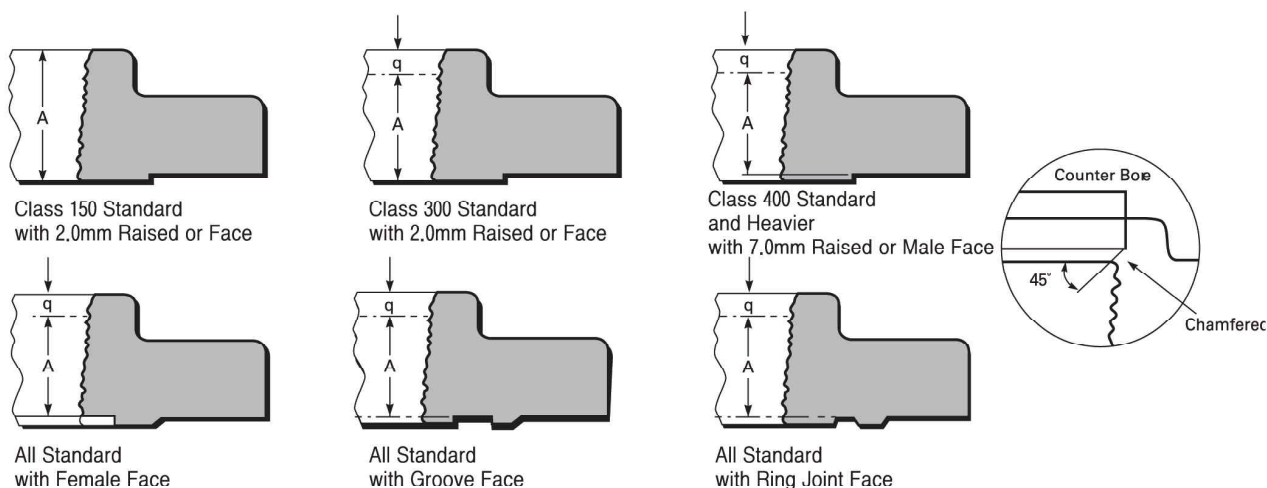
Nominal Pipe Size	OUTSIDE DIAMETER			Inside Diameter of Large and Small Tongue	OUTSIDE DIAMETER			Inside Diameter of Large and Small Groove	HEIGHT		Depth of Groove or Female	MIN. OUTSIDE DIAMETER OF RAISED PORTION		Nominal Pipe Size
	Raised Face, Lapped, Large Male & Large Tongue	Small Male	Small Tongue		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		W	X	Y					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 be 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.



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



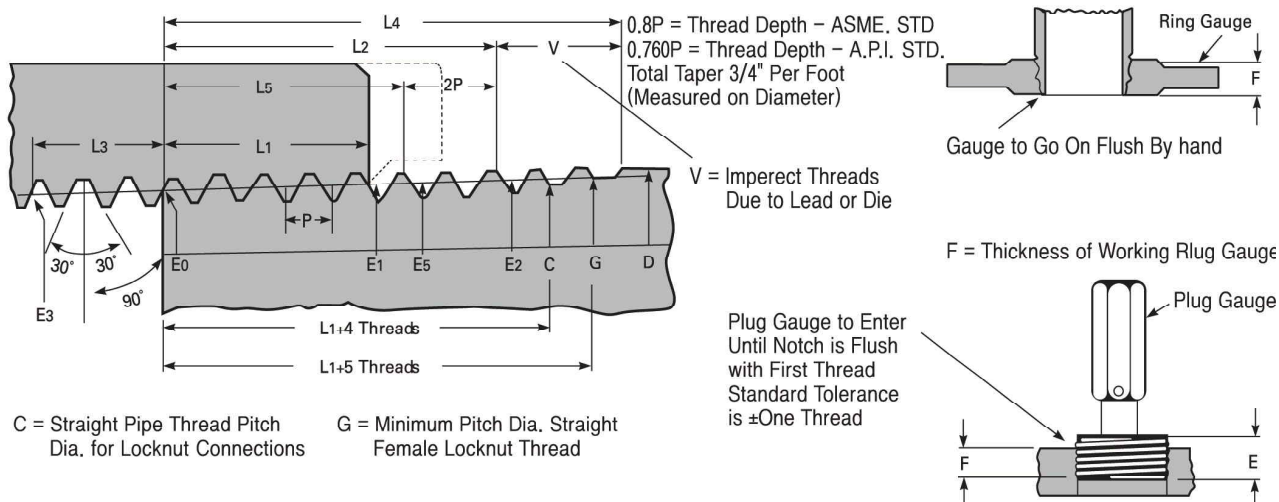
ASME B16.5 FORGED FLANGES

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 0.06(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 the 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 chamfer 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.



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		Effective Thread External		Wrench Make-Up Length for internal Threaded		Over all Length External Threads
					Length	Pitch Diameter	Length	Pitch Diameter	Length	Pitch Diameter	
	D	N	P	E ₀	L ₁	E ₁	L ₂	E ₂	L ₃	E ₃	
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	318.3	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

PIPE & FITTINGS WALL THICKNESS SCHEDULES DIMENSION

Nominal Pipe Size		Outside Diam.	Well	Nominal Wall Thickness (Stainless steel)					Nominal Wall Thickness (Carbon & Low Alloy Steel)			
A	B		I.D	S5S*	S10S*	S20S	S40S	S80S	S5	S10	S20	S30
6	1/8	10.3	W.T	-	1.24	-	1.73	2.41	-	1.24	-	1.45
			I.D	-	7.82	-	6.84	5.48	-	7.82	-	7.40
8	1/4	13.7	W.T	-	1.65	-	2.24	3.02	-	1.65	-	1.85
			I.D	-	10.40	-	9.22	7.66	-	10.40	-	10.00
10	3/8	17.1	W.T	-	1.65	-	2.31	3.20	-	1.65	-	1.85
			I.D	-	13.80	-	12.48	10.70	-	13.80	-	13.40
15	1/2	21.3	W.T	1.65	2.11	-	2.77	3.73	1.65	2.11	-	2.41
			I.D	18.00	17.08	-	15.76	13.84	18.00	17.08	-	16.48
20	3/4	26.7	W.T	1.65	2.11	-	2.87	3.91	1.65	2.11	-	2.41
			I.D	23.40	22.48	-	20.96	18.88	23.40	22.48	-	21.88
25	1	33.4	W.T	1.65	2.77	-	3.38	4.55	1.65	2.77	-	2.90
			I.D	30.10	27.86	-	26.64	24.30	30.10	27.86	-	27.60
32	1 1/4	42.2	W.T	1.65	2.77	-	3.56	4.85	1.65	2.77	-	2.97
			I.D	38.90	36.66	-	35.08	32.50	38.90	36.66	-	36.26
40	1 1/2	48.3	W.T	1.65	2.77	-	3.68	5.08	1.65	2.77	-	3.18
			I.D	45.00	42.76	-	40.94	38.14	45.00	42.76	-	41.94
50	2	60.3	W.T	1.65	2.77	-	3.91	5.54	1.65	2.77	-	3.18
			I.D	57.00	54.76	-	52.48	49.22	57.00	54.76	-	53.94
65	2 1/2	73.0	W.T	2.11	3.05	-	5.16	7.01	2.11	3.05	-	4.78
			I.D	68.78	66.90	-	62.68	58.98	68.78	66.90	-	63.44
80	3	88.9	W.T	2.11	3.05	-	5.49	7.62	2.11	3.05	-	4.78
			I.D	84.68	82.80	-	77.92	73.66	84.68	82.80	-	79.34
90	3 1/2	101.6	W.T	2.11	3.05	-	5.74	8.08	2.11	3.05	-	4.78
			I.D	97.38	95.50	-	90.12	85.44	97.38	95.50	-	92.04
100	4	114.3	W.T	2.11	3.05	-	6.02	8.56	2.11	3.05	-	4.78
			I.D	110.08	108.20	-	102.26	97.18	110.08	108.20	-	104.74
125	5	141.3	W.T	2.77	3.40	-	6.55	9.53	2.77	3.40	-	-
			I.D	135.76	134.50	-	128.20	122.24	135.76	134.50	-	-
150	6	168.3	W.T	2.77	3.40	-	7.11	10.97	2.77	3.40	-	-
			I.D	162.76	161.50	-	154.08	146.36	162.76	161.50	-	-
200	8	219.1	W.T	2.77	3.76	-	8.18	12.70	2.77	3.76	6.35	7.04
			I.D	213.56	211.58	-	202.74	193.70	213.56	211.58	206.40	205.02
250	10	273.1	W.T	3.40	4.19	-	9.27	12.70	3.40	4.19	6.35	7.80
			I.D	266.30	264.72	-	254.56	247.70	266.30	264.72	260.40	257.50
300	12	323.9	W.T	3.96	4.57	-	9.53	12.70	3.96	4.57	6.35	8.38
			I.D	315.98	314.76	-	304.84	298.50	315.98	314.76	311.20	307.14
350	14	355.6	W.T	3.96	4.78	-	9.53	12.70	3.96	6.35	7.92	9.53
			I.D	347.68	346.04	-	336.54	330.20	347.68	342.90	339.76	336.54
400	16	406.4	W.T	4.19	4.78	-	9.53	12.70	4.19	6.35	7.92	9.53
			I.D	398.02	396.84	-	387.34	381.00	398.02	393.70	390.56	387.34
450	18	457.0	W.T	4.19	4.78	-	9.53	12.70	4.19	6.35	7.92	11.13
			I.D	448.62	447.44	-	437.94	431.60	448.62	444.30	441.16	434.74
500	20	508.0	W.T	4.78	5.54	7.90	9.53	12.70	4.78	6.35	9.53	12.70
			I.D	498.44	496.92	492.20	488.94	482.60	498.44	495.30	488.94	482.60
550	22	559.0	W.T	4.78	5.54	-	-	-	4.78	6.35	9.53	12.70
			I.D	549.44	547.92	-	-	-	549.44	546.30	539.94	533.60
600	24	610.0	W.T	5.54	6.35	-	9.53	12.70	5.54	6.35	9.53	14.27
			I.D	598.92	597.30	-	590.94	584.60	598.92	597.30	590.94	581.46
650	26	660.4	W.T	-	-	-	9.53	12.70	-	7.92	12.70	-
			I.D	-	-	-	641.34	635.00	-	644.56	635.00	-
700	28	711.2	W.T	-	-	-	-	-	-	7.92	12.70	15.88
			I.D	-	-	-	-	-	-	695.36	685.80	679.44
750	30	762.0	W.T	6.35	7.92	-	-	-	6.35	7.92	12.70	15.88
			I.D	749.30	746.16	-	-	-	749.30	746.16	736.60	730.24
800	32	813.0	W.T	-	-	-	-	-	-	7.92	12.70	15.88
			I.D	-	-	-	-	-	-	797.16	787.60	781.24
850	34	864.0	W.T	-	-	-	-	-	-	7.92	12.70	15.88
			I.D	-	-	-	-	-	-	848.16	838.60	832.24
900	36	914.0	W.T	-	-	-	-	-	-	7.92	12.70	15.88
			I.D	-	-	-	-	-	-	898.16	888.60	882.24
950	38	965.0	W.T	-	-	-	-	-	-	-	-	-
			I.D	-	-	-	-	-	-	-	-	-
1000	40	1016.0	W.T	-	-	-	-	-	-	-	-	-
			I.D	-	-	-	-	-	-	-	-	-
1050	42	1067.0	W.T	-	-	-	-	-	-	-	-	-
			I.D	-	-	-	-	-	-	-	-	-
1100	44	1118.0	W.T	-	-	-	-	-	-	-	-	-
			I.D	-	-	-	-	-	-	-	-	-
1150	46	1168.0	W.T	-	-	-	-	-	-	-	-	-
			I.D	-	-	-	-	-	-	-	-	-
1200	48	1219.0	W.T	-	-	-	-	-	-	-	-	-
			I.D	-	-	-	-	-	-	-	-	-

► Carbon & Low Alloy Steel (B36.10M)

The wall thickness shown represent nominal or average wall dimensions which are subject to a-12½% mill tolerance.

Note that schedule 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 (Carbon & Low Alloy Steel)										Outside Diam.	Nominal Pipe Size	
STD	S40	S60	XS	S80	S100	S120	S140	S160	XXS		A	B
1.73	1.73	-	2.41	2.41	-	-	-	-	-	10.3	6	1/8
6.84	6.84	-	5.48	5.48	-	-	-	-	-			
2.24	2.24	-	3.02	3.02	-	-	-	-	-	13.7	8	1/4
9.22	9.22	-	7.66	7.66	-	-	-	-	-			
2.31	2.31	-	3.20	3.20	-	-	-	-	-	17.1	10	3/8
12.48	12.48	-	10.70	10.70	-	-	-	-	-			
2.77	2.77	-	3.73	3.73	-	-	-	4.78	7.47	21.3	15	1/2
15.76	15.76	-	13.84	13.84	-	-	-	11.74	6.36			
2.87	2.87	-	3.91	3.91	-	-	-	5.56	7.82	26.7	20	3/4
20.96	20.96	-	18.88	18.88	-	-	-	15.58	11.06			
3.38	3.38	-	4.55	4.55	-	-	-	6.35	9.09	33.4	25	1
26.64	26.64	-	24.30	24.30	-	-	-	20.70	15.22			
3.56	3.56	-	4.85	4.85	-	-	-	6.35	9.70	42.2	32	1 1/4
35.08	35.08	-	32.50	32.50	-	-	-	29.50	22.80			
3.68	3.68	-	5.08	5.08	-	-	-	7.14	10.15	48.3	40	1 1/2
40.94	40.94	-	38.14	38.14	-	-	-	34.02	28.00			
3.91	3.91	-	5.54	5.54	-	-	-	8.74	11.07	60.3	50	2
52.48	52.48	-	49.22	49.22	-	-	-	42.82	38.16			
5.16	5.16	-	7.01	7.01	-	-	-	9.53	14.02	73.0	65	2 1/2
62.68	62.68	-	58.98	58.98	-	-	-	53.94	44.96			
5.49	5.49	-	7.62	7.62	-	-	-	11.13	15.24	88.9	80	3
77.92	77.92	-	73.66	73.66	-	-	-	66.64	58.42			
5.74	5.74	-	8.08	8.08	-	-	-	12.70	-	101.6	90	3 1/2
90.12	90.12	-	85.44	85.44	-	-	-	76.20	-			
6.02	6.02	-	8.56	8.56	-	11.13	-	13.49	17.12	114.3	100	4
102.26	102.26	-	97.18	97.18	-	92.04	-	87.32	80.06			
6.55	6.55	-	9.53	9.53	-	12.70	-	15.88	19.05	141.3	125	5
128.20	128.20	-	122.24	122.24	-	115.90	-	109.54	103.20			
7.11	7.11	-	10.97	10.97	-	14.27	-	18.26	21.95	168.3	150	6
154.08	154.08	-	146.36	146.36	-	139.76	-	131.78	124.40			
8.18	8.18	10.31	12.70	12.70	15.09	18.26	20.62	23.01	22.23	219.1	200	8
202.74	202.74	198.48	193.70	193.70	188.92	182.58	177.86	173.08	174.64			
9.27	9.27	12.70	12.70	15.09	18.26	21.44	25.40	28.58	25.40	273.1	250	10
254.56	254.56	247.70	247.70	242.92	236.58	230.22	222.30	215.94	222.30			
9.53	10.31	14.27	12.70	17.48	21.44	25.40	28.58	33.32	25.40	323.9	300	12
304.84	303.28	295.36	298.50	288.94	281.02	273.10	266.74	257.26	273.10			
9.53	11.13	15.09	12.70	19.05	23.83	27.79	31.75	35.71	-	355.6	350	14
336.54	333.34	325.42	330.20	317.50	307.94	300.02	292.10	284.18	-			
9.53	12.70	16.66	12.70	21.44	26.19	30.96	36.53	40.49	-	406.4	400	16
387.34	381.00	373.08	381.00	363.52	354.02	344.48	333.34	325.42	-			
9.53	14.27	19.05	12.70	23.83	29.36	34.93	39.67	45.24	-	457.0	450	18
437.94	428.46	418.90	431.60	409.34	398.28	387.14	377.66	366.52	-			
9.53	15.09	20.62	12.70	26.19	32.54	38.10	44.45	50.01	-	508.0	500	20
488.94	477.82	466.76	482.60	455.62	442.92	431.80	419.10	407.98	-			
9.53	-	22.23	12.70	28.58	34.93	41.28	47.63	53.98	-	559.0	550	22
539.94	-	514.54	533.60	501.84	489.14	476.44	463.74	451.04	-			
9.53	17.48	24.61	12.70	30.96	38.89	46.02	52.37	59.54	-	610.0	600	24
590.94	575.04	560.78	584.60	548.08	532.22	517.96	505.26	490.92	-			
9.53	-	-	12.70	-	-	-	-	-	-	660.4	650	26
641.34	-	-	635.00	-	-	-	-	-	-			
9.53	-	-	12.70	-	-	-	-	-	-	711.2	700	28
692.14	-	-	685.80	-	-	-	-	-	-			
9.53	-	-	12.70	-	-	-	-	-	-	762.0	750	30
742.94	-	-	736.60	-	-	-	-	-	-			
9.53	17.48	-	12.70	-	-	-	-	-	-	813.0	800	32
793.94	778.04	-	787.60	-	-	-	-	-	-			
9.53	17.48	-	12.70	-	-	-	-	-	-	864.0	850	34
844.94	829.04	-	838.60	-	-	-	-	-	-			
9.53	19.05	-	12.70	-	-	-	-	-	-	914.0	900	36
894.94	875.90	-	888.60	-	-	-	-	-	-			
9.53	-	-	12.70	-	-	-	-	-	-	965.0	950	38
945.94	-	-	939.60	-	-	-	-	-	-			
9.53	-	-	12.70	-	-	-	-	-	-	1016.0	1000	40
996.94	-	-	990.60	-	-	-	-	-	-			
9.53	-	-	12.70	-	-	-	-	-	-	1067.0	1050	42
1047.94	-	-	1041.60	-	-	-	-	-	-			
9.53	-	-	12.70	-	-	-	-	-	-	1118.0	1100	44
1098.94	-	-	1092.60	-	-	-	-	-	-			
9.53	-	-	12.70	-	-	-	-	-	-	1168.0	1150	46
1148.94	-	-	1142.60	-	-	-	-	-	-			
9.53	-	-	12.70	-	-	-	-	-	-	1219.0	1200	48
1199.94	-	-	1193.60	-	-	-	-	-	-			

► Stainless steel (B 36.19M)

The wall thickness shown represent nominal or average wall dimensions which are subject to a-12½% mill tolerance.

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

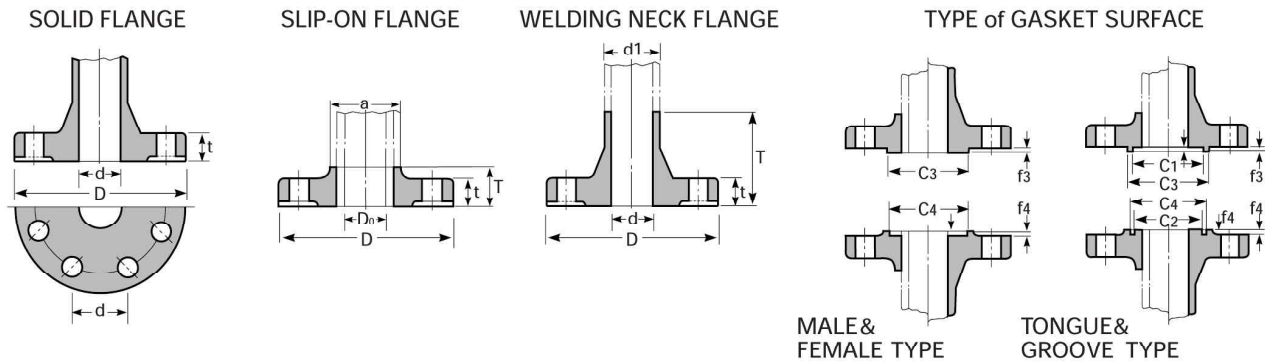
*Schedules 5S and 10S wall thicknesses do not permit threading in accordance with ASME B2 1.

**Note that schedule 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



TOLERANCE

ASME B16.5-2003ED FORGED FLANGES (Reversion of ASME B16.5-1996)



WELDING NECK

Place	Range	Tolerance (mm)
Outside Diameter	When O.D is 24" or Less	$\pm 1.6^* (\pm 0.063 \text{ in})$
	When O.D is Over 24"	$\pm 3.2^* (\pm 0.125 \text{ in})$
Inside Diameter	10" and Smaller	$\pm 1.0 (\pm 0.03 \text{ in})$
	12" thru 18"	$\pm 1.5 (\pm 0.16 \text{ in})$
	20" and Larger	$+3.0 (+0.12 \text{ in})$ $-1.5 (-0.06 \text{ in})$
Diameter of Contact Face	2.0mm Raised Face (Outside)	$\pm 1.0 (\pm 0.03 \text{ in})$
	7.0mm Raised Face (Outside)	$\pm 0.5 (\pm 0.02 \text{ in})$
	Tongue, groove, female (Inside & Outside)	$\pm 0.5 (\pm 0.02 \text{ in})$
Diameter of Hub at Base	When Hub Base is 24" or Smaller	$\pm 1.6^* (\pm 0.063 \text{ in})$
	When Hub Base is Over 24"	$\pm 3.2^* (\pm 0.125 \text{ in})$
Diameter of Hub at Welding Point	When O.D is 5" or Less	$+2.0 (+0.09 \text{ in})$ $-1.0 (-0.03 \text{ in})$
	When O.D is Over 6"	$+4.0 (+0.16 \text{ in})$ $-1.0 (-0.03 \text{ in})$
Drilling	Bolt Circle Diameter	$\pm 1.5 (\pm 0.06 \text{ in})$
	Bolt to Bolt Hole	$\pm 0.8 (\pm 0.03 \text{ in})$
	Eccentricity of Bolt Circle with Respect to Facing	NPS $\leq 2 \frac{1}{2}$ " $0.8 (0.03 \text{ in})$ Max. NPS ≥ 3 " $1.5 (0.06 \text{ in})$ Max.
	Eccentricity of Bolt Circle with Respect to Bore	$0.8 \text{ Max.}^* (0.03 \text{ in})$
Thickness	When O.D is 18" or Less	$+3.0 (+0.12 \text{ in})$ $-0.0 (-0.0 \text{ in})$
	When O.D is Over 20"	$+5.0 (+0.19 \text{ in})$ $-0.0 (-0.0 \text{ in})$
Length Thru Hub	When O.D is 4" or Less	$\pm 1.5 (\pm 0.06 \text{ in})$
	5" thru 10"	$+1.5 (+0.06 \text{ in})$ $-3.0 (-0.12 \text{ in})$
	When O.D is Over 12"	$+3.0 (+0.12 \text{ in})$ $-5.0 (-0.18 \text{ in})$

Notes :

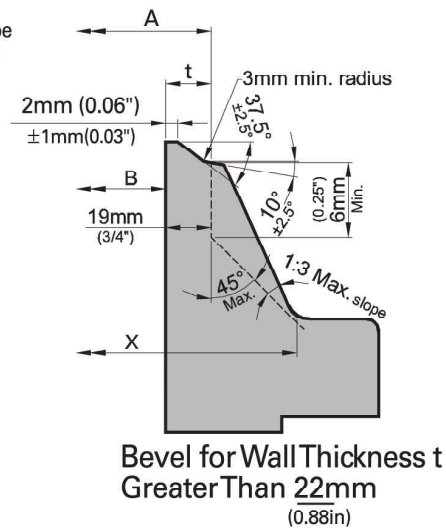
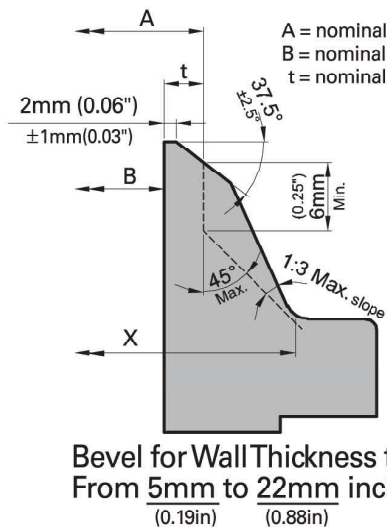
* This tolerance is not covered in ASME B 16.5, but maker's option.

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)
Diameter of Hub at Base		Tongue, groove, female (Inside & Outside)	±0.5 (±0.02in)
		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)

CLASS 1500 / 2500 FLANGES

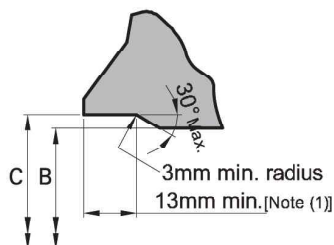
ASME B16.5 FORGED FLANGES



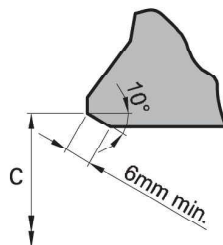
Notes :

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 slope 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 outside diameter of 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 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 intended mating pipe.



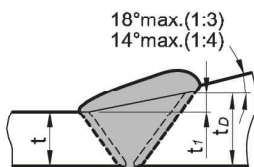
(a) Inside Contour for Use With Rectangular Backing Ring



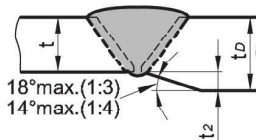
Inside Contour for Use With Taper Backing Ring

- 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 pipe to ASTM A106, etc.
- 1.75t = 87.5% of nominal wall (permitted by ASTM A106, etc.) multiplied by to convert into terms of diameter
- 0.25mm = plus tolerance on diameter C, mm.

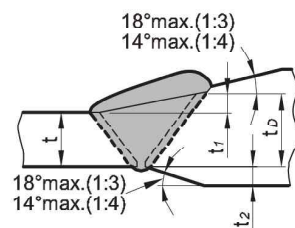
Note (1) 13mm depth based on use of 19mm wide backing ring



(a) Bevel for Outside Thickness



(b) Bevel for inside Thickness



(c) 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 t_1 , t_2 , nor their sum ($t_1 + t_2$) shall exceed $0.5t$.
- (3) When the minimum specified yield strengths of the sections to be joined are unequal, the value of t_0 shall at least equal times the ratio of minimum specified yield strength of the pipe to minimum specified yield strength of the flange.

ASTM Material Chemical Composition & Mechanical Requirements

ASTM Grade	UNS Designation	Chemical Composition (%)													Mechanical Requirements				
			C	Si	Mn	P	S	Ni	Cr	Mo	Cu	V	Nb	N	Y.S. ¹⁾ (Mpa)	T.S (Mpa)	E.L (%)	R.A (%)	H.B
A105	K03504	Max. Min.	0.35	0.35 0.10	1.05 0.60	0.035	0.040	0.40	0.30	0.12	0.40	0.08			250	485	22	30	187
A266 GR.1	K03506	Max. Min.	0.30	0.35 0.15	1.05 0.40	0.025	0.025								205	585 415	23	38	
A266 GR.2	K03506	Max. Min.	0.30	0.35 0.15	1.05 0.40	0.025	0.025								250	655 485	20	33	
A266 GR.3	K05001	Max. Min.	0.35	0.35 0.15	1.35 0.80	0.025	0.025								260	690 515	19	30	
A266 GR.4	K03017	Max. Min.	0.30	0.35 0.15	1.35 0.80	0.025	0.025								250	655 485	20	33	
A350 LF.1	K03009	Max. Min.	0.30	0.30 0.15	1.35 0.60	0.035	0.040	0.40	0.30	0.12	0.4	0.05			205	585 415		38	197
A350 LF.2	K03011	Max. Min.	0.30	0.30 0.15	1.35 0.60	0.035	0.040	0.40	0.30	0.12	0.4	0.05			250	655 485		30	197
A694	K03014	Max. Min.	0.26	0.35 0.15	1.40	0.025	0.025								F42:290 F46:315 F48:330 F50:345 F52:360 F56:385 F60:415 F65:450 F70:485	F42:415 F46:415 F48:425 F50:440 F52:455 F56:470 F60:515 F65:530 F70:565	F42- F65 :20		
A182 F1	K12822	Max. Min.	0.28	0.35 0.15	0.90 0.60	0.045	0.045			0.65 0.44					275	485	20	30	192 143
A182 F5	K41545	Max. Min.	0.15	0.50 0.30	0.60	0.030	0.030	0.50	6.00 4.00	0.65 0.44					275	485	20	35	217 143
A182 F5a	K42544	Max. Min.	0.25	0.50	0.60	0.040	0.030	0.50	6.00 4.00	0.65 0.44					450	620	22	50	248 187
A182 F9	K90941	Max. Min.	0.15	1.00 0.50	0.60 0.30	0.030	0.030		10.00 8.00	1.10 0.90					380	585	20	40	217 179
A182 F91	K90901	Max. Min.	0.12 0.08	0.50 0.20	0.60 0.30	0.020 *Al 0.02	0.010 Ti 0.01	0.40 Zr 0.01	9.50 8.00	1.05 0.85		0.25 0.18	0.10 0.06	0.07 0.03	415	585	20	40	248
A182 F11CL1	K11597	Max. Min.	0.15 0.05	1.00 0.50	0.60 0.30	0.030	0.030		1.50 1.00	0.65 0.44					205	415	20	45	174 121
A182 F11CL2	K11572	Max. Min.	0.20 0.10	1.00 0.50	0.80 0.30	0.040	0.040		1.50 1.00	0.65 0.44					275	485	20	30	207 143
A182 F11CL3	K11572	Max. Min.	0.20 0.10	1.00 0.50	0.80 0.30	0.040	0.040		1.50 1.00	0.65 0.44					310	515	20	30	207 156
A182 F12CL1	K11562	Max. Min.	0.15 0.05	0.50 0.30	0.60	0.045	0.045		1.25 0.80	0.65 0.44					220	415	20	45	174 121
A182 F12CL2	K11564	Max. Min.	0.20 0.10	0.60 0.30	0.80	0.040	0.040		1.25 0.80	0.65 0.44					275	485	20	30	207 143
A182 F22CL1	K21590	Max. Min.	0.15 0.05	0.50 0.30	0.60	0.040	0.040		2.50 2.00	1.13 0.87					205	415	20	35	170
A182 F22CL3	K21590	Max. Min.	0.15 0.05	0.50 0.30	0.60	0.040	0.040		2.50 2.00	1.13 0.87					310	515	20	30	207 156
A182 F22V	K31838	Max. Min.	0.15 0.11	0.10 0.30	0.60	0.015 *B 0.002	0.010 Ca 0.015	0.25	2.50 2.00	1.10 0.90	0.20	0.35 0.25	0.07 *Ti 0.030		415	780 585	18	45	237 174
A350 LF3	K32025	Max. Min.	0.20	0.35 0.20	0.90	0.035	0.040	3.70 3.30	0.30	0.12		0.03			260	655 485		35	197
A182 F304	S30400	Max. Min.	0.08	1.00	2.00	0.045	0.030	11.00 8.00	20.00 18.00						205	515 ^{bi}	30	50	
A182 F304L	S30403	Max. Min.	0.03	1.00	2.00	0.045	0.030	13.00 8.00	20.00 18.00						170	485 ^{bi}	30	50	
A182 F304H	S30409	Max. Min.	0.10 0.04	1.00	2.00	0.045	0.030	11.00 8.00	20.00 18.00						205	515 ^{bi}	30	50	
A182 F310	S31000	Max. Min.	0.25	1.00	2.00	0.045	0.030	22.00 19.00	26.00 24.00						205	515 ^{bi}	30	50	
A182 F316	S31600	Max. Min.	0.08	1.00	2.00	0.045	0.030	14.00 10.00	18.00 16.00	3.00 2.00					205	515 ^{bi}	30	50	
A182 F316L	S31603	Max. Min.	0.03	1.00	2.00	0.045	0.030	15.00 10.00	18.00 16.00	3.00 2.00					170	485 ^{bi}	30	50	
A182 F316H	S31609	Max. Min.	0.10 0.04	1.00	2.00	0.045	0.030	14.00 10.00	18.00 16.00	3.00 2.00					205	515 ^{bi}	30	50	
A182 F317	S31700	Max. Min.	0.08	1.00	2.00	0.045	0.030	15.00 11.00	20.00 18.00	4.00 3.00					205	515 ^{bi}	30	50	
A182 F317L	S31703	Max. Min.	0.03	1.00	2.00	0.045	0.030	15.00 11.00	20.00 18.00	4.00 3.00					170	485 ^{bi}	30	50	
A182 F321	S32100	Max. Min.	0.08	1.00	2.00	0.045	0.030	12.00 9.00	19.00 17.00		*Ti C% *5-0.7				205	515 ^{bi}	30	50	
A182 F347	S34700	Max. Min.	0.08	1.00	2.00	0.045	0.030	13.00 9.00	20.00 17.00				1.10 C*10		205	515 ^{bi}	30	50	
A182 F6aCL1	S41000	Max. Min.	0.15	1.00	1.00	0.040	0.030	0.50	13.50 11.50						275	485	18	35	207 143
A182 F51	S31803	Max. Min.	0.03	1.00	2.00	0.030	0.020	6.50 4.50	23.00 21.00	3.50 2.50				0.20 0.08	450	620	25	45	
A182 F53	S32750	Max. Min.	0.03	0.80	1.20	0.035	0.020	8.00 6.00	26.00 24.00	5.00 3.00	0.50			0.32 0.24	550 ⁽¹⁰⁾	800 ⁽¹⁰⁾	15		310

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 symbol 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

	GROUP 1 MATERIALS			PRODUCT FORMS			
Material Group No.	Nominal Designation Steel	Forgings		Castings		Plates	
		Spec.-Gr.	Notes	Spec.-Gr.	Notes	Spec.-Gr.	Notes
1.1	C-Si	A105		A216-WCB		A515.70	
	C-Mn-Si	A350-LF2				A516.70	
	3 1/2 Ni	A350-LF3					
1.2	C-Mn-Si			A216-WCC			
				A352-LCC			
	2 1/2 Ni			A352-LC2		A203-B	
	3 1/2 Ni			A352-LC3		A203-E	
1.3	C-Si			A352-LCB (1)		A515-65	
	C-Mn-Si					A516-65	
	2 1/2 Ni					A203-A	
	3 1/2 Ni					A203-D	
1.4	C-Si	A350-LF1 CL.1				A515 60	
	C-Mn-Si					A516-60	
1.5	C-1/2 Mo	A182-F1				A204-A	
						A204-B	
1.7	1/2Cr-1/2Mo	A182-F2					
	Ni-1/2Cr-1/2Mo			A217-WC4			
	3/4Ni-3/4Cr-1Mo			A217-WC5			
1.9	1/4Cr-1/2Mo			A217-WC6			
	1 1/4Cr-1/2Mo-Si	A182-11 CL.2				A378-11 CL.2	
1.10	2 1/4Cr-1Mo	A182-F22 CL.3		A217-WC9		A378-22 CL.2	
1.13	5 Cr-1/2Mo	A181-F5a		A217-C5			
1.14	9 Cr-1 Mo	A182-F9		A217-C12			

	GROUP 2 MATERIALS		PRODUCT FORMS	
	Nominal Designation Steel	Forgings	Castings	Plates
2.1	18 Cr-8Ni	A182-F304	A351-CF3	A240-304
		A182-F304H	A351-CF8	A240-304H
			A351-CF3M	
2.2	16 Cr-12 Ni-2 Mo	A182-F316		A240-316
		A182-F316H	A351-CF8M	A240-316H
	18 Cr-13 Ni-3 Mo	A182-F317		A240-317
2.3	19 Cr-10 Ni-3 Mo		A351-CG8M	
2.4	18 Cr-8 Ni	A182-F304L		A240-304L
	16 Cr-12 Ni-2 Mo	A182-F316L		A240-316L
	18 Cr-10 Ni-Ti	A182-F321		A240-321
2.5		A182-F321H		A240-321H
	18 Cr-10 Ni-Cb	A182-F347		A240-347
		A182-F347H		A240-347H
2.6		A182-F348		A240-348
		A182-F348H		A240-348H
2.7	23 Cr-12 Ni			A240-309H
	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 between the producer and the purchaser. In that case the total amount of REM shall be determined and reported.

4) Grades F304, F304L, F316, and F316L shall have a nitrogen content of 0.10%

5) Grade F321 shall have a titanium 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.

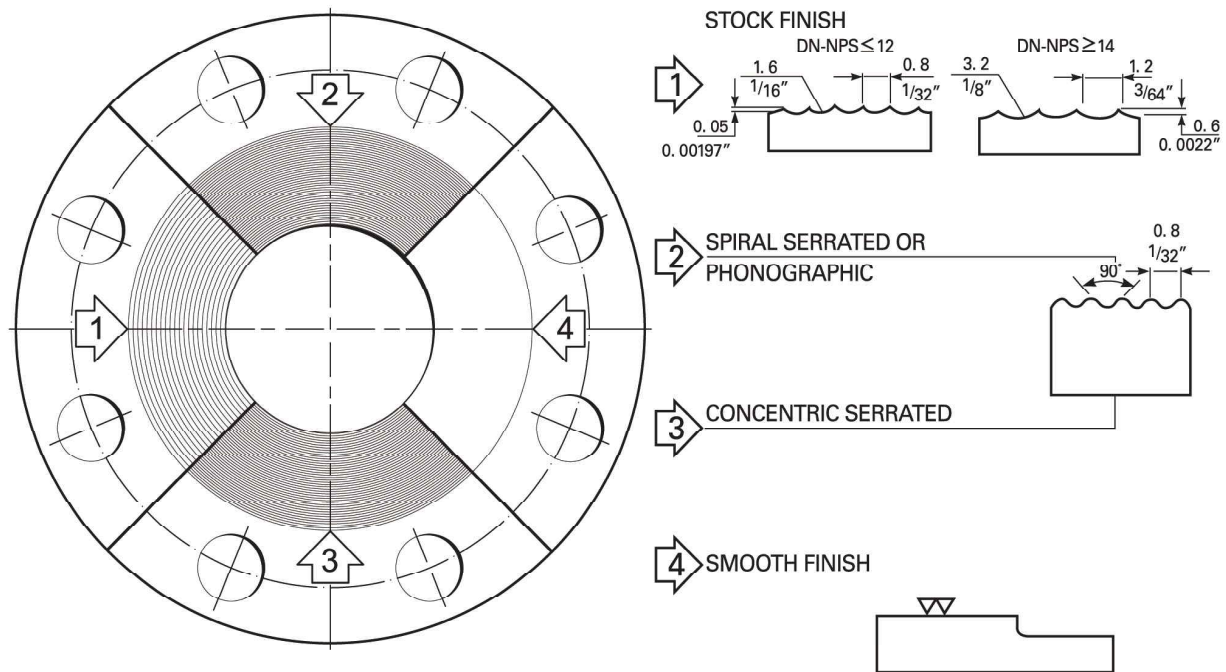
8) For sections over 5 in.(130mm) in thickness, the minimum tensile strength shall be 70 ksi(485 Mpa)

9) For sections over 5 in.(130mm) in thickness, the minimum tensile strength shall be 65 ksi(450 Mpa)

10) For sections over 2 in.(50mm) in thickness, the minimum tensile strength shall be 106 ksi(730 Mpa); the minimum yield strength shall be 75 ksi(515 Mpa)

STANDARD FINISH

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 (ASME B16.5 para 6.4.5)

1. RAISED FACE, AND LARGE MALE AND FEMALE

Either a serrated-concentric or serrated-spiral finish having from 3.2 to 6.3μ (125 to 250μ in) average roughness shall be furnished. The cutting tool employed should have an approximate 0.06 inch (1.5 mm) or larger radius. The resultant surface finish shall have a 125μ inch (3.2μ m) to 500μ inch (12.5μ m) approximate roughness.

2. TONGUE AND GROOVE, AND SMALL MALE AND FEMALE

The gasket contact surface finish shall not exceed 125μ inch (3.2μ m) roughness.

3. RING JOINT

The side wall surface finish of the gasket groove shall not exceed 63μ inch (1.6μ m) 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 inch 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 depressed center is not required.